Chronic Disease and Health Promotion Adapted From the *MMWR*

Tobacco Topics 1990–1999

CDC
CENTERS FOR DISEASE CONTROL
AND PREVENTION

Chronic Disease and Health Promotion Adapted From the MMWR

Tobacco Topics 1990–1999

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention
National Center for Chronic Disease and Health Promotion
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Note to the reader:

The articles printed in this volume correct a handful of errors that were printed in the *MMWR* and subsequently pointed out in errata notices in later issues (as noted in the table of contents here). The articles are otherwise reprinted exactly as they appeared in the *MMWR*.

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The following *MMWR Surveillance Summaries* and *MMWR Reports and Recommendations* were published during 1990–1999 but are not included in this volume because of their length. They may be found by searching on the CDC website (http://www.cdc.gov/epo/tobacco/mmwr).

State Laws on Tobacco Control — United States, 1998. MMWR 1999; 48(SS-3): 21–62

Youth Risk Behavior Surveillance — United States, 1997. MMWR 1998; 47(SS-3):1–89

State- and Sex-Specific Prevalence of Selected Characteristics — Behavioral Risk Factor Surveillance System, 1994 and 1995. MMWR 1997;46(SS-3).

Youth Risk Behavior Surveillance — United States, 1995. MMWR 1996; 45(SS-4): 1–83

State Laws on Tobacco Control — United States, 1995. MMWR 1995; 44(SS-6):1–28

Youth Risk Behavior Surveillance — United States, 1993. MMWR 1995; 44(SS-01):1–55

Surveillance for Selected Tobacco-Use Behaviors — United States, 1900–1994. MMWR 1994;43(SS-3)

Surveillance for Smoking-Attributable Mortality and Years of Potential Life Lost, by State — United States, 1990. MMWR 1994; 43(SS-1):1–8

Guidelines for School Health Programs to Prevent Tobacco Use and Addiction. MMWR 1994;43(RR-2):1–18

State Tobacco Prevention and Control Activities: Results of the 1989–1990 Association of State and Territorial Health Officials (ASTHO) Survey Final Report. MMWR 1991; 40(RR-11):1–41

Part One: Adult Prevalence and Cessation

State-Specific Prevalence of Current Cigarette and Cigar Smoking Among Adults — United States, 1998

Each year, cigarette smoking causes an estimated 430,000 deaths in the United States *(1)*. In addition, the health risks for smoking cigars, which include mouth, throat, and lung cancers, are well documented *(2)*. This report summarizes the findings from the 1998 Behavioral Risk Factor Surveillance System (BRFSS) on the prevalence of current cigarette and cigar smoking in the 50 states and the District of Columbia. The findings indicate that state-specific cigarette smoking prevalence among adults aged $\geq$18 years varied twofold and having ever smoked a cigar (i.e., ever cigar smoking) varied nearly fourfold.

BRFSS is a state-based, random-digit–dialed telephone survey of the civilian, noninstitutionalized U.S. population aged $\geq$18 years. To determine current cigarette smoking, respondents were asked "Have you ever smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Current cigarette smokers were defined as persons who reported having smoked at least 100 cigarettes during their lifetime and who currently smoke every day or some days. For cigar smoking (i.e., large cigars, cigarillos, and small cigars), respondents were asked "Have you ever smoked a cigar, even just a few puffs?" and "When was the last time you smoked a cigar?" Ever cigar smoking was defined as ever having smoked a cigar, even just a few puffs. Past month cigar smoking was defined as smoking a cigar within the previous month. Estimates were weighted to represent the populations of each state; because BRFSS data are state-specific, median values, rather than a national average, are reported.

During 1998, the median prevalence of current cigarette smoking was 22.9% (Table 1); state-specific prevalences ranged from 14.2% (Utah) to 30.8% (Kentucky). Range endpoints were higher for men (15.9%–36.5%) than for women (12.5%–28.5%). Median prevalence also was higher for men (25.3%) than for women (21.0%). Current cigarette smoking was highest in Kentucky (30.8%), Nevada (30.4%), West Virginia (27.9%), Michigan (27.4%), and South Dakota (27.3%). Current smoking prevalence was highest for men in South Dakota (36.5%) and for women in Kentucky (28.5%). Current smoking prevalence was lowest for both men (15.9%) and women (12.5%) in Utah.

The median prevalence of ever cigar smoking was 39.0% (Table 2); state-specific prevalences ranged from 14.8% (Arizona) to 52.0% (Alaska). The median prevalence of past month cigar smoking was 5.2%; state-specific prevalences ranged from 1.4% (Arizona) to 7.4% (Nevada). Range endpoints were higher for men than for women for both ever cigar smoking (23.1%–76.7% compared with 6.9%–26.0%) and past month cigar smoking (2.9–13.2% compared with 0.1–2.9%). Median prevalence rates for ever cigar smoking (67.4% compared with 15.8%) and past month cigar smoking (9.7% compared with 1.3%) also were higher for men than for women. Ever cigar smoking rates were highest in Alaska (52.0%), Wisconsin (49.7%), Nevada (48.6%), Michigan (47.9%), and Oregon (46.7). Ever cigar smoking was highest for men in Wisconsin (76.7%) and for women in Alaska (26.0%). Past month cigar smoking was highest in Nevada (7.4%), Indiana (7.3%), Illinois (7.1%), Michigan (6.9%), and New Jersey (6.6%). Past month cigar smoking was highest for men in Indiana (13.2%) and for women in Nevada (2.9%).

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TABLE 1. Prevalence of current cigarette smoking* among adults, by state and sex — United States, Behavioral Risk Factor Surveillance System, 1998

State	Men %	Men (95% CI†)	Women %	Women (95% CI)	Total %	Total (95% CI)
Alabama	27.2	(±3.5)	22.3	(±2.5)	**24.6**	**(±2.1)**
Alaska	28.3	(±3.9)	23.5	(±3.4)	**26.0**	**(±2.6)**
Arizona	24.7	(±4.0)	19.2	(±3.3)	**21.9**	**(±2.6)**
Arkansas	28.6	(±3.0)	23.7	(±2.2)	**26.0**	**(±1.8)**
California	21.9	(±2.2)	16.6	(±1.7)	**19.2**	**(±1.4)**
Colorado	26.4	(±3.6)	19.5	(±2.6)	**22.8**	**(±2.2)**
Connecticut	21.7	(±3.3)	20.6	(±2.3)	**21.1**	**(±2.0)**
Delaware	27.3	(±4.1)	21.9	(±2.8)	**24.5**	**(±2.4)**
District of Columbia	24.5	(±4.4)	19.0	(±3.1)	**21.6**	**(±2.6)**
Florida	23.5	(±2.2)	20.6	(±1.6)	**22.0**	**(±1.4)**
Georgia	28.0	(±3.4)	19.7	(±2.3)	**23.7**	**(±2.0)**
Hawaii	22.3	(±3.6)	16.7	(±2.7)	**19.5**	**(±2.3)**
Idaho	21.9	(±2.2)	18.8	(±1.7)	**20.3**	**(±1.4)**
Illinois	26.0	(±2.7)	20.6	(±2.3)	**23.1**	**(±1.8)**
Indiana	29.6	(±3.2)	22.7	(±2.4)	**26.0**	**(±2.0)**
Iowa	25.8	(±2.7)	21.1	(±2.0)	**23.4**	**(±1.7)**
Kansas	23.0	(±2.5)	19.5	(±1.9)	**21.2**	**(±1.5)**
Kentucky	33.3	(±2.8)	28.5	(±2.0)	**30.8**	**(±1.7)**
Louisiana	28.2	(±3.9)	23.1	(±3.0)	**25.5**	**(±2.4)**
Maine	21.2	(±3.5)	23.5	(±3.2)	**22.4**	**(±2.4)**
Maryland	24.3	(±3.2)	20.6	(±2.4)	**22.4**	**(±2.0)**
Massachusetts	22.5	(±2.5)	19.5	(±1.9)	**20.9**	**(±1.6)**
Michigan	30.3	(±3.1)	24.8	(±2.4)	**27.4**	**(±2.0)**
Minnesota	19.7	(±1.9)	16.4	(±1.7)	**18.0**	**(±1.3)**
Mississippi	26.9	(±3.4)	21.7	(±2.4)	**24.1**	**(±2.0)**
Missouri	29.4	(±3.2)	23.6	(±2.3)	**26.3**	**(±2.0)**
Montana	21.5	(±3.0)	21.5	(±2.9)	**21.5**	**(±2.1)**
Nebraska	25.2	(±2.8)	19.1	(±2.1)	**22.1**	**(±1.8)**
Nevada	32.6	(±4.6)	28.1	(±4.7)	**30.4**	**(±3.2)**
New Hampshire	25.7	(±4.0)	21.0	(±3.3)	**23.3**	**(±2.5)**
New Jersey	20.9	(±3.0)	17.6	(±2.2)	**19.2**	**(±1.9)**
New Mexico	25.1	(±2.4)	20.2	(±2.0)	**22.6**	**(±1.5)**
New York	25.9	(±3.1)	22.9	(±2.5)	**24.3**	**(±2.0)**
North Carolina	27.4	(±3.6)	22.3	(±2.6)	**24.7**	**(±2.2)**
North Dakota	21.8	(±3.1)	18.3	(±2.6)	**20.0**	**(±2.0)**
Ohio	29.7	(±3.6)	23.0	(±2.7)	**26.2**	**(±2.3)**
Oklahoma	26.7	(±3.2)	21.1	(±2.3)	**23.8**	**(±2.0)**
Oregon	21.6	(±3.4)	20.6	(±2.7)	**21.1**	**(±2.2)**
Pennsylvania	24.0	(±2.5)	23.6	(±2.1)	**23.8**	**(±1.6)**
Rhode Island	24.1	(±2.5)	21.5	(±1.9)	**22.7**	**(±1.6)**
South Carolina	29.8	(±3.0)	20.2	(±2.0)	**24.7**	**(±1.8)**
South Dakota	36.5	(±3.6)	18.5	(±2.4)	**27.3**	**(±2.3)**
Tennessee	30.3	(±3.2)	22.4	(±2.2)	**26.1**	**(±1.9)**
Texas	25.3	(±2.4)	18.9	(±1.6)	**22.0**	**(±1.4)**
Utah	15.9	(±2.5)	12.5	(±2.0)	**14.2**	**(±1.6)**
Vermont	23.6	(±2.7)	21.0	(±2.3)	**22.3**	**(±1.8)**
Virginia	25.8	(±3.1)	20.2	(±2.4)	**22.9**	**(±1.9)**
Washington	22.4	(±2.4)	20.3	(±2.1)	**21.4**	**(±1.6)**
West Virginia	29.6	(±3.3)	26.4	(±2.5)	**27.9**	**(±2.0)**
Wisconsin	24.0	(±3.4)	22.9	(±3.2)	**23.4**	**(±2.3)**
Wyoming	23.9	(±3.1)	21.7	(±2.3)	**22.8**	**(±1.9)**
Range	*15.9–36.5*		*12.5–28.5*		***14.2–30.8***	
Median	*25.3*		*21.0*		***22.9***	

* Persons aged ≥18 years who reported having smoked ≥100 cigarettes and who reported smoking every day and some days.
† Confidence interval.

TABLE 2. Prevalence of cigar smoking among adults, by state and sex — United States, Behavioral Risk Factor Surveillance System, 1998

	Ever cigar smoking*						Past month cigar smoking[†]					
	Men		Women		Total		Men		Women		Total	
State	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Alabama	65.8	(±3.9)	18.4	(±2.5)	40.8	(±2.5)	11.2	(±2.6)	2.0	(±0.9)	6.3	(±1.3)
Alaska	75.4	(±4.0)	26.0	(±3.6)	52.0	(±3.1)	9.9	(±2.8)	2.0	(±1.2)	6.1	(±1.6)
Arizona	23.1	(±3.7)	6.9	(±2.1)	14.8	(±2.1)	2.9	(±1.6)	0.1	(±0.1)	1.4	(±0.8)
Arkansas	60.9	(±3.2)	13.0	(±1.8)	35.6	(±2.0)	9.8	(±2.2)	1.4	(±0.7)	5.4	(±1.1)
California	63.0	(±2.5)	20.7	(±1.8)	41.7	(±1.7)	10.1	(±1.5)	1.8	(±0.6)	5.9	(±0.8)
Colorado	66.9	(±3.8)	22.4	(±2.9)	44.2	(±2.6)	8.2	(±2.0)	0.9	(±0.6)	4.4	(±1.0)
Connecticut	56.8	(±3.6)	13.0	(±2.0)	33.8	(±2.3)	9.7	(±2.2)	1.2	(±0.6)	5.2	(±1.1)
Delaware	52.3	(±4.4)	9.0	(±1.8)	29.6	(±2.6)	9.8	(±3.3)	0.5	(±0.3)	4.9	(±1.6)
District of Columbia	32.3	(±4.8)	10.5	(±2.4)	20.6	(±2.6)	7.1	(±2.5)	1.0	(±0.8)	3.8	(±1.2)
Florida	59.4	(±2.6)	15.8	(±1.6)	36.6	(±1.6)	10.8	(±1.7)	2.1	(±0.6)	6.2	(±0.9)
Georgia	64.7	(±3.9)	19.0	(±2.4)	40.9	(±2.4)	10.5	(±2.2)	1.8	(±1.0)	5.9	(±1.2)
Hawaii	53.6	(±4.3)	11.6	(±2.1)	32.8	(±2.6)	6.6	(±1.9)	0.8	(±0.6)	3.7	(±1.0)
Idaho	64.5	(±2.4)	18.3	(±1.6)	40.9	(±1.6)	7.2	(±1.3)	1.6	(±0.6)	4.3	(±0.7)
Illinois	68.9	(±4.2)	18.4	(±3.1)	41.8	(±2.9)	13.1	(±2.9)	2.0	(±1.6)	7.1	(±1.6)
Indiana	72.6	(±3.1)	18.3	(±2.2)	44.2	(±2.2)	13.2	(±2.4)	2.0	(±0.8)	7.3	(±1.2)
Iowa	73.5	(±2.7)	18.0	(±1.9)	44.4	(±1.9)	9.7	(±1.9)	1.3	(±0.5)	5.2	(±1.0)
Kansas	49.8	(±2.9)	12.5	(±1.6)	30.5	(±1.8)	5.4	(±1.2)	0.5	(±0.3)	2.8	(±0.6)
Kentucky	67.5	(±2.8)	11.7	(±1.4)	38.2	(±1.9)	10.4	(±2.1)	1.1	(±0.6)	5.5	(±1.1)
Louisiana	57.6	(±4.4)	12.4	(±2.4)	33.8	(±2.7)	7.8	(±2.2)	0.8	(±0.6)	4.1	(±1.1)
Maine	56.9	(±4.3)	14.2	(±2.8)	34.6	(±2.7)	7.3	(±2.4)	1.3	(±1.2)	4.1	(±1.3)
Maryland	53.7	(±3.6)	15.5	(±2.1)	33.7	(±2.2)	8.8	(±2.2)	1.6	(±1.0)	5.0	(±1.2)
Massachusetts	60.8	(+2.9)	17.1	(±2.1)	37.8	(±1.9)	11.2	(±1.8)	1.2	(±0.6)	5.9	(±0.9)
Michigan	74.5	(±3.0)	23.6	(±2.4)	47.9	(±2.2)	12.1	(±2.2)	2.2	(±0.8)	6.9	(±1.2)
Minnesota	45.3	(±2.4)	16.1	(±1.7)	30.3	(±1.5)	7.5	(±1.3)	1.3	(±0.5)	4.3	(±0.7)
Mississippi	66.1	(±3.6)	14.3	(±2.0)	38.6	(±2.3)	9.5	(±2.4)	1.0	(±0.6)	5.0	(±1.2)
Missouri	69.0	(±3.0)	18.2	(±2.1)	42.2	(±2.2)	10.9	(±2.3)	2.1	(±1.0)	6.2	(±1.2)
Montana	68.7	(±3.4)	16.9	(±2.5)	42.1	(±2.5)	8.2	(±2.0)	0.2	(±0.2)	4.1	(±1.0)
Nebraska	70.4	(±3.5)	20.0	(±2.2)	44.2	(±2.2)	9.5	(±2.0)	1.3	(±0.6)	5.2	(±1.0)
Nevada	71.1	(±4.3)	25.6	(±4.5)	48.6	(±3.3)	11.9	(±2.9)	2.9	(±1.4)	7.4	(±1.6)
New Hampshire	66.8	(±4.0)	15.9	(±3.0)	40.6	(±2.9)	10.7	(±3.2)	1.5	(±1.0)	5.9	(±1.6)
New Jersey	54.3	(±3.7)	15.1	(±2.2)	33.8	(±2.2)	12.5	(±2.4)	1.3	(±0.7)	6.6	(±1.2)
New Mexico	68.6	(±2.6)	20.0	(±1.9)	43.6	(±1.8)	7.7	(±1.5)	0.9	(±0.4)	4.2	(±0.8)
New York	54.4	(±3.5)	15.2	(±2.1)	33.6	(±2.2)	12.1	(±2.4)	1.0	(±0.5)	6.2	(±1.2)
North Carolina	61.0	(±4.3)	16.2	(±2.5)	37.6	(±2.6)	7.6	(±2.2)	1.6	(±1.0)	4.5	(±1.2)
North Dakota	68.1	(±3.6)	15.7	(±2.6)	41.5	(±2.6)	7.0	(±1.9)	1.0	(±0.8)	4.0	(±1.0)
Ohio	65.7	(±3.7)	14.8	(±2.2)	39.0	(±2.5)	10.0	(±2.5)	1.8	(±1.0)	5.7	(±1.3)
Oklahoma	35.4	(±3.4)	12.7	(±1.9)	23.6	(±2.0)	3.5	(±1.4)	1.2	(±0.7)	2.3	(±0.8)
Oregon	72.5	(±3.6)	22.3	(±2.7)	46.7	(±2.6)	8.8	(±2.3)	1.1	(±0.6)	4.8	(±1.2)
Pennsylvania	60.0	(±2.9)	14.3	(±1.7)	35.8	(±1.8)	11.9	(±2.0)	1.9	(±0.7)	6.5	(±1.0)
Rhode Island	59.3	(±2.9)	15.1	(±1.7)	36.0	(±1.8)	10.8	(±1.9)	1.0	(±0.5)	5.5	(±0.9)
South Carolina	60.6	(±3.1)	15.7	(±2.0)	37.1	(±2.0)	10.0	(±1.9)	1.6	(±0.7)	5.6	(±1.0)
South Dakota	66.2	(±3.5)	14.2	(±2.2)	39.5	(±2.4)	9.7	(±2.3)	1.0	(±0.7)	5.2	(±1.2)
Tennessee	46.2	(±3.5)	11.3	(±1.7)	27.8	(±2.0)	7.4	(±1.8)	0.8	(±0.4)	3.9	(±0.9)
Texas	62.9	(±2.6)	16.7	(±1.4)	39.2	(±1.7)	7.5	(±1.1)	1.6	(±0.6)	4.5	(±0.6)
Utah	47.8	(±3.8)	13.4	(±2.0)	30.2	(±2.3)	3.9	(±1.2)	1.1	(±0.7)	2.5	(±0.7)
Vermont	66.8	(±3.0)	17.4	(±2.1)	41.3	(±2.2)	9.6	(±3.1)	0.9	(±0.5)	5.1	(±1.6)
Virginia	65.4	(±3.6)	15.4	(±2.3)	39.6	(±2.5)	10.5	(±2.0)	1.3	(±0.6)	5.7	(±1.0)
Washington	69.7	(±2.6)	22.4	(±2.2)	45.6	(±1.9)	9.0	(±1.7)	1.4	(±0.5)	5.1	(±1.0)
West Virginia	65.9	(±3.3)	15.0	(±2.0)	39.0	(±2.2)	7.1	(±1.8)	1.0	(±0.6)	3.8	(±0.9)
Wisconsin	76.7	(±3.1)	24.6	(±3.1)	49.7	(±2.6)	11.8	(±2.5)	1.6	(±1.0)	6.5	(±1.3)
Wyoming	71.9	(±3.3)	21.6	(±2.3)	46.5	(±2.3)	5.9	(±1.5)	1.2	(±0.8)	3.5	(±0.8)
Range	23.1–76.7		6.9–26.0		14.8–52.0		2.9–13.2		0.1–2.9		1.4–7.4	
Median	64.7		15.8		39.0		9.7		1.3		5.2	

* Persons aged ≥18 years who reported having ever smoked a cigar, even just a few puffs.
[†] Persons aged ≥18 years who reported smoking a cigar within the previous month.
[§] Confidence interval.

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Editorial Note: In 1996, the prevalence of cigarette smoking was added to the list of nationally notifiable health conditions reported by states to CDC *(3)*. Current cigarette smoking has remained relatively stable during the 1990s in most states; however, smoking has declined significantly in Minnesota since 1997 and increased significantly in South Dakota since 1996 *(4)*. Utah is the only state to have achieved the health objective for 2000 to reduce cigarette smoking to a prevalence of no more than 15.0% among persons aged $\geq$18 years (objective 3.4) *(5)*. The wide variation in current cigarette smoking prevalence across states underscores the potential for prevention and the need for continued efforts aimed at reducing tobacco use.

The findings in this report indicate that cigar smoking prevalences by state vary significantly. Despite the health effects associated with cigar smoking, total cigar consumption in the United States was approximately 5.3 billion cigars in 1998 *(6)*. Overall, cigar consumption in the United States declined during the 1970s and 1980s but began increasing in the 1990s *(2)*; however, a 1998 report suggests that the recent growth in cigar sales may have slowed *(7)*.

National surveys have used various questions to ascertain cigar smoking status *(2)*. This variation, combined with the lack of inclusion of cigar smoking questions on most national surveys after 1992, makes comparison of data among national surveys difficult. Questions about cigar smoking were included on the 1998 National Health Interview Survey and will provide more data on national patterns in adult cigar smoking prevalence.

The findings in this report are subject to at least three limitations. First, data are based on self-reports without biochemical verification. Second, the lack of standardized questions for cigar use among surveys limits comparisons between state-specific estimates and national estimates. Third, these prevalence estimates are only for adults and do not include persons aged <18 years. However, to assess adequately the impact of cigarette and cigar smoking, data about the prevalence of youth tobacco use also should be considered. Data on youth cigarette and cigar smoking in 1997 are available through the Youth Risk Behavior Survey *(8,9)*.

Decreases in tobacco use consistent with national health objectives for 2010 are achievable. Given the large differences in current cigarette and cigar smoking rates among states, future state surveys should continue to monitor cigar smoking among adults and youth, and questions should be standardized across surveys. Such information is important to direct policy changes and develop public health initiatives that address the negative health effects of smoking. Monitoring trends of cigarette smoking and the use of other tobacco products also is essential for evaluating state efforts aimed at reducing tobacco-related morbidity and mortality.

CDC recommends that states establish tobacco-control programs that are comprehensive, sustainable, and accountable *(10)*. Guidelines determined by evidence-based analyses of existing comprehensive state tobacco-control programs have been prepared to help states assess options for comprehensive tobacco-control programs and to evaluate local funding priorities. The guidelines provide evidence to support each of nine specific elements of a comprehensive program, including community programs to reduce tobacco use, chronic disease programs to reduce the burden of tobacco-related diseases, school programs, enforcement, statewide programs, counter-marketing, cessation programs, surveillance and evaluation, and administration and management *(10)*.

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Cigarette Smoking Among Adults — United States, 1997

In the United States, cigarette smoking is the leading cause of preventable morbidity and mortality and results in approximately 430,000 deaths each year *(1)*. One of the national health objectives for 2000 is to reduce the prevalence of cigarette smoking among adults to no more than 15% (objective 3.4) *(2)*. To assess progress toward meeting this objective, CDC analyzed self-reported data about cigarette smoking among U.S. adults from the 1997 National Health Interview Survey (NHIS) Sample Adult Core Questionnaire. This report summarizes the findings of this analysis, which indicate that, in 1997, 24.7% of adults were current smokers and that the overall prevalence of current smoking in 1997 was unchanged from the overall prevalence of current smoking from the 1995 NHIS.

The 1997 NHIS Sample Adult questionnaire was administered to a nationally representative sample (n=36,116) of the U.S. noninstitutionalized civilian population aged $\geq$18 years; the overall response rate for the survey was 80.4%. Participants were asked, "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Current smokers were persons who reported having smoked $\geq$100 cigarettes during their lifetime and who smoked every day or some days at the time of the interview. Former smokers were those who had smoked $\geq$100 cigarettes during their lifetime but who did not smoke currently. Attempts to quit were determined by asking current daily smokers, "During the past 12 months, have you stopped smoking for one day or longer because you were trying to stop smoking?" Data were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated using SUDAAN.

In 1997, an estimated 48.0 million (24.7%) adults, including 25.7 million (27.6%) men and 22.3 million (22.1%) women, were current smokers (Table 1). Overall, 20.1% (95% CI=$\pm$ 0.5) of adults were every-day smokers, and 4.4% (95% CI=$\pm$ 0.2) were some-day smokers (every-day smokers constituted 81.9% [95% CI=$\pm$0.9] of all smokers). Prevalence of smoking was highest among persons aged 18–24 years (28.7%) and aged 25–44 years (28.6%) and lowest among persons aged $\geq$65 years (12%). Prevalence of current smoking was significantly higher among American Indians/Alaska Natives (34.1%), non-Hispanic blacks (26.7%), and non-Hispanic whites (25.3%) than among Hispanics (20.4%) or Asians/Pacific Islanders (16.9%). Current smoking prevalence was highest among persons with nine to 11 years of education (35.4%) and lowest among persons with greater than or equal to 16 years of education (11.6%), and was higher among persons living below the poverty level* (33.3%) than among those living at or above the poverty level (24.6%).

In 1997, an estimated 44.3 million adults (22.8% [95% CI=$\pm$ 0.5]) were former smokers, including 25.1 million men and 19.2 women. Former smokers constituted 48.0% (95% CI=$\pm$ 0.9) of persons who had ever smoked at least 100 cigarettes. Among current daily smokers in 1997, an estimated 16.0 million (40.7% [95% CI=$\pm$ 1.4]) had stopped smoking for at least 1 day during the preceding 12 months.

Reported by: Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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* Published 1996 poverty thresholds from the Bureau of the Census are used in these calculations.

TABLE 1. Percentage of persons aged ≥18 years who were current smokers,* by selected characteristics — United States, National Health Interview Survey, 1997

Characteristics	Men (n=15,361) %	(95% CI†)	Women (n=20,455) %	(95% CI)	Total (n=35,816) %	(95% CI)
Race/Ethnicity§						
White, non-Hispanic	27.4	(± 1.0)	23.3	(±0.8)	25.3	(±0.7)
Black, non-Hispanic	32.1	(± 2.4)	22.4	(±1.7)	26.7	(±1.4)
Hispanic	26.2	(± 2.1)	14.3	(±1.4)	20.4	(±1.4)
American Indian/ Alaska Native¶	37.9	(±13.7)	31.3	(±8.8)	34.1	(±7.7)
Asian/Pacific Islander	21.6	(± 4.4)	12.4	(±3.5)	16.9	(±2.7)
Education (yrs)						
≤8	29.9	(± 3.0)	15.1	(±2.2)	22.5	(±1.9)
9–11	41.3	(± 3.1)	30.5	(±2.4)	35.4	(±2.0)
12	31.8	(± 1.7)	25.7	(±1.3)	28.4	(±1.0)
13–15	27.4	(± 1.7)	23.1	(±1.4)	25.1	(±1.1)
≥16	13.0	(± 1.2)	10.1	(±1.0)	11.6	(±0.8)
Age group (yrs)						
18–24	31.7	(± 2.8)	25.7	(±2.4)	28.7	(±1.9)
25–44	31.2	(± 1.3)	26.1	(±1.1)	28.6	(±0.8)
45–64	27.6	(± 1.5)	21.5	(±1.3)	24.4	(±1.0)
≥65	12.8	(± 1.4)	11.5	(±1.1)	12.0	(±0.9)
Poverty status††						
At or above	27.3	(± 1.0)	21.8	(±0.8)	24.6	(±0.7)
Below	38.7	(± 2.8)	29.8	(±1.9)	33.3	(±1.7)
Unknown	23.4	(± 2.0)	18.2	(±1.5)	20.5	(±1.2)
Total	**27.6**	**(± 0.9)**	**22.1**	**(±0.7)**	**24.7**	**(±0.6)**

* Persons who reported having smoked ≥100 cigarettes during their lifetime and who reported now smoking every day or some days. Excludes 300 respondents for whom smoking status was unknown.
† Confidence interval.
§ Excludes 74 respondents of unknown, multiple, and other racial/ethnic categories.
¶ Wide variances on estimates reflect the small sample sizes.
** Persons aged ≥25 years. Excludes 305 persons with unknown years of education.
†† Published 1996 poverty thresholds from the Bureau of the Census are used in these calculations.

Editorial Note: The prevalence of smoking among adults aged ≥18 years in 1997 was similar to that in 1995 (3). The findings in this report suggest that the goal of reducing the prevalence of cigarette smoking among adults ≤15% by 2000 will not be attained. The 1997 NHIS data also demonstrate substantial differences in smoking prevalence across populations and suggest that prevalence may be increasing among young adults.

In 1997, smoking prevalence among persons aged 18–24 years was as high as the prevalence among persons aged 25–44 years. Historically, smoking prevalence has been highest among persons aged 25–44 years and significantly lower among persons aged 18–24 years. In addition, the data show a generally higher (although not statistically significant) prevalence among persons aged 18–24 years in 1997 than in 1995. Smoking prevalence among persons aged 25–44 years remained essentially unchanged from 1995 through 1997.

Increased smoking prevalence among persons aged 18–24 years was reported in a recent study from a nationally representative sample of approximately 15,000 students at 116 four-year colleges (4). Among these college students, the prevalence of current smoking increased from 22.3% in 1993 to 28.7% in 1997. If high school students retain their smoking behavior as they enter young adulthood, the increases documented in recent NHIS surveys may reflect the increased prevalence among high school students in recent years and the aging of this cohort into young adulthood. Alternatively, the increase may indicate increased initiation of smoking among young adults (5). Additional surveillance data are needed to clarify these patterns.

The high prevalence of smoking among persons aged 18–24 years indicates a need to focus tobacco-use treatment interventions on this age group. Interventions for young adults before they become addicted may be critical in reducing tobacco use among young adults. However, only one third of college

students aged 18–24 years reported receiving tobacco use prevention information at their educational institution *(6)*.

Smoking prevalence reported for racial/ethnic subgroups showed few changes from 1995 *(3)* through 1997. Among Asian/Pacific Islander women, smoking prevalence increased from 4.3% in 1995 to 12.4% in 1997. However, the sample size for Asian/Pacific Islander women was small. In addition, there were procedural changes in the NHIS survey design and changes in the questions defining racial/ethnic groups. Therefore, these data should be interpreted with caution.

The findings in this report are subject to at least two limitations. First, the questionnaire for the 1997 NHIS was completely redesigned. Although the smoking questions remained unchanged, their context changed substantially; therefore, trend analysis or comparison of data from the 1997 NHIS with data from prior years must be conducted with caution. Second, the sample size of certain subgroups was small, potentially creating unstable estimates.

To reduce the prevalence of smoking among adults, public health programs should include smoking cessation interventions. Before 1999, tobacco-control programs did not specifically include cessation as a major feature, but concentrated on policy interventions and the prevention of the initiation of tobacco use. Although preventing tobacco use among adolescents is critical to the long-term success of tobacco-control goals, reductions in morbidity and mortality in the short term can only be achieved by helping current smokers quit. To assist in this process, *Smoking Cessation: Clinical Practice Guideline* includes recommendations for a multifaceted approach to treating nicotine dependence *(7)*. This guideline has specific recommendations for three major target audiences: primary-care clinicians; tobacco cessation specialists and programs; and health-care administrators, insurers, and purchasers. CDC includes cessation as one of the nine core elements for tobacco control *(8)*. In addition, CDC's National Tobacco Control Program includes promoting cessation among adults as one of its four goals. The other three goals are preventing smoking initiation, reducing exposure to environmental tobacco smoke, and eliminating disparities among various populations in the health effects of tobacco use.

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Tobacco Use — United States, 1900–1999

   Smoking—once a socially accepted behavior—is the leading preventable cause of death and disability in the United States. During the first decades of the 20th century, lung cancer was rare; however, as cigarette smoking became increasingly popular, first among men and later among women, the incidence of lung cancer became epidemic (Figure 1). In 1930, the lung cancer death rate for men was 4.9 per 100,000; in 1990, the rate had increased to 75.6 per 100,000 *(1)*. Other diseases and conditions now known to be caused by tobacco use include heart disease, atherosclerotic peripheral vascular disease, laryngeal cancer, oral cancer, esophageal cancer, chronic obstructive pulmonary disease, intrauterine growth retardation, and low birthweight. During the latter part of the 20th century, the adverse health effects from exposure to environmental tobacco smoke also were documented. These include lung cancer, asthma, respiratory infections, and decreased pulmonary function *(2)*.

   Large epidemiologic studies conducted by Ernst Wynder (see box) and others in the 1940s and 1950s linked cigarette smoking and lung cancer. In 1964, on the basis of approximately 7000 articles relating to smoking and disease, the Advisory Committee to the U.S. Surgeon General concluded that cigarette smoking is a cause of lung and laryngeal cancer in men, a probable cause of lung cancer in women, and the most important cause of chronic bronchitis in both sexes *(3)*. The committee stated that "Cigarette smoking is a health hazard of sufficient importance in the United States to warrant appropriate remedial action." Substantial public health efforts to reduce the prevalence of tobacco use began shortly after the risk was described in 1964. With the subsequent decline in smoking, the incidence of smoking-related cancers (including cancers of the lung, oral cavity, and pharynx) have also declined (with the exception of lung cancer among women) *(4)*. In addition, age-adjusted death rates per 100,000 persons (standardized to the 1940 population) for heart disease (i.e., coronary heart disease) have decreased from 307.4 in 1950 to 134.6 in 1996 *(4)*. During 1964–1992, approximately 1.6 million deaths caused by smoking were prevented *(5)*.

Smoking Trends During the Century

   Early in the 20th century, several events coincided that contributed to increases in annual per capita consumption, including the introduction of blends and curing processes that allowed the inhalation of tobacco, the invention of the safety match, improvements in mass production, transportation that permitted widespread distribution of cigarettes, and use of mass media advertising to promote cigarettes *(6,7)*. Cigarette smoking among women began to increase in the 1920s when targeted industry marketing and social changes reflecting the liberalization of women's roles and behavior led to the increasing acceptability of smoking among women *(8,9)*. Annual per capita cigarette consumption increased from 54 cigarettes in 1900 to 4345 cigarettes in 1963 and then decreased to 2261 in 1998 *(10,11)*. Some decreases correlate with events, such as the first research suggesting a link between smoking and cancer in the 1950s, the 1964 Surgeon General's report, the 1968 Fairness Doctrine, and increased tobacco taxation and industry price increases during the 1980s (Figure 1).

   An important accomplishment of the second half of the 20th century has been the reduction of smoking prevalence among persons aged ≥18 years from 42.4% in 1965 to 24.7% in 1997, with the rate for men (27.6%) higher than for women (22.1%) (Figure 2). The percentage of adults who never smoked increased from 44% in the mid-1960s to 55% in 1997. In 1998, tobacco use varied within and among racial/ethnic groups. The prevalence of smoking was highest among American Indians/Alaska Natives,

FIGURE 1. Annual adult per capita cigarette consumption and major smoking and health events — United States, 1900–1998
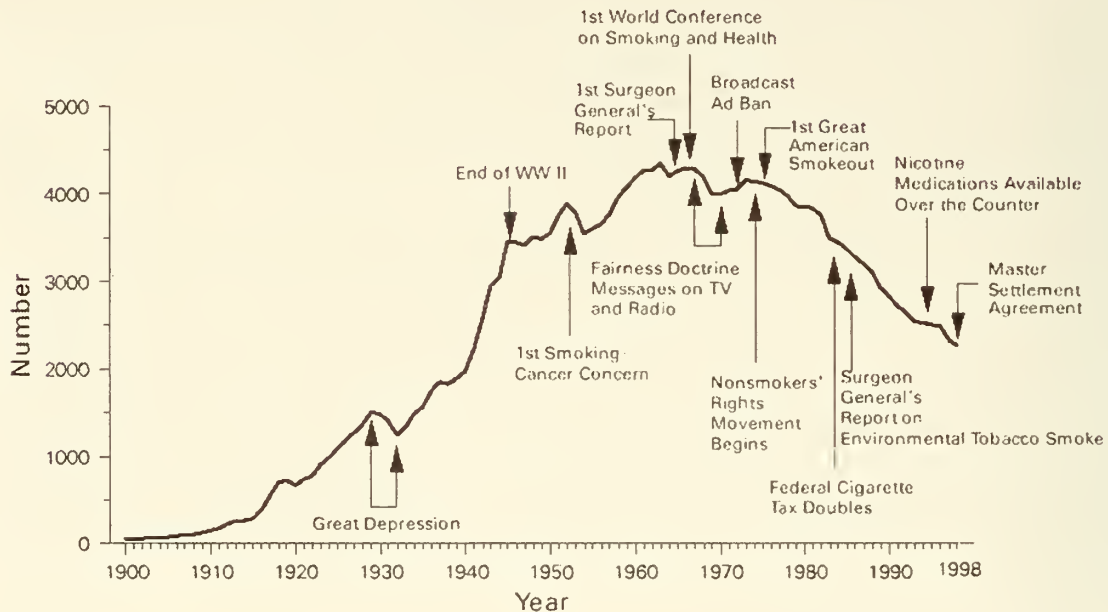
Sources: United State Department of Agriculture; 1986 Surgeon General's Report.

and second highest among black and Southeast Asian men. The prevalence was lowest among Asian American and Hispanic women *(12)*. Smokeless tobacco use has changed little since 1970, with a 5% prevalence in 1970 and a 6% prevalence in 1991 among men, and 2% and 1%, respectively, for women. The prevalence of smokeless tobacco use is highest among high school males, with prevalence being 20% among white males, 6% among Hispanics males, and 4% among blacks males. Prevalence of use tends to be lower in the northeastern region and higher in the southern region of the United States. Total consumption of large cigars decreased from 8 billion in 1970 to 2 billion in 1993 but increased 68% to 3.6 billion in 1997 *(13)*.

Reductions in smoking result from many factors, including scientific evidence of the relation among disease, tobacco use, and environmental exposure to tobacco; dissemination of this information to the public; surveillance and evaluation of prevention and cessation programs; campaigns by advocates for nonsmokers' rights; restrictions on cigarette advertising; counteradvertising; policy changes (i.e., enforcement of minors' access laws, legislation restricting smoking in public places, and increased taxation); improvements in treatment and prevention programs; and an increased understanding of the economic costs of tobacco.

The cigarette itself has changed. When cigarettes were first associated with lung cancer in the early 1950s, most U.S. smokers smoked unfiltered cigarettes. With a growing awareness of the danger of smoking came the first filter, which was designed to reduce the tar inhaled in the smoke. Later, low tar cigarettes were marketed; however, many smokers compensated by smoking more intensely and by blocking the filter's ventilation holes *(13)*. Adenocarcinoma has replaced squamous cell carcinoma as the leading cause of lung cancer-related death in the United States. This increase in adenocarcinoma parallels the changes in cigarette design and smoking behavior *(13)*.

Changes in the social norms surrounding smoking can be documented by examining changes in public policy, including availability of Fairness Doctrine counteradvertising messages on television and

Ernst L. Wynder, M.D.

Although cigarettes were considered a symbol of popularity and social acceptability from the opening of the 20th century, critics warned of the dangers of what they called "coffin nails," or "little white slavers." They implicated cigarettes in cancer, heart disease, and other serious health problems; however, opposition to the cigarette would gain little ground until compelling scientific evidence linked smoking and disease. Researcher, educator, and activist Ernst Wynder, M.D. (April 30, 1922– July 14, 1999), dedicated his career to producing this evidence.

Courtesy American Health Foundation

Ernst Wynder was born in Herford, Germany. His family emigrated to New Jersey in 1938 to escape Nazi persecution. He attended medical school at Washington University, St. Louis, Missouri, and received both a bachelor of science and a medical degree in 1950. Wynder began his lung cancer investigations when he was a medical student. While attending a summer internship at New York University, his curiosity was piqued during the autopsy of a two-pack-a-day smoker who had died from lung cancer. Wynder began collecting case histories of lung cancer victims, first in New York City and then in St. Louis. His research brought him to thoracic surgeon Evarts Graham, who, despite initial skepticism about Wynder's premise (Graham was a heavy smoker), granted access to his extensive case records, and agreed to sponsor the medical student.

In 1950, the *Journal of the American Medical Association* published Wynder and Graham's "Tobacco Smoking as a Possible Etiologic Factor in Bronchiogenic Carcinoma: A Study of 684 Proven Cases." Wynder and Graham's retrospective study was not the first to link smoking and cancer, but its sophisticated design, impressive population size, and unambiguous findings demanded attention and further research. During the next decade, hundreds of reports were published linking cancer and smoking, including large prospective studies, pathologic, and animal investigations. A second effect was to convince doctors that the health risks of smoking were serious. Many gave up the habit, including Graham, who quit smoking in 1952. Too late, it would seem, as he wrote to Wynder in 1957, weeks before the surgeon died from lung cancer.

Wynder devoted his career to the study and prevention of cancer and chronic disease, writing hundreds of scientific papers advocating further research and public education. Through the 1950s and 1960s he worked at the Sloan-Kettering Institute for Cancer Research; in 1969, he founded the American Health Foundation, serving as its medical director. In 1972, the foundation launched *Preventive Medicine*, with Wynder as editor. In 1999, the foundation employed approximately 200 researchers representing medicine, public health, biology, chemistry, nutrition, and behavior science. Wynder endured years of criticism from the tobacco industry and skepticism from many researchers, but he remained determined.
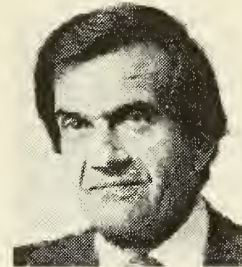
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FIGURE 2. Trends in cigarette smoking* among persons aged ≥18 years, by sex — United States, 1955–1997.
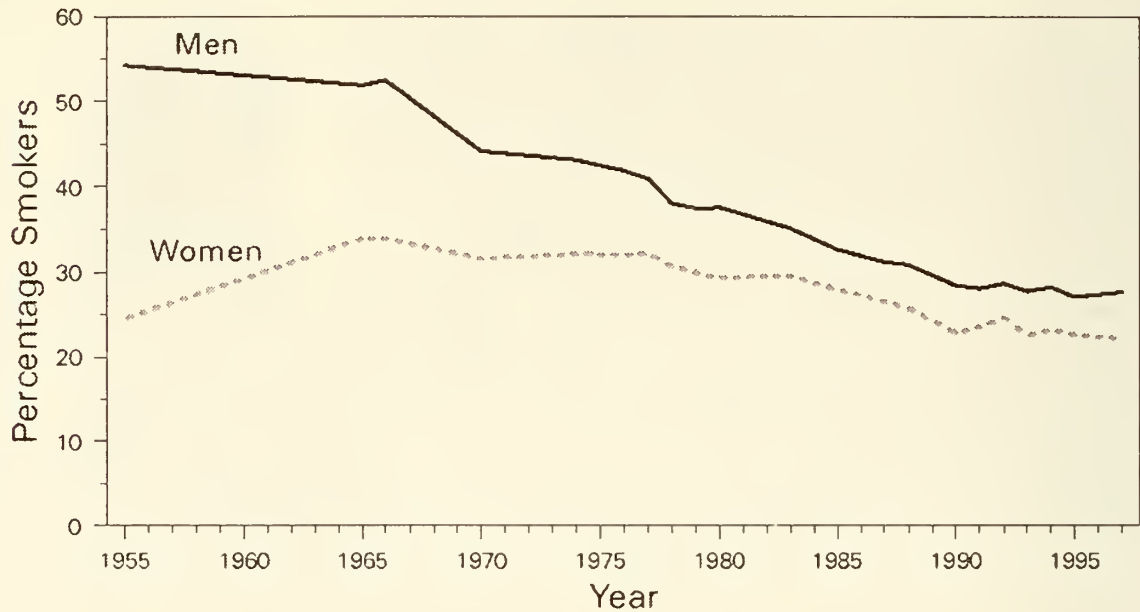
* Before 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes and who currently smoked. Since 1992, current smokers were defined as persons who reported having smoked ≥100 cigarettes during their lifetime and who reported now smoking every day or some days.

Sources: 1955 Current population Survey; 1965–1997 National Health Interview Survey.

radio and increased restrictions on tobacco advertising beginning with the ban on broadcast advertising in 1971. Cigarette advertising no longer appears on television or billboards, and efforts to restrict sales andmarketing to adolescents have increased. Indoor air policies switched from favoring smokers to favoring nonsmokers. Smoking is no longer permitted on airplanes, and many people, including 12.5% of adult smokers with children, do not smoke at home *(14)*. Now 42 states have restrictions on smoking at government work sites and 20 states have restrictions at private work sites.

One of the most effective means of reducing the prevalence of tobacco use is by increasing federal and state excise tax rates. A 10% increase in the price of cigarettes can lead to a 4% reduction in the demand for cigarettes. This reduction is the result of people smoking fewer cigarettes or quitting altogether *(15)*. Studies show that low-income, adolescent, Hispanic, and non-Hispanic black smokers are more likely than others to stop smoking in response to a price increase *(17)*.

The November 1998 Master Settlement Agreement marks the end of the 20th century with an unprecedented event. Although admitting no wrongdoing, the tobacco companies signed an agreement with the attorneys general of 46 states. This agreement settled lawsuits totaling $206 billion; however, the agreement did not require that any of the state money be spent for tobacco use prevention and control. The American Legacy Foundation was established as a result of a provision in the Master Settlement Agreement that called for a foundation with a mandate to conduct effective tobacco education programs based on scientific research.

Future Challenges

Despite the achievements of the 20th century, approximately 48 million U.S. adults smoke cigarettes; half of those who continue to smoke will die from a smoking-related disease. Tobacco use is responsible for approximately 430,000 deaths each year—one of every five. Parallel to the health burden is the economic burden of tobacco use, which amounts to at least $50 billion in medical expenditures and $50 billion in indirect costs. If trends continue, approximately 5 million children living today will die prematurely because as

adolescents they started smoking cigarettes *(16)*. Advances have been made in knowledge of tobacco use and its effect on health; intervention strategies to reduce these effects remain serious challenges.

First, trends from the 1975–1998 Monitoring the Future surveys *(18)* indicate that the 30-day prevalence of tobacco use (smoking on ≥1 of the 30 days before the survey) among high school seniors decreased from the late 1970s to the mid-1980s, and prevalence was approximately 30%; however, during 1991–1997 smoking prevalence increased to 36.5% (Figure 3). Prevalence among high school seniors today is highest among whites and lowest among blacks *(18)*. The recent increases in prevalence highlight the need for a nationwide comprehensive prevention program focused on this age group.

Second, decreasing prevalence among adults since the mid-1960s has not continued (Figure 2). Since 1990, prevalence among both men and women has remained constant (approximately 28.0% for men and approximately 22.5% for women). The stagnation emphasizes the need for policy changes that encourage quitting and for improved access to proven treatment interventions (e.g., Food and Drug Administration-approved pharmacotherapy and behavior counseling).

Third, large differences in tobacco use exist in the United States. For example, in 1997, smoking prevalence was 37.9% among American Indian/Alaska Native men, 32.1% among black men, and 27.6% among white men *(19)*. There are marked differences in deaths from malignant diseases of the respiratory system; the age-adjusted death rates per 100,000 U.S. residents in 1995 were 80.5 among black men and 53.7 among white men *(12)*. Age-adjusted death rates for cerebrovascular disease also reflect the disparity in health outcomes, with the rate being 53.1 per 100,000 among black men and 26.3 among white men *(12)*. No single factor determines the patterns of tobacco use among racial/ethnic groups; these patterns result from complex interactions among multiple factors such as socioeconomic status, cultural characteristics, acculturation, stress, biologic elements, targeted advertising, price of tobacco products, and varying capacities of communities to mount effective tobacco-control initiatives. These disparities in use and adverse health outcomes based on race/ethnicity and socioeconomic status need to be addressed.

FIGURE 3. Trends in cigarette smoking* among 12th graders, by racial/ethnic group — United States, 1977–1998†
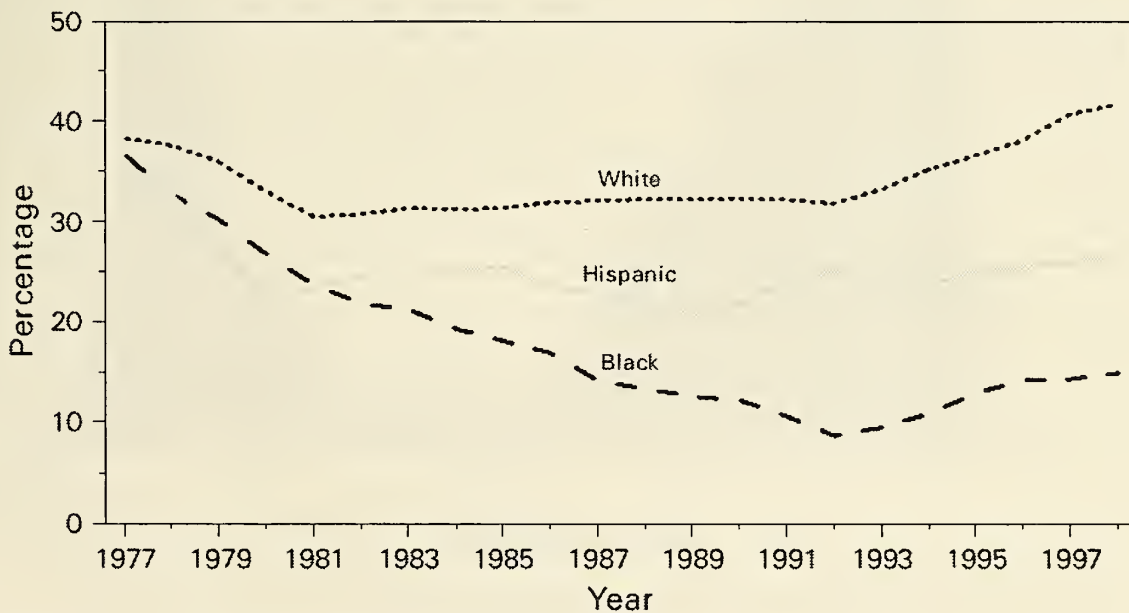
* Smoking on ≥1 of the 30 days before the survey.
† 2-year moving averages are used to stabilize estimates.

Source: University of Michigan, Monitoring the Future project.

    Fourth, exposure to environmental tobacco smoke (ETS) at home and at work is a substantial problem. One study found that 87.9% of children and adult nonusers of tobacco had detectable levels of serum cotinine *(20)*. The distribution of serum cotinine levels is bimodal: one peak for nonsmokers exposed to ETS and a higher one for smokers (Figure 4). Both the number of smokers in the household and the hours exposed at work were associated with increased serum cotinine levels among nonsmokers.

    Fifth, research is needed to determine whether new "highly engineered" products can reduce the harmful effects of tobacco or whether the mistakes associated with low tar and nicotine cigarettes will be repeated *(21)*. Several novel tobacco products, (e.g., bidis from India) appear to be increasing in popularity, but little is known about long-term health effects or about social and other factors associated with their use *(22)*.

    Sixth, a dramatic increase in tobacco use has occurred worldwide. Because of the increase, the World Health Organization (WHO) established the Tobacco Free Initiative, and the World Health Assembly unanimously approved the development of a Framework Convention on Tobacco Control. This WHO effort will promote global cooperation on aspects of tobacco control that transcend national boundaries and will necessitate political action; mobilization of resources; and implementation of national, regional, and global strategies.

    Much remains to be done despite the public health achievements in reducing tobacco use in the 20th century. The American Cancer Society has set goals for 2015 of a 25% reduction in cancer incidence and a

FIGURE 4. Serum cotinine levels among persons aged ≥4 years — United States, third National Health and Nutrition Examination Survey, 1988–1991*

Serum cotinine, ng/mL
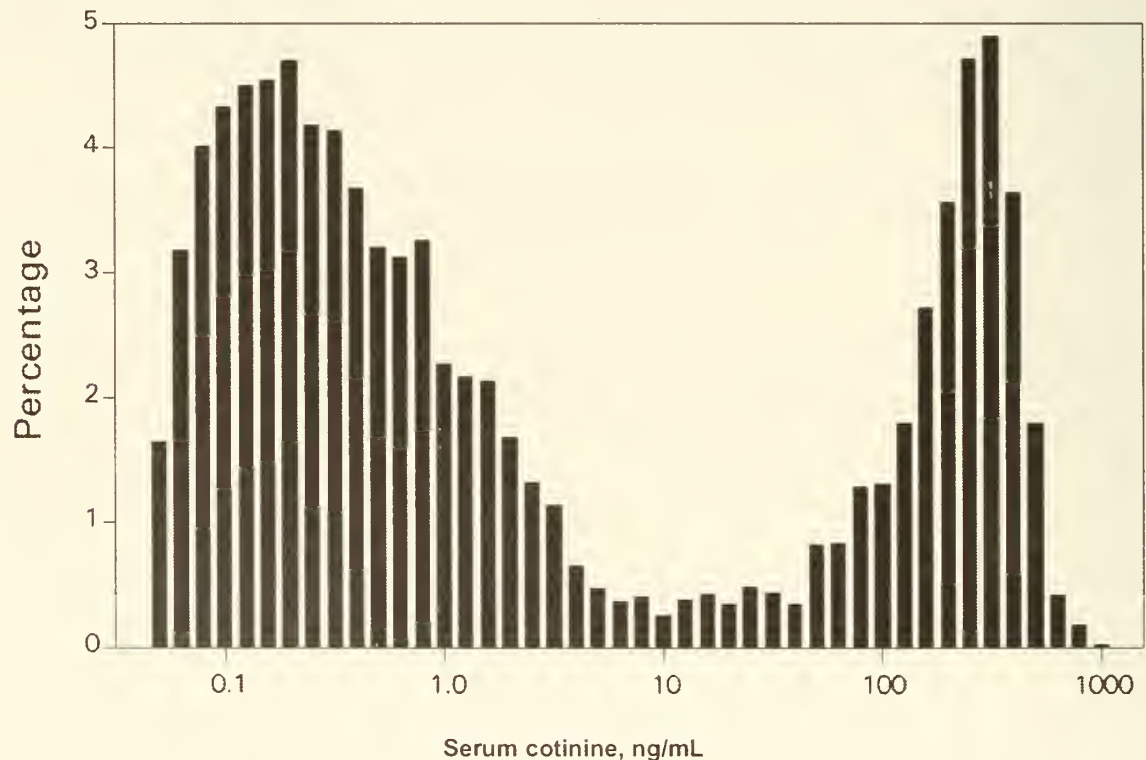
* Smokers have higher levels of serum cotinine. Nonsmokers with measurable cotinine levels include those who reported no exposure to environmental tobacco smoke in the home or work site.

Sources: Pirkle JL, Flegal KM, Bennert JT, Brody DJ, Etzel RA, Maurer KR. Exposure of the U.S. population to environmental tobacco smoke. JAMA 1996;275:1233–40.

50% reduction in cancer mortality rates *(23)*. Approximately 50% of that goal can be achieved with a 40%–50% reduction in smoking prevalence by 2005. Commensurate with the cost of the harm caused by tobacco, resources must be expended, including programs preventing adolescents from starting to smoke, getting adults and young people to quit smoking, and eliminating exposure to ETS and disparities among population groups.

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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Cigarette Smoking During the Last 3 Months of Pregnancy Among Women Who Gave Birth to Live Infants — Maine, 1988–1997

Cigarette smoking during pregnancy is associated with adverse birth outcomes (e.g., low birthweight and preterm delivery) *(1)*. The adverse effect of smoking on birthweight occurs primarily during the last trimester of pregnancy *(1)*. To study smoking prevalence over time among women who gave birth to live infants in Maine, CDC and the Maine Department of Human Services (MDHS) analyzed self-reported data from the Pregnancy Risk Assessment Monitoring System (PRAMS) collected during 1988–1997. This report summarizes the results of this analysis, which indicate that despite the overall decline in smoking prevalence in Maine among women who gave birth to live infants, smoking prevalence remains high during the last 3 months of pregnancy among young women and low-income women, particularly those participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).*

Maine PRAMS surveys a sample of new mothers about pregnancy-related behaviors, including smoking during pregnancy. Each month, a stratified systematic sample of 125 new mothers is selected from recently processed live-born infants' birth certificates. Selected women are mailed a questionnaire 2–6 months postpartum; nonrespondents are mailed up to two additional questionnaires, followed by attempted telephone contact, if necessary.

From 1988 through 1997, the response rate to PRAMS in Maine was approximately 80%. The 10,770 women participating in the survey were representative of 138,668 women in Maine who gave birth to live infants during these years. PRAMS participants were asked whether they smoked during the last 3 months of pregnancy. SUDAAN was used to account for the sample design in estimating prevalence percentages and standard errors *(2)*. Data were weighted to adjust for survey design, nonresponse, and sampling frame noncoverage.† To examine trends over time, logistic regression was performed using SUDAAN where the outcome was cigarette smoking during the last 3 months of pregnancy and the predictor variable was infant birth year. Data on smoking prevalence were examined by maternal age (<20 years and ≥20 years) and by WIC participation. Selected demographic characteristics and participation in WIC and Medicaid for 1988 and 1997 were examined to observe changes in the population participating in PRAMS.

The overall smoking prevalence during the last 3 months of pregnancy among women in Maine who gave birth to live infants declined from 30.7% (95% CI=26.3%–35.0%) in 1988 to 20.4% (95% CI=17.7%–23.2%) in 1997 (p <0.01). Smoking during the last 3 months of pregnancy among women aged ≥ 20 years declined from 30.0% (95% CI=25.4%–34.5%) in 1988 to 18.7% (95% CI=15.8%–21.6%) in 1997 (p <0.01); no significant change was observed for women aged <20 years, from 37.4% (95% CI=21.3%–53.5%) in 1988 to 37.9% (95% CI=26.9%–49.0%) in 1997 (Figure 1).

Smoking prevalence declined among WIC participants and nonparticipants. Among WIC participants, smoking prevalence declined from 53.1% (95% CI=42.9%–63.3%) in 1988 to 34.4% (95% CI=28.9%–39.8%) in 1997; among nonparticipants, smoking declined from 23.9% (95% CI=19.3%–28.5%) in 1988 to 12.6% (95% CI=9.8%–15.3%) in 1997 (Figure 2).

To examine demographic changes among women participating in PRAMS, selected population and program participation characteristics for 1988 and 1997 were analyzed. PRAMS participants who gave

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* WIC provides prenatal nutrition and health education services to low-income pregnant women.

† Noncoverage adjustment is performed to bring the totals estimated from sampled data in line with known population totals. The magnitude of the noncoverage is small, from 1% to 2% in Maine.

FIGURE 1. Percentage of women who smoked during the last 3 months of pregnancy and gave birth to live infants, by age group and infant birth year—Maine, Pregnancy Risk Assessment Monitoring System, 1988–1997*
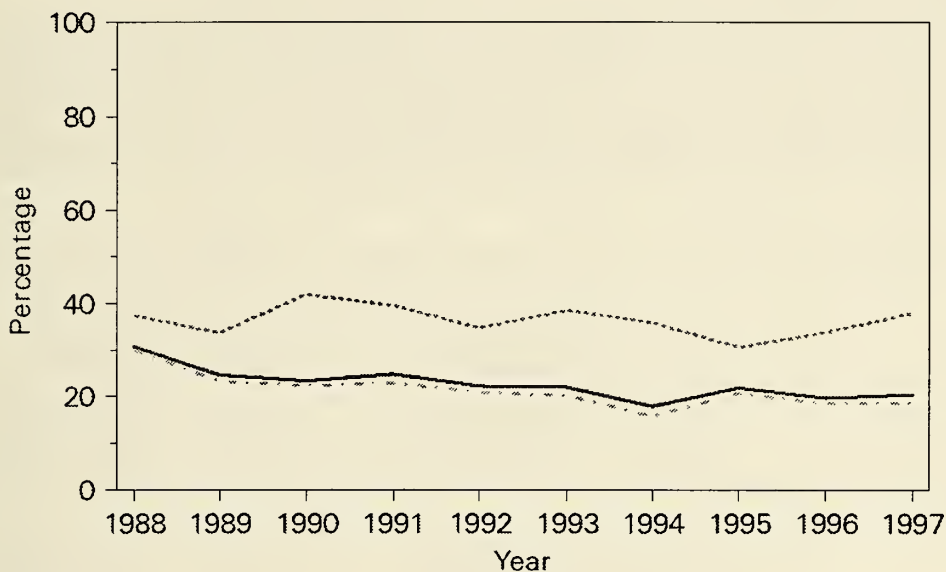
* Data for 1988 are for June–December.

FIGURE 2. Percentage of women who smoked during the last 3 months of pregnancy and gave birth to live infants, by WIC* participation and infant birth year—Maine, Pregnancy Risk Assessment Monitoring System, 1988–1997[†]
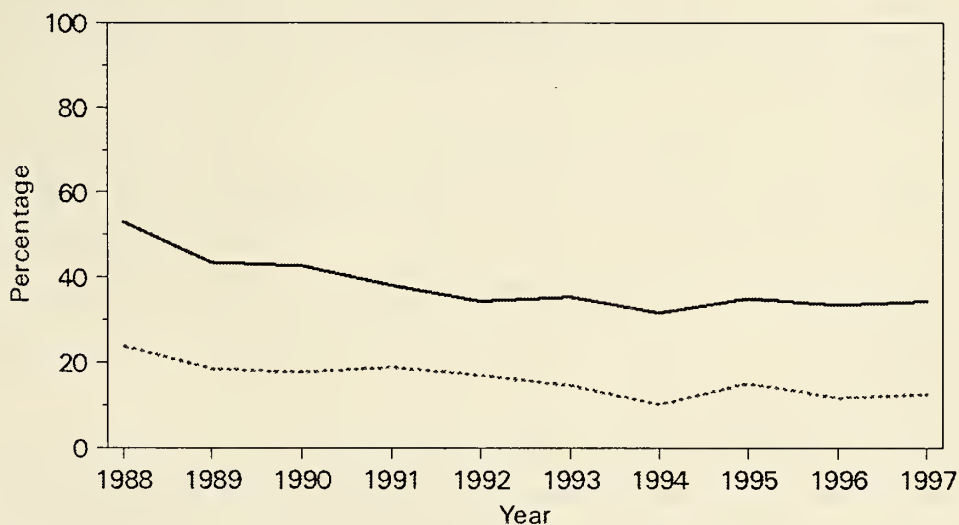
* Special Supplemental Nutrition Program for Women, Infants, and Children.
[†] Data for 1988 are for June–December.

birth to live infants in 1997 were older and more educated than were participants in 1988. They also were more likely to have entered prenatal care during the first trimester, to have enrolled in Medicaid and/or WIC, and to have received advice about smoking from a health-care provider (Table 1).

Reported by: Office of Data, Research, and Vital Statistics, Bur of Health, Maine Dept of Human Svcs. Program Svcs and Development Br, Div of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report indicate that during 1988–1997 smoking prevalence during the last 3 months of pregnancy decreased among women who gave birth to live infants in Maine. Consistent with these findings, the Maine Behavioral Risk Factor Surveillance System indicated that smoking prevalence among reproductive-aged women (18–44 years) declined from 34% in 1988 to 24% in 1997 (*3*; M. Henson, MDHS, personal communication, 1999). Among women aged <20 years participating in PRAMS, more than one third reported smoking during the last 3 months of pregnancy throughout this period.

TABLE 1. Demographic characteristics of women who gave birth to live infants — Maine, 1988 and 1997

Characteristic	1988 (n=704)		1997 (n=1187)	
	%*	(95% CI[†])	%	(95% CI)
Parity				
0	41.1	(36.4%–45.7%)	43.3	(40.1%–46.5%)
1	35.8	(31.2%–40.3%)	35.5	(32.4%–38.7%)
2	18.0	(14.4%–21.6%)	16.3	(13.8%–18.7%)
≥3	5.2	(3.0%– 7.2%)	4.9	(3.5%– 6.2%)
Age (yrs)				
<20	9.1	(6.3%–11.9%)	9.1	(7.1%–11.1%)
20–24	32.3	(27.9%–36.8%)	21.5	(18.8%–24.2%)
25–29	32.7	(28.2%–37.2%)	32.9	(29.9%–35.9%)
30–34	18.9	(15.3%–22.5%)	23.3	(20.5%–25.9%)
≥35	7.0	(4.6%– 9.4%)	13.3	(11.1%–15.4%)
Married	82.2	(78.4%–86.0%)	71.1	(68.0%–74.2%)
Education				
Less than high school	12.3	(8.9%–15.7%)	9.6	(7.6%–11.6%)
High school	50.8	(46.1%–55.5%)	38.1	(34.8%–41.3%)
More than high school	36.9	(32.3%–41.4%)	52.3	(49.0%–55.6%)
Entered prenatal care				
First trimester	71.1	(66.8%–75.4%)	83.5	(81.0%–86.0%)
Later or no care	28.8	(24.5%–33.1%)	16.5	(14.0%–19.0%)
Enrolled in Medicaid	20.5	(16.6%–24.4%)	33.9	(30.7%–37.0%)
Enrolled in WIC[§]	22.9	(18.9%–27.0%)	36.4	(33.2%–39.6%)
Received smoking advice[¶]	74.1	(69.9%–78.2%)	82.0	(79.5%–84.5%)
Smoked during the last 3 months of pregnancy	30.7	(26.3%–35.0%)	20.4	(17.7%–23.2%)

* Data for 1988 were collected for June–December.
[†] Confidence interval.
[§] Special Supplemental Nutrition Program for Women, Infants, and Children.
[¶] During the 10-year period, questionnaire wording changed to ascertain information about smoking advice received from a health-care provider. The 1988–1995 questionnaire asked "Did a doctor or nurse talk with you about how smoking during pregnancy could affect your baby?" The 1995–1997 questionnaire asked "During any of your prenatal care visits, did a doctor, nurse, or other health-care worker talk with you about any of the things listed below?" The second item was "How smoking during pregnancy could affect your baby?"

Among WIC participants who gave birth to live infants, smoking prevalence during the last 3 months of pregnancy remained high. Because WIC is a prenatal nutrition and health education program serving low-income women and children, WIC provides opportunities for intervention and follow-up of women who are pregnant and smoke.

Declines in smoking prevalences observed in this survey may be attributed to statewide tobacco prevention and control efforts, changes in the programs serving pregnant women, demographic and societal changes, or a combination of these factors. Project ASSIST (American Stop Smoking Intervention Study for Cancer Prevention), which began in 1991, has built a geographically and programmatically diverse network of activities that focus on tobacco-use prevention in Maine *(4)*. Beginning in 1993, MDHS sponsored a smoking cessation project for pregnant women. Shifts in demographic and social characteristics also occurred among women participating in PRAMS. Women who have more education were less likely to report smoking during pregnancy *(5)*, and other factors (e.g., early prenatal care and increased access to health-care services) may have contributed to declines in smoking during pregnancy.

The findings in this report are subject to at least two limitations. First, data are self-reported and can be subject to recall bias. Second, although smoking during the last 3 months of pregnancy was analyzed, smoking behaviors may have changed during pregnancy.

These trends indicate that Maine programs targeting tobacco prevention and control may have reduced smoking. Targeted and appropriate efforts for young, low-income, and less educated women are needed to increase smoking cessation in these populations, and WIC programs may be one channel to accomplish this goal. Comprehensive tobacco prevention and control programs in other states have shown a decline in smoking after the campaigns were implemented *(6–8)*. MDHS Partnership for a Tobacco Free Maine will design approaches to prevent young persons from starting to smoke, to protect citizens from environmental tobacco smoke, and to promote smoking cessation among adults. These activities might reduce smoking not only among adults in Maine but particularly among pregnant women, thereby reducing the adverse effects of smoking on mothers and infants.

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State-Specific Prevalence Among Adults of Current Cigarette Smoking and Smokeless Tobacco Use and Per Capita Tax-Paid Sales of Cigarettes — United States, 1997

In the United States each year, tobacco use causes approximately 400,000 deaths and is the single most preventable cause of death and disease (*1,2*). Consequently, state and local public health agencies closely monitor tobacco use and its correlates (*3*). In 1996, the prevalence of current cigarette smoking among adults was the first health behavior and the first noninfectious condition added by the Council of State and Territorial Epidemiologists (CSTE) to the list of nationally notifiable conditions reported to CDC (*4*). In 1998, per capita sales of cigarettes (along with prevalence among youth of current cigarette smoking and current smokeless tobacco use) was added by CSTE to the list of notifiable conditions reported by states to CDC. This report summarizes state-specific findings for current cigarette and current smokeless tobacco use by adults from the Behavioral Risk Factor Surveillance System (BRFSS) and number of packs of tax-paid cigarettes sold per capita in each state from data compiled annually by The Tobacco Institute. The findings indicate that current adult cigarette smoking prevalence by state ranged from 13.7% to 30.8%, annual per capita tax-paid cigarette sales ranged from 49.1 packs to 186.8 packs, and adult smokeless tobacco use·prevalence ranged from 1.4% to 8.8%.

State- and sex-specific prevalences of current cigarette smoking and current smokeless tobacco use among adults are available from the 1997 BRFSS. The BRFSS is a state-specific, random-digit–dialed telephone survey of health behaviors of the civilian, noninstitutionalized U.S. population aged ≥18 years (*5*) conducted by state health departments with assistance from CDC. In 1996 and 1997, respondents were asked, "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Current cigarette smokers were defined as persons who reported having smoked at least 100 cigarettes during their lifetime and who currently smoke every day or some days. To determine current smokeless tobacco use, respondents were asked, "Have you ever used or tried any smokeless tobacco products such as chewing tobacco or snuff?" and "Do you currently use any smokeless tobacco products such as chewing tobacco or snuff?" Current smokeless tobacco users were defined as persons who reported having ever used or tried any smokeless tobacco product and who currently use a smokeless tobacco product. To estimate prevalence, responses for each state were weighted to the current age, race, and sex distribution of the state's population (i.e., crude prevalence). To allow comparison of findings across states that had different age distributions, age-adjusted prevalences for each state were estimated by using direct standardization to 10-year age groups of the U.S. population in 1997 derived from U.S. census estimates (*6*). The number of packs of tax-paid cigarettes sold per capita in each state is compiled yearly by The Tobacco Institute by using information on federal, state, and local excise taxes and total population estimates (*7*).

In 1997, the median state prevalence of current cigarette smoking by adults was 23.2%; prevalence was 25.5% for men and 21.3% for women (Table 1). The crude median prevalence of current cigarette smoking was similar in 1997 and in 1996 (25.5% for men, 22.0% for women, and 23.6% for both groups combined) (*4*). In 1997, for

TABLE 1. Prevalence of current cigarette smoking* among adults, by state and sex, and per capita tax-paid sales of cigarettes, by state† — United States, 1997

State	Men %	Men (95% CI§)	Women %	Women (95% CI)	Total %	Total (95% CI)	Per capita tax-paid sales of cigarettes (in packs)
Alabama	28.6	(±3.3)	21.3	(±2.5)	24.7	(±2.0)	104.9
Alaska	27.4	(±4.9)	25.8	(±4.3)	26.7	(±3.3)	81.7
Arizona	22.1	(±3.9)	20.2	(±3.6)	21.1	(±2.5)	64.6
Arkansas	32.1	(±4.4)	25.2	(±3.0)	28.5	(±2.6)	108.7
California	22.4	(±2.3)	14.5	(±1.6)	18.4	(±1.4)	53.8
Colorado	24.0	(±3.2)	21.2	(±3.0)	22.6	(±2.2)	81.3
Connecticut	21.4	(±3.2)	22.2	(±2.7)	21.8	(±2.1)	75.9
Delaware	29.3	(±3.5)	24.2	(±2.5)	26.6	(±2.1)	124.1
District of Columbia	22.7	(±4.0)	15.5	(±2.8)	18.8	(±2.4)	54.3
Florida	26.0	(±2.6)	21.4	(±1.9)	23.6	(±1.6)	93.0
Georgia	25.2	(±3.2)	19.9	(±2.7)	22.4	(±2.1)	100.6
Hawaii	21.4	(±2.9)	15.8	(±2.5)	18.6	(±1.9)	49.1
Idaho	21.8	(±2.2)	18.0	(±1.9)	19.9	(±1.4)	75.0
Illinois	25.0	(±2.7)	21.6	(±2.2)	23.2	(±1.7)	79.6
Indiana	29.2	(±3.2)	23.7	(±2.7)	26.3	(±2.1)	135.3
Iowa	25.5	(±2.4)	20.9	(±2.0)	23.1	(±1.6)	93.9
Kansas	26.8	(±3.4)	18.9	(±2.3)	22.7	(±2.0)	89.2
Kentucky	33.1	(±2.9)	28.7	(±2.1)	30.8	(±1.8)	186.8
Louisiana	29.3	(±4.1)	20.4	(±2.7)	24.6	(±2.4)	105.3
Maine	25.2	(±3.3)	20.4	(±2.8)	22.7	(±2.2)	101.1
Maryland	21.8	(±2.4)	19.4	(±2.0)	20.6	(±1.6)	72.7
Massachusetts	21.8	(±3.7)	19.2	(±2.6)	20.4	(±2.2)	66.7
Michigan	29.6	(±3.0)	22.8	(±2.2)	26.1	(±1.9)	75.6
Minnesota	24.1	(±2.0)	19.8	(±1.6)	21.8	(±1.3)	84.1
Mississippi	28.3	(±4.2)	18.6	(±2.8)	23.2	(±2.5)	106.3
Missouri	31.7	(±4.1)	26.0	(±2.9)	28.7	(±2.5)	120.6
Montana	20.8	(±3.0)	20.2	(±2.6)	20.5	(±2.0)	88.9
Nebraska	24.4	(±3.1)	20.2	(±2.6)	22.2	(±2.0)	88.5
Nevada	25.7	(±5.0)	29.8	(±4.6)	27.7	(±3.4)	95.6
New Hampshire	26.0	(±4.1)	23.7	(±3.0)	24.8	(±2.5)	174.4
New Jersey	23.3	(±3.0)	19.8	(±2.3)	21.5	(±1.9)	77.0
New Mexico	21.6	(±3.2)	22.6	(±2.7)	22.1	(±2.1)	61.8
New York	25.0	(±2.6)	21.5	(±2.0)	23.1	(±1.6)	64.5
North Carolina	29.7	(±2.7)	22.3	(±2.0)	25.8	(±1.7)	125.6
North Dakota	24.3	(±3.2)	20.3	(±2.7)	22.2	(±2.1)	77.5
Ohio	26.3	(±3.2)	24.0	(±2.5)	25.1	(±2.0)	108.6
Oklahoma	25.2	(±3.7)	24.1	(±3.0)	24.6	(±2.4)	111.8
Oregon	22.1	(±2.7)	19.4	(±2.1)	20.7	(±1.7)	89.5
Pennsylvania	26.2	(±2.6)	22.5	(±2.0)	24.3	(±1.6)	92.9
Rhode Island	25.6	(±3.6)	23.0	(±3.2)	24.2	(±2.4)	90.0
South Carolina	29.5	(±3.5)	17.8	(±2.3)	23.4	(±2.1)	124.5
South Dakota	28.1	(±3.3)	20.8	(±2.6)	24.3	(±2.1)	88.8
Tennessee	27.9	(±3.1)	26.0	(±2.2)	26.9	(±1.9)	118.9
Texas	28.0	(±3.1)	17.5	(±2.2)	22.6	(±1.9)	72.6
Utah	16.1	(±2.4)	11.5	(±2.0)	13.7	(±1.6)	57.0
Vermont	25.1	(±2.9)	21.5	(±2.4)	23.2	(±1.9)	97.7
Virginia	26.2	(±3.4)	23.1	(±2.6)	24.6	(±2.1)	108.0
Washington	25.1	(±2.8)	22.7	(±2.2)	23.9	(±1.8)	55.6
West Virginia	27.1	(±3.1)	27.7	(±2.6)	27.4	(±2.0)	114.5
Wisconsin	25.6	(±3.4)	21.0	(±2.8)	23.2	(±2.2)	91.9
Wyoming	24.0	(±3.8)	24.1	(±2.8)	24.0	(±2.4)	108.8

* Percentage of persons aged ≥18 years who reported having smoked ≥100 cigarettes during their lifetime and who currently smoke every day or some days. Estimates are weighted to the age, race, and sex distribution of the state population (crude prevalence). Source: Behavioral Risk Factor Surveillance System.
† Source: The Tobacco Institute. Data are for July 1, 1996, through June 30, 1997 (7).
§ Confidence interval.

every state except Florida, the crude prevalence of current cigarette smoking was within 1% of the age-adjusted prevalence for that state.

Current adult cigarette smoking prevalence differed approximately twofold across the states (Table 1). In 1997, the current cigarette smoking prevalence was highest in Kentucky (30.8%), Missouri (28.7%), Arkansas (28.5%), Nevada (27.7%), and West Virginia (27.4%), and lowest in Utah (13.7%), California (18.4%), Hawaii (18.6%), the District of Columbia (18.8%), and Idaho (19.9%). The current cigarette smoking prevalence for men was highest in Kentucky (33.1%), and for women in Nevada (29.8%). For both men and women, current smoking prevalence was lowest in Utah.

Per capita tax-paid sales of cigarettes for July 1, 1996, through June 30, 1997, varied approximately fourfold across the states (Table 1). The state median tax-paid cigarette sales was 90 packs per person per year. Sales were highest in Kentucky (186.8 packs) and lowest in Hawaii (49.1 packs).

Questions about current adult smokeless tobacco use were included in the 1997 BRFSS in 17 states (Table 2). The difference in prevalence was more than sixfold (from 1.4% in Arizona to 8.8% in West Virginia). Among men, the prevalence of current smokeless tobacco use was highest in West Virginia (18.4%) and Wyoming (14.7%); five states (Alabama, Alaska, Kansas, Kentucky, and Montana) reported prevalences of 9%–12%, and 10 states reported prevalences of ≤8%. For women, the prevalence of current smokeless tobacco use was ≤1.7% in all 17 states.

Reported by the following BRFSS coordinators: J Cook, Alabama, MBA; P Owen, Alaska; B Bender, MBA, Arizona; J Senner, PhD, Arkansas; B Davis, PhD, California; M Leff, MSPH,

TABLE 2. Prevalence of current smokeless tobacco use* among adults, by state and sex — United States, 1997

State	Men		Women		Total	
	%	(95% CI[†])	%	(95% CI)	%	(95% CI)
Alabama	9.9	(±2.2)	1.4	(±0.7)	5.4	(±1.1)
Alaska	9.2	(±3.2)	1.6	(±1.0)	5.5	(±1.7)
Arizona	2.6	(±1.3)	0.3	(±0.3)	1.4	(±0.7)
Georgia	6.4	(±1.8)	1.7	(±0.9)	4.0	(±1.0)
Indiana	6.8	(±1.7)	0.0	(±0.0)	3.2	(±0.8)
Kansas	10.3	(±2.5)	0.2	(±0.3)	5.1	(±1.2)
Kentucky	12.2	(±3.0)	0.6	(±0.5)	6.1	(±1.5)
Louisiana	7.6	(±2.1)	0.3	(±0.4)	3.7	(±1.1)
Montana	10.5	(±2.5)	0.2	(±0.3)	5.3	(±1.3)
Ohio	5.1	(±1.6)	0.0	(±0.1)	2.4	(±0.8)
Oklahoma	7.7	(±2.2)	0.3	(±0.3)	3.8	(±1.1)
Pennsylvania	7.4	(±1.7)	0.4	(±0.3)	3.8	(±0.9)
South Carolina	4.8	(±1.7)	1.0	(±0.6)	2.8	(±0.9)
Virginia	6.1	(±1.4)	0.1	(±0.1)	3.0	(±0.7)
Washington	5.6	(±1.4)	0.2	(±0.2)	2.9	(±0.7)
West Virginia	18.4	(±2.6)	0.2	(±0.2)	8.8	(±1.3)
Wyoming	14.7	(±2.3)	0.7	(±0.4)	7.6	(±1.2)

*Percentage of persons aged ≥18 years who reported having ever used or tried smokeless tobacco products such as chewing tobacco or snuff and who currently use a smokeless tobacco product. Estimates are weighted to the age, race, and sex distribution of the state population (crude prevalence). Source: Behavioral Risk Factor Surveillance System.
[†]Confidence interval.

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Editorial Note: This report includes information about two CSTE-recommended indicators of tobacco use for all states (current cigarette smoking by adults and per capita tax-paid sales of cigarettes) and current smokeless tobacco use among adults for 17 states. Information on cigarette and smokeless tobacco use by youth in 1997 is available elsewhere (8). National surveys provide information about tobacco use and are useful for monitoring overall trends, but their effectiveness is limited for monitoring state-level year-to-year changes in tobacco consumption. National surveys also mask the twofold variation in current adult cigarette smoking prevalence among the states.

In the BRFSS, the crude and age-adjusted prevalences of current adult cigarette smoking were similar, indicating that differences in prevalence among states are related primarily to factors other than differences in adult age distributions. Although the median prevalence for current cigarette smoking among adults was nearly the same in 1996 and 1997, the twofold difference in prevalence among states, the wide variation in per capita tax-paid cigarette sales, and the wide variation in smokeless tobacco prevalence among adults suggest that further reductions in tobacco use are achievable.

The findings in this report are subject to at least three limitations. First, the BRFSS standardizes procedures among states, but the quality and completeness of the surveys can vary by state and year. Second, the changes in questions about current cigarette use in 1996 limit comparisons with previous years (9). Finally, estimates of per capita tax-paid cigarette sales provide populationwide rather than individual-based estimates of behaviors; because these estimates are based on tax revenues they may not accurately estimate actual consumption (10).

By monitoring tobacco-related health effects, policy changes, and public attitudes at state and local levels, tobacco-related activities can be evaluated and public health programs can be tailored to local populations. CDC and state health departments are working together to improve state-specific measures of tobacco-related health outcomes, policy interventions, and related activities to improve the prevention and control of tobacco use. In 1999, CDC will provide all states with funding for tobacco-use prevention and control programs. CDC also is collaborating with states that have other sources of funding for activities related to tobacco-use prevention to develop effective public health intervention, surveillance, and evaluation activities.

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Cigarette Smoking Among Adults — United States, 1995

One of the national health objectives for 2000 is to reduce the prevalence of cigarette smoking among adults to no more than 15% (objective 3.4) (*1*). To assess progress toward meeting this objective, CDC analyzed self-reported information about cigarette smoking among U.S. adults from the Year 2000 Objectives Supplement of the 1995 National Health Interview Survey (NHIS). This report summarizes the findings of this analysis, which indicate that, in 1995, 24.7% (47.0 million) of adults were current smokers.

The 1995 NHIS was administered to a nationally representative sample (n=17,213) of the U.S. noninstitutionalized civilian population aged ≥18 years; the overall response rate for the supplement was 80.9%. Participants were asked, "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Current smokers were persons who reported having smoked ≥100 cigarettes during their lifetimes and who smoked every day or some days at the time of interview. Former smokers were those who had smoked ≥100 cigarettes during their lifetimes but who did not smoke currently. Interest in quitting was determined by asking current smokers, "Would you like to completely quit smoking cigarettes?" Attempts to quit were determined by asking current every-day smokers, "During the past 12 months, have you stopped smoking for one day or longer?" Data were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated using SUDAAN.

In 1995, an estimated 47.0 million adults (24.7% [95% CI=±0.8 percentage points]), including 24.5 million men (27.0% of adult men [95% CI=±1.2]), were current smokers (Table 1). Overall, 20.1% (95% CI=±0.8) were every-day smokers, and 4.6% (95% CI=±0.4) were some-day smokers (every-day smokers constituted 81.2% [95% CI=±1.5] of all smokers). Prevalences of current smoking were higher among American Indians/ Alaskan Natives (36.2% [95% CI=±10.6]), non-Hispanic blacks (25.8% [95% CI=±2.6], and non-Hispanic whites (25.6% [95% CI=±1.0]) than among Hispanics (18.3% [95% CI=±1.8]) and Asians/Pacific Islanders (16.6% [95% CI=±4.6]). Current smoking prevalence was highest among persons with nine to 11 years of education (37.5% [95% CI=±2.9]) and lowest among persons with ≥16 years of education (14.0% [95% CI=±1.4]) and was higher among persons living below the poverty level* (32.5% [95% CI=±2.5]) than among those living at or above the poverty level (23.8% [95% CI=±0.9]).

In 1995, an estimated 44.3 million adults (23.3% [95% CI=±0.8]) were former smokers, including 25 million men and 19.3 million women. Former smokers constituted 48.6% (95% CI=±1.4) of persons who had ever smoked at least 100 cigarettes. Among current smokers in 1995, an estimated 32 million (68.2% [95% CI=±1.8]) wanted to quit smoking completely, and 17.3 million (45.8% [95% CI=±2.0]) current every-day smokers had stopped smoking for at least 1 day during the preceding 12 months.

Reported by: Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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*Poverty statistics are based on definitions developed by the Social Security Administration in 1964 (which were subsequently modified by federal interagency committees in 1969 and 1980) and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

TABLE 1. Percentage of persons aged ≥18 years who were current cigarette smokers*, by selected characteristics — United States, Year 2000 Objectives Supplement of the National Health Interview Survey, 1995

Characteristic	Men (n=7,423)		Women (n=9,790)		Total (n=17,213)	
	%	(95% CI[†])	%	(95% CI)	%	(95% CI)
Race/Ethnicity[§]						
White, non-Hispanic	27.1	(± 1.5)	24.1	(± 1.3)	25.6	(± 1.0)
Black, non-Hispanic	28.8	(± 3.7)	23.5	(± 3.1)	25.8	(± 2.6)
Hispanic	21.7	(± 2.9)	14.9	(± 2.1)	18.3	(± 1.8)
American Indian/ Alaskan Native[¶]	37.3	(±17.2)	35.4	(±13.9)	36.2	(±10.6)
Asian/Pacific Islander	29.4	(± 8.6)	4.3	(± 3.1)	16.6	(± 4.6)
Education (yrs)**						
≤8	28.4	(± 4.2)	17.8	(± 2.8)	22.6	(± 2.5)
9–11	41.9	(± 4.4)	33.7	(± 3.5)	37.5	(± 2.9)
12	33.7	(± 2.3)	26.2	(± 1.8)	29.5	(± 1.4)
13–15	25.0	(± 2.6)	22.5	(± 2.2)	23.6	(± 1.6)
≥16	14.3	(± 1.8)	13.7	(± 1.8)	14.0	(± 1.4)
Age group (yrs)						
18–24	27.8	(± 3.9)	21.8	(± 3.0)	24.8	(± 2.4)
25–44	30.5	(± 1.8)	26.8	(± 1.6)	28.6	(± 1.2)
45–64	27.1	(± 2.1)	24.0	(± 2.0)	25.5	(± 1.5)
≥65	14.3	(± 2.1)	11.5	(± 1.5)	13.0	(± 1.3)
Poverty status[††]						
At or Above	25.9	(± 1.3)	21.8	(± 1.1)	23.8	(± 0.9)
Below	36.9	(± 4.3)	29.3	(± 2.9)	32.5	(± 2.5)
Unknown	26.9	(± 5.7)	21.0	(± 3.5)	23.5	(± 3.2)
Total	**27.0**	**(± 1.2)**	**22.6**	**(± 1.1)**	**24.7**	**(± 0.8)**

*Persons who reported having smoked ≥100 cigarettes and who reported now smoking every day or some days. Excludes 104 respondents for whom smoking status was unknown.
[†]Confidence interval.
[§]Excludes 192 respondents in unknown, multiple, and other racial/ethnic categories.
[¶]Wide variances on estimates reflect the small sample sizes.
**Persons aged ≥25 years. Excludes 60 persons with unknown years of education.
[††]Poverty statistics are based on definitions developed by the Social Security Administration in 1964 (which were subsequently modified by federal interagency committees in 1969 and 1980) and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

Editorial Note: The prevalence of smoking in 1995 (24.7% [95% CI=±0.8]) was similar to that in 1994 (25.5% [95% CI=±0.7]) (2). The findings in this report and previous trends (3) suggest that the goal of reducing the prevalence of cigarette smoking among adults to ≤15% by 2000 will not be attained. Smoking prevalence can be reduced by decreasing the rate of smoking initiation and by increasing the rate of smoking cessation. Methods for decreasing the rate of smoking initiation among adolescents include increases in prices of tobacco products, education, counter advertising campaigns, and efforts to restrict access to and limit the appeal of tobacco products (4).

Effective efforts to assist smokers to quit permanently produce substantial and immediate health and economic benefits (5). Despite the desire of most smokers to stop smoking completely and the existence of proven interventions (6), most smokers may not have easy access to such interventions. One of the national health objectives for 2000 is to increase to 100% the proportion of health plans that offer treatment for nicotine addiction (objective 3.24) (1). Based on a survey of 105 large health-maintenance organizations in 1995, a substantial proportion (two thirds) reported offering some level of smoking-cessation program or product as a covered member service (7). However, coverage of cessation services and products was subject to restrictions; for example, only 23% of plans covered nicotine replacement therapy (NRT) as a standard drug benefit (7). Indemnity plans are less likely than managed-care plans to cover preventive services such as smoking cessation (8). In addition, more than half of corporations self-insure for their employees' health insurance benefits, and few corporations include coverage for smoking-cessation services in their benefit designs (8). As of March 1997, only five state Medicaid programs provided reimbursement for smoking-cessation counseling or group programs (L. Dixon, Health Policy Tracking Service, National Conference of State Legislatures, personal communication, 1997). Although Medicare pays for medically necessary services furnished by a physician or other Medicare provider, it does not pay for either special smoking-cessation programs or for over-the-counter drugs, including NRT (J. Stieber, Office of Legislation, Health Care Financing Administration, US Department of Health and Human Services, personal communication, 1997).

Advice from health-care providers to smokers to quit smoking increases cessation rates by 30% (6), and guidelines published by the Agency for Health Care Policy and Research state that all smokers should be advised by their health-care provider to quit (6). In addition, one of the national health objectives for 2000 is to increase to at least 75% the proportion of primary-care and oral health-care providers who routinely advise cessation and provide assistance and follow-up for tobacco-using patients (objective 3.16) (1). In 1996, for the first time, the Health Plan Employer Data Information Set (HEDIS), a managed-care "report card," included a measure of smokers' receipt of medical advice to quit.[†] In 1996, the plan average for smokers reporting receipt of advise from health-care providers to quit was 61%; however, advice rates were as low as 30% for some plans (9).

Racial/ethnic variations in smoking prevalence are influenced by differences in educational level and cultural factors (e.g., the ceremonial use of tobacco among American Indians). Proven smoking-cessation treatments need to be culturally and language-appropriate (6).

Effective smoking-cessation interventions are less costly than other preventive medical interventions (e.g., treatment of hypercholesterolemia) (10). Although all proven types of cessation are cost-effective, those involving more intense counseling and the nicotine patch are most cost-effective (10). The prevalence of current smoking can be decreased by intensifying efforts to establish proven smoking cessation treatments (both pharmacotherapy and counseling) as a covered medical benefit and to reimburse clinicians for providing effective cessation interventions (6). Other priori-

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[†]The source for data contained in this article is Quality Compass™ and is used with the permission of the National Committee for Quality Assurance (NCQA). Any analysis, interpretation, or conclusion based on these data is solely that of CDC, and NCQA specifically disclaims responsibility for any such analysis, interpretation, or conclusion.

ties include the needs to train health-care providers and health-system administrators about the current cessation guideline recommendations, evaluate cessation interventions for children and adolescents, and better inform smokers about the availability and variety of proven smoking-cessation interventions.

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State-Specific Prevalence of Cigarette Smoking Among Adults, and Children's and Adolescents' Exposure to Environmental Tobacco Smoke — United States, 1996

In 1996, the prevalence of cigarette smoking was added to the list of nationally notifiable health conditions reported by states to CDC (1). The addition of a health-related behavior to the list of diseases and illnesses reflected the recognized role of tobacco use as the leading preventable cause of death in the United States (2). This report summarizes the 1996 prevalence of current smoking among adults in 49 states and the District of Columbia and presents state-specific estimates of environmental tobacco smoke (ETS) exposure for children and adolescents residing in homes where adults smoke. The findings indicate that state-specific smoking prevalence among adults varied twofold and that approximately 15 million children and adolescents were exposed to ETS in their home.

State-specific data about adult smoking prevalence were obtained from the Behavioral Risk Factor Surveillance System (BRFSS), a state-based, random-digit–dialed telephone survey of the noninstitutionalized U.S. population aged ≥18 years. The 1996 BRFSS was conducted in 49 states and the District of Columbia. Respondents were asked "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Current smokers were defined as persons who reported having smoked ≥100 cigarettes during their lifetimes and who currently smoked every day or on some days. Estimates were weighted to represent the populations of each state. For estimates of the percentage of homes with both current cigarette smokers and children and adolescents (persons aged <18 years) living at home, data were weighted to represent the number of households in each state.

Children's and adolescents' ETS exposure was calculated by applying the BRFSS-derived prevalence estimates to data from the 1992–1993 and 1996 Current Population surveys (CPSs), an annual survey of the civilian, noninstitutionalized U.S. population. Responses to questions included in the September 1992, January 1993, and May 1993 CPS were used to calculate the state-specific percentage of households that had an adult smoker and any children aged <18 years and that permitted smoking in all or some areas of the home (3). To estimate the percentage of households in which a child was exposed to ETS from an adult smoker residing in the home, the percentage of households in which smoking was allowed in the home (1992–1993 CPS) was applied to the percentage of households with an adult smoker and any children (1996 BRFSS). Finally, the resulting percentage was applied to the number of households and multiplied by the number of children in the home (1996 CPS) to calculate the number of children exposed to ETS in the home. Variances associated with these estimates were combined using a Taylor-Series approximation method.

During 1996, the median prevalence of current smoking was 23.6% (Table 1); state-specific prevalences ranged from 15.9% (Utah) to 31.6% (Kentucky). Range endpoints were higher for men (18.6%–33.9%) than for women (13.4%–29.5%). The percentage of households with an adult smoker and any children ranged from 7.0% (District of Columbia) to 14.9% (Alaska) (Table 2). The percentage of households with an adult smoker and children and in which smoking was allowed in some or all areas of the home ranged from 70.6% (Washington) to 95.6% (District of Columbia). The estimated number of children exposed to ETS in the home ranged from 32,105 (Delaware) to

TABLE 1. Prevalence of current cigarette smoking among adults,* by state[†] and sex — United States, Behavioral Risk Factor Surveillance System, 1996

State	Men %	Men (95% CI[§])	Women %	Women (95% CI)	Total %	Total (95% CI)
Alabama	24.4	(±3.3%)	20.8	(±2.4%)	22.5	(±2.1%)
Alaska	30.9	(±5.2%)	24.3	(±4.1%)	27.7	(±3.4%)
Arizona	27.2	(±4.2%)	20.6	(±3.2%)	23.8	(±2.5%)
Arkansas	27.7	(±4.2%)	23.3	(±2.7%)	25.4	(±2.4%)
California	21.4	(±2.2%)	15.9	(±1.6%)	18.6	(±1.4%)
Colorado	24.5	(±3.5%)	21.2	(±2.8%)	22.8	(±2.2%)
Connecticut	22.7	(±3.5%)	21.2	(±2.9%)	21.9	(±2.2%)
Delaware	25.0	(±3.3%)	23.5	(±2.7%)	24.2	(±2.2%)
District of Columbia	23.8	(±4.4%)	17.8	(±3.0%)	20.6	(±2.6%)
Florida	23.3	(±2.3%)	20.4	(±1.9%)	21.8	(±1.5%)
Georgia	24.7	(±3.2%)	16.3	(±2.2%)	20.3	(±1.9%)
Idaho	21.3	(±2.6%)	21.1	(±2.2%)	21.2	(±1.7%)
Illinois	26.3	(±2.8%)	23.5	(±2.3%)	24.8	(±1.8%)
Indiana	31.6	(±3.2%)	26.0	(±2.6%)	28.7	(±2.1%)
Iowa	26.3	(±2.5%)	21.2	(±1.9%)	23.6	(±1.6%)
Kansas	26.1	(±3.3%)	18.3	(±2.4%)	22.1	(±2.0%)
Kentucky	33.8	(±2.9%)	29.5	(±2.1%)	31.6	(±1.8%)
Louisiana	31.6	(±3.9%)	20.8	(±2.8%)	25.9	(±2.4%)
Maine	28.9	(±3.7%)	22.0	(±2.9%)	25.3	(±2.4%)
Maryland	22.6	(±2.5%)	19.6	(±1.9%)	21.0	(±1.5%)
Massachusetts	23.9	(±3.6%)	22.9	(±2.9%)	23.4	(±2.3%)
Michigan	26.5	(±2.9%)	24.8	(±2.4%)	25.6	(±1.9%)
Minnesota	21.7	(±2.0%)	19.5	(±1.7%)	20.6	(±1.3%)
Mississippi	28.6	(±4.2%)	18.5	(±2.6%)	23.2	(±2.4%)
Missouri	29.0	(±4.0%)	26.7	(±3.1%)	27.8	(±2.5%)
Montana	20.5	(±3.1%)	22.8	(±2.9%)	21.7	(±2.2%)
Nebraska	25.4	(±4.5%)	18.9	(±2.5%)	22.0	(±2.6%)
Nevada	28.5	(±4.5%)	28.0	(±4.0%)	28.2	(±3.0%)
New Hampshire	25.5	(±4.3%)	24.3	(±3.5%)	24.9	(±2.7%)
New Jersey	25.0	(±2.9%)	20.9	(±2.2%)	22.8	(±1.8%)
New Mexico	24.9	(±5.0%)	20.9	(±3.8%)	22.9	(±3.1%)
New York	23.2	(±2.2%)	23.3	(±1.8%)	23.3	(±1.4%)
North Carolina	30.0	(±3.2%)	21.9	(±2.3%)	25.7	(±2.0%)
North Dakota	24.4	(±3.4%)	22.5	(±2.9%)	23.4	(±2.3%)
Ohio	33.9	(±4.2%)	23.6	(±3.1%)	28.5	(±2.6%)
Oklahoma	26.4	(±3.7%)	21.9	(±3.0%)	24.1	(±2.4%)
Oregon	24.4	(±2.7%)	22.6	(±2.2%)	23.5	(±1.7%)
Pennsylvania	23.8	(±2.4%)	25.2	(±2.1%)	24.5	(±1.6%)
Rhode Island	25.7	(±3.5%)	19.8	(±2.6%)	22.5	(±2.2%)
South Carolina	25.3	(±4.2%)	23.8	(±3.0%)	24.5	(±2.5%)
South Dakota	22.3	(±2.9%)	19.2	(±2.4%)	20.7	(±1.9%)
Tennessee	31.1	(±2.9%)	25.2	(±2.2%)	28.0	(±1.8%)
Texas	27.5	(±3.7%)	18.5	(±2.6%)	22.9	(±2.2%)
Utah	18.6	(±2.7%)	13.4	(±2.1%)	15.9	(±1.7%)
Vermont	26.6	(±3.7%)	21.8	(±2.4%)	24.1	(±2.2%)
Virginia	27.6	(±3.7%)	22.2	(±2.8%)	24.8	(±2.3%)
Washington	24.6	(±2.4%)	22.4	(±2.1%)	23.5	(±1.6%)
West Virginia	28.0	(±3.2%)	25.5	(±2.5%)	26.7	(±2.0%)
Wisconsin	27.6	(±3.6%)	22.4	(±2.9%)	24.9	(±2.3%)
Wyoming	24.4	(±2.9%)	24.8	(±2.5%)	24.6	(±1.9%)
Range	18.6–33.9		13.4–29.5		15.9–31.6	
Median	25.5		22.0		23.6	

* Persons aged ≥18 years who reported having smoked ≥100 cigarettes and who reported smoking every day or some days.

[†] No data were available for Hawaii.

[§] Confidence interval.

1,120,051 (New York), and the estimated percentage of children ranged from 11.7% (Utah) to 34.2% (Kentucky) (Table 2).

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Editorial Note: The findings in this report highlight the wide range of smoking prevalence and children's and adolescents' exposure to ETS across states and underscore the large population at risk for serious health effects of tobacco use (both smokers and nonsmokers). Compared with 1995 (*4*), the 1996 median prevalence of current smoking among adults increased approximately 1%; in 24 states, state-specific prevalences increased ≥1%, and increases were statistically significant in 10 states. The increase from 1995 to 1996 may reflect, in part, the 1996 change in the definition used to assess self-reported smoking prevalence (in 1995, respondents were asked "Have you smoked at least 100 cigarettes in your entire lifetime?" and "Do you smoke cigarettes now?") (*5*). By including some-day smoking with every-day smoking in the definition of current smoking, prevalence estimates increase by approximately 1% (*5*).

The estimates in this report are subject to at least three limitations. First, because the proportion of restrictive smoking policies in the home may have increased since 1992–1993, the CPS data may have overestimated the percentage of households in which smoking in all or some areas was permitted. Second, total exposures for children may have been underestimated because of failure or inability to include other sources of exposure to ETS both inside the home (e.g., a household guest smoking a cigarette, cigar, or pipe) and outside the home. Finally, prevalence estimates may be underestimated because data were collected through telephone interviews; previous studies have documented substantial differences in the characteristics of persons who reside in households without a telephone compared with those who reside in households with a telephone.

In 1992, the Environmental Protection Agency classified ETS as a Group A carcinogen known to cause cancer in humans (*6*). The primary source of children's exposure to ETS is in the home (*7*); children exposed to ETS are at an increased risk for sudden infant death syndrome, acute lower respiratory tract infections, asthma induction and exacerbation, and middle-ear effusions (*6,8*). The findings in this report indicate that approximately one third to one half of adult current cigarette smokers have children residing in their homes, and in most (>70%) of those homes smoking was permitted in

TABLE 2. Percentage of households with an adult* current cigarette smoker and any children and adolescents† in the home, rules§ about smoking in the home, and the estimated number of children exposed to environmental tobacco smoke (ETS) in the home, by state¶ — United States, Behavioral Risk Factor Surveillance System, 1996

State	Current cigarette smoker and any children in the home		Smoking allowed in some or all areas of the home		Children exposed to ETS in the home		
	%	(95% CI**)	%	(95% CI)	%	No.	(95% CI)
Alabama	10.0	(±1.3%)	88.0	(±5.5%)	23.6	289,110	(± 45,817)
Alaska	14.9	(±2.6%)	77.9	(±6.3%)	21.6	47,493	(± 9,244)
Arizona	9.8	(±1.8%)	76.9	(±7.3%)	18.5	227,316	(± 51,459)
Arkansas	10.8	(±1.4%)	90.2	(±4.5%)	26.6	177,686	(± 28,902)
California	7.3	(±0.8%)	72.3	(±3.3%)	12.3	1,114,865	(±154,535)
Colorado	9.1	(±1.4%)	81.6	(±7.1%)	19.0	193,138	(± 34,746)
Connecticut	9.7	(±1.5%)	84.4	(±6.8%)	20.8	186,859	(± 34,432)
Delaware	10.0	(±1.3%)	86.2	(±6.4%)	17.7	32,105	(± 5,663)
District of Columbia	7.0	(±1.6%)	95.6	(±5.1%)	31.8	40,196	(± 9,985)
Florida	8.1	(±0.9%)	79.8	(±3.3%)	19.6	692,720	(± 86,083)
Georgia	8.8	(±1.2%)	91.0	(±4.8%)	21.0	423,332	(±108,547)
Idaho	9.3	(±1.1%)	79.9	(±6.1%)	18.6	61,811	(± 8,996)
Illinois	9.7	(±1.1%)	87.6	(±2.8%)	24.1	773,657	(± 92,787)
Indiana	11.6	(±1.3%)	85.4	(±5.1%)	27.5	420,257	(± 58,376)
Iowa	11.4	(±1.1%)	91.7	(±4.1%)	27.2	231,575	(± 28,310)
Kansas	8.9	(±1.3%)	88.9	(±4.6%)	22.8	161,255	(± 26,077)
Kentucky	13.9	(±1.3%)	95.0	(±3.2%)	34.2	363,937	(± 40,646)
Louisiana	10.7	(±1.5%)	85.4	(±5.8%)	23.0	294,892	(± 51,436)
Maine	11.3	(±1.6%)	86.7	(±4.9%)	25.3	79,530	(± 12,242)
Maryland	8.8	(±0.9%)	89.3	(±6.1%)	20.1	270,018	(± 39,213)
Massachusetts	7.4	(±1.2%)	84.3	(±3.4%)	19.7	297,469	(± 52,068)
Michigan	10.9	(±1.2%)	91.2	(±2.3%)	26.8	716,003	(± 85,401)
Minnesota	9.1	(±0.9%)	88.9	(±4.6%)	21.6	282,794	(± 33,276)
Mississippi	11.2	(±1.7%)	86.2	(±5.7%)	23.6	192,720	(± 34,155)
Missouri	10.2	(±1.5%)	88.9	(±5.1%)	26.9	352,936	(± 58,571)
Montana	8.6	(±1.3%)	92.9	(±4.2%)	23.3	52,487	(± 8,773)
Nebraska	9.4	(±1.3%)	86.0	(±5.2%)	21.0	96,897	(± 15,293)
Nevada	8.7	(±1.6%)	86.0	(±5.8%)	20.8	84,551	(± 16,847)
New Hampshire	10.4	(±1.6%)	87.0	(±6.0%)	24.6	70,576	(± 12,163)
New Jersey	9.8	(±1.2%)	82.9	(±3.6%)	20.4	398,218	(± 49,758)

New Mexico	10.0 (±2.0%)	81.9 (±6.0%)	19.1	103,431 (± 26,654)
New York	9.6 (±0.9%)	88.9 (±2.2%)	23.2	1,120,051 (±111,384)
North Carolina	10.1 (±1.2%)	87.5 (±2.7%)	26.1	416,544 (± 51,488)
North Dakota	10.0 (±1.4%)	89.7 (±4.8%)	23.9	42,729 (± 6,663)
Ohio	11.8 (±1.6%)	91.0 (±2.2%)	29.8	919,290 (±128,696)
Oklahoma	9.7 (±1.6%)	91.7 (±4.3%)	25.6	216,335 (± 36,983)
Oregon	9.8 (±1.1%)	75.9 (±7.8%)	20.1	167,533 (± 26,977)
Pennsylvania	11.0 (±1.1%)	87.6 (±2.7%)	27.9	858,229 (± 87,807)
Rhode Island	9.3 (±1.4%)	92.4 (±4.9%)	23.9	53,646 (± 8,179)
South Carolina	11.3 (±1.7%)	86.2 (±4.7%)	22.2	240,315 (± 43,386)
South Dakota	8.6 (±1.3%)	89.7 (±4.3%)	22.3	45,027 (± 7,448)
Tennessee	14.0 (±1.4%)	90.0 (±4.4%)	32.1	488,846 (± 64,578)
Texas	9.6 (±1.4%)	82.0 (±3.4%)	18.4	995,462 (±158,639)
Utah	8.0 (±1.2%)	73.5 (±8.4%)	11.7	82,929 (± 16,503)
Vermont	10.4 (±1.3%)	88.4 (±5.2%)	24.2	42,340 (± 6,499)
Virginia	8.6 (±1.3%)	87.5 (±4.8%)	22.5	336,794 (± 59,265)
Washington	9.5 (±1.1%)	70.6 (±7.5%)	17.7	244,887 (± 39,191)
West Virginia	10.8 (±1.2%)	93.6 (±3.5%)	30.4	128,665 (± 17,100)
Wisconsin	11.4 (±1.6%)	90.9 (±4.1%)	28.5	428,302 (± 67,344)
Wyoming	10.2 (±1.2%)	86.8 (±5.9%)	23.0	33,950 (± 5,017)
Range	*7.0–14.9*	*70.6–95.6*		*32,105–1,120,051*
Median	*9.8*	*87.5*		*229,446*

*Persons aged ≥18 years who reported having smoked ≥100 cigarettes and who reported smoking every day or some days.
†Persons aged <18 years.
§Based on the 1992–93 Current Population Survey question, "Which statement best describes the rules about smoking in your home?" Allowing smoking is defined as "Smoking is allowed in some places or at some times" and "Smoking is permitted anywhere."
Restricted to adult smokers with children in the home.
¶No data were available for Hawaii.
**Confidence interval.

some or all areas of the home. Therefore, during 1996, approximately 15 million (21.9%) children and adolescents aged <18 years were exposed to ETS in homes. One of the national health objectives for 2000 is to reduce to ≤20% the number of children aged ≤6 years exposed to ETS in the home (objective 3.8) (7). The findings in this report underscore the need for continued national and state-level public health initiatives to reduce cigarette smoking and children's exposure to ETS in the home.

In addition to addressing the smoking behaviors of adults and the related direct deleterious health effects for smokers, public health initiatives also must be directed toward the adverse effects on nonsmokers and on children exposed to ETS in the home. Strategies for reducing the prevalence of cigarette smoking and minimizing children's exposure to ETS include preventing young persons from initiating smoking, encouraging smokers to quit, and educating smokers about the hazards of ETS (9).

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State-Specific Prevalence of Cigarette Smoking — United States, 1995

State-specific variation in the prevalence of cigarette smoking contributes to differences in the mortality patterns of smoking-related diseases, such as lung cancer, coronary heart disease, chronic bronchitis, and emphysema (1). In 1990, approximately 400,000 deaths were attributable to smoking: the median percentage of deaths attributable to smoking in all states was 19.2% (range: 13.4% in Utah to 24.0% in Nevada) (1). State-specific surveillance of the prevalence of cigarette smoking can be used to direct and evaluate public health interventions to reduce smoking and the burden of smoking-related diseases on society. In June 1996, the Council of State and Territorial Epidemiologists (CSTE) recommended that cigarette smoking be added to the list of conditions designated as reportable by states to CDC (2). This report responds to the CSTE recommendation and summarizes state-specific prevalences of cigarette smoking by U.S. adults in 1995. During 1995, the prevalence of smoking varied among states and ranged from 13.2% (Utah) to 27.8% (Kentucky).

The 1995 Behavioral Risk Factor Surveillance System (BRFSS)—a state-based, random-digit–dialed telephone survey of the noninstitutionalized U.S. population aged ≥18 years—was conducted in 50 states and was used to determine self-reported cigarette smoking among adults. Respondents were asked "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" Current smokers were persons who reported having smoked ≥100 cigarettes during their lifetimes and who smoke now. Every-day smoking was determined by asking current smokers "On how many of the past 30 days did you smoke cigarettes?" A quit attempt was determined by asking current every-day smokers "During the past 12 months, have you quit smoking for one day or longer?" Data from the 50 states were weighted to represent state populations and used to produce point estimates; 95% confidence intervals were calculated using SUDAAN.

During 1995, the median prevalence of current smoking was 22.4%; state-specific prevalences ranged from 13.2% (Utah) to 27.8% (Kentucky) (Table 1). Range endpoints were higher for men (16.4% to 31.6%) than for women (10.0% to 27.8%); however, state-specific prevalences were significantly higher for men than for women in only eight states (Alabama, Arizona, Georgia, Illinois, Missouri, North Carolina, Ohio, and Utah). Among current smokers, reported every-day smoking during the preceding 30 days ranged from 79.7% (New Jersey) to 92.9% (Oklahoma) (Table 2). The percentage of every-day smokers who reported having quit for ≥1 day during the previous year ranged from 32.4% (Georgia) to 59.4% (Hawaii) (Table 2).

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TABLE 1. Prevalence of current cigarette smoking among adults,* by state and sex — United States, Behavioral Risk Factor Surveillance System, 1995

State[†]	Men %	(95% CI[§])	Women %	(95% CI)	Total %	(95% CI)
Alabama	30.0	(±3.9%)	19.7	(±2.6%)	24.5	(±2.3%)
Alaska	26.5	(±4.7%)	23.3	(±4.0%)	25.0	(±3.1%)
Arizona	26.8	(±4.5%)	19.1	(±3.1%)	22.9	(±2.7%)
Arkansas	26.8	(±3.6%)	23.8	(±2.7%)	25.2	(±2.2%)
California	17.5	(±2.2%)	13.6	(±2.3%)	15.5	(±1.6%)
Colorado	22.2	(±3.2%)	21.4	(±2.7%)	21.8	(±2.1%)
Connecticut	21.0	(±3.3%)	20.6	(±2.7%)	20.8	(±2.1%)
Delaware	27.5	(±3.3%)	23.6	(±2.7%)	25.5	(±2.1%)
Florida	24.9	(±2.5%)	21.6	(±2.0%)	23.1	(±1.6%)
Georgia	24.3	(±3.0%)	16.9	(±2.3%)	20.5	(±1.9%)
Hawaii	18.8	(±3.0%)	16.8	(±2.6%)	17.8	(±2.0%)
Idaho	20.4	(±2.5%)	19.2	(±2.1%)	19.8	(±1.6%)
Illinois	26.6	(±2.9%)	19.9	(±2.1%)	23.1	(±1.8%)
Indiana	28.5	(±2.8%)	26.0	(±2.6%)	27.2	(±1.9%)
Iowa	24.8	(±2.4%)	21.7	(±1.9%)	23.2	(±1.5%)
Kansas	24.0	(±3.0%)	20.1	(±2.5%)	22.0	(±2.0%)
Kentucky	28.8	(±3.2%)	26.9	(±2.5%)	27.8	(±2.0%)
Louisiana	26.3	(±3.8%)	24.2	(±3.0%)	25.2	(±2.5%)
Maine	26.9	(±4.1%)	23.2	(±3.5%)	25.0	(±2.6%)
Maryland	22.4	(±2.0%)	20.1	(±1.6%)	21.2	(±1.3%)
Massachusetts	22.5	(±3.3%)	21.0	(±2.8%)	21.7	(±2.2%)
Michigan	26.3	(±2.9%)	25.2	(±2.4%)	25.7	(±1.9%)
Minnesota	22.5	(±2.2%)	18.6	(±1.7%)	20.5	(±1.4%)
Mississippi	27.6	(±4.0%)	20.9	(±2.9%)	24.0	(±2.5%)
Missouri	28.0	(±4.0%)	20.9	(±2.9%)	24.3	(±2.5%)
Montana	22.5	(±3.8%)	19.8	(±3.1%)	21.1	(±2.5%)
Nebraska	24.8	(±3.4%)	19.3	(±2.5%)	21.9	(±2.1%)
Nevada	24.8	(±3.6%)	27.8	(±3.2%)	26.3	(±2.4%)
New Hampshire	21.9	(±3.8%)	21.0	(±3.0%)	21.4	(±2.4%)
New Jersey	21.6	(±4.5%)	17.0	(±2.8%)	19.2	(±2.6%)
New Mexico	22.7	(±4.4%)	19.7	(±3.2%)	21.2	(±2.7%)
New York	23.6	(±3.1%)	19.6	(±2.3%)	21.5	(±1.9%)
North Carolina	30.2	(±2.8%)	21.8	(±2.1%)	25.8	(±1.7%)
North Dakota	24.9	(±3.2%)	20.5	(±2.9%)	22.7	(±2.1%)
Ohio	31.6	(±4.7%)	21.0	(±3.2%)	26.0	(±2.8%)
Oklahoma	21.6	(±3.3%)	21.7	(±3.0%)	21.7	(±2.2%)
Oregon	22.9	(±2.7%)	20.8	(±2.3%)	21.8	(±1.8%)
Pennsylvania	26.0	(±2.7%)	22.5	(±2.5%)	24.2	(±1.8%)
Rhode Island	24.0	(±3.4%)	25.4	(±3.1%)	24.7	(±2.3%)
South Carolina	24.6	(±3.2%)	23.0	(±2.8%)	23.7	(±2.1%)
South Dakota	22.8	(±3.0%)	20.9	(±2.8%)	21.8	(±2.1%)
Tennessee	27.9	(±3.4%)	25.2	(±2.6%)	26.5	(±2.1%)
Texas	27.1	(±3.9%)	20.4	(±2.8%)	23.7	(±2.4%)
Utah	16.4	(±2.9%)	10.0	(±1.8%)	13.2	(±1.7%)
Vermont	24.9	(±3.0%)	19.5	(±2.5%)	22.1	(±1.9%)
Virginia	23.7	(±3.5%)	20.5	(±2.7%)	22.0	(±2.3%)
Washington	20.0	(±2.3%)	20.3	(±2.0%)	20.2	(±1.5%)
West Virginia	24.8	(±3.0%)	26.5	(±2.5%)	25.7	(±2.0%)
Wisconsin	24.5	(±3.5%)	19.3	(±2.6%)	21.8	(±2.2%)
Wyoming	22.1	(±2.8%)	21.9	(±2.3%)	22.0	(±1.8%)
Range	*16.4–31.6*		*10.0–27.8*		*13.2–27.8*	
Median	*24.7*		*20.9*		*22.4*	

* Persons aged ≥18 years who reported having smoked ≥100 cigarettes and who reported smoking now.
[†] No data were available for the District of Columbia.
[§] Confidence interval.

TABLE 2. Percentage of current adult smokers who smoked every day* and percentage of every-day smokers who quit smoking for ≥1 day†, by state — United States, Behavioral Risk Factor Surveillance System, 1995

State§	Smoked every day		Quit smoking for ≥1 day	
	%	(95% CI¶)	%	(95% CI)
Alabama	88.5	(±3.4%)	42.5	(±5.9%)
Alaska	88.8	(±3.8%)	55.9	(±7.6%)
Arizona	88.3	(±4.0%)	48.7	(±6.9%)
Arkansas	89.8	(±2.7%)	46.0	(±5.5%)
California	81.3	(±3.9%)	52.3	(±6.4%)
Colorado	81.9	(±4.2%)	47.0	(±5.9%)
Connecticut	88.8	(±3.3%)	48.3	(±6.1%)
Delaware	90.3	(±3.1%)	50.5	(±5.1%)
Florida	87.3	(±2.8%)	46.4	(±4.1%)
Georgia	89.8	(±3.1%)	32.4	(±5.0%)
Hawaii	84.5	(±4.4%)	59.4	(±6.4%)
Idaho	91.1	(±2.5%)	42.1	(±4.8%)
Illinois	86.1	(±3.2%)	43.1	(±4.6%)
Indiana	89.0	(±2.8%)	41.2	(±4.2%)
Iowa	87.0	(±2.6%)	40.4	(±3.9%)
Kansas	83.7	(±3.8%)	38.1	(±5.3%)
Kentucky	89.0	(±2.6%)	38.8	(±4.4%)
Louisiana	83.3	(±4.1%)	50.7	(±6.0%)
Maine	88.6	(±4.2%)	34.6	(±5.7%)
Maryland	84.6	(±2.6%)	42.9	(±3.7%)
Massachusetts	86.3	(±4.0%)	56.5	(±5.9%)
Michigan	83.2	(±3.3%)	46.2	(±4.6%)
Minnesota	84.5	(±2.7%)	42.1	(±4.1%)
Mississippi	84.2	(±4.5%)	48.5	(±6.0%)
Missouri	89.3	(±3.5%)	45.2	(±6.4%)
Montana	89.2	(±4.2%)	41.5	(±6.8%)
Nebraska	88.3	(±3.4%)	41.5	(±5.8%)
Nevada	88.0	(±3.3%)	45.1	(±5.7%)
New Hampshire	87.1	(±4.3%)	44.6	(±6.9%)
New Jersey	79.7	(±6.1%)	43.2	(±8.4%)
New Mexico	82.2	(±5.4%)	47.4	(±7.6%)
New York	88.5	(±3.0%)	47.3	(±5.2%)
North Carolina	88.7	(±2.5%)	47.9	(±4.1%)
North Dakota	88.1	(±3.3%)	40.5	(±5.4%)
Ohio	90.6	(±3.5%)	45.2	(±6.8%)
Oklahoma	92.9	(±3.3%)	38.6	(±6.0%)
Oregon	84.3	(±3.2%)	37.0	(±4.7%)
Pennsylvania	83.7	(±3.0%)	42.0	(±4.8%)
Rhode Island	86.0	(±3.9%)	45.5	(±5.8%)
South Carolina	87.6	(±3.1%)	42.9	(±5.5%)
South Dakota	90.7	(±3.0%)	41.7	(±5.6%)
Tennessee	91.1	(±2.6%)	38.1	(±4.7%)
Texas	83.8	(±4.0%)	51.0	(±6.4%)
Utah	85.2	(±5.2%)	44.0	(±6.9%)
Vermont	85.1	(±3.4%)	37.5	(±5.2%)
Virginia	83.9	(±4.2%)	41.3	(±5.9%)
Washington	86.1	(±2.8%)	45.6	(±4.5%)
West Virginia	91.8	(±2.3%)	40.6	(±4.4%)
Wisconsin	83.3	(±4.2%)	49.3	(±6.1%)
Wyoming	86.5	(±3.3%)	40.1	(±4.8%)
Range	*79.7–92.9*		*32.4–59.4*	
Median	*87.2*		*43.6*	

*During the preceding 30 days.
†During the preceding 12 months.
§No data were available for the District of Columbia.
¶Confidence interval.

M Gildemaster, South Dakota; D Ridings, Tennessee; R Diamond, MPH, Texas; R Giles, Utah; R McIntyre, PhD, Vermont; J Stones, Virginia; K Wynkoop-Simmons, PhD, Washington; F King, West Virginia; E Cautley, MS, Wisconsin; M Futa, MA, Wyoming. Council of State and Territorial Epidemiologists. Epidemiology Br, Office on Smoking and Health, and Behavioral Surveillance Br, Div of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report are a milestone for public health surveillance in the United States: these findings document the first time surveillance for a behavior—rather than a disease or illness—has been nationally reportable (*2*). Although the wide state-specific variation in prevalence of cigarette smoking may reflect, in part, differences in sociodemographic characteristics (e.g., age, race, and educational level), previous reports indicated that variations persisted even after estimates were standardized to adjust for these differences (*3*). Despite some state-specific variations in prevalences, smoking patterns across most states were similar for men and women, indicating that the historically observed gap between men and women has decreased substantially.

Compared with previous years, prevalences of smoking decreased in some states while remaining relatively stable in others (*4*). For example, from 1984 to 1995, the prevalence declined from 26% to 16% in California, but remained consistently low in Utah (16% to 13%). Only Utah has achieved the national health objective for the year 2000 of reducing the prevalence of cigarette smoking among adults to no more than 15% (objective 3.4) (*5*); this objective has been nearly achieved in California. Successful state efforts may reflect a combination of factors including community-based tobacco-control programs, antitobacco use media campaigns, and enactment and enforcement of policies to restrict and prevent tobacco use (*6*).

Prevalences of reported every-day smoking and quitting smoking for ≥1 day may be related to factors that influence current smoking prevalence, including physician advice to quit smoking, smoke-free indoor-air policies, the price of cigarettes, and counter-advertising campaigns. For example, prevalences of tobacco use and the amount of tobacco consumed may vary substantially in relation to the price of tobacco products (*5*)—price increases may prompt current smokers to quit and deter young persons from starting, accounting for the prevention of premature deaths and resulting in savings of billions of dollars in health-care costs (*1,5*).

The findings in this report are subject to at least two limitations. First, prevalence estimates may be underestimated because data were collected through telephone interviews; previous studies indicate substantial differences in the characteristics of persons who reside in households without a telephone compared with those who reside in households with a telephone (*7*). Second, these estimates were only for adults and did not include persons aged <18 years. However, to adequately assess the impact of cigarette smoking, data about the prevalence of smoking among young persons also should be considered. Data about youth tobacco use during 1995 are available in 31 states; of these, 22 can produce generalizable state estimates (*8*).

The national health objectives for the year 2000 have established measurable goals for reducing the prevalence of cigarette smoking, preventing young persons from initiating smoking, encouraging smokers to quit, and developing public policies that are less supportive of tobacco use (*5*). Public health measures necessary to achieve the objective of reducing smoking in all states include individual-based interventions

(e.g., services to help smokers quit), and population-based interventions (e.g., public health policies that prevent nicotine addiction and promote quitting smoking) (*5,9*).

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Cigarette Smoking Among Adults —
United States, 1994

Reducing the prevalence of cigarette smoking among adults to no more than 15% is one of the national health objectives for the year 2000 (objective 3.4) (*1*). To assess progress toward meeting this objective, CDC analyzed self-reported information about cigarette smoking among U.S. adults contained in the Year 2000 Objectives Supplement of the 1994 National Health Interview Survey (NHIS-2000). This report summarizes the findings of this analysis, which indicate that, in 1994, 25.5% (48.0 million) of adults were current smokers and that the overall prevalence of current smoking and estimates for sociodemographic subgroups were unchanged from 1993 to 1994.

The 1994 NHIS-2000 was administered to a nationally representative sample (n=19,738) of the U.S. noninstitutionalized civilian population aged ≥18 years; 79.5% responded. Participants were asked "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Current smokers were persons who reported having smoked ≥100 cigarettes in their lifetime and who smoked every day or some days at the time of interview. Former smokers were those who had smoked ≥100 cigarettes in their lifetime but who did not smoke currently. Interest in quitting smoking was determined by asking current smokers "Would you like to completely quit smoking cigarettes?" Quit attempt was determined by asking current every-day smokers "During the past 12 months, have you stopped smoking for one day or longer?" Data were adjusted for non-response and weighted to provide national estimates. Confidence intervals (CIs) were calculated using SUDAAN.

In 1994, an estimated 48.0 million adults (25.5% [95% CI=±0.7%]), including 25.3 million men and 22.7 million women, were current smokers (Table 1): 21.0% (95% CI=±0.7%) were every-day smokers, and 4.6% (95% CI=±0.4%) were some-day smokers. Current every-day smokers in 1994 constituted 82.1% (95% CI=±1.3%) of current smokers, similar to that for 1993 (81.8% [95% CI=±1.2%]) (CDC, unpublished data, 1996). Men were significantly more likely to be current smokers (28.2% [95% CI=±1.1%]) than were women (23.1% [95% CI=±0.9%]). Racial/ethnic group-specific prevalence was highest for American Indians/Alaskan Natives (42.2% [95% CI=±9.4%]) and lowest for Asians/Pacific Islanders (13.9% [95% CI=±3.5%]). With the exception of persons with 0–8 years of education, smoking prevalence varied inversely with level of education and was highest among persons with 9–11 years of education (38.2% [95% CI=±2.5%]). Smoking prevalence was higher among persons living below the poverty level* (34.7% [95% CI=±2.3%]) than among those living at or above the poverty level (24.1% [95% CI=±0.8%]).

In 1994, an estimated 46.0 million adults (24.5% [95% CI=±0.7%]) were former smokers, including 26.0 million men and 20.0 million women. An estimated 33.2 million (69.3% [95% CI=±1.6%]) current smokers wanted to quit smoking completely, and 18.1 million (46.4% [95% CI=±1.9%]) current every-day smokers had stopped smoking for at least 1 day during the preceding 12 months.

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*Poverty statistics are based on definitions originated by the Social Security Administration in 1964 (which were subsequently modified by federal interagency committees in 1969 and 1980) and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

TABLE 1. Percentage of persons aged ≥18 years who were current cigarette smokers*, by selected characteristics — Year 2000 Objectives Supplement of the National Health Interview Survey, United States, 1994

Characteristic	Men (n=8,303)		Women (n=11,435)		Total (n=19,738)	
	%	(95% CI[†])	%	(95% CI)	%	(95% CI)
Race/Ethnicity[§]						
White	28.0	(± 1.2)	24.7	(± 1.1)	26.3	(±0.9)
Black	33.9	(± 4.0)	21.8	(± 2.2)	27.2	(±2.3)
Hispanic	24.3	(± 4.1)	15.2	(± 2.8)	19.5	(±2.5)
American Indian/						
Alaskan Native[¶]	53.7	(±16.9)	33.1	(±10.8)	42.2	(±9.4)
Asian/Pacific Islander	20.4	(± 6.1)	7.5	(± 3.5)	13.9	(±3.5)
Education (yrs)**						
≤8	30.4	(± 4.1)	17.8	(± 2.8)	23.7	(±2.4)
9–11	45.8	(± 3.9)	32.1	(± 3.0)	38.2	(±2.5)
12	33.2	(± 2.1)	27.3	(± 1.6)	29.8	(±1.3)
13–15	28.4	(± 2.5)	23.3	(± 2.1)	25.7	(±1.6)
≥16	13.8	(± 1.7)	10.4	(± 1.4)	12.3	(±1.1)
Age (yrs)						
18–24	29.8	(± 3.3)	25.2	(± 2.8)	27.5	(±2.2)
25–44	32.3	(± 1.7)	27.8	(± 1.4)	30.0	(±1.1)
45–64	28.3	(± 2.1)	22.8	(± 1.9)	25.5	(±1.4)
≥65	13.2	(± 1.9)	11.1	(± 1.3)	12.0	(±1.1)
Poverty status[††]						
At/Above	26.6	(± 1.1)	21.6	(± 1.0)	24.1	(±0.8)
Below	41.9	(± 4.1)	30.2	(± 2.6)	34.7	(±2.3)
Unknown	31.8	(± 4.2)	26.8	(± 3.4)	28.8	(±2.7)
Total	**28.2**	**(± 1.1)**	**23.1**	**(± 0.9)**	**25.5**	**(±0.7)**

*Persons who reported having smoked ≥100 cigarettes and who reported now smoking every day or some days. Excludes 171 respondents for whom smoking status was unknown.
[†]Confidence interval.
[§]Excludes 251 respondents in unknown, multiple, and other racial categories.
[¶]Estimates should be interpreted with caution because of the small sample sizes.
**Persons aged ≥25 years. Excludes 118 persons with unknown years of education.
[††]Poverty statistics are based on definitions developed by the Social Security Administration in 1964 (which were subsequently modified by federal interagency committees in 1969 and 1980) and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

Reported by: Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report indicate that the overall prevalence of current cigarette smoking among U.S. adults in 1994 was unchanged compared with that in 1993 (*2*) and suggest a plateau in the prevalence (*2,3*); in addition, estimated prevalences were unchanged for sociodemographic subgroups, for current and every-day smokers, and for former smokers. From 1981 to 1993, average per capita consumption of cigarettes declined by 108.2 cigarettes annually (3836 cigarettes per adult to 2538); in comparison, the annual decline was only 11.5 cigarettes from 1993 to 1995

(2515 per adult) (*3,4*). The plateau in prevalence and consumption corresponded with a 10.4% decrease in the real price per pack of cigarettes during 1992–1994 after annual increases of an average of 4% since 1984 (*5*). This decrease in the real price of cigarettes was because of increased market shares for discount brands and price decreases in premium brands. In addition, during this period, domestic cigarette marketing expenditures increased at more than four times the rate of inflation, with the largest increases in expenditures for coupons and other items that make cigarettes more affordable (*6*).

Racial/ethnic variations in smoking prevalence probably reflect the differences in education level (*7*), income, employment status, and cultural factors. For example, in many Asian cultures, smoking by women is unacceptable (*8*). To further assess these differences, CDC has funded 11 academic institutions to collaborate in examining variations in smoking behavior among racial, ethnic, and sex groups. These studies include focus groups of teenagers to determine differences among groups in the functional values, parenting styles, and social norms associated with tobacco use.

To achieve national health objectives for decreased prevalence of smoking, efforts must be intensified to discourage the initiation of smoking among youth and to encourage smokers to quit. Specific prevention strategies include reducing both the access to and the appeal of tobacco products for minors, educational efforts encouraging cessation, improved access to cessation services for smokers interested in quitting, and implementation of other strategies (e.g., mass media campaigns) (*9*). The document *Smoking Cessation: Clinical Practice Guideline* recently released by the Agency for Health Care Policy and Research (*10*) should be widely disseminated and its recommendations fully implemented by all health-care professionals; in addition, all health insurance plans are encouraged to offer treatment for nicotine addiction as a covered benefit (*1*).

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Addition of Prevalence of Cigarette Smoking as a Nationally Notifiable Condition — June 1996

On June 6, 1996, by a unanimous vote, the Council of State and Territorial Epidemiologists (CSTE) added **prevalence of cigarette smoking** to the list of conditions designated as reportable by states to CDC. The addition of prevalence of cigarette smoking marks the first time a behavior, rather than a disease or illness, has been considered nationally reportable.

Goals of smoking prevalence surveillance identified by CSTE include monitoring trends in tobacco use, guiding allocation of tobacco-use prevention resources, and evaluating public health interventions to reduce smoking. Given these goals, CSTE selected population sampling as the appropriate surveillance methodology and designated the Behavioral Risk Factor Surveillance System (BRFSS) as the preferred data source. CSTE and CDC are developing the format to regularly present this information in national disease reporting statistics. The addition of cigarette smoking prevalence brings to 56 the number of diseases and conditions designated by CSTE as reportable by states to CDC.

Reported by: Council of State and Territorial Epidemiologists. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Surveillance and Epidemiology, Epidemiology Program Office, CDC.

Editorial Note: National notifiable disease surveillance has been critical to the successful campaign against infectious diseases throughout this century. By agreement among states, CSTE, in partnership with CDC, determines the list of conditions reportable to CDC. The addition of prevalence of cigarette smoking to this list is a historic step in the evolution of the public health surveillance in the United States.

Although most conditions reportable by states to CDC have been acute infectious diseases, and surveillance for such diseases remains a public health priority, the addition of prevalence of cigarette smoking reflects shifts in morbidity and mortality patterns in the United States and therefore the need to expand the range of nationally reportable conditions. Traditionally, infectious disease reporting has relied on a single methodology—mandated reporting of all cases. The decision by CSTE to designate BRFSS as the recommended data source for reporting of this condition marks a transition to a more flexible system in which surveillance methods are determined by surveillance goals. Most importantly, this action underscores the role of tobacco use as the leading preventable cause of death in the United States and the need to conduct national public health surveillance for both conventional disease outcomes and for underlying causes (e.g., smoking and other risky behaviors) amenable to public health intervention (*1*).

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CDC's 50th Anniversary — July 1, 1996

The Centers for Disease Control and Prevention—CDC—traces its roots to an organization established in the southeastern United States during World War II to prevent malaria among personnel training on U.S. military bases. On July 1, 1996, CDC formally celebrates its 50th anniversary as a federal agency dedicated to ensuring the public's health through close cooperation with state and local health departments and with other organizations committed to improving health in the United States and throughout the world.

To commemorate this anniversary, this issue of *MMWR* presents reports that offer special perspectives: a historical overview of CDC; national morbidity data from June 8, 1946, and June 22, 1996; reprints of articles published in CDC's earlier years—reports about an outbreak of smallpox and an outbreak of penta- chlorophenol poisoning in newborn infants; and information resources about CDC. In addition, this issue reports the recent historic decision by the Council of State and Territorial Epidemiologists to designate the prevalence of cigarette smoking as a notifiable condition for national public health surveillance. A "late-breaking" report summarizes the investigation of a multistate outbreak of *Cyclospora* (an emerging pathogen) infection and underscores the continuing need to address new public health threats. Subsequent issues of *MMWR* this year may include reprints of selected reports of historical interest.

CDC and its employees invite you to use CDC services and learn more about CDC by visiting our site on the World-Wide Web (http://www.cdc.gov), by obtaining copies of information resources listed in this issue of *MMWR,* and by visiting the Global Health Odyssey exhibit at CDC headquarters in Atlanta.

David Satcher, M.D., Ph.D.
Director, CDC

MMWR 1996;45(25):525

Symptoms of Substance Dependence
Associated with Use of Cigarettes, Alcohol, and Illicit Drugs —
United States, 1991–1992

Each year in the United States, approximately 400,000 deaths result from cigarette smoking, 100,000 from misuse of alcohol, and 20,000 from use of illicit drugs (1). Many of the adverse health effects associated with the use of tobacco, alcohol, and illicit drugs result from long-term use caused by substance dependence (i.e., addiction) (2,3)—a cluster of cognitive, behavioral, and physiological symptoms indicating sustained psychoactive substance use despite substance-related problems (4). In addition, substance dependence is characterized by repeated self-administration that usually results in tolerance, withdrawal, and compulsive drug-taking behavior. Nicotine is the psychoactive substance in cigarettes and other forms of tobacco that accounts for the addictive properties of tobacco (2). In addition to tobacco, other potentially addictive substances include alcohol, marijuana, and cocaine (3). To assess the prevalence of selected indicators of substance dependence among the U.S. population, CDC and the National Institute on Drug Abuse analyzed data from the National Household Survey on Drug Abuse (NHSDA) (5) for 1991–1992. The findings in this report suggest that a symptom of substance dependence is more likely to be reported by persons who smoke cigarettes and persons who use cocaine than by persons who use alcohol or marijuana.

NHSDA is a household survey of a nationally representative sample of the U.S. civilian, noninstitutionalized population aged ≥12 years. Data from the 1991 and 1992 surveys were combined (n=61,426) to estimate the prevalence of daily use of cigarettes, alcohol, marijuana, and cocaine for ≥2 consecutive weeks during the preceding 12 months; attempts to reduce use; and four indicators of substance dependence among persons aged ≥12 years who reported having used one of the four substances one or more times during the 30 days preceding the survey. Indicators of dependence for other substances (including heroin, tranquilizers, sedatives, analgesics, and inhalants) were not analyzed because the numbers of persons who reported use were too small to calculate reliable estimates.

Information about the indicators of dependence was based on responses to four questions; persons who reported current use* of cigarettes, alcohol, marijuana, or cocaine were asked whether, during the 12 months preceding the survey, they 1) "felt [they] needed or were dependent on [the substance]," 2) "needed larger amounts to get the same effect," 3) "felt unable to cut down on [their] use even though [they] tried," and 4) "had withdrawal symptoms, that is, felt sick because [they] stopped or cut down on [their] use." The analysis of "unable to cut down" and "felt sick" was restricted to persons who reported trying to reduce their substance use during the preceding 12 months. Data were adjusted for nonresponse and weighted to provide national estimates. Standard errors were calculated by using SUDAAN (6).

Of the 61,426 total NHDSA participants during 1991–1992, use of cigarettes, alcohol, marijuana, or cocaine during the 30 days preceding the survey was reported by 14,688 (26.6%), 27,814 (49.4%), 3904 (4.6%), and 821 (0.8%) persons, respectively (Table 1). Daily use of these substances for ≥2 consecutive weeks during the 12 months preceding the survey was reported by 78.4% of persons who smoked

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*Used one or more times during the 30 days preceding the survey.

TABLE 1. Percentage of respondents* who reported current substance use† during the 12 months preceding the survey, by selected indicators of dependence§ — United States, National Household Survey on Drug Abuse, 1991–1992

Category/ Substance	No. persons who reported use	Used daily for ≥2 weeks		Tried to cut down		Unable to cut down		Felt need for more		Felt dependent		Felt sick when stopped		≥1 indicator¶	
		%	(95% CI**)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
All respondents††															
Cigarettes	14,688	78.4	(±1.7)	64.4	(± 1.7)	76.6	(± 1.8)	14.0	(± 1.2)	68.9	(± 1.7)	34.9	(± 2.0)	75.2	(± 1.6)
Alcohol	27,814	13.8	(±0.9)	25.1	(± 1.0)	39.8	(± 2.5)	5.8	(± 0.5)	6.6	(± 0.6)	8.8	(± 1.4)	14.1	(± 0.8)
Marijuana	3,904	22.6	(±2.5)	31.7	(± 2.5)	33.6	(± 4.2)	10.3	(± 1.6)	12.2	(± 1.6)	9.8	(± 2.6)	22.6	(± 2.1)
Cocaine	821	12.4	(±4.0)	39.7	(± 7.1)	38.4	(±10.8)	17.6	(± 5.3)	13.9	(± 3.8)	19.4	(± 8.1)	29.1	(± 6.3)
Daily users§§															
Cigarettes	10,343	NA¶¶	NA	74.9	(± 1.9)	79.6	(± 1.8)	17.5	(± 1.5)	85.0	(± 1.4)	37.4	(± 2.1)	90.9	(± 1.1)
Alcohol	3,335	NA	NA	48.8	(± 3.8)	61.7	(± 5.3)	23.9	(± 3.2)	32.8	(± 2.9)	25.4	(± 4.0)	48.1	(± 3.7)
Marijuana	830	NA	NA	51.9	(± 6.1)	49.9	(± 7.1)	30.7	(± 5.3)	39.0	(± 5.8)	17.8	(± 5.4)	59.8	(± 6.3)
Cocaine	107	NA	NA	72.1	(±15.6)	66.0	(±21.4)	65.0	(±17.7)	62.7	(±17.9)	48.9	(±20.8)	78.9	(±14.9)

* Aged ≥12 years.
† Used cigarettes, alcohol, marijuana, or cocaine one or more times during the 30 days preceding the survey.
§ Tried to cut down on the use of substance; "felt unable to cut down on [their] use even though [they] tried"; "needed larger amounts to get the same effect"; "felt [they] needed or were dependent on [the substance]"; "had withdrawal symptoms, that is, felt sick because [they] stopped or cut down on [their] use."
¶ Current substance users who responded yes to at least one of the last four indicators.
** 95% Confidence interval.
†† n=61,426.
§§ Respondents who reported daily use for ≥2 consecutive weeks during the 12 months preceding the survey; n=14,615.
¶¶ Not applicable.

cigarettes, and by 22.6%, 13.8%, and 12.4% of those who used marijuana, alcohol, and cocaine, respectively. Cigarette smokers were more likely than persons who used the other substances to report having tried to cut down, and were approximately twice as likely as persons who used alcohol, marijuana, or cocaine to report having been unable to cut down (Table 1). Cigarette smokers were more likely than users of the other substances to report feeling dependent on the substance or feeling sick when they stopped or cut down on its use. Cigarette smokers (75.2%) were more likely to report one of the four symptoms of dependence than were persons who used cocaine (29.1%), marijuana (22.6%), or alcohol (14.1%).

To compare·data for more frequent users, the analysis was restricted to persons who had used these substances daily for ≥2 consecutive weeks during the 12 months preceding the survey. Of the 47,227 current substance users, 14,615 (30.9%) reported daily use. Among these persons, those who smoked cigarettes were more likely than those who used alcohol or marijuana to report having been unable to cut down (Table 1). Persons who had used cocaine daily were more likely than persons who had used cigarettes, alcohol, or marijuana to report feeling a need for more of the substance to get the same effect. Persons who were daily cigarette smokers were more likely than persons who used alcohol, marijuana, or cocaine daily to report feeling dependent on the substance and were more likely than daily users of alcohol or marijuana to report feeling sick when they stopped or cut down. Among persons who had used any of the four substances every day for ≥2 consecutive weeks, those who smoked cigarettes (90.9%) and those who used cocaine (78.9%) were more likely to report a symptom of addiction than were persons who used alcohol (48.1%) or marijuana (58.8%)

To determine whether the prevalence of reported symptoms varied for different measures of frequency of use, the analysis was further restricted to persons who reported that, on average, they used each substance on a daily or weekly basis during the 12 months preceding the survey. Although the prevalance estimates varied within each category of substance use, the relative ranking of the substances by frequency of symptoms of dependency remained constant.

Reported by: J Henningfield, Clinical Pharmacology Research Br, Addiction Research Center, National Institute on Drug Abuse. Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report suggest that persons who smoked cigarettes and persons who used cocaine were more likely than those who used alcohol or marijuana to report a symptom of substance dependence after controlling for frequency of use. The high level of dependency associated with cigarette smoking may account, in part, for the low success rate for attempts to quit smoking (only 2.5% of smokers successfully quit each year) even though most smokers report wanting to quit smoking (7). In addition, a high proportion (73%) of adolescents who smoke but who intended to quit smoking in 5–6 years were still smoking 5 years later (8).

The findings in this report are subject to at least three limitations. First, the four NHSDA indicators do not provide a comprehensive measure of substance dependence because not all symptoms of the withdrawal syndromes characteristic of each substance were included. As a result, the proportion of persons who reported at least one indicator of substance dependence may be underestimated. Second, the categories of substance use were not mutually exclusive, and possible interactions

experienced by users of multiple substances were not examined. Finally, these findings are based on self-reported data, and self-perception of substance dependence was not validated; however, self-reported symptoms of nicotine dependence have been confirmed previously by observer rating (*2*).

Although the severity of dependence can be estimated by the number of symptoms reported for persons using a particular psychoactive substance (*4*), criteria have not been developed to enable comparisons of the severity of dependence of different substances (*9*). Therefore, the findings in this report cannot be interpreted to indicate that nicotine produces more severe addiction than cocaine, marijuana, or alcohol. In addition, differences in the patterns of use of these substances and in the development of dependency may reflect their availability and accessibility: because cigarettes and alcohol are legal for adults, they are more available and accessible than marijuana and cocaine. Other factors that may account for some of these differences include price, advertising and promotion, social pressure, regulations, sanctions, and pharmacologic characteristics (*9*).

The use of cigarettes, alcohol, and illicit drugs all result in excess dependence, morbidity, and mortality and in substantial economic costs (*1,3,10*). Public health interventions that decrease the availability and social acceptability of tobacco use assist in reducing the initiation of use and the development of nicotine addiction (*8*). These approaches include reducing illegal sales of tobacco to minors, increasing the real price of tobacco products, restricting tobacco advertising and promotion targeted toward minors, and conducting educational and advertising campaigns that "deglamorize" tobacco use. School- and community-based educational interventions can help prevent tobacco initiation (*8*) and the use of alcohol and other substances (*10*). In addition, improved access to substance-dependence treatment programs may help reduce the health burden resulting from the use of tobacco, alcohol, and illicit drugs (*10*).

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Prevalence of Smoking by Area of Residence — Missouri, 1989–1991

Variation in smoking prevalence by area of residence may be an important consideration in the development, implementation, and management of programs that promote nonsmoking. In general, the prevalence of cigarette smoking is highest among persons at economic, educational, and social disadvantage (*1,2*), and the proportion of persons who are disadvantaged is greater in urban and nonmetropolitan areas. Because smoking prevalence varies by area of residence and characterization of these differences can assist in directing efforts to promote nonsmoking, the Missouri Department of Health compared urban, suburban, and nonmetropolitan areas using data from two sources: the Behavioral Risk Factor Surveillance System (BRFSS) for Missouri from 1989 through 1991 (suburban and nonmetropolitan areas) and a survey specially commissioned in 1990 (Smoking Cessation in Black Americans [SCBA]) of persons living in low-income census tracts in north St. Louis and central Kansas City (urban areas). This report summarizes the results of this analysis.

BRFSS is a population-based, random-digit–dialed telephone survey of the civilian, noninstitutionalized population aged ≥18 years (*3*). For this analysis, respondents' suburban or nonmetropolitan residence was determined by county of residence: respondents not living in counties composing a metropolitan statistical area (MSA) were categorized as residing in nonmetropolitan areas; respondents living in counties composing MSAs were categorized as residing in suburban areas. Persons living in the urban areas of St. Louis or Kansas City (Jackson County) were excluded from the BRFSS data. However, the SCBA survey was conducted in 60 low-income census tracts to determine smoking prevalence and attitudes among residents of these areas (*4*). To estimate prevalences, BRFSS data were weighted to reflect the total population in each area (based on the 1990 census) and for respondent probability of selection. Based on the 1990 census, 46% of persons resided in suburban areas, 34% in nonmetropolitan areas, and 20% in St. Louis and Kansas City. BRFSS data were aggregated for 3 survey years to increase the number of respondents in the demographic categories* for the suburban and nonmetropolitan areas, and SUDAAN was used to calculate the variance (*5*). For both the BRFSS and SCBA, current smokers were defined as persons who had smoked ≥100 cigarettes and who reported being a smoker at the time of the interview. The prevalence of cessation was obtained by dividing the number of former smokers by the number of ever smokers (respondents who have ever smoked ≥100 cigarettes during their lifetime) and multiplying by 100. Differences in group-specific prevalence rates in this report reflect nonoverlapping confidence intervals.

Overall, the prevalence of current smoking was higher among persons residing in the urban areas (32.4%) than in the suburban (24.8%) and nonmetropolitan areas (26.5%) (Table 1). This pattern was consistent across all sex and education subgroups. The prevalence of current smoking also was higher in the urban areas for adults aged 35–54 years and ≥55 years. For the 18–34–year age group, the prevalence of current smoking in the urban areas (31.3%) was comparable to that in the suburban (27.8%) and nonmetropolitan (33.5%) areas. For whites, the prevalence of current smoking was higher for those living in the urban areas (34.8%) than in suburban (24.9%) or nonmetropolitan (26.0%) areas. For blacks, the prevalence of current smoking was

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*Numbers for races other than black and white were too small for meaningful analysis.

similar in urban areas (32.0%) and nonmetropolitan areas (32.1%) but higher than in suburban areas (24.0%).

Among current smokers, the mean number of cigarettes smoked per day was highest in the nonmetropolitan areas (22.8), lowest in the urban areas (15.0), and intermediate in suburban areas (19.9). The prevalence of cessation was lower in the urban areas (37.4%) than in the suburban (50.0%) or nonmetropolitan areas (47.6%).

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Editorial Note: In Missouri during 1989–1991, the prevalence of smoking generally was highest in urban areas regardless of sex, education, age, and race. These findings are consistent with those of previous reports describing the relation between urban area of residence and smoking status (*6,7*). The persistence of the association between urban residence and smoking status, despite controlling for demographic characteristics, suggests that other factors contribute to the higher prevalence of smoking in urban areas. Such factors may include cultural norms, the burden and management of stress (*8*), relative effectiveness of risk-reduction messages (*9*), and exposure to tobacco advertisement and promotions. Differences in prevalences among racial/ethnic groups may be influenced by differences in educational levels, socioeconomic status, and social and cultural phenomena that require further explanation.

The findings in this report are subject to at least three limitations. First, because these estimates are based on self-reported data, prevalences may be underestimated

TABLE 1. Prevalence of current smoking among adults in urban*, suburban[†], and nonmetropolitan[†] areas — Missouri, 1989–1991

Characteristic	Urban		Suburban		Nonmetropolitan	
	%	(CI[§])	%	(CI)	%	(CI)
Sex						
Male	37.3	(±3.5)	25.5	(±3.1)	32.6	(± 4.2)
Female	29.9	(±2.4)	24.1	(±2.5)	20.9	(± 2.9)
Education						
≤12 years	35.1	(±2.6)	30.7	(±3.2)	29.7	(± 3.2)
>12 years	27.9	(±3.2)	19.2	(±2.4)	19.0	(± 4.1)
Age group (yrs)						
18-34	31.3	(±3.3)	27.8	(±3.4)	33.5	(± 5.0)
35-54	42.1	(±3.9)	28.7	(±3.4)	32.8	(± 4.9)
≥55	25.2	(±3.3)	15.6	(±3.2)	14.3	(± 3.1)
Race[¶]						
White	34.8	(±4.5)	24.9	(±2.1)	26.0	(± 2.6)
Black	32.0	(±2.3)	24.0	(±7.8)	32.1	(±22.2)
Total	**32.4**	**(±2.0)**	**24.8**	**(±2.0)**	**26.5**	**(± 2.6)**

*Smoking Cessation in Black Americans Survey, 1990.
[†]Missouri Behavioral Risk Factor Surveillance System, 1989–1991.
[§]95% confidence interval.
[¶]Numbers for races other than black and white were too small for meaningful analysis.

(*10*). Second, a stratified analysis was conducted to control for each demographic variable individually because combining data from separate surveys with differing sampling designs precluded use of multivariate techniques to control for each variable simultaneously. Third, grouping areas at the urban, suburban, and nonmetropolitan levels may mask important community differences within each of these areas.

The findings in Missouri suggest that urban areas are an important target for nonsmoking promotion efforts. In general, local survey data can provide useful information to assist state and local health departments in identifying populations for risk-reduction programs. In Missouri, state and local health departments and community organizations are using these findings to develop programs and activities to reduce the prevalence of smoking among urban residents. For example, in Kansas City, intensive education efforts have been initiated to change social and community norms about smoking through activities such as rallies and town hall meetings and the promulgation of nonsmoking regulations. In St. Louis, activities have included counter-advertising, public service announcements, tobacco education in schools, and training of health-care providers about tobacco-use prevention.

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Smokeless Tobacco Use Among American Indian Women —
Southeastern North Carolina, 1991

Rates of smokeless tobacco use among U.S. adults are highest for young males, American Indians/Alaskan Natives, persons residing in the South or rural areas of the country, and those of low socioeconomic status (1). In addition, the prevalence of smokeless tobacco use has been reported to be high in tobacco-producing regions, including rural North Carolina and Kentucky (2,3). In southeastern North Carolina, reports from physicians and dentists suggested a high prevalence of smokeless tobacco use in the local American Indian population, the Lumbee—particularly among women and children. In response to these reports, the Department of Family and Community Medicine at the Bowman Gray School of Medicine of Wake Forest University analyzed data from a National Cancer Institute-sponsored cervical cancer prevention program to estimate the prevalence of smokeless tobacco use during 1991 among Lumbee women aged ≥18 years residing in Robeson County, North Carolina (1990 population: 105,179).

This analysis was based on responses to a survey conducted as part of the cancer-prevention program; these data are the most complete on tobacco use for this population. The survey included questions about cervical cancer knowledge, attitudes, and practices; demographic characteristics; social support; and health behavior, including use of tobacco and alcohol. A random sample of 479 women was selected from the official Lumbee tribal enrollment database using a computer-generated list of phone numbers; the database lists approximately 43,000 persons (86% of the estimated 1990 population of the Lumbee tribe). A telephone number was listed for 99% of the Lumbee tribal members in the database. The survey was conducted in respondents' homes during August–October 1991 by nine Lumbee women who had been trained as research assistants.

Smokeless tobacco use was classified as ever or never use based on the question, "Have you ever used chewing tobacco or snuff?" Ever use was further subdivided into current use (those who reported using smokeless tobacco at the time of the survey) and former use (those who reported not using smokeless tobacco at the time of the survey). Early initiation (defined as beginning use at age <6 years) was based on the question, "How old were you when you began using chewing tobacco or snuff regularly?" The survey also assessed smoking status (never, former [smoked at least 100 cigarettes during their lifetime but did not smoke at the time of the survey], and current [smoked at least 100 cigarettes during their lifetime and smoked at the time of the survey]), self-reported health status (excellent, good, fair, or poor), social or church group participation, number of close friends, and reported use of medical services. Chi-square analysis was used to assess differences in smokeless tobacco use by demographic, social support, and health behavior categories and to assess the frequency of early initiation of smokeless tobacco use in relation to age group.

Of the 479 women surveyed, 307 (64%) reported never using smokeless tobacco, 64 (13%) reported former use, and 108 (23%) reported current use. The prevalence of current smokeless tobacco use was greatest among women aged ≥65 years (51%) and lowest among those aged 25–34 years (6%) and 18–24 years (11%) (Table 1). Current use also was high among women who had <12 years of education (42%), whose annual income was <$11,000 (31%), who were widowed (42%), who had never smoked

TABLE 1. Percentage of Lumbee women reporting current smokeless tobacco use, by demographic, health, and social support categories — North Carolina, 1991

| Category | Sample size | Current use | | |
		No.	(%)	(95% CI*)
Demographics				
Age group (yrs)				
18–24	80	9	(11.2)	(4.3–18.1)[†]
25–34	106	6	(5.7)	(1.3–10.1)
35–44	104	24	(23.1)	(15.0–31.2)
45–54	66	19	(28.9)	(18.0–39.8)
55–64	56	16	(28.6)	(16.8–40.4)
≥65	67	34	(50.7)	(38.7–62.7)
Education (yrs)				
<12	175	74	(42.3)	(35.0–49.6)[†]
12	169	22	(13.0)	(7.9–18.1)
>12	135	12	(8.9)	(4.1–13.7)
Annual household income				
≤$10,999	132	41	(31.0)	(23.1–38.9)[†]
$11,000–$19,999	120	26	(21.7)	(14.3–29.1)
≥$20,000	227	41	(18.1)	(13.1–23.1)
Health				
Self assessment of health				
Poor or fair	148	57	(38.5)	(30.7–46.3)[†]
Good or excellent	331	51	(15.4)	(11.5–19.3)
Smoking status				
Never smoker	278	83	(29.8)	(24.4–35.2)[†]
Former smoker[§]	71	11	(15.5)	(7.1–23.9)
Current smoker[¶]	130	14	(10.8)	(5.6–16.1)
Alcohol use				
Monthly, weekly, or daily	46	11	(23.9)	(11.6–36.2)[†]
Never or infrequent	433	97	(22.4)	(14.2–30.6)
Annual physical examination				
Yes	301	61	(20.3)	(15.8–24.8)
No	178	47	(26.4)	(19.6–33.2)
Social support				
Marital status				
Married	275	53	(19.2)	(14.5–23.9)[†]
Separated/Divorced	60	18	(30.0)	(18.4–41.6)
Widowed	55	23	(41.8)	(28.8–54.8)
Never married	89	14	(15.7)	(8.1–23.3)
Church group participation				
Yes	241	59	(24.5)	(19.1–29.9)
No	238	49	(20.6)	(15.5–25.7)
Social group participation				
Yes	42	6	(14.3)	(3.7–24.8)
No	437	102	(23.3)	(19.3–27.7)
Number of close friends				
0	26	6	(23.1)	(6.9–39.3)
1–5	361	78	(21.6)	(17.4–25.8)
>5	92	24	(26.1)	(17.1–35.1)
Total population	479	108	(22.5)	(14.6–30.4)

*Confidence interval.
[†] p<0.05.
[§] Smoked at least 100 cigarettes during their lifetime and did not smoke at the time of the survey.
[¶] Smoked at least 100 cigarettes during their lifetime and smoked at the time of the survey.

cigarettes (30%), and who perceived their health as poor or fair (39%). Current smoke-less tobacco use was not associated with alcohol use, use of medical services, church or social group participation, or number of close friends.

Age at initiation of smokeless tobacco use was unknown for 18 (10%) of the 172 ever users; although demographic characteristics of these women were similar to those for whom complete initiation data were available, these respondents were excluded from analyses of age at initiation of use. The median age at initiation of smokeless tobacco use was 10 years; of the ever users for whom data were available, 90% initiated smokeless tobacco use before age 18 years. Median duration of smoke-less tobacco use among all current users was 37 years.

Because women in older age groups had a greater chance of beginning smokeless tobacco use at age ≥18 years, women who initiated smokeless tobacco use at age ≥18 years (n=16) were eliminated from the analysis of women who initiated smokeless tobacco use at an early age to ensure comparability between the youngest and older age groups; the women who were excluded did not differ from the others by income or education. The prevalence of early initiation of smokeless tobacco use was highest among those aged 18–24 years (77%) (Table 2). The prevalence of early initiation in other age groups ranged from 18% to 30%. Based on analysis of aggregated data, 35% of women aged ≤44 years began smokeless tobacco use before age 6 years, compared with 22% of women aged ≥45 years.

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Editorial Note: Based on the findings of this survey, the prevalence of smokeless tobacco use among Lumbee women in North Carolina in 1991 was nine times the national mean prevalence for American Indian women (2.5%) and 38 times that for women in the total U.S. population (0.6%) (1). Robeson County, where most of the Lumbee reside, is the third largest tobacco-producing county in North Carolina (E. Davis, Robeson County [North Carolina] Agricultural Extension Service, personal communication, 1994), and the high prevalence of smokeless tobacco use among the Lumbee women may reflect, in part, the tobacco-based local economy. High prevalences of smokeless tobacco use also have been documented in other

TABLE 2. Frequency of initiation of smokeless tobacco use among Lumbee women at age <6 years among ever users*, by age group — North Carolina, 1991

Age group (yrs)	Total ever users	Initiation of use at age <6 yrs		
		No.	(%)	(95% CI[†])
18–24	13	10	(77)	(54.1%–99.9%)[§]
25–34	17	4	(24)	(5.4%–42.1%)
35–44	36	9	(25)	(10.9%–39.1%)
45–54	20	6	(30)	(9.9%–50.1%)
55–64	18	4	(22)	(3.0%–41.3%)
≥65	34	6	(18)	(5.2%–30.8%)
Total	**138**	**39**	**(28)**	**(20.5%–35.5%)**

*n=172. Age was unknown for 18 (10%). To make older groups comparable to the youngest age group (18–24 years), ever users were limited to those initiating use by age <18 years; this eliminated 16 (10%) ever users from the analysis.
[†] Confidence interval.
[§] p<0.005.

tobacco-producing regions of the United States (*2,3*). However, the prevalence of smokeless tobacco use among these women was more than twice that of women in Pitt County, North Carolina (*3*), the leading tobacco-producing county in the United States, and approximates the prevalence among some male adolescent populations (*4*).

Cultural factors specific to American Indians and the economic impact of tobacco on residents of this region may be associated with this unusually high prevalence of smokeless tobacco use. For example, use of tobacco has been a part of American Indian culture, including medicinal uses such as treatment of gastrointestinal symptoms (*5*), since before the arrival of Europeans (*6,7*). Such uses of tobacco, combined with the availability of tobacco leaf among tobacco-farming families, may be associated with initiation of nicotine addiction in young children.

The findings in this study are subject to at least two limitations. First, respondents were asked to recall their use of smokeless tobacco as children; because early age at initiation among younger women was more recent and, therefore, more likely to be remembered, the high prevalence of early onset of use among younger women may partly reflect this bias. Second, family use of tobacco and family or personal involvement in tobacco production were not analyzed. Employment in tobacco production may play a role in attitudes toward smokeless tobacco use (*3*) because personal involvement in growing tobacco has been associated with a high prevalence of smokeless tobacco use among adolescents (*2*).

The high prevalence of smokeless tobacco use among Lumbee women increases the risk for health hazards, including gingival recession, tooth loss, leukoplakia, and oral cancer. Nicotine use may also increase the risk for cardiovascular disease (*8*) and reproductive risks such as low birthweight, premature delivery, and spontaneous abortion (*9*). Further assessment of parents' attitudes toward childhood smokeless tobacco use, the anthropologic characteristics of smokeless tobacco use among the Lumbee, and the influence of a tobacco-based economy on early initiation and high prevalence of smokeless tobacco use should assist in the development of culturally and economically acceptable interventions.

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Indicators of Nicotine Addiction Among Women —
United States, 1991–1992

An estimated 22 million U.S. women were current smokers in 1993; of these, 73% wanted to quit smoking (*1*). However, attempts to quit smoking and to remain abstinent are hindered by nicotine addiction and by the subsequent effects of nicotine withdrawal (*2*). To assess the prevalence of selected indicators of nicotine addiction among U.S. women, CDC analyzed data from the National Household Survey on Drug Abuse (NHSDA) in 1991 and 1992 (*3*). This report presents the findings of the analysis.

The NHSDA is a household survey of a nationally representative sample of the civilian, noninstitutionalized U.S. population. Combined data from the 1991 and 1992 surveys (n=7137) were used to estimate the prevalences of four indicators of nicotine addiction among women who smoke. Information about these indicators was based on responses to four questions; current smokers* were asked whether, during the 12 months preceding the survey, they 1) "felt [they] needed or were dependent on cigarettes," 2) "needed larger amounts [more cigarettes] to get the same effect," 3) "felt unable to cut down on [their] use even though [they] tried," and 4) "had withdrawal symptoms, that is, felt sick because [they] stopped or cut down on [their] use." The analysis of "unable to cut down" (n=4422) and "felt sick" (n=4646) was restricted to persons who reported trying to reduce their use of cigarettes during the preceding 12 months. In addition, for the indicator "unable to cut down," because of the question design, respondents who reported not trying to reduce any drug use during the preceding 12 months (n=224) also were excluded. Because the likelihood of daily smoking (*4*; CDC, unpublished data, 1991) and the intensity of smoking (i.e., number of cigarettes smoked per day) (*4,5*) varies directly with age, respondents were classified into two age groups—12–24-year-olds and ≥25-year-olds. Data were adjusted for nonresponse and weighted to provide national estimates. Standard errors were calculated by using SUDAAN (*6*).

Among female smokers in both age groups, 75% reported feeling dependent on cigarettes (Table 1). The prevalence of feeling dependent varied directly with intensity of smoking; among those who smoked six to 15 cigarettes per day, 80.6% (95% confidence interval [CI]=77.1%–84.2%) of those aged 12–24 years and 76.1% (95% CI=72.3%–79.9%) of those aged ≥25 years reported feeling dependent on cigarettes. Female smokers aged 12–24 years were more likely to report needing more cigarettes to attain the same effect than were those aged ≥25 years (18.0% [95% CI=15.8%–20.2%] versus 13.2% [95% CI=11.3%–15.0%]). Among those who had tried to reduce smoking during the preceding 12 months, 81.5% (95% CI=78.9%–84.1%) of 12–24-year-olds and 77.8% (95% CI=75.1%– 80.5%) of ≥25-year-olds reported being unable to do so; even among those who smoked six to 15 cigarettes per day, inability to reduce smoking was reported by 82.6% (95% CI=78.7%–86.4%) of 12–24-year-olds and 73.8% (95% CI=68.4%–79.2%) of the ≥25-year-olds. Of all female smokers aged ≥12 years, 35.4% reported withdrawal symptoms (i.e., feeling sick) when they tried to reduce their smoking.

Females in both the younger and older age groups were equally likely to report at least one of the four indicators of nicotine addiction (81.2% [95% CI=78.6%–83.8%] and

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*Defined as persons who had ever smoked 100 cigarettes and had smoked during the 30 days preceding the survey.

TABLE 1. Percentage of females who were current cigarette smokers* and who reported experiencing selected indicators of nicotine addiction†, by age and intensity§ of smoking — National Household Survey on Drug Abuse, United States, 1991 and 1992¶

Age group/ Smoking intensity	Felt dependent on cigarettes		Needed more cigarettes for same effect		Unable to cut down**		Felt sick when cut down on smoking**		Any addiction indicator††	
	%	(95% CI§§)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
12-24 yrs	(n=2138)		(n=2137)		(n=1376)		(n=1446)		(n=2138)	
≤5	52.4	(45.6%-59.3%)	12.8	(9.2%-16.4%)	67.4	(60.7%-74.1%)	21.6	(16.4%-26.9%)	63.1	(56.4%-69.8%)
6-15	80.6	(77.1%-84.2%)	17.5	(14.2%-20.7%)	82.6	(78.7%-86.4%)	33.3	(28.0%-38.5%)	87.0	(83.9%-90.1%)
16-25	86.2	(82.3%-90.0%)	18.8	(14.2%-23.3%)	92.3	(88.8%-95.9%)	48.3	(42.0%-54.6%)	90.4	(87.3%-93.6%)
≥26	88.1	(80.1%-96.1%)	36.4	(26.9%-45.8%)	88.9	(78.7%-99.1%)	45.3	(30.5%-60.0%)	88.2	(80.1%-96.2%)
Total	74.8	(71.8%-77.8%)	18.0	(15.8%-20.2%)	81.5	(78.9%-84.1%)	35.4	(32.5%-38.3%)	81.2	(78.6%-83.8%)
≥25 yrs	(n=4996)		(n=4997)		(n=3046)		(n=3199)		(n=4999)	
≤5	42.7	(37.1%-48.3%)	6.8	(3.9%-9.7%)	54.0	(46.3%-61.7%)	22.1	(15.5%-28.7%)	53.0	(46.9%-59.1%)
6-15	76.1	(72.3%-79.9%)	12.9	(9.2%-16.7%)	73.8	(68.4%-79.2%)	33.8	(27.9%-39.6%)	82.1	(78.8%-85.4%)
16-25	81.1	(77.7%-84.5%)	11.6	(9.1%-14.2%)	82.0	(77.4%-86.5%)	34.4	(28.8%-40.0%)	84.0	(81.0%-87.1%)
≥26	85.9	(81.6%-90.1%)	21.1	(15.3%-27.0%)	93.7	(90.5%-97.0%)	48.6	(39.5%-57.7%)	88.7	(85.1%-92.3%)
Total	74.6	(72.4%-76.9%)	13.2	(11.3%-15.0%)	77.8	(75.1%-80.5%)	34.8	(31.4%-38.2%)	79.4	(77.3%-81.5%)

* Persons who reported smoking 100 cigarettes during their lifetime and who reported smoking cigarettes during the preceding 30 days.
† The indicators were, during the 12 months preceding the survey, 1) "felt [they] needed or were dependent on cigarettes," 2) "needed larger amounts [more cigarettes] to get the same effect," 3) "felt unable to cut down on [their] use, even though [they] tried," and 4) "had withdrawal symptoms, that is, felt sick because [they] stopped or cut down on cigarette use."
§ Number of cigarettes smoked per day.
¶ n=7137.
** The analysis of "unable to cut down" (n=4422) and "felt sick" (n=4646) was restricted to persons who reported trying to reduce their use of cigarettes during the preceding 12 months. In addition, for the indicator "unable to cut down," because of the question design, respondents who reported not trying to reduce any drug use during the preceding 12 months (n=224) also were excluded.
†† Current smokers who reported at least one of the four indicators of nicotine addiction.
§§ Confidence interval.

79.4% [95% CI=77.3%–81.5%], respectively) (Table 1). Even among females who smoked five or fewer cigarettes per day, 63.1% (95% CI=56.4%–69.8%) of those aged 12–24 years and 53.0% (95% CI=46.9%–59.1%) of those aged ≥25 years reported one or more of these indicators.

Reported by: J Gfroerer, Prevalence Br, Office of Applied Studies, Substance Abuse and Mental Health Svcs Administration. Office on Smoking and Health, and Div of Chronic Disease Control and Community Intervention, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: In 1990, an estimated 61,000 U.S. women aged ≥35 years died from cardiovascular diseases attributable to cigarette smoking (*7*). Because the risk for myocardial infarction can be reduced by 50% after 1 year of abstaining from smoking (*8*), interventions to encourage smoking cessation are an important strategy to reduce cardiovascular mortality. Although most women smokers want to quit smoking, only 2.5% of all smokers successfully quit each year (*9*). The finding in this report that approximately 80% of female smokers reported symptoms of nicotine addiction underscores the importance of measures to increase women's access to cessation interventions, including adjunctive nicotine-replacement therapy.

The findings in this report are subject to at least two limitations. First, the NHSDA indicators are not comprehensive measures of nicotine addiction and do not include all symptoms of nicotine withdrawal (e.g., anxiety, irritability, anger, difficulty concentrating, hunger, or cravings for cigarettes) (*2*); as a result, the NHDSA data may underestimate the proportion of smokers who report at least one indicator of nicotine addiction. Second, these findings are based on self-reported data, and perceptions of nicotine addiction were not validated. However, in previous studies, self-reported symptoms of nicotine addiction have been confirmed by observer rating (*2*).

Although manifestations of cardiovascular disease occur primarily during adulthood, related high-risk behaviors, such as tobacco use, often are initiated during adolescence; an estimated 87% of female daily smokers began smoking at ≤18 years of age (CDC, unpublished data, 1991). Young persons often try using tobacco with a belief that they can quit. However, of adolescent smokers who have intended to not be smoking in 5–6 years, 73% still smoked 5 years later (*10*). The 1991 and 1992 NHSDA data suggest that an important reason for young smokers' failure to quit smoking is a prevalence of addiction similar to that among older smokers. Because of the difficulty in achieving abstinence and the strength and early onset of nicotine addiction, interventions to prevent smoking initiation are important.

School-based programs, combined with community interventions, have been effective in preventing smoking initiation (*10*). Other measures that can prevent smoking initiation, onset of nicotine addiction, and subsequent morbidity and mortality associated with cardiovascular diseases include enforcement of laws that prohibit sales to minors, counter-advertising campaigns that "deglamorize" smoking to youth, and increases in the real price of cigarettes.

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Cigarette Smoking Among Adults — United States, 1993

The annual prevalence of cigarette smoking among adults in the United States declined 40% during 1965–1990 (from 42.4% to 25.5%) (*1*) but was virtually unchanged during 1990–1992 (*2*). To determine the prevalence of smoking among adults, smoker interest in quitting, and the prevalence of cessation (i.e., quit ratio) among adults during 1993, the Year 2000 Health Objectives Supplement of the 1993 National Health Interview Survey (NHIS-2000) collected self-reported information about cigarette smoking from a random sample of civilian, noninstitutionalized adults aged ≥18 years. This report presents the prevalence estimates for 1993 and compares them with estimates from the 1992 Cancer Epidemiology Supplement and presents 1993 estimates for smoker interest in quitting completely and the prevalence of cessation among ever smokers.

The overall response rate for the 1993 NHIS-2000 (n=20,860) was 81.2%. For 1993, current smoking status was determined through two questions: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Ever smokers were persons who reported having smoked at least 100 cigarettes during their entire lives. Current smokers were defined as those who had smoked 100 cigarettes and now smoked either every day (i.e., daily smokers) or some days (i.e., some-day smokers). Former smokers had smoked at least 100 cigarettes in their lives but did not currently smoke. The prevalence of cessation was the percentage of former smokers among ever smokers. Interest in quitting smoking was assessed using answers to the question "Would you like to completely stop smoking cigarettes?" Data were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (*3*).

Prevalence estimates for 1992 were based on two definitions of current smoking and were calculated by averaging the estimates generated by each definition (*2*). One of the 1992 definitions of current smoking (smoking every day or some days) was identical to the definition used in 1993; these estimates are compared in this report.

In 1993, an estimated 46 million (25.0% [95% CI=±0.7%]) adults in the United States were current smokers (Table 1): 20.4% (95% CI=±0.7%) were daily smokers, and 4.6% (95% CI=±0.3%) were some-day smokers. Smoking prevalence was significantly higher among men (27.7% [95% CI=±1.1%] [24 million men]) than among women (22.5% [95% CI=±0.9%] [22 million women]) (Table 1). The racial/ethnic group-specific prevalence was highest among American Indians/Alaskan Natives (38.7% [95% CI=±8.7%]) and lowest among Asians/Pacific Islanders (18.2% [95% CI=±4.1%]). The prevalence of smoking among persons with ≤8 years of education was significantly lower than that among persons with 9–15 years of education; however, among persons with ≥9 years of education, prevalences varied inversely with education level. For all groups, the prevalence of smoking was highest among males who had dropped out of high school (42.1% [95% CI=±4.4%]). Smoking prevalence was higher among persons living below the poverty level* (32.1% [95% CI=±2.4%]) than among those living at or above the poverty level (23.8% [95% CI=±0.8%]).

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*Poverty statistics are based on a definition originated by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

TABLE 1. Percentage of adults aged ≥18 years who were current cigarette smokers,* by sex, race/ethnicity, education level, age group, and socioeconomic status — National Health Interview Survey (NHIS), United States, 1992 and 1993[†]

Characteristic	1992 CES[§]						1993 NHIS-2000[¶]					
	Men (n=5,065)		Women (n=6,816)		Total (n=11,881)		Men (n=8,783)		Women (n=12,077)		Total (n=20,860)	
	%	(95% CI**)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Race/Ethnicity[††]												
White	28.3	(± 1.6)	26.3	(± 1.5)	27.3	(± 1.1)	27.0	(± 1.2)	24.0	(± 1.0)	25.4	(±0.8)
Black	30.1	(± 4.7)	24.9	(± 3.1)	27.3	(± 2.7)	32.4	(± 3.4)	21.0	(± 2.2)	26.0	(±2.0)
Hispanic	22.3	(± 4.0)	15.6	(± 3.2)	18.7	(± 2.6)	28.3	(± 4.2)	12.7	(± 2.7)	20.4	(±2.6)
American Indian/ Alaskan Native[§§]	41.2	(±17.7)	42.5	(±14.5)	41.9	(±10.9)	35.9	(±13.6)	40.9	(±11.8)	38.7	(±8.7)
Asian/Pacific Islander	19.3	(± 7.7)	4.9	(± 3.7)	12.2	(± 4.5)	27.4	(± 7.2)	9.5	(± 4.8)	18.2	(±4.1)
Education (yrs)[¶¶]												
≤8	27.8	(± 4.9)	17.7	(± 3.4)	22.4	(± 2.9)	28.5	(± 3.7)	13.6	(± 2.6)	20.5	(±2.3)
9–11	40.3	(± 4.9)	31.9	(± 3.8)	35.6	(± 3.2)	42.1	(± 4.4)	32.3	(± 2.9)	36.8	(±2.7)
12	33.5	(± 2.7)	29.2	(± 2.2)	31.1	(± 1.8)	32.0	(± 1.9)	26.9	(± 1.5)	29.2	(±1.2)
13–15	26.4	(± 3.3)	23.8	(± 2.7)	25.0	(± 2.1)	28.4	(± 2.4)	22.1	(± 1.9)	25.0	(±1.5)
≥16	17.6	(± 2.4)	15.0	(± 2.5)	16.5	(± 1.7)	14.8	(± 1.7)	11.9	(± 1.6)	13.5	(±1.2)
Age group (yrs)												
18–24	28.4	(± 4.1)	25.9	(± 3.7)	27.1	(± 2.8)	28.8	(± 3.3)	22.9	(± 2.7)	25.8	(±2.1)
25–44	32.7	(± 2.1)	28.7	(± 2.0)	30.6	(± 1.5)	31.1	(± 1.6)	27.3	(± 1.3)	29.2	(±1.1)
45–64	26.3	(± 2.7)	26.5	(± 2.4)	26.4	(± 1.8)	29.2	(± 2.0)	23.0	(± 1.7)	26.0	(±1.3)
≥65	16.0	(± 2.8)	12.9	(± 2.0)	14.2	(± 1.6)	13.5	(± 2.2)	10.5	(± 1.3)	11.8	(±1.2)
Socioeconomic status[***]												
At/Above poverty level	26.9	(± 1.4)	24.5	(± 1.4)	25.7	(± 1.0)	26.1	(± 1.2)	21.7	(± 0.9)	23.8	(±0.8)
Below poverty level	35.1	(± 5.3)	28.9	(± 3.7)	31.4	(± 3.2)	38.1	(± 4.1)	28.2	(± 2.7)	32.1	(±2.4)
Unknown	33.6	(± 5.7)	22.3	(± 3.7)	26.7	(± 3.2)	37.6	(± 4.9)	22.2	(± 3.0)	28.3	(±2.8)
Total	28.0	(± 1.4)	24.8	(± 1.3)	26.3	(± 1.0)	27.7	(± 1.1)	22.5	(± 0.9)	25.0	(±0.7)

* Persons who reported having smoked at least 100 cigarettes and who reported now smoking every day or some days.
† Excludes 168 respondents with unknown smoking status.
§ Cancer Epidemiology Supplement.
¶ Year 2000 Health Objectives Supplement.
** Confidence interval.
†† Excludes 257 respondents in unknown, multiple, and other race categories.
§§ Estimates should be interpreted with caution because of the small number of cases.
¶¶ Persons aged ≥25 years.
*** Poverty statistics are based on definitions developed by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

The prevalence of current smokers in 1993 was unchanged statistically from 1992 (25.0% and 26.3%, respectively). However, the prevalence of daily smoking in 1993 (20.4% [95% CI=±0.7%]) was significantly lower than in 1992 (22.3% [95% CI=±0.9%]). In addition, prevalence estimates for current smokers during 1993 were lower overall for women, persons with a college education or higher, total persons living at or above the poverty level, and women living at or above the poverty level (Table 1).

Of current smokers, an estimated 32 million persons (69.7% [95% CI=±1.6%]) reported they wanted to quit smoking completely. Women were more likely to report an interest in quitting (72.7% [95% CI=±1.9%]) than men (67.1% [95% CI=±2.2%]). Current smokers aged ≥65 years (49.9% [95% CI=5.8%]) were the least likely to report that they wanted to completely stop smoking.

In 1993, an estimated 46 million adults were former smokers (49.6% [95% CI=±1.2%] of ever smokers) (Table 2). The prevalence of cessation was higher among men (51.9% [95% CI=±1.5%]), whites (51.6% [95% CI=±1.3%]), and persons living at or above the poverty level (52.4% [95% CI=±1.2%]), and increased directly with age. Among education levels, the prevalence of cessation was lowest among persons with 9–11 years of education (38.2% [95% CI=±3.3%]).

Reported by: Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Although the overall prevalence of current smoking did not change from 1992 to 1993, the prevalence of daily smoking declined during 1993, possibly reflecting the proliferation of restrictive worksite and public smoking policies (*4*). In addition, the relatively greater decline among women is consistent with a previous report that, in workplace settings, women may be more likely to quit smoking because of worksite smoking bans (*5*).

Differences in prevalence among racial/ethnic groups may be influenced by differences in education levels and socioeconomic status, as well as by social and cultural phenomena. For example, in a recent report (*6*), the prevalence of behavioral risk factors, including cigarette smoking, was generally higher among persons with ≤12 years of education.

From 1992 to 1993, daily smoking prevalence increased among high school seniors from 17.2% to 19.0% (*1*). To be effective, school-based prevention programs should begin in kindergarten and continue through high school. This intervention should be especially intensive in middle school and should be reinforced in high school. CDC has published guidelines for incorporating tobacco-use prevention and cessation strategies in the early grades in schools (*7*). School-based programs should provide instruction about the short- and long-term physiologic and social consequences of tobacco use, social influences on tobacco use, peer norms regarding tobacco use, and refusal skills.

The findings in this report are subject to at least two limitations. First, because the 1992 and 1993 estimates are based on data collected during a 6-month period, these estimates may not be representative of annual prevalence. In particular, other data suggest that the restriction of the surveys to these periods may have minimized the true magnitude of declines in prevalence (National Household Survey on Drug Abuse, unpublished data, 1992 and 1993). Second, because these estimates are based on

self-reported data, prevalences may be underestimated. However, underreporting is believed to be low in national prevalence surveys (8).

To sustain the decline in smoking prevalence, efforts must be intensified to discourage initiation and to promote cessation. Although 70% of smokers want to stop smoking and 34% attempt to quit each year, only 2.5% successfully stop smoking each year (9). The high rate of relapse is a consequence of the effect of nicotine dependence. Smokers who need assistance with stopping can receive self-help

TABLE 2. Percentage of interest in quitting among current smokers aged ≥18 years* and prevalence of cessation among ever smokers aged ≥18 years,† by sex, race/ethnicity, education level, age group, and socioeconomic status — National Health Interview Survey, United States, 1993§

Characteristic	Interest in quitting among current smokers (n=5,261)		Prevalence of cessation among ever smokers (n=10,370)	
	%	(95% CI¶)	%	(95% CI)
Sex				
Men	67.1	(± 2.2)	51.9	(± 1.5)
Women	72.7	(± 1.9)	46.7	(± 1.6)
Race/Ethnicity**				
White	70.0	(± 1.8)	51.6	(± 1.3)
Black	71.4	(± 4.8)	37.8	(± 3.4)
Hispanic	68.7	(± 5.8)	44.3	(± 5.0)
American Indian/				
Alaskan Native††	65.0	(±14.5)	35.1	(±16.6)
Asian/Pacific Islander	60.2	(±12.2)	46.1	(± 8.7)
Education (yrs)§§				
≤8	62.6	(± 5.5)	56.2	(± 3.9)
9–11	67.8	(± 4.4)	38.2	(± 3.3)
12	71.5	(± 2.2)	45.3	(± 1.7)
13–15	71.8	(± 3.6)	50.7	(± 2.3)
≥16	67.5	(± 4.5)	65.4	(± 2.5)
Age group (yrs)				
18–24	68.6	(± 4.5)	21.7	(± 3.1)
25–44	73.7	(± 2.0)	39.0	(± 1.5)
45–64	68.5	(± 3.0)	56.6	(± 2.0)
≥65	49.9	(± 5.8)	76.6	(± 2.1)
Socioeconomic status¶¶				
At/Above poverty level	70.7	(± 1.8)	52.4	(± 1.2)
Below poverty level	69.7	(± 3.8)	30.4	(± 3.1)
Unknown	59.0	(± 5.6)	41.6	(± 4.3)
Total	**69.7**	**(± 1.6)**	**49.6**	**(± 1.2)**

*Persons who reported having smoked at least 100 cigarettes and who reported now smoking every day or some days.
†Persons who reported ever smoking 100 cigarettes during their lifetime.
§Excludes 168 respondents with unknown smoking status.
¶Confidence interval.
**Excludes 257 respondents in unknown, multiple, and other race categories.
††Estimates should be interpreted with caution because of the small number of cases.
§§Persons aged ≥25 years.
¶¶Poverty statistics are based on definitions developed by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

materials from local voluntary agencies, CDC (telephone [800] 232-1311 or [404] 488-5705), and the National Institutes of Health (telephone [800] 422-6237). Many smokers are addicted to nicotine and could potentially benefit from nicotine replacement therapy (NRT); NRT and other cessation assistance can be obtained from physicians and dentists. Information about formal cessation programs can be obtained from local voluntary agencies or health-care providers.

The health risks of cigarette smoking can be eliminated only by quitting; switching to lower "tar" and nicotine cigarettes is not a safe alternative (*10*). Comprehensive measures for promoting cessation and reducing the prevalence of smoking include increasing tobacco excise taxes, enforcing minors' access laws, restricting smoking in public places, restricting tobacco advertising and promotion, and conducting counter-advertising campaigns.

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Prevalence of Selected Risk Factors for Chronic Disease by Education Level in Racial/Ethnic Populations — United States, 1991–1992

One of the three broad national health objectives for the year 2000 is to reduce health disparities within the U.S. population (1). Disparities in risks for chronic diseases are particularly prominent among racial/ethnic minorities (blacks, American Indians/ Alaskan Natives, Asians/Pacific Islanders, and Hispanics). This report summarizes findings from the 1991 and 1992 Behavioral Risk Factor Surveillance System (BRFSS) that characterize the distribution of three major risk factors for chronic disease—current cigarette smoking, sedentary lifestyle, and overweight—across racial/ethnic groups and by level of education within the racial/ethnic groups.

Data were analyzed for 180,255 adults who participated in the 1991 or the 1992 BRFSS, a state-based, random-digit–dialed telephone survey that collects self-reported data from a representative sample of civilian, noninstitutionalized persons aged ≥18 years. Data from 1991 and 1992 were combined to increase precision of the prevalence estimates for minority populations. In 1991, monthly BRFSS surveys were conducted in the District of Columbia and all states except Kansas, Nevada, and Wyoming, and in 1992 in the District of Columbia and all states except Arkansas and Wyoming. Race/ethnicity and other demographic characteristics were self-reported. Current cigarette smoking was defined as ever having smoked 100 cigarettes and currently smoking regularly. Sedentary lifestyle was defined as reported participation in fewer than three 20-minute sessions of leisure-time physical activity per week; physical activity as part of usual job activities was not included. Self-reported data on height and weight were used to calculate body mass index (BMI) (weight in kilograms divided by height in meters squared). Overweight was defined as BMI ≥27.8 for men and ≥27.3 for women (1). Years of education were grouped as <12 years, 12 years, or >12 years.

For both women and men, the percentage of respondents reporting current cigarette smoking was highest among American Indians/Alaskan Natives and lowest among Asians/Pacific Islanders (Tables 1 and 2). Among women, a sedentary lifestyle was reported most frequently by blacks (68%) and least frequently by whites (56%). Among men, the prevalence of a sedentary lifestyle was highest for both blacks (63%)

TABLE 1. Weighted prevalences of selected risk factors for women, by race and ethnicity — Behavioral Risk Factor Surveillance System, United States, 1991–1992*

Risk factor	White (n=90,369)		Black (n=10,465)		American Indian/ Alaskan Native (n=989)		Asian/ Pacific Islander (n=2,332)		Hispanic[†] (n=4,063)	
	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Current cigarette smoking[¶]	21.6	(±0.4)	19.4	(±1.1)	28.7	(±4.9)	9.7	(±2.1)	14.5	(±1.5)
Sedentary lifestyle**	56.4	(±0.5)	67.7	(±1.3)	64.1	(±5.2)	64.7	(±3.4)	61.9	(±2.3)
Overweight[††]	21.7	(±0.4)	37.7	(±1.3)	30.3	(±4.9)	10.1	(±2.0)	26.5	(±2.1)
Education level										
<12 yrs	14.8	(±0.4)	23.6	(±1.2)	25.0	(±5.0)	7.3	(±1.5)	33.7	(±2.3)
12 yrs	36.3	(±0.5)	35.2	(±1.3)	36.9	(±5.6)	21.9	(±3.0)	31.1	(±2.2)
>12 yrs	48.7	(±0.5)	40.8	(±1.4)	38.0	(±5.4)	70.0	(±3.3)	34.9	(±2.2)

*Data were weighted and aggregated. Full descriptions of the weighting procedures and sample sizes for the states are given in Appendix F of *Chronic Disease in Minority Populations* (2).

[†]Persons of Hispanic origin may be of any race.

[§]Confidence interval.

[¶]Reported ever having smoked 100 cigarettes and currently smoking regularly.

**Reported participation in fewer than three 20-minute sessions of leisure-time physical activity per week; physical activity as part of usual job activities was not included.

[††]Self-reported data on height and weight were used to calculate body mass index (BMI) (weight in kilograms divided by height in meters squared). Overweight was defined as BMI ≥27.3 for women.

TABLE 2. Weighted prevalences of selected risk factors for men, by race and ethnicity — Behavioral Risk Factor Surveillance System, United States, 1991–1992*

Risk factor	White (n=67,444)		Black (n=5,913)		American Indian/ Alaskan Native (n=822)		Asian/ Pacific Islander (n=1,921)		Hispanic[†] (n=2,929)	
	%	(95% CI§)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Current cigarette smoking¶	24.5	(±0.5)	27.4	(±1.6)	39.9	(±5.9)	19.4	(±3.1)	22.0	(±2.2)
Sedentary lifestyle**	56.2	(±0.6)	62.8	(±1.7)	50.8	(+6.0)	56.6	(±3.8)	61.5	(±2.7)
Overweight††	25.8	(±0.5)	21.4	(±1.6)	33.8	(±5.8)	10.8	(±2.2)	23.8	(±2.3)
Education level										
<12 yrs	14.4	(±0 4)	23.3	(±1.5)	25.1	(±5.4)	7.6	(±2.2)	33.9	(±2.7)
12 yrs	32.2	(±0.5)	36.8	(±1.7)	35.1	(±5.7)	16.0	(±2.7)	28.8	(±2.5)
>12 yrs	53.3	(±0.6)	39.7	(±1.7)	39.7	(±5.8)	75.7	(±3 3)	37.1	(±2.6)

*Data were weighted and aggregated. Full descriptions of the weighting procedures and sample sizes for the states are given in Appendix F of *Chronic Disease in Minority Populations* (*2*).
†Persons of Hispanic origin may be of any race.
§Confidence interval.
¶Reported ever having smoked 100 cigarettes and currently smoking regularly.
**Reported participation in fewer than three 20-minute sessions of leisure-time physical activity per week; physical activity as part of usual job activities was not included.
††Self-reported data on height and weight were used to calculate body mass index (BMI) (weight in kilograms divided by height in meters squared). Overweight was defined as BMI ≥27.8 for men.

and Hispanics (62%) and lowest for American Indians/Alaskan Natives (51%). The prevalence of overweight among women was highest for blacks (38%) and lowest for Asians/Pacific Islanders (10%). Among men, the prevalence of overweight was highest for American Indians/Alaskan Natives (34%) and lowest for Asians/Pacific Islanders (11%). Education levels by sex varied widely across the five racial/ethnic groups.

When results for the racial/ethnic groups were stratified by level of education, the prevalence of risk factors generally varied inversely with level of education within all five population groups (Table 3); however, prevalence of cigarette smoking among women was less consistent with this pattern. In addition, when respondents with <12 years of education were compared with respondents with >12 years of education, most differences in prevalence estimates were statistically significant. Despite the aggregation of data for the 2-year period, confidence intervals for prevalence estimates among these groups were wide because of the small sample sizes for American Indians/Alaskan Natives (1811) and for Asians/Pacific Islanders (4253).

Reported by: Office of Surveillance and Analysis, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Although the general inverse association between years of education and important risk factors—including current cigarette smoking, sedentary lifestyle, and overweight—has been clearly established (*3–5*), data characterizing such associations among U.S. racial/ethnic minorities are limited. The BRFSS findings in this report document substantial differences in the prevalence of risk factors among racial/ethnic groups and indicate that using culturally appropriate and culturally based messages in public health programs may be important in decreasing these risk factors in the highest risk groups. For example, a pilot study on effective weight-loss strategies for black

TABLE 3. Weighted prevalences of selected risk factors, by race, ethnicity, sex, and education level — Behavioral Risk Factor Surveillance System, United States, 1991–1992*

Sex/ Risk factor/ Education level	White		Black		American Indian/ Alaskan Native		Asian/ Pacific Islander		Hispanic[†]	
	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Women										
Current cigarette smoking[¶]										
Education level										
<12 yrs	25.3	(±1.1)	19.7	(±2.1)	27.0	(± 9.7)	17.6	(± 8.0)	13.6	(±2.4)
12 yrs	26.0	(±0.7)	22.0	(±2.1)	28.4	(± 8.0)	17.8	(± 5.3)	16.2	(±2.8)
>12 yrs	17.2	(±0.5)	17.1	(±1.6)	30.0	(± 8.0)	6.4	(± 2.3)	13.3	(±2.7)
Sedentary lifestyle**										
Education level										
<12 yrs	72.0	(±1.2)	78.2	(±2.3)	76.6	(± 9.3)	68.5	(±10.0)	73.6	(±3.6)
12 yrs	60.3	(±0.8)	70.0	(±2.2)	70.5	(± 8.1)	70.0	(± 6.5)	58.2	(±4.1)
>12 yrs	48.8	(±0.7)	59.5	(±2.1)	49.9	(± 8.6)	62.4	(± 4.3)	53.4	(±3.8)
Overweight[††]										
Education level										
<12 yrs	31.6	(±1.2)	50.9	(±2.8)	42.9	(±11.3)	21.6	(± 8.7)	34.7	(±4.0)
12 yrs	23.8	(±0.7)	39.3	(±2.4)	25.8	(± 7.7)	12.1	(± 4.1)	25.6	(±3.5)
>12 yrs	17.1	(±0.5)	28.9	(±1.9)	28.1	(± 7.3)	8.3	(± 2.4)	19.5	(±3.1)
Men										
Current cigarette smoking										
Education level										
<12 yrs	34.1	(±1.4)	31.2	(±3.3)	40.7	(±12.4)	34.4	(±15.2)	25.4	(±4.1)
12 yrs	30.9	(±0.9)	29.7	(±2.7)	45.3	(±10.2)	27.6	(± 8.6)	24.0	(±4.2)
>12 yrs	18.1	(±0.6)	23.4	(±2.4)	34.9	(± 8.8)	16.3	(± 3.2)	17.4	(±3.1)
Sedentary lifestyle										
Education level										
<12 yrs	69.4	(±1.4)	77.4	(±3.0)	58.8	(±12.9)	47.0	(±14.5)	71.8	(±4.6)
12 yrs	62.2	(±1.0)	62.8	(±2.9)	53.3	(±10.2)	62.6	(± 8.8)	61.4	(±4.9)
>12 yrs	49.1	(±0.8)	54.1	(±2.7)	43.3	(± 9.2)	55.9	(± 4.4)	51.9	(±4.2)
Overweight										
Education level										
<12 yrs	27.9	(±1.4)	28.4	(±3.2)	41.2	(±13.0)	—[§§]		25.6	(±4.3)
12 yrs	27.0	(±0.9)	29.5	(± 2.6)	38.2	(± 9.7)	16.5	(± 5.4)	26.5	(±4.4)
>12 yrs	23.1	(±0.6)	27.7	(±2.5)	25.6	(± 8.3)	9.6	(± 2.5)	20.3	(±3.3)

*Data were weighted and aggregated. Full descriptions of the weighting procedures and sample sizes for the states are given in Appendix F of *Chronic Disease in Minority Populations* (2).
[†]Persons of Hispanic origin may be of any race.
[§]Confidence interval.
[¶]Reported ever having smoked 100 cigarettes and currently smoking regularly.
**Reported participation in fewer than three 20-minute sessions of leisure-time physical activity per week; physical activity as part of usual job activities was not included.
[††]Self-reported data on height and weight were used to calculate body mass index (BMI) (weight in kilograms divided by height in meters squared). Overweight was defined as BMI ≥27.8 for men and ≥27.3 for women.
[§§]Estimate is not given because there were fewer than 50 respondents.

women had trained black women as group leaders and used ethnic foods and educational materials reviewed by black advisors to ensure that they were culturally appropriate (*6*). Further evaluation of culturally appropriate interventions is needed to determine whether they are more effective than interventions that have no cultural adaptations.

The findings in this report are subject to at least two limitations. First, because BRFSS is a telephone survey and 5% of households are without telephones, the findings cannot be generalized to the total respective population groups. In addition, telephone ownership varies substantially across racial/ethnic groups: the Bureau of the Census reported that, by race and ethnicity of the householder, in 1990 telephones were in the homes of 98% of Asians/Pacific Islanders, 96% of whites, 88% of Hispanics, 87% of blacks, and 77% of American Indians/Alaskan Natives (*7*). Second, prevalence estimates of chronic disease risk factors are based on self-reported data and may be subject to reporting bias.

Because poverty is associated with poor health status and poverty is distributed unequally among racial/ethnic groups, education levels and other socioeconomic factors must be considered when examining racial/ethnic group-specific differences in health status and determining intervention strategies. Within the racial/ethnic groups analyzed in this report, the prevalences of current cigarette smoking, sedentary lifestyle, and overweight generally were highest among those with <12 years of education. Although education level is an imperfect proxy measure for socioeconomic status (SES), it is often the only SES marker available from routine surveillance data. Therefore, education level is an important factor in the design of risk-reduction programs to help targeted audiences better understand health messages (*8,9*). In addition, despite the lower prevalence of telephone ownership among racial/ethnic groups, telephone-based intervention strategies may assist in communicating risk-reduction programs to persons in households with telephones who would not routinely attend risk-reduction programs (*10*).

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Cigarette Smoking Among Women of Reproductive Age —
United States, 1987–1992

Women who smoke cigarettes are at increased risk for lung cancer, chronic ob-
structive pulmonary disease, and complications of oral contraceptive use. During
pregnancy, cigarette smoking increases the risks for a low birthweight infant and in-
fant mortality. A national health objective for the year 2000 is to reduce cigarette
smoking among women of reproductive age (i.e., 18–44 years) to a prevalence of no
more than 12% (objective 3.4h) (1). This goal is substantially lower than the estimated
baseline prevalence of 29% measured by CDC's 1987 National Health Interview Survey
(NHIS). To characterize recent trends in cigarette smoking and monitor progress to-
ward the year 2000 objective, data from the NHIS for 1987 through 1992 were analyzed
for women aged 18–44 years.

The NHIS is an ongoing household survey conducted annually among a nationally
representative sample (n=120,000) of the civilian, noninstitutionalized U.S. population.
Information about tobacco use was collected through personal interviews with an
adult (aged ≥18 years) randomly selected from each surveyed household (n=40,000).*
Each year during 1987–1992, the sample sizes for the target study group that was
asked tobacco-use questions (i.e., women aged 18–44 years) ranged from 3717 to
13,809. Respondents were asked if they ever smoked 100 cigarettes during their life-
times and whether they currently smoked (2). Annual prevalence estimates and
95% confidence intervals (CIs) were calculated using SUDAAN (3). Data were
weighted to provide national estimates.

During 1987–1992, the prevalence of cigarette smoking among reproductive-aged
women in the United States declined 3.7%, from 29.6% in 1987 to 26.9% in 1992
(Table 1). The prevalence declined substantially from 1987 (29.6%) to 1990 (25.6%) but
increased slightly from 1991 (26.7%) to 1992 (26.9%). In 1992, an estimated 14.3 mil-
lion U.S. women aged 18–44 years were smokers.

Smoking prevalence was inversely related to level of education and was consis-
tently highest among women with less than a high school education (Table 1). Among
women with less than a high school education, smoking prevalence decreased from
46.5% in 1987 to 40.6% in 1990; in 1992, the rate (40.2%) remained unchanged. For
women with 16 or more years of education, smoking prevalence declined from
14.2% in 1987 to 10.5% in 1990; however, in 1992, the rate increased to 12.5%.

During 1987–1992, smoking prevalence rates varied by race. During 1987–1990,
race-specific declines in smoking prevalence occurred among both black and white
women (Table 1). For black women, the rate declined from 31.2% in 1987 to 22.8% in
1990, but increased significantly to 28.1% in 1991 before declining to 22.6% in 1992.
For white women, the rate declined from 30.0% in 1987 to 26.5% in 1990, then in-
creased to 27.1% in 1991 and 28.6% in 1992.

Among women aged 18–24 years, smoking prevalence among black women de-
clined dramatically during 1987–1992, from 21.8% to 5.9%. In comparison, among
white women, the prevalence was unchanged, 27.8% and 27.2% in 1987 and 1992,
respectively.

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*Health-topic supplements: Cancer Control and Epidemiology, 1987; Occupational Health, 1988;
Diabetes Risk Factors, 1989; Health Promotion and Disease Prevention, 1990 and 1991; and
Cancer Control, 1992.

Reported by: Div of Health Interview Statistics, National Center for Health Statistics; Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: In 1965 (the first year the NHIS was used to monitor tobacco use), 33% of U.S. women were cigarette smokers (*4*). Since then, however, the health risks of cigarette smoking have been widely publicized, and the prevalence of cigarette smoking among women has declined gradually. During 1974–1985, smoking prevalence among women decreased at a rate of 0.3% per year, one third the rate for men (*5*). While smoking rates declined among women, death rates for lung cancer increased; in 1987, lung cancer surpassed breast cancer as the leading cause of cancer death among U.S. women. By 1990, 25.6% of women aged 18–44 years were current smokers.

TABLE 1. Prevalence of current smoking* among women aged 18–44 years — United States, National Health Interview Survey,[†] 1987–1992

Characteristic	1987 (n=13,809)		1988 (n=13,746)		1989 (n=6,502)		1990 (n=12,954)		1991 (n=13,439)		1992 (n=3,717)	
	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Race (Age group [yrs])												
White												
18–24	27.8	(±2.2)	27.5	(±2.1)	26.0	(±3.0)	25.4	(±2.2)	25.2	(±2.1)	27.2	(±4.2)
25–34	31.8	(±1.5)	31.0	(±1.5)	30.9	(±2.3)	28.5	(±1.5)	28.4	(±1.5)	30.0	(±3.0)
35–44	29.2	(±1.5)	28.3	(±1.5)	26.2	(±2.3)	25.0	(±1.5)	26.8	(±1.5)	27.9	(±2.8)
Total	30.0	(±1.0)	29.2	(±1.0)	28.1	(±1.5)	26.5	(±1.0)	27.1	(±1.0)	28.6	(±1.9)
Black												
18–24	20.4	(±4.4)	21.8	(±4.1)	18.0	(±5.5)	10.0	(±2.8)	11.9	(±3.2)	5.9	(±4.2)
25–34	35.8	(±3.4)	37.2	(±3.6)	28.8	(±4.8)	29.1	(±3.3)	32.5	(±3.6)	29.0	(±6.9)
35–44	35.3	(±4.3)	27.6	(±3.8)	31.4	(±5.3)	25.5	(±3.6)	35.5	(±4.0)	27.9	(±7.3)
Total	31.2	(±2.5)	30.0	(±2.3)	26.6	(±3.3)	22.8	(±2.1)	28.1	(±2.4)	22.6	(±4.1)
Ethnicity												
Hispanic	20.0	(±2.7)	20.4	(±2.5)	21.9	(±4.1)	16.9	(±2.6)	16.5	(±2.1)	18.9	(±4.2)
Non-Hispanic	30.6	(±1.0)	29.7	(±0.9)	28.1	(±1.4)	26.6	(±1.0)	27.9	(±1.0)	27.8	(±1.8)
Education (yrs)												
<12	46.5	(±2.7)	45.9	(±2.7)	42.7	(±3.9)	40.6	(±2.9)	40.5	(±2.7)	40.2	(±4.8)
12	33.7	(±1.4)	32.7	(±1.4)	31.2	(±2.1)	31.1	(±1.5)	32.0	(±1.5)	31.9	(±3.0)
13–15	24.7	(±1.6)	24.7	(±1.6)	25.9	(±2.5)	20.6	(±1.5)	22.8	(±1.7)	24.0	(±3.1)
≥16	14.2	(±1.5)	13.9	(±1.4)	12.0	(±2.0)	10.5	(±1.3)	12.0	(±1.4)	12.5	(±2.4)
Socioeconomic status[¶]												
At/Above poverty level	28.3	(±1.0)	27.2	(±0.9)	26.4	(±1.4)	23.6	(±0.9)	25.3	(±0.9)	24.7	(±1.9)
Below poverty level	37.0	(±3.1)	38.0	(±2.7)	34.9	(±3.9)	36.1	(±3.1)	32.7	(±3.0)	40.0	(±4.9)
Unknown	31.1	(±4.0)	31.9	(±4.2)	28.9	(±5.2)	30.4	(±3.8)	31.0	(±3.3)	24.7	(±5.6)
Total	29.6	(±0.9)	28.8	(±0.9)	27.6	(±1.3)	25.6	(±0.9)	26.7	(±0.9)	26.9	(±1.7)

*Smoked at least 100 cigarettes and currently smoking. This analysis excludes persons with unknown smoking status.
[†] Health topic supplements: Cancer Control and Epidemiology, 1987; Occupational Health, 1988; Diabetes Risk Factors, 1989; Health Promotion and Disease Prevention, 1990 and 1991; and Cancer Control, 1992.
[§] Confidence interval.
[¶] Poverty statistics are based on a definition originated by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

Two important findings in this report regarding cigarette smoking by women during 1987–1992 are that 1) rates of cigarette smoking for young black women declined substantially during this period, and 2) after a 25-year decline, rates among women of other races and older women of reproductive age stopped declining in 1990. An important factor probably associated with the decline in smoking among younger black females was the decrease in rates of smoking reported by black female high school seniors during 1985–1989 (6). In addition, cigarette smoking has been suggested to have less functional value for black women (i.e., they may be less likely to use smoking for weight control or social acceptability) (7). However, reasons for the increase in smoking among black women aged 18–44 years in 1991 only have not been determined. At least two factors have been suggested to account for the reduction or termination of declines in cigarette smoking among women of reproductive age: first, tobacco companies used advertising campaigns (8) and other approaches to target women, and second, the increase in rates of smoking initiation by young adolescent females during the early 1970s resulted in a greater number of adult women smokers (9).

Although the mean education level† of Hispanic women in this study was lower when compared with non-Hispanic women, the prevalence of cigarette smoking was significantly lower among Hispanic women, possibly reflecting the effect of potential cultural differences that decrease the social acceptability of smoking among Hispanic women. The findings in this report also indicate that, during 1987–1992, smoking rates were significantly higher for women living below the poverty level than those living at or above the poverty level. This inverse association between income and smoking prevalence also has been documented for men and reflects correlations with education level.

Comprehensive strategies to discourage tobacco use by women and to achieve the year 2000 national health objective should include four basic components: research, outreach, education, and advocacy. Research efforts should focus on the disparate race-specific trends in smoking by race and translation of successes in efforts to reduce smoking among other groups. Outreach should especially be directed toward providing interventions for the high proportion of women smokers with less than a high school education. Education campaigns that employ paid antismoking advertising have been implemented successfully in California and may be adapted for use in other locations in the United States (10). Examples of measures to strengthen advocacy of tobacco-control policies include increases in the excise taxes on tobacco products and enforcement of laws that restrict access to tobacco products by minors.

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†In this study, the mean number of years of education completed by Hispanic women was 11.3 years and for non-Hispanic women, 13.1 years.

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Cigarette Smoking Among Adults — United States, 1992, and Changes in the Definition of Current Cigarette Smoking

Use of tobacco in the United States is monitored continually by CDC to evaluate efforts to control and prevent the use of this substance. The prevalence of cigarette smoking among U.S. adults decreased from 1965 to 1990 (from 42.4% to 25.5%) and remained stable from 1990 to 1991 (from 25.5% to 25.6%) (1). To determine the prevalence of smoking among adults during 1992, the National Health Interview Survey–Cancer Control and Epidemiology Supplements (NHIS-CCES) collected self-reported information on cigarette smoking from a random sample of civilian, non-institutionalized adults aged ≥18 years. For 1992, the definition used to assess self-reported smoking prevalence was changed to more accurately assess some-day (i.e., intermittent) smoking because of a recognized higher prevalence of intermittent smoking (2). This report presents the prevalence estimates for 1992, compares findings with 1991, and assesses the impact of changes in the definition of current smoker on these estimates.

The overall response rate for the 1992 NHIS–CCES (n=24,040) was 86.5%. For 1992, two nationally representative random samples from the NHIS–CCES were used to assess the new definition of current smoking status that included intermittent smoking. The Cancer Control Supplement (CCS) (n=12,035) asked, "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" Persons who said they did not smoke now were asked, "Do you now smoke cigarettes not at all or some days?" Current smokers were defined as those who had smoked 100 cigarettes and smoked now; persons who said they did not smoke now but subsequently stated they smoked on some days were also classified as current smokers. The Cancer Epidemiology Supplement (CES) (n=12,005) asked, "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days or not at all?" Current smokers were defined as those who had smoked 100 cigarettes and now smoked either every day or some days. Data were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (3).

Because the first two questions were the same for the 1991 NHIS–Health Promotion and Disease Prevention supplement and the 1992 CCS, these findings were compared directly. The overall prevalence of cigarette smoking among adults (25.6%) was the same in 1991 and 1992 (Table 1). The 1992 estimates that incorporated some-day smoking (CCS and CES) also were compared with 1991 and 1992 estimates based on the original definition. Estimates for both sets of definitions that incorporated an assessment of some-day smoking in 1992 were similar (CCS=26.7% and CES=26.3%) (Table 1). Because of the comparability of methods (i.e., assessing some-day smoking), results were combined to provide an overall prevalence estimate for 1992. Based on the inclusion of intermittent smoking, the prevalence of smoking increased by 0.9% (from 25.6% to 26.5%) (Table 1).

In 1992, an estimated 48 million (26.5% [95% CI=±0.5%]) adults in the United States were current smokers, reflecting prevalences of daily smoking of 22.1% (95% CI=±0.7%) and some-day smoking of 4.4% (95% CI=±0.3%). Smoking prevalence was highest among persons aged 25–44 years (30.8% [95% CI=±1.0%]). Smoking

TABLE 1. Percentage of adults aged ≥18 years who were current cigarette smokers*, by sex, age group, race/ethnicity, level of education, and socioeconomic status — United States, National Health Interview Survey, 1991 and 1992[†]

Characteristic	1991 Original (HPDP§) (n=43,154)		1992 Original (CCS¶) (n=11,875)		1992 Interim (CCS) (n=11,865)		1992 Revised (CES***) (n=11,881)		1992 Combination (CCS/CES) (n=23,746)	
	%	(95% CI[††])	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Sex										
Men	28.1	(±0.6%)	28.0	(±1.1%)	29.3	(±1.1%)	28.0	(±1.1%)	28.6	(±0.8%)
Women	23.5	(±0.5%)	23.5	(±0.9%)	24.3	(±1.0%)	24.8	(±0.9%)	24.6	(±0.7%)
Age group (yrs)										
18–24	22.9	(±1.2%)	24.4	(±2.2%)	25.8	(±2.3%)	27.1	(±2.3%)	26.4	(±1.6%)
25–44	30.4	(±0.6%)	29.7	(±1.1%)	30.9	(±1.1%)	30.6	(±1.1%)	30.8	(±0.8%)
45–64	26.8	(±0.8%)	27.3	(±1.4%)	28.2	(±1.4%)	26.4	(±1.4%)	27.3	(±1.0%)
≥65	13.3	(±0.7%)	13.3	(±1.3%)	13.7	(±1.3%)	14.2	(±1.3%)	14.0	(±0.9%)
Race/Ethnicity§§										
White	26.0	(±0.4%)	26.2	(±0.8%)	27.1	(±0.8%)	27.3	(±0.8%)	27.2	(±0.6%)
Black	29.4	(±1.3%)	27.0	(±2.3%)	28.4	(±2.4%)	27.3	(±2.3%)	27.8	(±1.7%)
Hispanic	20.1	(±1.5%)	20.4	(±2.7%)	22.5	(±2.9%)	18.7	(±2.4%)	20.7	(±1.9%)
American Indian/ Alaskan Native¶¶	31.9	(±3.7%)	36.5	(±7.6%)	36.5	(±7.6%)	41.9	(±8.8%)	39.4	(±6.0%)
Asian/Pacific Islander	15.9	(±3.1%)	16.9	(±5.7%)	17.9	(±5.8%)	12.2	(±4.1%)	15.2	(±3.6%)
Education level (yrs)										
<12	32.0	(±0.9%)	32.2	(±1.6%)	33.4	(±1.6%)	30.3	(±1.6%)	31.8	(±1.1%)
12	29.9	(±0.6%)	29.8	(±1.2%)	30.6	(±1.2%)	31.4	(±1.3%)	31.0	(±0.9%)
13–15	23.4	(±0.9%)	23.8	(±1.6%)	24.8	(±1.6%)	23.3	(±1.5%)	24.1	(±1.1%)
≥16	13.6	(±0.7%)	13.4	(±1.3%)	14.5	(±1.3%)	16.5	(±1.4%)	15.5	(±1.0%)
Socioeconomic status*										
At/Above poverty level	24.7	(±0.4%)	24.2	(±0.8%)	25.2	(±0.8%)	25.7	(±0.8%)	25.4	(±0.6%)
Below poverty level	33.1	(±1.5%)	37.0	(±2.1%)	38.4	(±2.1%)	31.4	(±2.0%)	34.9	(±1.5%)
Unknown	26.0	(±1.3%)	26.2	(±2.1%)	27.0	(±2.2%)	26.7	(±2.2%)	26.9	(±1.6%)
Total	25.6	(±0.4%)	25.6	(±0.7%)	26.7	(±0.8%)	26.3	(±0.7%)	26.5	(±0.5%)

* Persons who reported having smoked at least 100 cigarettes and who were currently smoking based on one of the following definitions: "Original" definition: Smoke now; "Interim" definition: Smoke now, or do not smoke now but on further questioning reported smoking some days; "Revised" definition: Smoke every day or some days now; "Combination" definition: Combined prevalence using the interim and revised prevalence estimates.
† Excludes 578 respondents in 1991 and 285 respondents in 1992 with unknown smoking status.
§ Health Promotion and Disease Prevention supplement.
¶ Cancer Control Supplement.
** Cancer Epidemiology Supplement.
†† Confidence interval.
§§ Excludes 317 respondents in 1991 and 252 respondents in 1992 in unknown, multiple, and other race categories.
¶¶ Estimates should be interpreted with caution because of the small number of respondents.
*** Poverty statistics are based on definitions originated by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

prevalence was highest among American Indians/Alaskan Natives (39.4% [95% CI=±8.3%]) and lowest among Asians/Pacific Islanders (15.2% [95% CI=±3.9%]), declined with increasing levels of education, and was highest among persons who lived below the poverty level* (34.9% [95% CI=±2.6%]). Approximately 25 million men (28.6% [95% CI=±1.0%]) and 23 million women (24.6% [95% CI=±0.9%]) were current smokers (Table 2). For most demographic groups, smoking prevalence was higher among men than women.

Using the original definition of current smoking, smoking prevalence was the same in 1991 and 1992 overall, for both men and women, for all racial/ethnic groups, for all educational levels, and by poverty status. Among persons with incomes below the poverty level, there were substantial differences in smoking prevalence as measured by the two question formats that included some-day smokers. However, the combined prevalence estimate for 1992 was not significantly different from the 1991 estimate.

Reported by: Surveillance Program, National Cancer Institute. National Institutes of Health. Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics, CDC.

Editorial Note: The findings in this report indicate that the estimated prevalence of smoking in 1992 was the same as in 1991 overall and for all demographic groups. In addition, these findings indicate that including some-day smoking in the definition of current smoking will increase the prevalence estimate by approximately 1.0%. The definition used in the 1992 CES will become the standard for CDC efforts to measure smoking prevalence in the United States. The inclusion of intermittent smoking improves both the accuracy and precision of the definition of current smoking and facilitates efforts to monitor changes in current smoking status.

Based on use of the original definition of current smoker, which did not assess some-day smoking, the prevalence of smoking in 1992 was not significantly higher than in 1991 among persons living below the poverty level. However, the impact of changes in the question format that incorporated an assessment of some-day smoking substantially altered the prevalence estimates for persons living below the poverty level. Specifically, in the CCS survey—which used a two-part question to assess some-day smoking—smoking prevalence increased among persons living below the poverty level. In comparison, in the CES survey—which used a single question to assess some-day smoking—there was no change in smoking prevalence.

For the first time since 1983, smoking prevalence among persons aged 18–24 years did not decrease. Factors that may have contributed to the stabilization include the steady growth in market share of discount cigarettes (4) and the $4.6 billion in advertising and promotional expenditures by tobacco companies during 1991—a 16% increase in expenditures when compared with 1990 (5,6). Efforts to address smoking among young persons have included the 1994 Surgeon General's report (6) and a companion report for adolescents. In addition, CDC has published school guidelines for incorporating tobacco-use prevention and tobacco-cessation strategies (7).

The findings in this report are subject to at least two limitations. First, the prevalence estimate for 1992 was based on information collected from January through

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*Poverty statistics are based on definitions originated by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

TABLE 2. Percentage of men and women aged ≥18 years who were current cigarette smokers*, by race/ethnicity, level of education, age group, and socioeconomic status — United States, National Health Interview Survey, 1991 and 1992†

	Men						Women					
	1991 Original (HPDP§) (n=18,050)		1992 Original (CCS¶) (n=5,000)		1992 Combined (CCS/CES**) (n=10,061)		1991 Original (HPDP§) (n=25,104)		1992 Original (CCS) (n=6,875)		1992 Combined (CCS/CES) (n=13,685)	
Characteristic	%	(95% CI††)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Race/Ethnicity§§												
White	27.5	(±0.7%)	27.5	(±1.2%)	28.6	(±0.9%)	24.6	(±0.6%)	24.6	(±1.0%)	25.9	(±0.8%)
Black	35.5	(±2.1%)	32.2	(±3.6%)	32.3	(±2.8%)	24.5	(±1.5%)	22.9	(±2.8%)	24.1	(±2.0%)
Hispanic	25.2	(±2.7%)	22.2	(±3.9%)	23.6	(±2.9%)	15.5	(±1.7%)	18.6	(±3.3%)	18.0	(±2.3%)
American Indian/ Alaskan Native¶¶	27.5	(±4.9%)	36.2	(±13.3%)	39.0	(±10.4%)	36.7	(±5.8%)	36.7	(±8.5%)	39.8	(±6.8%)
Asian/Pacific Islander	24.1	(±4.8%)	30.8	(±10.4%)	26.3	(± 6.4%)	7.1	(±2.9%)	3.2	(±2.2%)	4.0	(±2.0%)
Education level (yrs)												
<12	37.4	(±1.4%)	37.8	(± 2.4%)	36.9	(± 1.8%)	27.4	(±1.2%)	27.4	(±1.9%)	27.5	(±1.4%)
12	33.5	(±1.0%)	33.8	(±1.9%)	34.4	(± 1.3%)	27.1	(±0.8%)	26.6	(±1.6%)	28.2	(±1.1%)
13–15	25.1	(±1.3%)	24.8	(±2.5%)	25.2	(± 1.7%)	22.0	(±1.0%)	22.9	(±2.0%)	23.1	(±1.4%)
16	14.5	(±1.0%)	13.8	(±2.0%)	16.2	(± 1.4%)	12.5	(±1.0%)	13.0	(±1.8%)	14.6	(±1.4%)
Age group (yrs)												
18–24	23.5	(±1.7%)	26.0	(±3.5%)	28.0	(± 2.5%)	22.4	(±1.6%)	22.9	(±2.6%)	24.9	(±2.0%)
25–44	32.9	(±0.9%)	31.3	(±1.7%)	32.8	(± 1.2%)	28.0	(±0.8%)	28.0	(±1.4%)	28.8	(±1.1%)
45–64	29.3	(±1.1%)	30.1	(±2.1%)	28.6	(± 1.5%)	24.6	(±1.0%)	24.7	(±1.9%)	26.1	(±1.3%)
≥65	15.1	(±1.2%)	15.8	(±2.3%)	16.1	(± 1.6%)	12.0	(±0.7%)	11.6	(±1.6%)	12.4	(±1.1%)
Socioeconomic status*												
At/Above poverty level	26.8	(±0.7%)	26.2	(±1.2%)	27.1	(± 0.9%)	22.7	(±0.6%)	22.3	(±1.1%)	23.8	(±0.8%)
Below poverty level	39.3	(±2.3%)	42.5	(±3.4%)	39.7	(± 2.6%)	29.3	(±1.7%)	33.5	(±2.4%)	31.7	(±1.7%)
Unknown	31.0	(±2.3%)	33.1	(±3.6%)	33.8	(± 2.7%)	22.4	(±1.5%)	21.3	(±2.5%)	22.1	(±1.8%)
Total	28.1	(±0.6%)	28.0	(±1.1%)	28.6	(± 0.8%)	23.5	(±0.5%)	23.5	(±0.9%)	24.6	(±0.7%)

* Persons who reported having smoked at least 100 cigarettes and who were currently smoking based one of the following definitions: "Original" definition: Smoke now; "Interim" definition: Smoke now, or do not smoke now but on further questioning reported smoking some days; "Revised" definition: Smoke every day or some days now; "Combination" definition: Combined prevalence using the interim and revised prevalence estimates.
† Excludes 578 respondents in 1991 and 285 respondents in 1992 with unknown smoking status.
§ Health Promotion and Disease Prevention supplement.
¶ Cancer Control Supplement.
** Cancer Epidemiology Supplement.
†† Confidence interval.
§§ Excludes 317 respondents in 1991 and 252 respondents in 1992 with unknown, multiple, and other race categories.
¶¶ Estimates should be interpreted with caution because of the small number of respondents.
*** Poverty statistics are based on definitions originated by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

July 1992. In comparison, a different survey that collected data for the entire year indicated that smoking prevalence among adults declined in the second half of the year (Substance Abuse and Mental Health Services Administration, unpublished data, 1992), a finding consistent with a 3% per capita decrease in consumption of cigarettes in 1992 (*8*). Second, differences in prevalence among racial/ethnic groups may be influenced by differences in educational levels and socioeconomic status, as well as by social and cultural phenomena that require further explanation.

Acceleration of the decline in smoking prevalence will require intensified efforts to discourage the use of tobacco by helping smokers break the addiction to nicotine, persuading children to never initiate smoking, and enacting public policies that discourage smoking. Examples of such policies include increasing taxes on tobacco products, enforcing minors'-access laws, restricting smoking in public places, and restricting tobacco advertising and promotion. In January 1994, for the first time, all 50 states and the District of Columbia were receiving public funds for tobacco-control activities: 49 states and the District of Columbia were receiving federal funds, and California was receiving state funds.

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Smoking Cessation During Previous Year Among Adults —
United States, 1990 and 1991

Although most smokers in the United States report that they want to stop using
cigarettes (*1*), 46 million persons aged ≥18 years continue to smoke (*2*). Current infor-
mation about factors predictive of smoking or cessation is required to develop and
assess measures effective in reducing smoking prevalence. To characterize the pat-
terns of attempting to quit smoking and smoking cessation among U.S. adults during
1990 and 1991, CDC's National Health Interview Survey–Health Promotion and Dis-
ease Prevention (NHIS–HPDP) supplement collected self-reported information on
cigarette smoking from a representative sample of the U.S. civilian, noninstitutional-
ized population aged ≥18 years. This report summarizes findings from this survey.

The overall response rate for the 1991 NHIS–HPDP was 87.8%. Participants
(n=43,732) were asked: "Have you smoked at least 100 cigarettes in your entire life?"
Those who responded "yes" (i.e., ever smokers) were asked: "Around this time last
year, were you smoking cigarettes every day, some days, or not at all?" They were
then asked: "Do you smoke cigarettes now?" Those who responded "yes" were
asked: "Do you now smoke cigarettes every day or some days?"; those who re-
sponded "no" were asked: "Do you now smoke cigarettes not at all or some days?"
The time period from the reference time 1 year earlier (about which the ever smoker
reported the frequency of smoking) to the date of interview was considered the study
period.

Current every-day smokers were persons who stated that they smoked now and
that they smoked every day. Those who stated that they did not smoke at all at the
time of the survey were considered former smokers. Some-day smokers were those
who smoked on some days. These definitions differ slightly from traditional defini-
tions used by CDC's National Center for Health Statistics because they incorporate the
concepts of every-day and some-day smoking. Current every-day smokers who stated
that they quit for at least 1 day during the past year, some-day smokers, and former
smokers were all considered to have been abstinent from smoking for at least 1 day
during the study period. Those former smokers who quit smoking cigarettes for at
least 1 month at the time of the survey in 1991 were considered to have maintained
abstinence.

For this analysis, three racial/ethnic categories were used: white, non-Hispanic;
black, non-Hispanic; and Hispanic. Other racial/ethnic groups were not included be-
cause numbers were too small for meaningful analysis. Data were adjusted for
nonresponse and weighted to provide national estimates. Investigators used the Soft-
ware for Survey Data Analysis (SUDAAN) to calculate 95% confidence intervals (CIs)
and adjusted odds ratios (*3*).

Among U.S. adults who had smoked at least 100 cigarettes during their lifetimes as
of 1991, an estimated 40.5 million smoked cigarettes every day at the beginning of the
study period. Approximately 17.0 million (42.1%) of these did not smoke cigarettes for
at least 1 day during the subsequent 12 months. Hispanics (52.1% [95% CI=46.4%–
57.8%]) and blacks (48.7% [95% CI=45.2%–52.2%]) were more likely than whites
(40.3% [95% CI=39.0%–41.6%]) to quit smoking cigarettes for at least 1 day. Abstinence
for at least 1 day, by age, was highest among persons aged 18–24 years (56.7%
[95% CI=52.9%–60.5%]) and, by education, was lowest among those with <12 years of

education (36.5% [95% CI=34.1%–38.9%]). These relations were also evident after statistical adjustment was made for other sociodemographic variables (Table 1).

Among persons who reported that they did not smoke cigarettes for at least 1 day during the previous year, 13.8% (2.3 million) were abstinent for 1 month or more at the end of the study period. Hispanics (16.3% [95% CI=10.3%–22.2%]) and whites (14.0% [95% CI=12.6%–15.4%]) were more likely than blacks (7.9% [95% CI=5.1%–10.7%]) to

TABLE 1. Adjusted odds ratios (AORs)* for three measures of abstinence from cigarette smoking during the previous year, by sex, race/ethnicity,[†] age group, level of education,[§] and poverty status[¶] — United States, National Health Interview Survey, 1991**

Category	Abstinence for ≥1 day		Maintenance among abstainers		Maintenance[††] among all persons who were daily smokers 1 year earlier	
	AOR	(95% CI[§§])	AOR	(95% CI)	AOR	(95%CI)
Sex						
Male	1.0	Referent	1.0	Referent	1.0	Referent
Female	1.0	(0.9–1.2)	1.1	(0.9–1.3)	1.0	(0.9–1.3)
Race/Ethnicity						
White, non-Hispanic	1.0	Referent	1.0	Referent	1.0	Referent
Black, non-Hispanic	1.6	(1.3–1.8)	0.6	(0.4–0.9)	0.8	(0.5–1.2)
Hispanic	1.7	(1.3–2.1)	1.3	(0.9–2.1)	1.7	(1.1–2.7)
Age group (yrs)						
18–24	1.0	Referent	1.0	Referent	1.0	Referent
25–44	0.5	(0.5–0.6)	0.9	(0.6–1.3)	0.7	(0.5–0.9)
45–64	0.4	(0.3–0.5)	0.9	(0.6–1.4)	0.6	(0.4–0.8)
≥65	0.5	(0.4–0.6)	1.5	(1.0–2.4)	0.9	(0.6–1.4)
Education (yrs)						
<12	1.0	Referent	1.0	Referent	1.0	Referent
12	1.3	(1.1–1.5)	1.0	(0.7–1.4)	1.2	(0.9–1.6)
13–15	1.6	(1.3–1.8)	1.1	(0.8–1.5)	1.4	(1.0–1.9)
≥16	1.6	(1.3–2.0)	1.5	(1.0–2.2)	1.9	(1.3–2.7)
Poverty status						
At/above poverty level	1.0	Referent	1.0	Referent	1.0	Referent
Below poverty level	1.0	(0.8–1.1)	0.5	(0.3–0.8)	0.5	(0.4–0.8)
Unknown	0.7	(0.6–0.9)	0.9	(0.6–1.4)	0.8	(0.5–1.1)

*The odds ratios presented for each sociodemographic variable are adjusted for the other four sociodemographic variables in the table.
[†]Excludes 268 respondents of other or unknown race; race/ethnicity and education were both unknown for four respondents.
[§]Excludes 24 respondents of unknown education status.
[¶]Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.
**Sample size=9415.
[††]Abstinence from smoking cigarettes for at least 1 month preceding the interview. Excludes 92 respondents who abstained from cigarettes for <1 month or for whom duration of abstinence was unknown.
[§§]Confidence interval.

remain abstinent; this difference remained after statistical adjustments were made for sex, age, education, and poverty status (Table 1). Persons aged ≥65 years (19.4% [95% CI=14.6%–24.2%]) and college graduates (18.8% [95% CI=14.9%–22.7%]) were the most likely to maintain abstinence. Persons at or above the poverty level* (14.8% [95% CI=13.4%–16.3%]) were more likely to maintain abstinence than those below the poverty level (7.5% [95% CI=4.7%–10.3%]).

Of all persons who were daily smokers at the beginning of the study period, 5.7% quit smoking and maintained abstinence for at least 1 month. Among persons who were daily smokers at the beginning of the study period, college graduates and persons at or above the poverty level were more likely than those with fewer years of formal education and persons below the poverty level, respectively, to abstain from cigarette smoking for 1 month or more.

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics, CDC.

Editorial Note: The findings from this survey indicate that, in 1990 and 1991, approximately 42% of daily smokers abstained from smoking cigarettes for at least 1 day but that approximately 86% of these persons subsequently resumed smoking. The high relapse rate is likely because of the addictive nature of nicotine (4). However, because relapse occurs later in the process of maintenance, the overall rate of cessation will be lower than suggested by this report. From 1974 through 1991, an estimated 45.8–53.5 million persons aged ≥18 years smoked; of these, approximately 1.2 million persons became former smokers each year (CDC, unpublished data), suggesting that approximately 2.5% of U.S. smokers quit smoking permanently each year.

Education level and age are both important predictors for cessation attempts and maintaining abstinence. The findings in this report are consistent with previous studies noting that increasing level of education correlates directly with smoking cessation prevalence and inversely with prevalence of smoking (2). In addition, although persons aged ≥65 years were less likely to abstain for 1 day, those who did abstain were the most likely to be successful in maintaining abstinence during the study period. This finding may suggest that older persons may be more motivated than younger persons to overcome nicotine addiction (5).

In 1991, among the three racial/ethnic groups studied, the maintenance rate of abstinence from smoking was higher for Hispanics and whites than for blacks. Potential explanations for the high relapse rate among blacks include the use of cigarettes with higher tar and nicotine yields (4), a higher prevalence of nicotine dependency among persons who smoke (6), and comparatively limited access to preventive health services (4,7). Smoking-cessation programs are important for all racial/ethnic groups. Programs have been developed for Asian/Pacific Islanders, American Indians/Alaskan Natives (T. Stratton, California Department of Health Services, personal communication, 1993), and Hispanics (8). The elevated prevalence of cigarette smoking among (2) and the higher smoking-attributable death rate for (9) blacks indicate the need for specific efforts to reduce the adverse impact of tobacco use among blacks. CDC and the National Medical Association are initiating a targeted mass media campaign in

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*Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

who reported smoking at least 100 cigarettes and who were currently smoking and former smokers as those who reported having smoked at least 100 cigarettes and who were not smoking now. Ever smokers included current and former smokers. Data on smokeless tobacco use were available for 43,732 persons aged ≥18 years and were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated by using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (3).

In 1991, an estimated 5.3 million (2.9%) U.S. adults were current users of smokeless tobacco, including 4.8 million (5.6%) men and 533,000 (0.6%) women. For all categories of comparison, the prevalence of smokeless tobacco use was substantially higher among men. For men, the prevalence of use was highest among those aged 18–24 years (Table 1); for women, the prevalence was highest among those aged ≥75 years. The prevalence of smokeless tobacco use among men was highest among American Indians/Alaskan Natives and whites; the prevalence among women was highest among American Indians/Alaskan Natives and blacks. Among both men and women, prevalence of smokeless tobacco use declined with increasing education. Prevalence was substantially higher among residents of the southern United States and in rural areas. Although the prevalence of smokeless tobacco use was higher among men and women below the poverty level,* this difference was significant only for women (p<0.05) (Table 1).

Among men, the prevalence of current use of snuff was highest among those aged 18–44 years but varied considerably by age; the prevalence of use of chewing tobacco was more evenly distributed by age group (Table 2). Although women rarely used smokeless tobacco, the prevalence of snuff use was highest among those aged ≥75 years.

An estimated 7.9 million (4.4% [95% CI=4.1–4.6]) adults reported being former smokeless tobacco users. Among ever users, the proportion who were former smokeless tobacco users was 59.9% (95% CI=57.7–62.1). Among persons aged 18–24 years, the proportion of former users was lower among snuff users (56.2% [95% CI=49.4–63.0]) than among chewing tobacco users (70.4% [95% CI=64.2–76.6]). Among persons aged 45–64 years, the proportion of former users was similar for snuff (68.9% [95% CI=63.1–74.7]) and chewing tobacco (73.5% [95% CI=68.9–78.1]).

Among current users of smokeless tobacco, 22.9% (95% CI=19.9–26.0) currently smoked, 33.3% (95% CI=30.0–36.5) formerly smoked, and 43.8% (95% CI=39.9–47.7) never smoked. In comparison, among current smokers, 2.6% (95% CI=2.3–3.0) were current users of smokeless tobacco.

Daily use of smokeless tobacco was more common among snuff users (67.3% [95% CI=63.2–71.4]) than among chewing tobacco users (45.1% [95% CI=40.6–49.6]).

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics, CDC.

Editorial Note: The findings in this report indicate that the use of smokeless tobacco was highest among young males. Adolescent and young adult males, in particular, are the target of marketing strategies by tobacco companies that link smokeless tobacco with athletic performance and virility. Use of oral snuff has risen markedly among

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*Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

July 1993 called "Legends" that contrasts the deaths of black civil-rights leaders to preventable smoking-related deaths. In addition, a toll-free telephone number ([800] 232-1311) is available to request a smoking-cessation guide, *Pathways to Freedom*. This guide addresses important topics including nicotine addiction, possible misconceptions about the safety of smoking menthol cigarettes, stress-reduction techniques, preparing for quitting, relapse-prevention techniques, and the cultural meaning of smoking (*6*).

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Use of Smokeless Tobacco Among Adults — United States, 1991

Consumption of moist snuff in the United States almost tripled from 1972 through 1991 (*1*). Long-term use of smokeless tobacco is associated with nicotine addiction and increased risk of oral cancer (*2*)—the incidence of which could increase if young persons who currently use smokeless tobacco continue to use these products frequently (*1*). To monitor trends in the prevalence of use of smokeless tobacco products, CDC's 1991 National Health Interview Survey–Health Promotion and Disease Prevention supplement (NHIS-HPDP) collected information on snuff and chewing tobacco use and smoking from a representative sample of the U.S. civilian, noninstitutionalized population aged ≥18 years. This report summarizes findings from this survey.

The 1991 NHIS-HPDP supplement asked "Have you used snuff at least 20 times in your entire life?" and "Do you use snuff now?" Similar questions were asked about chewing tobacco use and cigarette smoking. Current users of smokeless tobacco were defined as those who reported snuff or chewing tobacco use at least 20 times and who reported using snuff or chewing tobacco at the time of the interview; former users were defined as those who reported having used snuff or chewing tobacco at least 20 times and not using either at the time of the interview. Ever users of smokeless tobacco included current and former users. Current smokers were defined as those

professional baseball players, encouraging this behavior among adolescent and young adult males and increasing their risk for nicotine addiction, oral cancer, and other mouth disorders (4).

Differences in the prevalence of smokeless tobacco use among racial/ethnic groups may be influenced by differences in educational levels and socioeconomic status as well as social and cultural phenomena that require further explanation. For example, targeted marketing practices may play a role in maintaining or increasing prevalence

TABLE 1. Percentage of adults who reported current use of smokeless tobacco,* by sex and by age group, race, Hispanic origin, education, region, urban/rural residence, and poverty status — United States, National Health Interview Survey–Health Promotion and Disease Prevention Supplement, 1991

Category	Men %	Men (95% CI[†])	Women %	Women (95% CI)	Total %	Total (95% CI)
Age group (yrs)						
18–24	8.2	(6.9– 9.6)	0.2	(0.0–0.5)	4.2	(3.5–4.8)
25–44	5.8	(5.2– 6.4)	0.1	(0.1–0.2)	2.9	(2.6–3.2)
45–64	3.6	(3.0– 4.2)	0.6	(0.4–0.9)	2.1	(1.8–2.4)
65–74	5.4	(4.2– 6.6)	1.3	(0.8–1.8)	3.1	(2.5–3.8)
≥75	5.8	(4.3– 7.4)	2.3	(1.6–2.9)	3.6	(2.9–4.3)
Race						
White	6.2	(5.7– 6.7)	0.3	(0.2–0.4)	3.1	(2.9–3.4)
Black	2.2	(1.4– 3.0)	2.3	(1.6–3.1)	2.3	(1.7–2.8)
Asian/Pacific Islander	1.4	(0.1– 2.7)	0.0	—	0.7	(0.0–1.4)
American Indian/ Alaskan Native[§]	8.1	(1.9–14.3)	2.5	(1.2–3.8)	5.4	(2.1–8.8)
Hispanic origin						
Hispanic	1.5	(1.0– 2.2)	0.2	(0.0–0.4)	0.9	(0.5–1.2)
Non-Hispanic	5.9	(5.5– 6.4)	0.6	(0.5–0.7)	3.1	(2.9–3.4)
Education (yrs)						
<12	7.7	(6.6– 8.8)	2.0	(1.5–2.4)	4.6	(4.0–5.2)
12	6.6	(5.8– 7.3)	0.3	(0.2–0.4)	3.1	(2.8–3.5)
13–15	5.2	(4.3– 6.0)	0.1	(0.0–0.2)	2.5	(2.1–2.9)
≥16	2.5	(2.1– 3.0)	0.0	(0.0–0.1)	1.4	(1.1–1.7)
Region						
Northeast	2.7	(2.0– 3.3)	0.0	(0.0–0.1)	1.3	(1.0–1.6)
Midwest	5.7	(4.9– 6.4)	0.2	(0.1–0.3)	2.8	(2.5–3.2)
South	8.4	(7.5– 9.3)	1.4	(1.1–1.7)	4.6	(4.1–5.1)
West	4.0	(3.3– 4.8)	0.2	(0.0–0.4)	2.1	(1.7–2.4)
Residence						
Urban	4.0	(3.6– 4.4)	0.3	(0.2–0.4)	2.1	(1.9–2.3)
Rural	11.2	(11.0–11.4)	1.5	(1.1–2.0)	6.0	(5.4–6.7)
Poverty status[¶]						
At/above poverty level	5.4	(4.9– 5.8)	0.3	(0.2–0.4)	2.8	(2.5–3.0)
Below poverty level	6.6	(5.2– 8.1)	1.9	(1.4–2.3)	3.7	(3.0–4.4)
Unknown	6.4	(4.7– 8.2)	1.5	(0.7–2.3)	3.6	(2.7–4.4)
Total	5.6	(5.1– 6.0)	0.6	(0.4–0.7)	2.9	(2.7–3.2)

*Snuff or chewing tobacco use at least 20 times and use at the time of the interview.
[†] Confidence interval.
[§] Estimates should be interpreted with caution because of the small number of cases (n=339).
[¶] Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

among some groups, and affecting the differential initiation of smokeless tobacco use by young persons (*5,6*).

In this report, one concern is that nearly one fourth of current smokeless tobacco users also smoke cigarettes. In the 1991 NHIS-HPDP, the prevalence of cigarette smoking was higher among former smokeless tobacco users than among current and never smokeless tobacco users. In a previous study among college students, 18% of current smokeless tobacco users smoked occasionally (*7*). In addition, approximately 7% of adults who formerly smoked reported substituting other tobacco products for cigarettes in an effort to stop smoking (*8*). Health-care providers should recognize the potential health implications of concurrent smokeless tobacco and cigarette use.

The national health objectives for the year 2000 have established special population target groups for the reduction of the prevalence of smokeless tobacco use, including males aged 12–24 years (to no more than 4% by the year 2000 [objective 3.9]) and American Indian/Alaskan Native youth (to no more than 10% by the year 2000 [objective 3.9a]) (*9*). Strategies to lower the prevalence of smokeless tobacco use include continued monitoring of smokeless tobacco use, integrating smoking and smokeless tobacco-control efforts, enforcing laws that restrict minors' access to tobacco, making excise taxes commensurate with those on cigarettes, encouraging health-care providers to routinely provide cessation advice and follow-up, providing school-based prevention and cessation interventions, and adopting policies that prohibit tobacco use on school property and at school-sponsored events (*5*).

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TABLE 2. Percentage of adults who reported using chewing tobacco or snuff, by sex and age group — United States, 1991

Age group (yrs)	Men				Women			
	Chewing tobacco		Snuff		Chewing tobacco		Snuff	
	%	(95% CI*)	%	(95% CI)	%	(95% CI)	%	(95% CI)
18–24	4.1	(3.1–5.1)	6.2	(4.9–7.5)	0.1	(0.0–0.2)	0.2	(0.0–0.4)
25–44	2.8	(2.4–3.2)	3.9	(3.4–4.4)	0.1	(0.0–0.2)	0.1	(0.0–0.2)
45–64	2.4	(1.9–3.0)	1.4	(1.1–1.8)	0.4	(0.2–0.6)	0.3	(0.1–0.5)
65–74	3.9	(2.8–5.0)	2.1	(1.4–2.8)	0.6	(0.3–1.0)	0.9	(0.5–1.3)
≥75	3.9	(2.7–5.1)	2.3	(1.3–3.3)	0.6	(0.2–1.0)	2.0	(1.3–2.7)
Total	3.1	(2.8–3.4)	3.3	(3.0–3.7)	0.3	(0.2–0.7)	0.4	(0.3–0.5)

*Confidence interval.

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Cigarette Smoking Among Adults — United States, 1991

From 1965 through 1985, smoking prevalence in the United States declined at a rate of 0.5 percentage points per year (1), and from 1987 through 1990, the rate of decline accelerated to 1.1 percentage points per year (2). CDC monitors the use of tobacco in the United States to evaluate progress in reducing smoking prevalence. To determine the prevalence of smoking among U.S. adults during 1991, the National Health Interview Survey–Health Promotion and Disease Prevention (NHIS-HPDP) supplement collected self-reported information on cigarette smoking from a representative sample of the U.S. civilian, noninstitutionalized population aged ≥18 years. This report summarizes the results of this survey.

The overall response rate for the 1991 NHIS-HPDP was 87.8%. Participants (n=43,732) were asked: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" Current smokers were defined as those who reported smoking at least 100 cigarettes and who were currently smoking and former smokers as those who reported having smoked at least 100 cigarettes and who were not smoking now. Ever smokers included current and former smokers. Current smokers were then asked: "Do you now smoke cigarettes every day or some days?" Respondents reporting they smoked every day were asked: "On the average, how many cigarettes do you now smoke a day?" Data were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (3).

In 1991, an estimated 89.8 million (49.8%) adults in the United States were ever smokers, and 46.3 million (25.7%) were current smokers. Approximately 43.5 million persons (48.5% of all ever smokers [95% CI=47.7%–49.3%]) were former smokers during 1991. The proportion of former smokers among ever smokers was higher among men (51.6% [95% CI=50.4%–52.7%]) than among women (44.7% [95% CI=43.6%–45.8%]) and increased with increased education from 41.8% (95% CI=40.1%–43.6%) for those with <12 years of education to 66.1% (95% CI=64.3%–67.9%) for those with ≥16 years of education.

Among men, 24.0 million (28.1%) were current smokers; among women, 22.2 million (23.5%) were current smokers (Table 1). The prevalence of smoking was higher among men than among women for most sociodemographic groups (Table 1). Smoking was most prevalent among persons aged 25–44 years. The prevalence of smoking was highest among American Indians/Alaskan Natives and blacks, and lowest among

Asians/Pacific Islanders. Differences between black and white adults were mainly among men. The prevalence of smoking was lower among Hispanics than non-Hispanics, reflecting the lower prevalence of smoking among Hispanic women. Cigarette smoking prevalence decreased with increasing education, and was higher among persons who lived below the poverty level* (Table 1).

In 1991, the mean number of cigarettes smoked daily per smoker was 20.0 (95% CI=19.7–20.3). The mean was substantially higher for men (21.6 [95% CI=21.2–22.0]) than women (18.3 [95% CI=18.0–18.6]), for whites (21.0 [95% CI=20.7–21.3) than blacks (15.0 [95% CI=14.4–15.6]), for non-Hispanics (20.4 [95% CI=20.1–20.7]) than Hispanics

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*Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

TABLE 1. Percentage of adults who were current cigarette smokers,* by sex and by age group, race, Hispanic origin, level of education, and poverty status — United States, National Health Interview Survey, 1991[†]

	Men		Women		Total	
	%	(95% CI[§])	%	(95% CI)	%	(95% CI)
Age (yrs)						
18–24	23.5	(21.4–25.7)	22.4	(20.5–24.3)	22.9	(21.5–24.4)
25–44	32.9	(31.7–34.1)	28.0	(27.0–29.0)	30.4	(29.7–31.2)
45–64	29.3	(27.8–30.8)	24.6	(23.4–25.8)	26.9	(25.9–27.8)
65–74	18.2	(16.3–20.1)	15.1	(13.6–16.5)	16.5	(15.2–17.7)
≥75	9.2	(7.1–11.3)	7.9	(6.7– 9.1)	8.4	(7.3– 9.5)
Race[¶]						
White	27.4	(26.5–28.2)	23.8	(23.1–24.5)	25.5	(24.9–26.0)
Black	35.1	(32.5–37.7)	24.4	(22.6–26.2)	29.2	(27.7–30.7)
Asian/Pacific Islander	24.2	(19.3–29.1)	7.5	(4.6–10.4)	16.0	(12.9–19.1)
American Indian/ Alaskan Native**	27.9	(20.4–35.4)	35.2	(25.1–45.3)	31.4	(25.3–37.5)
Hispanic origin						
Hispanic	25.2	(22.2–28.1)	15.5	(13.6–17.4)	20.2	(18.5–21.9)
Non-Hispanic	28.3	(27.5–29.1)	24.2	(23.5–24.9)	26.1	(25.6–26.7)
Education (yrs)						
<12	37.4	(35.4–39.3)	27.4	(25.9–28.8)	32.0	(30.8–33.1)
12	33.5	(32.3–34.8)	27.1	(26.1–28.1)	30.0	(29.2–30.7)
13–15	25.1	(23.5–26.7)	22.0	(20.7–23.3)	23.4	(22.4–24.5)
≥16	14.5	(13.4–15.7)	12.5	(11.3–13.6)	13.6	(12.8–14.4)
Poverty status[††]						
At/above poverty level	26.8	(25.9–27.6)	22.8	(22.1–23.4)	24.7	(24.2–25.3)
Below poverty level	39.3	(36.2–42.4)	29.3	(27.1–31.5)	33.1	(31.2–35.0)
Unknown	31.0	(28.0–34.0)	22.4	(20.4–24.4)	26.0	(24.2–27.7)
Total	28.1	(27.3–28.8)	23.5	(22.8–24.1)	25.7	(25.2–26.1)

* Persons aged ≥18 years who reported having smoked at least 100 cigarettes and who were currently smoking.
[†]Sample size=43,154; excludes 578 respondents with unknown smoking status.
[§]Confidence interval.
[¶]Excludes 717 respondents in unknown, multiple, and other race categories.
** Estimates should be interpreted with caution because of the small number of cases.
[††]Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

(13.4 [95% CI=12.5–14.3]), and for persons at or above the poverty level (20.3 [95% CI=20.0–20.6]) than persons below the poverty level (18.7 [95% CI=18.1–19.3]).

Reported by: Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics, CDC.

Editorial Note: The findings in this report indicate that the estimate of smoking prevalence in 1991 was the same as in 1990 (*2*). These findings are consistent with national household surveys on drug abuse (*4–6*), and public polls (*7*) that reveal similar patterns of declining prevalence until 1990 followed by a leveling during 1991. Among blacks and women, the prevalence of current smoking during 1991 was slightly higher than during 1990 (*2*). Factors that contributed to the leveling in smoking prevalence may include the steady growth in market share of discount cigarettes (*8*) and the recent 10.4% annual increase to an estimated $3.9 billion in domestic cigarette advertising and promotional expenditures (*9*).

Differences in prevalence among racial and ethnic groups may be influenced by differences in educational levels and socioeconomic status, as well as social and cultural phenomena that require further explanation. For example, targeted marketing practices may play a role in maintaining or increasing prevalence among some groups, and affecting the differential initiation of smoking by young people (*1*). The national health objectives for the year 2000 have established special population target groups for the reduction of smoking prevalence including blacks, Hispanics, American Indians/Alaskan Natives, and Southeast Asian men (*10*).

Acceleration of the decline in smoking prevalence will require intensified efforts to discourage the use of tobacco by helping smokers break the addiction to nicotine, persuading children never to start smoking, and enacting public policies that discourage smoking. Such policies include increasing taxes on tobacco products, enforcing minors'-access laws, restricting smoking in public places, and restricting tobacco advertising and promotion (*1*).

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Cigarette Smoking Among American Indians and Alaskan Natives — Behavioral Risk Factor Surveillance System, 1987–1991

Cardiovascular disease and cancer are two of the leading causes of premature death among American Indians and Alaskan Natives (*1*). Although cigarette smoking contributes to these diseases, cigarette smoking behaviors among American Indians and Alaskan Natives have not been well characterized nationally (*2,3*). To better assess the impact of smoking on these populations, CDC analyzed data obtained from the Behavioral Risk Factor Surveillance System (BRFSS) during 1987–1991. This report summarizes the findings from this study.

Data were analyzed for 3102 American Indians and Alaskan Natives and for 297,438 white persons aged ≥18 years from 47 states and the District of Columbia. Data were from the BRFSS, a telephone interview survey that uses a standardized, multistage, cluster sampling design. Data were weighted to provide estimates representative of each state. Current smokers were defined as persons who reported current smoking and who had smoked at least 100 cigarettes. Survey participants were asked the average number of cigarettes smoked per day. SESUDAAN (*4*) was used to calculate prevalence estimates, standard errors, and confidence intervals (*5*).

During 1987–1991, the prevalence of smoking was higher among American Indian and Alaskan Native men (33.4%) and women (26.6%) than among white men (25.7%) and women (23.0%). Although the prevalence of smoking declined with increasing education and income for white men, among American Indian and Alaskan Native men with a college education or more, the rate of smoking was substantially higher (37.5%) than for whites (14.6%) (Table 1).

The average number of cigarettes smoked per day among smokers was lower for American Indian and Alaskan Native men (19.4) and women (15.5) than for white men (21.4) and women (17.7)—a relation that was consistent across age, education, and income categories (Table 2).

Reported by: Epidemiology Br, Office on Smoking and Health, and Behavioral Risk Factor Surveillance Br, Office of Surveillance and Analysis, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The higher prevalence of smoking among American Indians and Alaskan Natives described in this report is consistent with findings from other national surveys (*6,7*). However, because many American Indians and Alaskan Natives in rural areas do not have telephones (*8*), this telephone survey may overrepresent urban respondents.

Explanations for the higher smoking prevalence among American Indians and Alaskan Natives may include lower educational attainment, lower income levels,

traditional cultural practices involving tobacco use, and concurrent alcohol use (*2,9*). Culturally sensitive and empirically tested prevention and cessation efforts may be necessary to adequately address tobacco use in these populations.

The year 2000 national health objectives have targeted a smoking prevalence of 20% or less among American Indians and Alaskan Natives (objective 3.4f) (15% among the total population [objective 3.4]) (*10*). To achieve this objective, smoking-cessation and smoking-prevention efforts must be targeted and intensified for these groups.

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TABLE 1. Prevalence of cigarette smoking among American Indian, Alaskan Native, and white adults,* by sex, age, education, and income — United States, Behavioral Risk Factor Surveillance System, 1987–1991[†]

| | American Indian and Alaskan Native | | | | White | | | |
| | Men | | Women | | Men | | Women | |
Category	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)
Age (yrs)								
18–24	21.2	(12.2–30.2)	28.0	(17.1–38.8)	23.7	(22.6–24.9)	23.7	(22.7–24.7)
25–44	39.7	(33.3–46.2)	27.0	(21.8–32.1)	29.7	(29.1–30.3)	26.7	(26.2–27.2)
45–54	39.0	(25.9–52.1)	36.8	(24.0–49.6)	29.2	(28.1–30.3)	27.3	(26.3–28.3)
≥55	28.2	(18.1–38.3)	14.3	(8.4–20.3)	18.4	(17.8–19.0)	16.4	(15.9–16.9)
Education								
Less than high school diploma	40.5	(31.3–49.7)	29.3	(20.6–37.9)	34.1	(33.0–35.2)	26.4	(25.5–27.2)
High school diploma	30.8	(23.6–38.1)	27.2	(20.8–33.7)	32.2	(31.5–33.0)	27.1	(26.6–27.7)
Some college	28.4	(20.9–36.0)	26.6	(19.0–34.1)	24.3	(23.6–25.0)	22.8	(22.2–23.4)
Undergraduate degree or higher	37.5	(19.7–55.3)	20.4	(6.7–34.1)	14.6	(14.0–15.1)	13.2	(12.7–13.8)
Annual income								
<$10,000	42.5	(29.8–55.2)	28.5	(21.7–35.3)	29.5	(28.1–31.0)	24.7	(23.9–25.6)
$10,000–$14,999	42.8	(31.4–54.2)	30.9	(19.0–42.9)	29.6	(28.3–31.0)	26.6	(25.6–27.6)
$15,000–$19,999	27.0	(16.5–37.5)	27.4	(16.4–38.4)	29.7	(28.4–31.0)	27.8	(26.7–28.9)
$20,000–$24,999	32.5	(19.6–45.4)	19.6	(11.0–28.2)	30.5	(29.3–31.8)	26.2	(25.2–27.3)
$25,000–$34,999	27.0	(16.1–38.0)	26.6	(14.4–38.9)	27.1	(26.2–28.0)	25.3	(24.4–26.1)
≥$35,000	31.0	(21.2–40.8)	23.4	(11.8–35.0)	22.1	(21.4–22.7)	19.6	(19.0–20.2)
Total	**33.4**	**(28.8–37.9)**	**26.6**	**(22.4–30.8)**	**25.7**	**(25.3–26.0)**	**23.0**	**(22.7–23.3)**

*Persons aged ≥18 years who reported having smoked at least 100 cigarettes and who were currently smoking.
[†]Aggregated, weighted data.
[§]Confidence interval.

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TABLE 2. **Mean number of cigarettes smoked daily by current smokers among American Indian, Alaskan Native, and white adults,* by sex, age, education, and income — United States, Behavioral Risk Factor Surveillance System, 1987–1991†**

| | American Indian and Alaskan Native | | | | White | | | |
| | Men | | Women | | Men | | Women | |
Category	No.	(95% CI§)	No.	(95% CI)	No.	(95% CI)	No.	(95% CI)
Age (yrs)								
18–24	16.6	(12.8–20.3)	14.7	(10.9–18.4)	16.1	(15.6–16.5)	14.6	(14.2–15.0)
25–44	20.1	(17.2–23.1)	15.8	(14.0–17.6)	21.5	(21.2–21.7)	17.9	(17.7–18.2)
45–54	20.9	(14.6–27.3)	14.9	(11.7–18.2)	24.9	(24.3–25.4)	20.0	(19.6–20.5)
≥55	18.0	(11.9–24.1)	18.0	(11.2–24.8)	22.2	(21.7–22.7)	17.6	(17.2–17.9)
Education								
Less than high school diploma	23.7	(19.8–27.7)	15.1	(12.4–17.9)	22.4	(21.9–22.9)	19.3	(18.9–19.7)
High school diploma	17.7	(14.3–21.0)	14.8	(12.8–16.7)	21.6	(21.3–21.9)	17.8	(17.6–18.1)
Some college	18.8	(14.7–22.8)	17.9	(14.6–21.2)	20.9	(20.5–21.3)	17.1	(16.8–17.4)
Undergraduate degree or higher	12.9	(7.1–18.7)	12.2	(8.4–16.1)	20.2	(19.7–20.7)	16.4	(15.9–16.8)
Annual income								
<$10,000	18.2	(15.1–21.3)	18.0	(15.0–21.1)	19.9	(19.2–20.6)	18.1	(17.7–18.5)
$10,000–$14,999	16.9	(11.8–22.0)	14.6	(10.4–18.8)	20.1	(19.4–20.7)	17.7	(17.2–18.1)
$15,000–$19,999	14.2	(9.9–18.4)	13.3	(10.8–15.8)	21.4	(20.8–22.0)	18.2	(17.7–18.7)
$20,000–$24,999	21.8	(15.6–28.1)	12.2	(9.2–15.1)	21.6	(21.0–22.2)	17.7	(17.2–18.1)
$25,000–$34,999	22.9	(15.5–30.3)	16.7	(14.1–19.2)	22.0	(21.5–22.4)	17.6	(17.3–18.0)
≥$35,000	19.6	(13.6–25.5)	16.3	(11.2–21.4)	21.9	(21.5–22.3)	17.7	(17.4–18.1)
Total	**19.4**	**(17.2–21.6)**	**15.5**	**(13.9–17.1)**	**21.4**	**(21.2–21.6)**	**17.7**	**(17.6–17.9)**

*Persons aged ≥18 years who reported having smoked at least 100 cigarettes and who were currently smoking. These data include only persons who reported smoking one or more cigarettes per day.
†Aggregated, weighted data.
§Confidence interval.

Cigarette Smoking Among Southeast Asian Immigrants —
Washington State, 1989

Since 1975, approximately one million Southeast Asians have immigrated to the United States (1). In general, the efforts of local public health agencies to meet the needs of these immigrants have focused on identifying and treating acute and chronic diseases rather than identifying and modifying health-risk behaviors (e.g., smoking) among these immigrants (2–4). However, efforts to determine the prevalence of smoking suggest that smoking rates are high, especially among men of Southeast Asian origin (5–7). During 1989, to characterize cigarette smoking among Southeast Asian immigrants, the Seattle-King County (Washington) Health Department surveyed newly arriving Southeast Asian immigrants who intended to reside in the county regarding their health problems and health-risk behaviors. This report summarizes survey findings regarding their smoking habits.

Washington has the third largest population of Southeast Asian immigrants (an estimated 50,000) in the United States; approximately 32,000 reside in Seattle-King County (B. Duong, Division of Refugee Assistance, Washington State Department of Social and Health Services, personal communication, 1992). Each year since 1982, approximately 1000 persons immigrating to the United States from Vietnam, Cambodia, and Laos have received medical screening interviews and examinations at Seattle-King County Department of Public Health clinics. During 1989, Southeast Asian immigrants were interviewed in their native language by trained interpreters at the Seattle-King County Central Clinic (one of two county public health clinics). Persons aged 18 years were asked if they were current smokers (i.e., "Do you smoke now?"), and smokers were asked how many cigarettes they smoked per day. A convenience sample of medical interview records were analyzed for 274 Vietnamese, 147 Laotian, and 112 Cambodian immigrants. Of the 533 records analyzed, 280 (52.5%) were for women.

The overall prevalence of smoking (23.1%) differed substantially by sex and age (Table 1). Men (42.5%) were more likely than women (5.7%) to smoke, and prevalence of smoking was higher for men aged 30 years (54.6%) than for men aged 18–29 years (29.5%). Among men, prevalence of smoking was highest for Laotians (51.2%), followed by Vietnamese (41.7%) and Cambodians (32.8%) (Table 2).

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Editorial Note: In Washington during 1988, the overall prevalence of smoking for men was 25.5%; therefore, the findings in this report suggest that, in 1989, Southeast Asian male immigrants were 1.6 times more likely to smoke than were men statewide. In comparison, the prevalence of smoking among Southeast Asian female immigrants during 1989 was one fourth that among all women in Washington (8). Previous reports also have documented a high prevalence of smoking among Southeast Asian male immigrants, especially Vietnamese (6–7), and low rates of smoking among Southeast Asian female immigrants (7).

For at least two reasons, the findings in this report may underestimate actual smoking prevalence among Southeast Asian immigrants arriving in Seattle. First, during the immigration health screening interviews, respondents and their family members often discussed how to answer questions, including those about smoking. Several respondents were advised by family members to deny that they smoked because of concern about criticism or penalties (D. Vu, Fred Hutchinson Cancer Research Center, personal observation, 1989). Second, the results regarding the number of cigarettes these immigrants smoked per day were unreliably recorded and interviewers did not repeat questions regarding smoking habits. In addition, although these results were stratified by country of origin, the findings reported represent a small convenience sample of newly arriving immigrants screened at one health clinic and, therefore, may not be generalizable to newly arriving Vietnamese, Laotian, and Cambodian immigrants elsewhere or to the existing Southeast Asian immigrant population in the United States.

Educational efforts to reduce smoking in the overall U.S. population may not be as effective for recently-arrived immigrants because of differences in language and culture; in particular, many immigrants may neither understand nor believe health risks are associated with smoking (7). To develop culturally appropriate smoking-prevention and smoking-cessation programs in Washington and other locations, the knowledges, attitudes, and behaviors of Southeast Asian immigrants concerning smoking require further characterization (9). In addition, educational materials must be tailored to the cultural background of these immigrants, available in their native languages, and evaluated for effectiveness. Finally, prevalence of smoking in these and other immigrant populations should be monitored through public health

TABLE 1. Prevalence of smoking among Southeast Asian immigrants, by sex and age — Washington State, 1989*

Age group (yrs)	Men			Women			Total		
	No.	(%)	(95% CI[†])	No.	(%)	(95% CI)	No.	(%)	(95% CI)
18–29	36	(29.5)	(22.2–39.7)	3	(3.0)	(0.6– 8.3)	39	(17.6)	(12.6–22.6)
30–39	22	(53.7)	(37.4–69.3)	3	(5.6)	(1.2–15.7)	25	(26.3)	(18.8–37.5)
40–59	30	(54.5)	(40.6–68.1)	7	(8.3)	(3.3–15.8)	37	(26.6)	(19.8–35.2)
≥60	19	(55.9)	(37.9–72.8)	3	(7.1)	(1.5–19.1)	22	(28.9)	(19.3–40.6)
Total	107	(42.5)	(36.2–49.2)	16	(5.7)	(3.8–10.4)	123	(23.1)	(19.5–26.7)

*n=533.
[†] Confidence interval.

TABLE 2. Prevalence of smoking among Southeast Asian male immigrants, by age and country of origin — Washington State, 1989*

Age group (yrs)	Cambodian			Laotian			Vietnamese		
	No.	(%)	(95% CI[†])	No.	(%)	(95% CI)	No.	(%)	(95% CI)
18–29	3	(13.0)	(2.8–33.0)	11	(33.3)	(18.0–51.9)	22	(33.3)	(21.9–45.4)
≥30	16	(45.7)	(28.8–63.4)	25	(65.9)	(43.3–75.1)	28	(51.9)	(37.8–65.7)
Total	19	(32.8)	(20.7–45.6)	38	(51.2)	(41.1–64.9)	50	(41.7)	(33.0–51.3)

*n=253.
[†] Confidence interval.

surveillance efforts to determine whether smoking rates change in relation to years of residence in the United States.

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Cigarette Smoking Among Chinese, Vietnamese, and Hispanics — California, 1989–1991

Although cigarette smoking causes 434,000 premature deaths annually in the United States (*1*), information characterizing smoking behaviors generally lacks specificity for racial/ethnic groups and subgroups (*2*). To characterize smoking and other risk behaviors more fully for program planning efforts at the local level, three California communities and the California Department of Health Services developed culturally adapted versions of CDC's Behavioral Risk Factor Surveillance System (BRFSS). These surveys were administered to selected Chinese (*3*), Vietnamese (*4*), or Hispanic populations in California. This report summarizes information about smoking from these surveys during 1989–1991.

Questionnaires used for these surveys were modified for cultural appropriateness; translated into Chinese, Vietnamese, or Spanish; backtranslated; and field tested. Each questionnaire included standard BRFSS questions on smoking status and socio-demographic characteristics but differed on questions rating level of acculturation (*5,6*)—the cultural and behavioral adaptation that occurs to persons in a new culture. In the Chinese survey, little or no English fluency and <25% of lifetime in the United States indicated less acculturation. For Vietnamese, English fluency and immigration before 1981 indicated more acculturation. Hispanics who self-reported they primarily think, read, and speak Spanish were classified as less acculturated; Hispanics who self-reported they primarily think, read, and speak English were classified as more acculturated.

The survey of Chinese included a representative sample in Oakland Chinese and was completed by face-to-face interviews during June 1989–February 1990. The survey of Vietnamese included a statewide sample and was completed by

computer-assisted telephone interviews during February–March 1991. The survey of Hispanics included a representative sample of Monterey County (excluding the Monterey peninsula) and was completed by computer-assisted telephone interviews during July–December 1989. Because results for each group are not age-adjusted (except for age-specific prevalences), they cannot be compared directly.

Response rates varied substantially: of 359 eligible for the Chinese survey, 296 (82%) participated; of 1705 eligible for the Vietnamese survey, 1011 (59%) participated; and of 1067 persons eligible for the Hispanic survey, 801 (75%) participated. Because of the low number of women who reported that they were smokers, demographic characteristics (i.e., age, education level, annual income, and acculturation) are given only for men. For example, two of 454 Vietnamese women surveyed reported that they were current smokers.

Chinese. Smoking prevalence among Chinese men in Oakland was 28.1% (Table 1). Smoking prevalence was highest among those with less than a high school education; however, those who were high school graduates smoked the highest average number of cigarettes. Men who lived in households with annual incomes <$25,000 were more likely to smoke than were men in higher income households. The average number of cigarettes smoked per day increased in relation to percentage of lifetime spent in the United States.

Vietnamese. In California, Vietnamese men aged 25–44 years were more likely to smoke than were those in other age groups (Table 2). Smoking prevalence was higher among men who immigrated in 1981 or later and who were not fluent in English; however, acculturation did not affect daily cigarette consumption.

Hispanics. For Hispanic men in Monterey County, smoking prevalence was substantially lower among those with more than a high school education (Table 3). More acculturated Hispanic men were also less likely to smoke. Among Hispanic women, the smoking prevalence was less than that among Hispanic men, but they smoked more cigarettes per day.

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Editorial Note: During the 1980s, the Asian/Pacific Islander and Hispanic populations were the fastest growing racial/ethnic groups in the United States (7). The findings in this report suggest that acculturation may influence smoking behavior among these groups, although these effects may vary. These three surveys used different measures of acculturation; only the Hispanic acculturation scale has been validated. Other models of acculturation need further investigation to develop standardized measures for comparisons between racial/ethnic groups and subgroups.

The findings in this report are subject to limitations described for previous BRFSS surveys in selected populations (3,4). These considerations reflect the limitations of self-reported information that is not independently validated, sampling frames that exclude households without telephones, and constraints on generalizability—in

particular, because these results have not been age-adjusted, even these three groups cannot be compared.

Data from each of the community surveys were presented to the respective communities and were used by community coalitions to establish priorities for program development. Data for Chinese indicated that men aged 25–44 years are most likely to smoke, which led to the development of a comprehensive community-wide tobacco-control campaign. The campaign included the development of culturally appropriate health education materials (e.g., brochures and videos) and prevention and cessation workshops. Data for Vietnamese also indicated that men aged 25–44 years are most likely to smoke; antismoking messages were directed to smokers regarding the effect of smoking on children and families. As the spouses, mothers, sisters, or daughters of

TABLE 1. Percentage of current smokers and mean number of cigarettes smoked per day among Chinese men in Oakland, California,* aged ≥18 years, by selected sociodemographic variables — Behavioral Risk Factor Surveillance System, June 1989–February 1990[†]

Characteristics	Current smokers		Mean no. cigarettes smoked	
	%	(95%CI[§])	No.	(95% CI)
Sex				
Men	28.1	(20.3–35.9)	15.9	(10.4–21.4)
Women	*1.2*	*(0.0– 2.8)*	—	—
Age (yrs)				
18–24	—[¶]	—	—[¶]	—
25–44	38.5	(23.2–53.7)	12.6	(3.5–10.7)
45–64	28.1	(12.5–43.7)	22.6	(10.2–35.0)
≥65	24.4	(11.9–37.0)	15.4	(7.9–23.0)
Education				
Eighth grade or less	30.2	(17.8–42.5)	15.7	(10.2–21.2)
Some high school	45.5	(24.6–66.3)	11.2	(6.7–15.7)
High school graduate	28.6	(9.2–47.9)	28.0	(0.0–56.4)
Some college	0	—	0	—
College graduate or more	20.0	(2.5–37.5)	10.0	—
Annual income				
<$10,000	25.5	(13.5–37.5)	9.5	(5.6–13.4)
$10,000–$24,999	32.1	(19.5–44.6)	14.7	(12.0–17.4)
$25,000–$50,000	20.0	(0.0–44.8)	55.0	—
>$50,000	—[¶]	—	—[¶]	—
Acculturation				
% of lifetime in United States				
<25%	29.8	(20.0–39.5)	13.0	(9.3–16.7)
≥25%	26.2	(12.9–39.5)	22.3	(6.4–38.2)
English fluency				
Fluent**	—[¶]	—	—[¶]	—
Not fluent	31.8	(23.0–40.6)	13.3	(10.2–16.4)

*Based on a face-to-face survey of a representative sample in Oakland, California, during June 1989–February 1990.
[†]Because the number of current smokers who were women was too small for analysis, data for education, age, annual income, and acculturation are provided for men only.
[§]Confidence interval.
[¶]Numbers too small for analysis.
**Self-report of ability to speak English well or fluently.

smokers, women were targeted because of their increased risk from environmental tobacco smoke. In addition, because most male smokers do not speak English fluently, all intervention materials have been produced in Vietnamese. Data for Hispanics provided the basis for the coalition to develop a comprehensive plan for delivering messages about smoking and resources available through multiple channels, such as libraries, media, clinics, worksites, and housing projects.

These surveys provide models for other communities and national data collecting systems to collect specific baseline data that address the nation's year 2000 health objectives (*8*) for racial/ethnic groups and subgroups. In addition, the findings from

TABLE 2. Percentage of current smokers and mean number of cigarettes smoked per day among Vietnamese men in California* aged ≥18 years, by selected sociodemographic variables — Behavioral Risk Factor Surveillance System, February–March 1991[†]

Characteristics	Current smokers		Mean no. cigarettes smoked	
	%	(95% CI[§])	No.	(95% CI)
Sex				
Men	34.7	(30.7–38.6)	10.1	(9.1–11.1)
Women	*0.4*	*(0.0– 0.8)*	*11.0*	*(0.0–28.6)*
Age (yrs)				
18–24	12.3	(3.8–20.8)	10.0	(3.5–16.5)
25–44	42.4	(37.1–47.7)	10.3	(9.0–11.6)
45–64	27.4	(19.9–34.9)	9.9	(8.2–11.6)
≥65	23.3	(8.2–38.5)	7.3	(4.3–10.3)
Education				
Eighth grade or less	36.6	(25.4–47.8)	11.9	(9.0–14.8)
Some high school	39.6	(31.3–47.8)	10.6	(8.9–12.3)
High school graduate	40.4	(27.6–53.1)	8.8	(6.4–11.2)
Some college	32.9	(25.7–40.2)	9.9	(7.8–12.0)
College graduate or more	26.8	(19.1–34.5)	9.1	(6.4–11.8)
Annual income				
<$10,000	38.7	(27.6–49.7)	10.3	(8.2–12.4)
$10,000–$24,999	29.9	(22.8–37.1)	10.1	(8.1–12.1)
$25,000–$50,000	36.9	(29.2–44.7)	10.1	(8.2–12.0)
>$50,000	29.5	(19.4–39.6)	8.3	(5.0–11.6)
Acculturation				
Immigration before 1981	32.2	(27.0–37.5)	10.5	(9.0–12.0)
Immigration in 1981 or later	37.7	(31.7–43.7)	9.8	(8.3–11.2)
English fluency				
Fluent[¶]	29.7	(22.1–37.3)	10.7	(8.1–13.3)
Not fluent	36.6	(31.7–40.9)	10.0	(8.9–11.1)

*Based on a survey of a statewide sample completed by computer-assisted telephone interviews of Vietnamese in California during February–March 1991.
[†]Because the number of current smokers who were women was too small for analysis, data for education, age, annual income, and acculturation are provided for men only.
[§]Confidence interval.
[¶]Self-report of ability to speak English well or fluently.

these BRFSS surveys in California provide a basis for developing and evaluating culturally appropriate tobacco-control programs.

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TABLE 3. Percentage of current smokers and mean number of cigarettes smoked per day among Hispanic men in Monterey County, California,* aged ≥18 years, by selected sociodemographic variables — Behavioral Risk Factor Surveillance System, July–December 1989[†]

Characteristics	Current smokers %	(95% CI[§])	Mean no. cigarettes smoked No.	(95% CI)
Sex				
Men	21.6	(18.8–24.5)	9.4	(7.4–11.3)
Women	*8.2*	*(6.3–10.1)*	*11.6*	*(8.0–15.2)*
Age (yrs)				
18–24	16.4	(12.7–20.1)	7.6	(4.8–10.4)
25–44	24.8	(20.5–29.1)	9.1	(6.6–11.7)
45–64	16.4	(12.7–20.1)	12.5	(8.0–17.0)
≥65	25.0	(20.7-29.3)	8.0	(4.1–11.9)
Education				
Eighth grade or less	24.0	(19.7–28.2)	8.5	(6.4–10.6)
Some high school	25.7	(21.3–30.1)	7.5	(4.6–10.4)
High school graduate	22.8	(18.6–27.0)	13.6	(7.2–20.0)
Some college	9.6	(6.7–12.6)	9.6	(2.4–16.8)
College graduate or more	8.3	(5.6–11.1)	—	—
Annual income				
<$10,000	18.6	(14.7–22.6)	10.8	(4.4–17.1)
$10,000–$24,999	23.0	(18.7–27.3)	5.8	(2.1– 9.5)
$25,000–$50,000	21.5	(17.3–25.7)	8.7	(6.7–10.7)
>$50,000	11.8	(8.5–15.1)	13.2	(7.4–19.0)
Acculturation**				
1 (less acculturated)	20.1	(16.1–24.2)	—	—
2	29.4	(24.8–34.0)	8.6	(5.9–11.3)
3	20.8	(16.7–24.8)	6.4	(4.3– 8.5)
4	20.9	(16.8–25.0)	7.7	(5.1–10.4)
5 (more acculturated)	13.1	(9.8–16.6)	14.6	(6.7–22.6)

*Based on a survey of a representative sample in Monterey County (excluding Monterey peninsula), California, completed by computer-assisted telephone interviews during July–December 1989.
†Because the number of current smokers who were women was too small for analysis, data for education, age, annual income, and acculturation are provided for men only.
§Confidence interval.
⁴Numbers too small for analysis.
**Those who self-reported they primarily think, read, and speak Spanish were classified as less acculturated; those who self-reported they primarily think, read and speak English were classified as more acculturated.

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Cigarette Smoking Among Adults — United States, 1990

An essential component of tobacco-control programs is the monitoring of tobacco use over time (1). To determine the prevalence of smoking among adults in the United States during 1990, the National Health Interview Survey-Health Promotion and Disease Prevention (NHIS-HPDP) supplement collected self-reported information about cigarette smoking from a representative sample of the U.S. civilian, noninstitutionalized population. This report presents data from that survey supplement.

The overall response rate for the NHIS-HPDP supplement was 83.4%. Approximately 41,000 persons aged ≥18 years responded to the following questions on smoking behavior: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" Current smokers were defined as those who answered "yes" to both questions; former smokers were defined as those who answered "yes" to the first question and "no" to the second question. Ever smokers included current and former smokers. Current smokers were also asked, "On the average, about how many cigarettes a day do you now smoke?" The data were adjusted for nonresponse and weighted to provide national estimates. Ninety-five percent confidence intervals (CIs) were calculated by using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (2).

In 1990, an estimated 89.9 million (50.1%) U.S. adults were ever smokers, and 45.8 million (25.5%) were current smokers. Approximately 44.1 million (49.1% of all ever smokers) were former smokers in 1990.

An estimated 24.2 million (28.4%) men and 21.6 million (22.8%) women were current smokers (Table 1); in all sociodemographic groups, the prevalence of smoking was higher among men than among women. The prevalence of smoking was highest among persons aged 25–44 years, American Indians/Alaskan Natives, non-Hispanics, and persons with fewer than 12 years of education (Table 1).

During 1990, 26.4% of persons in the United States aged 20–24 years were current cigarette smokers (Table 2). Smoking prevalence in this age group (which can be used as an indirect measure of smoking initiation [3]), was 28.6% for men, 24.3% for women, 28.3% for whites, and 17.3% for blacks. Regardless of education level, among persons in this age group, men were more likely than women to be current cigarette smokers; prevalence was highest among men who had not completed 12 years of education (Table 2).

During 1990, for all age groups combined, the average number of cigarettes smoked per day by current smokers who smoked one or more cigarettes per day was

19.1 (95% CI=18.8%–19.4%); 22.9% (95% CI=21.8%–23.9%) of current smokers reported smoking 25 or more cigarettes per day.

Reported by: Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics, CDC.

Editorial Note: The 1990 NHIS-HPDP data indicate that, for the first time since NHIS monitoring began in 1965 (3), the prevalence of smoking was similar among blacks and whites overall. In addition, the difference in smoking prevalences among black men and white men is less than when compared with previous years (4). Based on an analysis of data for 1974–1985, the rate of decline in smoking prevalence was higher for blacks than whites, and this difference was substantial for men (4). The decrease in smoking prevalence among blacks aged 20–24 years (from 38.7% in 1983 [3]) is consistent with recent reports of lower smoking rates among black adolescents (3,5).

From 1965 through 1985, the overall smoking prevalence among U.S. adults declined an average of 0.5 percentage points annually (3). During this time, prevalence among women aged 20–24 years with ≤12 years education ranged from 39% to 45% with no declines; however, a sharp decline in smoking prevalence occurred in this subgroup by 1990. From 1987, when overall prevalence among adults was 28.8% (6), to 1990, overall prevalence declined an average of 1.1 percentage points annually. This rate of decline must be sustained to achieve the year 2000 national health

TABLE 1. Percentage of men and women who smoke cigarettes, by age group, race, Hispanic origin, and education — United States, National Health Interview Survey, 1990*

Category	Men %	Men (95% CI[†])	Women %	Women (95% CI)	Total %	Total (95% CI)
Age (yrs)						
18–24	26.6	(24.3–28.9)	22.5	(20.6–24.4)	24.5	(23.0–26.0)
25–44	32.9	(31.7–34.1)	26.6	(25.6–27.6)	29.7	(28.9–30.5)
45–64	29.3	(27.8–30.8)	24.8	(23.5–26.1)	27.0	(26.0–28.0)
65–74	18.3	(16.2–20.5)	15.6	(14.2–17.0)	16.8	(15.5–18.1)
≥75	7.6	(5.8– 9.4)	5.8	(4.7– 6.9)	6.5	(5.6– 7.5)
Race[§]						
White	27.9	(27.1–28.9)	23.5	(22.7–24.2)	25.6	(25.0–26.2)
Black	32.6	(30.2–34.8)	21.2	(19.6–22.8)	26.2	(24.8–27.6)
Asian/Pacific Islander	24.8	(20.4–29.2)	6.2	(4.1– 8.3)	16.4	(13.5–19.3)
American Indian/ Alaskan Native	40.1	(29.4–50.8)	36.2	(24.4–48.0)	38.1	(28.3–47.9)
Hispanic origin						
Hispanic	30.9	(27.8–34.0)	16.3	(14.1–18.5)	23.0	(21.1–24.9)
Non-Hispanic	28.2	(27.4–29.1)	23.4	(22.7–24.1)	25.7	(25.1–26.3)
Education (yrs)						
<12	37.3	(35.4–39.2)	27.1	(25.7–28.5)	31.8	(30.6–33.0)
12	33.5	(32.1–34.9)	26.5	(25.5–27.5)	29.6	(28.7–30.5)
13–15	26.2	(24.5–27.9)	20.2	(19.0–21.4)	23.0	(22.0–24.0)
≥16	14.5	(13.3–15.7)	12.3	(11.2–13.4)	13.5	(12.7–14.3)
Total	**28.4**	**(27.6–29.2)**	**22.8**	**(22.1–23.5)**	**25.5**	**(25.0–26.1)**

*Sample size = 40,666; excludes 438 respondents with unknown smoking status.
[†]Confidence interval.
[§]Excludes unknown, multiple, and other races.

objective of reducing cigarette smoking prevalence to no more than 15% among persons aged ≥20 years (objectives 3.4 and 16.6) (*7*).

Factors that may have contributed to the accelerated decline in smoking include a decrease in the social acceptability of smoking (*3*), the increased cost of cigarettes (*8*), and an increased awareness of the health consequences of active and passive smoking (*3*). The possibility of underreporting of smoking (*9*) needs further research.

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TABLE 2. Smoking prevalence among men and women aged 20–24 years, by race, Hispanic origin, and education — United States, National Health Interview Survey, 1990*

Category	Men %	Men (95% CI[†])	Women %	Women (95% CI)	Total %	Total (95% CI)
Race[§]						
White	28.9	(25.8–32.0)	27.7	(25.0–30.4)	28.3	(26.2–30.4)
Black	23.9	(17.0–30.8)	11.9	(8.6–15.2)	17.3	(13.6–21.0)
Hispanic origin						
Hispanic	26.8	(18.6–35.0)	15.2	(8.6–21.8)	20.7	(15.3–26.1)
Non-Hispanic	28.9	(25.9–31.9)	25.8	(23.5–28.1)	27.3	(25.4–29.2)
Education (yrs)						
<12	55.4	(48.2–62.6)	46.6	(39.9–53.3)	51.2	(46.3–56.1)
12	29.6	(25.4–33.8)	28.1	(24.6–31.6)	28.9	(26.1–31.7)
≤12	37.3	(33.4–41.2)	33.4	(30.0–36.8)	35.4	(32.8–38.0)
≥13	16.1	(12.9–16.7)	13.8	(11.4–16.2)	14.8	(12.9–16.8)
Total	28.6	(25.8–31.4)	24.3	(22.1–26.5)	26.4	(24.6–28.2)

*Sample size = 3548; excludes 31 respondents with unknown smoking status.
[†]Confidence interval.
[§]Excludes Asians/Pacific Islanders; American Indians/Alaskan Natives; and unknown, multiple, and other races.

Cigarette Smoking Among Adults — United States, 1988

In 1964, the first Surgeon General's report on smoking focused on the health hazards associated with cigarette smoking (1). From 1965 through 1987, the overall prevalence of cigarette smoking among adults in the United States declined by approximately 0.5 percentage points per year (1,2). To determine the prevalence of smoking among adults in the United States in 1988, the Occupational Health Supplement (OHS) of CDC's National Health Interview Survey collected information on cigarette smoking from a representative sample of the U.S. civilian, noninstitutionalized population aged ≥18 years.

For 1988, the OHS included the following questions on smoking behavior: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" Among persons who reported smoking at least 100 cigarettes, current smokers were defined as those who reported being a smoker at the time of the interview, and former smokers, as those who were not current smokers. Both current and former smokers were classified as ever smokers. The proportion of persons who had stopped smoking was defined as the number of former smokers divided by the number of ever smokers. Current smokers were asked, "On the average, about how many cigarettes a day do you smoke?" Data were available on cigarette smoking status for approximately 44,000 persons aged ≥18 years and were weighted to provide national estimates. Ninety-five percent confidence intervals (CIs) were calculated using SESUDAAN (3).

Based on the survey, in 1988 an estimated 91.1 million (51.9%) adults in the United States were ever smokers, and 49.4 million (28.1%) were current smokers. Current smokers included 30.8% of all men (25.6 million) and 25.7% of all women (23.7 million). In all age groups except 18–24-year-olds, the prevalence of smoking was higher among men than women; smoking was most prevalent among persons 25–64 years of age (Table 1). The overall prevalence of smoking was higher among blacks (31.7%) than whites (27.8%), and lowest among persons of other races (23.8%). The overall prevalence also was higher among non-Hispanics (28.4%) than Hispanics (23.5%). The prevalence of smoking was highest among persons with less than a high school education (34.0%) and with only a high school education (32.0%) (Table 1).

The prevalence of smoking was significantly higher among separated and divorced persons (42.6% [95% CI=41.3%–44.0%]) than among persons in other marital categories: married (27.4% [95% CI=26.7%–28.1%]), never married (26.5% [95% CI=25.2%– 27.7%]), and widowed (19.5% [95% CI=18.3%–20.6%]).

In 1988, 41.8 million (45.8%) ever smokers were former smokers. The proportion of men (49.0% [95% CI=47.8%–50.1%]) who had stopped smoking was higher than that of women (42.0% [95% CI=40.8%–43.1%]), and the proportion of whites (47.6% [95% CI=46.8%–48.4%]) who had stopped smoking was higher than that of blacks (32.4% [95% CI=30.2%–34.6%]). The proportion of Hispanics who had stopped smoking (44.9% [95% CI=41.7%–48.1%]) was similar to that for non-Hispanics (45.9% [95% CI=45.1%–46.7%]). The proportions of adults with less than a high school education who had stopped smoking (41.1% [95% CI=39.6%–42.7%]) and of adult high school graduates who had stopped smoking (41.3% [95% CI=40.0%–42.6%]) were lower than those for persons with some college education (47.7% [95% CI= 46.1%–49.3%]) and for college graduates (63.1% [95% CI=61.3%–64.9%]).

Overall, the mean number of cigarettes smoked per day by current smokers in 1988 was 20.2 (Table 2). In general, the mean number of cigarettes smoked by men was higher than the number smoked by women. Whites smoked more cigarettes per day than did blacks and persons of other races, and non-Hispanics smoked more cigarettes per day than did Hispanics. In 1988, 25.6% (95% CI=24.7%–26.5%) of smokers smoked 25 or more cigarettes per day.

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics; Surveillance Br, Div of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC.

Editorial Note: The findings in this report indicate that, from 1987 to 1988, the overall prevalence of smoking among adults ≥18 years of age declined from 28.8% (*2*) to 28.1%—approximately 0.7 percentage points. In addition, in 1988, the proportion of ever smokers who were former smokers was 45.8%, compared with 44.2% in 1987 (*4*).

The higher rates of cigarette smoking among separated and divorced persons appear to reflect higher rates of smoking initiation before the usual age of marriage (*5*). In addition, separated and divorced persons were less likely to have quit smoking than married persons (*5*). Social support provided in marriage may increase the probability of cessation (*5*), while stress (which has been associated with difficulty in quitting [*6*]) from marital discord may decrease the likelihood of quitting.

TABLE 1. Percentage of adults who were current cigarette smokers,* by sex, age, race, Hispanic origin, and level of education — United States, 1988

Category	Men %	Men (95% CI†)	Women %	Women (95% CI)	Total %	Total (95% CI)
Age (yrs)						
18–24	25.5	(23.1–27.8)	26.3	(24.3–28.2)	25.9	(24.3–27.4)
25–44	36.3	(35.1–37.5)	29.7	(28.6–30.8)	32.9	(32.1–33.8)
45–64	31.3	(29.7–32.9)	27.7	(26.3–29.1)	29.4	(28.4–30.4)
65–74	21.4	(19.5–23.4)	16.7	(15.3–18.2)	18.8	(17.6–20.1)
≥75	11.4	(9.0–13.7)	7.3	(6.2– 8.3)	8.8	(7.7– 9.8)
Race						
White	30.1	(29.2–31.0)	25.7	(25.0–26.4)	27.8	(27.2–28.4)
Black	36.5	(34.0–38.9)	27.8	(25.9–29.8)	31.7	(30.1–33.2)
Other	31.1	(25.9–36.3)	16.7	(13.7–19.6)	23.8	(20.5–27.1)
Hispanic origin						
Hispanic	29.1	(26.4–31.9)	18.7	(16.8–20.7)	23.5	(22.1–25.0)
Non-Hispanic	30.9	(30.1–31.8)	26.2	(25.4–26.9)	28.4	(27.9–29.0)
Education						
Less than high school diploma	39.9	(38.3–41.5)	28.9	(27.6–30.3)	34.0	(32.9–35.1)
High school diploma	35.4	(34.0–36.8)	29.4	(28.3–30.4)	32.0	(31.1–32.9)
Some college	27.5	(26.0–29.1)	23.5	(22.3–24.8)	25.4	(24.5–26.4)
College degree	16.9	(15.7–18.1)	14.6	(13.3–15.9)	15.9	(15.0–16.7)
Total	30.8	(30.0–31.6)	25.7	(25.0–26.3)	28.1	(27.6–28.6)

*Persons ≥18 years of age who reported having smoked at least 100 cigarettes and who were currently smoking.
†Confidence interval.

Cigarette smoking is the single most important preventable cause of death in the United States (7). One of the national health objectives for the year 2000 (objective 3.4) is to reduce the prevalence of cigarette smoking among adults to no more than 15% (8). To achieve this goal, the current rate of decline must be doubled.

Health-care providers and public health agencies must increase efforts to prevent the initiation of smoking and, for smokers, to support attempts to quit and maintain cessation. Persons with less than a high school education and in low socioeconomic groups are at especially high risk for becoming smokers (1,9). In addition to directing interventions toward these groups, smoking control and prevention efforts will require intensified public health education, increased emphasis on school health education, and enactment and enforcement of effective health-promoting policies and laws.

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TABLE 2. Mean number of cigarettes smoked daily by current smokers,* by sex, age, race, Hispanic origin, and level of education — United States, 1988

	Men		Women		Total	
	No.	(95% CI†)	No.	(95% CI)	No.	(95% CI)
Age (yrs)						
18–24	16.7	(15.9–17.5)	14.7	(14.0–15.4)	**15.7**	**(15.2–16.2)**
25–44	22.1	(21.6–22.6)	18.9	(18.5–19.3)	**20.6**	**(20.3–20.9)**
45–64	24.1	(23.3–24.9)	20.3	(19.6–21.0)	**22.2**	**(21.7–22.7)**
65–74	20.2	(18.8–21.6)	17.3	(16.3–18.3)	**18.8**	**(17.9–19.7)**
≥75	15.7	(13.5–17.9)	14.2	(12.7–15.7)	**14.9**	**(13.5–16.3)**
Race						
White	22.8	(22.4–23.2)	19.3	(19.0–19.6)	**21.1**	**(20.8–21.4)**
Black	15.4	(14.6–16.2)	13.3	(12.6–14.0)	**14.4**	**(13.8–15.0)**
Other	16.5	(14.8–18.2)	17.1	(12.1–22.2)	**16.7**	**(14.3–19.1)**
Hispanic origin						
Hispanic	15.0	(13.5–16.5)	12.1	(10.9–13.3)	**13.8**	**(12.8–14.8)**
Non-Hispanic	22.1	(21.7–22.5)	18.8	(18.5–19.1)	**20.5**	**(20.2–20.8)**
Education						
Less than high school diploma	22.1	(21.3–22.9)	19.4	(18.8–20.0)	**20.9**	**(20.4–21.4)**
High school diploma	21.7	(21.2–22.2)	18.6	(18.2–19.0)	**20.1**	**(19.8–20.4)**
Some college	22.1	(21.2–23.0)	17.8	(17.0–18.6)	**19.9**	**(19.3–20.5)**
College graduate	20.6	(19.6–21.6)	16.6	(15.6–17.6)	**19.0**	**(18.3–19.7)**
Total	**21.7**	**(21.3–22.1)**	**18.5**	**(18.2–18.8)**	**20.2**	**(20.0–20.5)**

*Persons ≥18 years of age who reported having smoked at least 100 cigarettes and who were currently smoking. These data include only persons who reported smoking one or more cigarettes per day.
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Cigarette Smoking Among Reproductive-Aged Women — Behavioral Risk Factor Surveillance System, 1989

Women who smoke cigarettes are at increased risk not only for chronic diseases (e.g., lung cancer and chronic obstructive pulmonary disease) but—if they use oral contraceptives—also for myocardial infarction (*1*). In addition, cigarette smoking during pregnancy increases the risk for low birth weight and premature infants, miscarriage, stillbirth, sudden infant death syndrome, and infant mortality (*2*). Because of these risks and other health problems associated with cigarette smoking, one of the national health objectives for the year 2000 is to reduce the prevalence of smoking to 12% among reproductive-aged women (18–44 years of age) (*3*). This report summarizes data from the 1989 Behavioral Risk Factor Surveillance System (BRFSS) on the prevalence of smoking among reproductive-aged women.

In 1989, health departments in 39 participating states and the District of Columbia used a standard questionnaire to conduct telephone interviews of adults aged ≥18 years (*4*). Current smokers were defined as persons who had smoked at least 100 cigarettes and who reported being a smoker at the time of the interview. Individual responses were weighted to provide estimates representative of the adult population of each participating state. To compare smoking prevalences between states, weighted state-specific prevalences were standardized for the distribution of the 1980 U.S. population by age, race, and educational level. Smoking prevalences for subgroups (age, race, educational level, and pregnancy status) were standardized by adjusting for the other variables.

In 1989, weighted crude prevalences of cigarette smoking among reproductive-aged women varied from 17% in Utah to 32% in Kentucky and Rhode Island (median: 26.5%) (Table 1). Standardized smoking prevalences ranged from 21% in Texas to 37% in Wisconsin. In general, standardized smoking prevalences were highest in the midwestern states and lowest in the Rocky Mountain and midcentral states.

Older women and women with less than a high school education were more likely to smoke (Table 2). Pregnant women were less likely than nonpregnant women to smoke. Smoking prevalences did not vary substantially between white and black women, the only racial groups for which rates could be calculated because the numbers of respondents of other racial/ethnic groups were too small to provide stable estimates.

Among reproductive-aged women who smoked, 84% smoked fewer than 25 cigarettes per day (Table 3). Women aged 35–44 years tended to be heavier smokers than younger women. Approximately 44% of all women who were current smokers had

attempted to quit smoking (i.e., quitting for at least 1 week) in the previous year. Women aged 35–44 years were substantially less likely than younger women to have attempted quitting.

TABLE 1. Weighted and standardized* smoking prevalences† among reproductive-aged women§, by state — Behavioral Risk Factor Surveillance System, 1989

State	Sample size	Weighted prevalence		Standardized prevalence	
		%	(95% CI¶)	%	(95% CI)
Alabama	549	23.4	(±3.9)	29.2	(±4.3)
Arizona	500	26.1	(±4.5)	31.0	(±5.7)
California	793	20.8	(±3.1)	29.5	(±4.4)
Connecticut	446	30.3	(±4.8)	34.8	(±5.5)
District of Columbia	513	24.9	(±4.8)	21.8	(±6.8)
Florida	466	28.7	(±4.5)	29.6	(±4.7)
Georgia	565	23.0	(±3.8)	28.1	(±4.5)
Hawaii	566	20.6	(±3.6)	22.3	(±6.2)
Idaho	539	21.0	(±3.5)	22.7	(±3.6)
Illinois	533	26.8	(±4.1)	32.6	(±5.1)
Indiana	611	30.0	(±4.0)	33.8	(±4.0)
Iowa	324	29.0	(±5.5)	35.0	(±6.9)
Kentucky	556	32.1	(±4.5)	33.2	(±4.4)
Maine	387	31.0	(±5.3)	36.0	(±5.3)
Maryland	582	22.4	(±3.9)	27.5	(±5.0)
Massachusetts	384	26.7	(±4.9)	31.7	(±5.3)
Michigan	746	28.2	(±3.4)	32.5	(±3.9)
Minnesota	1073	24.0	(±2.8)	33.4	(±3.5)
Missouri	460	27.1	(±4.6)	30.6	(±5.1)
Montana	332	18.8	(±4.3)	24.6	(±5.3)
Nebraska	399	24.2	(±4.5)	25.4	(±5.1)
New Hampshire	444	26.7	(±4.7)	31.9	(±5.0)
New Mexico	370	22.2	(±4.7)	24.7	(±5.3)
New York	426	26.9	(±5.1)	30.5	(±6.5)
North Carolina	553	26.4	(±4.2)	28.9	(±4.5)
North Dakota	470	20.8	(±3.7)	25.0	(±5.0)
Ohio	461	28.0	(±4.7)	30.0	(±4.6)
Oklahoma	348	26.7	(±5.5)	28.9	(±5.6)
Oregon	499	25.3	(±4.1)	29.9	(±4.6)
Pennsylvania	544	30.4	(±4.2)	32.4	(±4.3)
Rhode Island	523	32.1	(±4.5)	34.4	(±4.3)
South Carolina	518	22.4	(±3.9)	28.1	(±4.6)
South Dakota	513	23.3	(±4.0)	24.4	(±4.8)
Tennessee	732	30.0	(±3.6)	31.4	(±3.5)
Texas	486	21.9	(±4.0)	21.2	(±4.4)
Utah	617	17.1	(±3.5)	24.2	(±4.0)
Virginia	530	24.2	(±4.4)	26.2	(±4.5)
Washington	461	26.8	(±4.3)	31.8	(±5.2)
Wisconsin	380	30.0	(±5.0)	36.7	(±5.0)
West Virginia	475	29.8	(±5.4)	31.3	(±4.7)
Median		**26.5**		**30.0**	

*Weighted to provide estimates representative of the adult population of each participating state. Standardized for the distribution of the 1980 U.S. population by age, race, and educational level to allow comparisons between states.
†Percentage of women who had smoked at least 100 cigarettes and who reported being a smoker at the time of the interview.
§Aged 18–44 years.
¶Confidence interval.

Reported by the following state BRFSS coordinators: L Eldridge, Alabama; J Contreras, Arizona; W Wright, California; M Adams, Connecticut; M Rivo, District of Columbia; S Hoecherl, Florida; J Smith, Georgia; A Villafuerte, Hawaii; J Mitten, Idaho; B Steiner, Illinois; S Joseph, Indiana;

TABLE 2. Weighted and standardized* smoking prevalences[†] among reproductive-aged women[§], by age, race, educational level, and pregnancy status — Behavioral Risk Factor Surveillance System, 1989

Characteristic	Weighted prevalence		Standardized prevalence	
	%	(95% CI[¶])	%	(95% CI)
Age (yrs)				
18–24**	23.3	(±2.0)	20.6	(±3.2)
25–34	28.1	(±1.4)[††]	31.4	(±2.6)[††]
35–44	27.9	(±1.5)[††]	30.8	(±3.1)[††]
Race[§§]				
Black**	25.2	(±2.7)	30.4	(±3.3)
White	27.0	(±1.0)	32.4	(±1.5)
Educational level				
Less than high school**	43.1	(±3.5)	43.9	(±3.5)
High school	33.4	(±1.7)[††]	33.3	(±1.7)[††]
More than high school	19.5	(±1.1)[††]	19.0	(±1.2)[††]
Pregnant				
No**	27.2	(±1.0)	30.2	(±1.2)
Yes	17.7	(±4.5)[††]	19.0	(±4.4)[††]

*Weighted to provide estimates representative of the adult population of each participating state. Standardized by adjusting for other sociodemographic variables in the 1980 U.S. population (e.g., age was standardized for race and educational level). Pregnancy status was standardized for age, race, and educational level.
[†]Percentage of women who had smoked at least 100 cigarettes and who reported being a smoker at the time of the interview.
[§]Aged 18–44 years.
[¶]Confidence interval.
**Referent group.
[††]Prevalence of smoking is significantly different from that of the referent group (p<0.05).
[§§]Information for standardizing rates was available only for blacks and whites.

TABLE 3. Smoking quantity and quit attempt* prevalences among reproductive-aged women smokers, by age — Behavioral Risk Factor Surveillance System, 1989

Age (yrs)	No. cigarettes per day						Quit attempts during past year	
	1–14		15–24		≥25			
	%	(95% CI[†])	%	(95% CI)	%	(95% CI)	%	(95% CI)
18–24[§]	52.0	(±4.8)	38.7	(±4.7)	9.3	(±2.8)	53.7	(±4.8)
25–34	43.3	(±2.9)[¶]	41.1	(±2.9)[¶]	15.7	(±2.1)[¶]	44.6	(±2.9)[¶]
35–44	31.8	(±3.0)[¶]	47.5	(±3.3)[¶]	20.8	(±2.6)[¶]	36.7	(±3.1)[¶]
Total	41.3	(±2.0)	42.7	(±2.0)	16.0	(±1.4)	43.9	(±2.0)

*Quitting for at least 1 week in the year preceding the survey.
[†]Confidence interval.
[§]Referent group.
[¶]Significantly different than the referent group (p<0.05).

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Editorial Note: In this report, the state-to-state variations of smoking prevalences among reproductive-aged women may reflect differences in sociodemographic characteristics (e.g., age, race, and educational level) of state populations. However, because these variations persisted after standardization to adjust for these differences, other factors (e.g., occupation, employment status, and family income) may affect state-specific smoking prevalences. These variations may also reflect differences in the intensity of cigarette advertising and in the effectiveness of statewide smoking-control interventions (2,5). In addition, reasons for the lower prevalences of smoking among certain groups could include 1) declining smoking initiation rates in younger cohorts of women (a trend observed previously for white and Hispanic women [6]); 2) decreasing smoking-initiation and increasing smoking-cessation rates over time among women with higher educational levels (7); and 3) the effect of higher smoking-cessation rates for pregnant women (8).

The BRFSS findings regarding amounts of smoking and attempts to quit are consistent with previous reports (2,5). However, the proportion of women who attempted to quit smoking for at least 1 week in the year preceding the survey (44%) was substantially higher than that estimated in 1987 for the proportion of all women in the general U.S. population who had attempted to quit for at least 1 day (32%) (5). Therefore, smoking-cessation education for reproductive-aged women may be more successful than for women aged ≥45 years because reproductive-aged women appear to be more willing to attempt to quit smoking.

The 1989 BRFSS determined that the median prevalence of current smoking was 26.5% among reproductive-aged women in the states surveyed; accordingly, nearly all states will require concerted efforts to reduce prevalence of smoking among reproductive-aged women to 12% by the year 2000 (3). Efforts to reduce smoking initiation among adolescent girls and to target young women for smoking-cessation interventions are important priorities to accomplish this objective (2,5).

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Cessation of Cigarette Smoking — United States, 1989

Smoking-initiation and smoking-cessation interventions are important in reducing the prevalence of cigarette smoking in the United States. However, progress in smoking cessation has varied appreciably by smokers' age, race, sex, educational attainment, and state of residence (*1,2*). To monitor progress in smoking cessation in relation to these factors, data from the 1989 Behavioral Risk Factor Surveillance System (BRFSS) were analyzed.

In 1989, health departments from 39 states and the District of Columbia participated in the BRFSS, a monthly random-digit-dialed telephone interview survey of adults aged ≥18 years, to obtain information on selected health behaviors (*3*). Respondents were asked if they had ever smoked at least 100 cigarettes and if they currently smoked. The "quit ratio" was the percentage of ever smokers who were former smokers when interviewed. Ratios were weighted to represent the adult population of each participating state. To compare quit ratios between states, the weighted state-specific ratios were standardized for the age, race, sex, and educational attainment of the 1980 U.S. population. Quit ratios for subgroups (age, race, sex, and educational attainment) were standardized by adjusting for the other three variables.

The weighted quit ratio varied from 43% in Kentucky to 59% in Montana (median: 51%), and the standardized quit ratio from 41% in Oklahoma to 55% in Hawaii (Table 1). In general, standardized ratios were lowest in states in the Ohio River Valley and the south and highest in states in the Rocky Mountain and mid-central regions (Figure 1). The standardized quit ratio was also greater in persons >35 years of age, whites, men, and persons with high school education or more (Table 2).

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Editorial Note: The differences between states in the weighted quit ratio can be explained only in part by state-specific differences in age, race, sex, and educational

TABLE 1. Quit ratio* of ever smokers, by state[†] — Behavioral Risk Factor Surveillance System (BRFSS), 1989

State	No.	Weighted quit ratio			Standardized[§] quit ratio		
		Rank	%	95% CI[¶]	Rank	%	95% CI
Alabama	695	35	45.0	±4.1	35	43.8	±4.1
Arizona	743	14	51.7	±4.2	20	47.0	±4.4
California	1017	6	55.1	±3.3	15	47.9	±3.6
Connecticut	747	12	52.8	±4.1	10	48.5	±4.3
District of Columbia	566	39	43.8	±5.0	9	48.5	±8.7
Florida	887	10	53.8	±3.6	19	47.0	±3.8
Georgia	720	28	47.9	±4.1	16	47.5	±3.9
Hawaii	390	11	52.8	±3.8	1	55.2	±5.6
Idaho	723	9	54.0	±4.1	5	52.3	±4.3
Illinois	874	27	48.5	±3.6	29	45.6	±3.6
Indiana	1068	34	45.0	±3.1	34	43.8	±3.1
Iowa	615	18	51.0	±4.5	12	48.2	±4.0
Kentucky	909	40	43.0	±3.7	39	42.1	±3.2
Maine	685	20	50.7	±3.9	18	47.3	±4.0
Maryland	758	19	50.9	±4.1	17	47.4	±4.1
Massachusetts	648	3	56.9	±4.2	4	52.3	±4.2
Michigan	1178	30	46.5	±3.2	36	43.5	±3.1
Minnesota	1674	2	57.4	±2.5	8	49.3	±2.7
Missouri	710	25	49.0	±4.1	33	44.1	±4.2
Montana	577	1	59.0	±4.3	2	54.3	±4.7
Nebraska	634	21	50.5	±4.2	26	46.0	±4.2
New Hampshire	756	5	55.3	±3.9	7	50.3	±4.2
New Mexico	567	8	54.5	±4.4	11	48.2	±4.7
New York	633	17	51.2	±4.7	25	46.0	±4.2
North Carolina	832	31	45.9	±4.0	28	45.7	±3.7
North Dakota	739	4	56.5	±3.9	3	52.7	±3.9
Ohio	694	32	45.3	±4.3	32	45.0	±3.9
Oklahoma	562	37	44.6	±4.6	40	41.2	±4.4
Oregon	855	7	55.1	±3.6	13	48.2	±4.0
Pennsylvania	917	29	47.0	±3.5	27	46.0	±3.6
Rhode Island	922	22	49.9	±3.5	30	45.5	±3.1
South Carolina	826	36	44.8	±3.8	31	45.1	±3.4
South Dakota	730	24	49.4	±3.8	22	46.6	±3.8
Tennessee	1129	38	44.0	±3.2	37	42.0	±3.1
Texas	655	16	51.3	±4.3	14	48.1	±4.7
Utah	588	15	51.5	±4.6	6	50.4	±4.6
Virginia	686	26	48.9	±4.3	23	46.3	±4.3
Washington	744	13	52.6	±3.8	21	46.9	±4.1
West Virginia	879	33	45.1	±3.9	38	42.4	±3.7
Wisconsin	656	23	49.7	±4.1	24	46.2	±4.0

*The percentage of ever smokers (those who had ever smoked ≥100 cigarettes) who were former smokers when interviewed.
[†]For the BRFSS, the District of Columbia is considered a state.
[§]Standardized for the distribution of the 1980 U.S. population by age, race, sex, and educational attainment.
[¶]Confidence interval.

FIGURE 1. Smoking quit ratios* in selected states†, by tercile — Behavioral Risk Factor Surveillance System (BRFSS), 1989
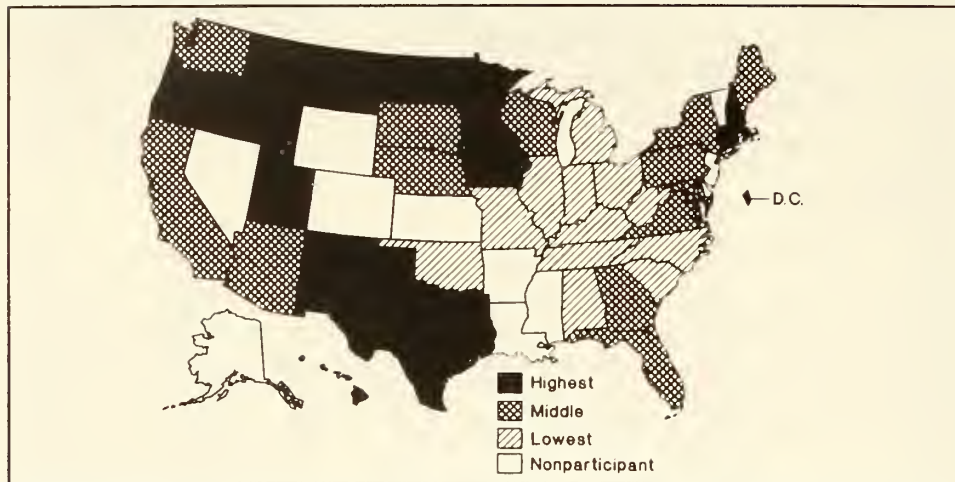
*The percentage of ever smokers (those who had ever smoked ≥100 cigarettes) who were former smokers when interviewed.
†For the BRFSS, the District of Columbia is considered a state.

TABLE 2. Quit ratio* of ever smokers, by age, race, sex, and educational attainment — Behavioral Risk Factor Surveillance System, 1989

Characteristic	No.	Standardized† quit ratio	
		%	95% CI§
Age (yrs)			
18–34¶	9,440	32.3	±1.5
35–54	11,843	43.5**	±1.5
≥55	9,905	64.5**	±1.5
Race			
Black¶	2,461	39.1	±2.8
White	28,727	47.0**	±0.9
Sex			
Female¶	16,073	43.3	±1.2
Male	15,115	49.8**	±1.2
Education (yrs)			
<12¶	5,688	36.0	±1.8
12	11,424	43.2**	±1.3
>12	14,076	55.9**	±1.3

*The percentage of ever smokers (those who had ever smoked ≥100 cigarettes) who did not smoke at the time of the survey.
†Standardized by adjusting for other sociodemographic variables in the 1980 U.S. population (e.g., age was standardized for race, sex, and educational attainment).
§Confidence interval.
¶Referent group.
**Quit ratio is significantly higher than the referent group (p<0.05).

attainment of the populations, since these differences persisted after standardization for differences in sociodemographic composition.

Other factors affecting smoking cessation that may explain the variations in smoking cessation by state include the percentage of heavy smokers (1), societal norms and attitudes about smoking cessation (1), and the existence, strength, and scope of smoking cessation services (4). Restrictions on smoking also may play a role in the variations by state in smoking cessation (1). In general, states with the lowest quit ratios have the highest prevalence of current cigarette smoking (2). Concerns about the health effects of smoking (5) and the occurrence of smoking-related illnesses (6) may contribute to the higher quit ratios for persons aged >35 years.

Because continuing smokers are less likely than former smokers to survive to older ages, this differential mortality contributes to the higher quit ratios observed for older age groups (7). In addition, the higher quit ratios for older than for younger age groups may represent a longer opportunity to quit.

Findings in this and other reports (8) show that blacks were less likely than whites to be former smokers regardless of educational attainment. Limited use of established smoking cessation programs by blacks contributes to these racial differences (9). Nonetheless, trend data suggest that the rate of increase in the quit ratio since 1974 has been similar for whites and blacks (1,7).

Although men were more likely than women to be former smokers, the rate of increase in quit ratios over time has been similar for men and women (1,7). This finding is consistent with a diffusion phenomenon (i.e., quitting activity adopted initially by men that later diffused into the female population where it follows a pattern similar to that for men). Additionally, more men than women who quit cigarette smoking begin using cigars, pipes, or snuff or chewing tobacco (7). Thus, differences in smoking cessation by sex are smaller when use of other forms of tobacco are considered (7).

Greater difficulty in quitting among persons of low socioeconomic status may contribute to the lower quit ratios among persons with high school education or less (1). These and other findings suggest that smoking cessation interventions should target younger persons and persons of low socioeconomic status. In addition, such interventions should be aimed at blacks, who in general have a lower rate of smoking cessation than do whites (10).

Continued efforts are essential to motivate smokers to quit. Growth in tobacco-use prevention and control coalitions, which bring together a broad range of persons and organizations with the common goal of reducing the prevalence of tobacco use (11), will likely strengthen smoking cessation efforts by fostering a social climate that motivates smokers to quit. The American Stop Smoking Intervention Study, a planned 7-year project of the National Cancer Institute and the American Cancer Society, will substantially increase resources for tobacco control coalitions in the United States (12) and may accelerate progress in smoking cessation.

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Cigarette Smoking Among Reproductive-Aged Women — Idaho and New York

Smoking by mothers during pregnancy is associated with a range of serious
adverse pregnancy outcomes. To identify strategies to reduce the prevalence of ma-
ternal smoking during pregnancy, state health departments should have current and
specific information about smoking practices of these reproductive-aged women. This
report presents findings from surveys conducted in Idaho and New York to determine
family planning needs of reproductive-aged women; the surveys also gathered infor-
mation on cigarette smoking practices of these women. The sampling methods and
questionnaire were similar in both states (*1,2*).

During 1985, the Idaho Department of Health and Welfare conducted the first state-
wide Female Health Needs Assessment Telephone Survey. Clusters of residential
telephone numbers were sampled to identify women aged 18–44 years; 2025 women
were administered a standardized questionnaire regarding their smoking practices,
their use of family planning methods, and other reproductive health topics (*1*). The
New York Reproductive Health Survey was conducted during late 1988 and early 1989.
Computer-assisted telephone interviews were used to collect data from 1910 women
aged 15–44 years living in New York, excluding New York City (*2*). For this report,
analysis of the New York data was restricted to 1809 women aged 18–44 years. In both
surveys, current cigarette smoking was defined as responding "yes" to the question
"Do you smoke cigarettes now?"

In Idaho and New York, 25.0% (95% confidence interval [CI]=22.8–27.1) and 31.6%
(95% CI=29.0–34.1) of respondents, respectively, reported that they currently smoked
cigarettes. Prevalence of current smoking did not vary substantially in either state by
age group. In both states, however, unmarried women were more likely than married*

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*Married women comprised those currently married and those living with a partner or boy-
friend.

women to be current smokers; 32.3% (95% CI=26.8–37.7) and 36.7% (95% CI=31.6–41.8) of unmarried women in Idaho and New York, respectively, were current smokers, compared with 23.1% (95% CI=20.9–25.4) and 28.7% (95% CI=25.8–31.7) of married women in Idaho and New York, respectively. Smoking prevalence also varied inversely with level of education in both states; in Idaho and New York, 55.2% (95% CI=47.4–63.0) and 43.1% (95% CI=38.8–47.5), respectively, of respondents with <12 years of education were current smokers, compared with 16.0% (95% CI=13.5–18.4) and 18.6% (95% CI=12.1–25.0) of respondents with >12 years of education in Idaho and New York, respectively.

In Idaho, where information was collected about religious affiliation, 11.4% of Mormons were current smokers, compared with 28.2% of Protestants, 31.9% of Roman Catholics, and 42.9% of women who reported no religious affiliation. In New York, women who reported an annual income <$25,000 were more likely to smoke (40.4% [95% CI=34.4–46.4]) than those who reported an income ≥$35,000 per year (26.3% [95% CI=22.8–29.9]). Among women who were current smokers, 20.0% (95% CI=16.4–23.8) in Idaho and 14.2% (95% CI=10.6–17.7) in New York reported smoking more than one pack of cigarettes per day.

In both states, women who reported having had a liveborn child were asked about their smoking practices during their most recent pregnancy. In Idaho and New York, 19.9% and 26.1% of women, respectively, smoked during their most recent pregnancy (Table 1). In both states, women with less than a high school education were more likely to smoke during pregnancy, as were unmarried women. In Idaho, Mormon women were least likely to smoke during pregnancy (9.7%). In New York, white women and women with an annual income <$25,000 were more likely to smoke during pregnancy. In Idaho and New York, nearly equal percentages of women smoked more than one pack of cigarettes per day during pregnancy (12.1% [95% CI=8.0–16.3] and 11.6% [95% CI=7.1–16.0], respectively).

In Idaho, 27.7% (95% CI=22.1–33.2) of women taking oral contraceptives were current smokers; of oral contraceptive users aged 30–44 years, 30.4% (95% CI=18.1–42.6) smoked. In New York, 33.3% (95% CI=27.0–39.6) of women taking oral contraceptives also smoked; of oral contraceptive users 30–44 years of age, 20.3% (95% CI=11.0–29.5) smoked.

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Editorial Note: Maternal smoking during pregnancy is associated with a doubling in the risk for low birth weight and with an increased risk for placenta previa, abruptio placentae, bleeding during pregnancy, spontaneous abortion, and preterm rupture of membranes (3). The 1990 Health Objectives for the Nation recommended that the proportion of pregnant women who smoke should be no more than one half the proportion of all women who smoke (4); results from these surveys indicate this objective is unlikely to be met.

Based on the reported number of live births for 1987 in Idaho and New York (5) and on the prevalence of smoking during pregnancy (data from these surveys), each year approximately 3200 infants in Idaho and 71,000 infants in New York are exposed to the potentially harmful effects of maternal smoking during pregnancy.

In both states, a substantial proportion of women who used oral contraceptives also were current smokers. For women who use oral contraceptives and smoke cigarettes, the risk for both myocardial infarction and stroke is increased, especially for older women (*6,7*). Therefore, smoking cessation counseling is particularly important for women taking oral contraceptives (*8*).

Estimates of reproductive health needs within states are often based on national or regional estimates of such needs. However, data for local areas may not exist or may differ strikingly from national data—particularly for teenagers, unmarried women, and certain racial groups. For example, among women 15–17 years of age in New York, 29.3% were current smokers (*2*). National surveys may not adequately sample specific subpopulations important in particular states. In the Idaho study, for example, smoking practices among Mormon women, a religious group that advocates healthy

TABLE 1. Percentage of reproductive-aged women who smoked during most recent pregnancy, by selected characteristics — Idaho, 1985, and New York, 1988–89

Characteristic	Idaho (n = 1481)		New York (n = 1112)	
	%*	95% CI†	%*	95% CI
Age (yrs)				
18–24	21.2	14.5–28.0	25.6	15.2–36.0
25–34	18.1	15.0–21.2	26.3	22.1–30.5
35–44	21.4	17.8–24.9	25.9	21.5–30.4
Education (yrs)				
<12	45.2	37.2–53.3	34.8	29.9–39.6
12	22.7	18.8–26.6	18.7	14.8–22.7
>12	10.9	8.3–13.4	15.5	8.0–23.0
Marital status				
Married§	18.5	16.1–20.9	24.5	21.3–27.7
Unmarried	30.7	23.4–38.0	33.7	25.8–41.6
Religion				
Mormon	9.7	7.2–12.2	—	—
Protestant	22.6	19.1–26.2	—	—
Roman Catholic	23.3	16.5–30.1	—	—
None	39.5	30.9–48.1	—	—
Race				
White	—	—	28.1	24.8–31.3
Other	—	—	15.2	8.4–21.9
Annual income				
<$25,000	21.3	18.4–24.2	35.3	28.4–42.1
$25,000–$34,999	16.5	11.6–21.3	31.3	24.7–37.8
≥$35,000	17.7	12.5–23.0	21.7	17.6–25.9
Total	19.9	17.6–22.2	26.1	23.2–29.0

*Percentages weighted to account for sampling.
†Confidence interval.
§Married women comprised those currently married and those living with a partner or boyfriend.

behaviors, could be compared with that of women representing other religious groups in that state. These findings underscore the potential usefulness of data from state-specific surveys to program planners and administrators who must allocate and target available resources in local areas.

During the 1980s, the prevalence of smoking in the United States declined, although the decline occurred at a slower rate for women than for men (*9*). Therefore, smoking prevention and cessation efforts should be focused on women. Health-care personnel who provide family planning and prenatal care services should incorporate these efforts into their counseling of reproductive-aged women.

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Smokers' Beliefs About the Health Benefits of Smoking Cessation — 20 U.S. Communities, 1989

The health risks associated with smoking and the reduction in risk associated with smoking cessation are well documented (*1,2*). Although public knowledge of the health hazards of smoking is high and has increased steadily since the 1950s (*1*), data are limited regarding public knowledge of the health benefits of smoking cessation. This report presents data on smokers' beliefs about their chances of avoiding disease by quitting smoking.

Data were obtained from a telephone survey conducted from January through April 1989 of a random sample of 4351 smokers aged 25–64 years. The survey was conducted in 20 communities* in the United States as part of the National Cancer

*Bellingham and Longview/Kelso, Washington; Albany/Corvallis and Medford/Ashland, Oregon; Vallejo and Hayward, California; Santa Fe and Las Cruces, New Mexico; Cedar Rapids and Davenport, Iowa; Raleigh and Greensboro, North Carolina; Paterson and Trenton, New Jersey; Yonkers, New Rochelle, Utica, and Binghamton/Johnson City, New York; and Lowell and Fitchburg/Leominster, Massachusetts.

Institute's Community Intervention Trial for Smoking Cessation (3). Interviews were completed with 3669 (84%) eligible smokers regarding their knowledge, attitudes, and behavior relevant to cigarette smoking. For this report, responses to two items were analyzed: 1) "How likely do you think it is that you will avoid or decrease serious health problems from smoking if you quit?" (four response choices ranged from "very likely" to "very unlikely"); and 2) "If a person has smoked for more than 20 years, there is little health benefit to quitting" (four response choices ranged from "strongly agree" to "strongly disagree").

Responses were examined in relation to sex, age, level of education (high school graduate or less vs. some college or more), and daily cigarette consumption (<25 or ≥25 cigarettes per day).

Overall, 83% of smokers responded that it was "very likely" or "likely" that by quitting they would avoid or decrease serious health problems from smoking. Eighty-five percent of smokers disagreed that little health benefit exists from quitting for a person who has smoked >20 years. For both items, beliefs about the benefits of quitting varied by age and education but not by sex. Within each age group, respondents who had attended college were more likely to both perceive benefits and disagree that there is little benefit from quitting than were those who had not (p<0.05, chi-square test) (Figure 1); this difference increased with age. For smokers with no college education, 87% of those aged 25–34 years and 67% of those aged 55–64 years believed they would avoid or decrease serious health problems by quitting (p<0.05). For college-educated smokers, age group differences did not vary significantly (Figure 1).

Editorial Note: Former smokers most frequently cite concern about health as the reason for quitting smoking (4). Although most of the public is aware of the health risks associated with smoking and the health benefits of smoking cessation, smokers tend to be less aware of these risks and benefits, and sizable gaps in public knowledge persist in certain sociodemographic groups.

Educational level appears to be the best sociodemographic predictor of smoking behavior. Cessation rates are higher for college-educated than for noncollege-educated groups, a disparity that appears to be increasing (1,5). Educational status may be linked to attitudes and values that predispose a person to accept or reject warnings about tobacco use and may reflect exposure to antismoking messages (6). Future antismoking campaigns need to be more sensitive to educational status when defining messages and selecting communication channels.

Knowledge of the benefits of smoking cessation was lowest in smokers aged 55–64 years who had no college education. Thus, greater attention must be directed at informing this group about the health benefits of quitting smoking.

CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion (CCDPHP), is initiating a public information campaign on the health benefits of smoking cessation for older Americans based on the theme "It's never too late to quit smoking." The program is being conducted in collaboration with the National Institutes of Health, the Administration on Aging, the Department of Veterans

Affairs, the Office of Disease Prevention and Health Promotion, the American Association of Retired Persons, and the Fox Chase Cancer Center. Information on this campaign and print materials are available from the Office on Smoking and Health, CCDPHP, CDC, 5600 Fishers Lane, Rockville, MD 20857; telephone (301) 443-5287.

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FIGURE 1. Percentage of smokers who reported* that quitting reduces their risk for disease, by age and education level — 20 U.S. communities[†]
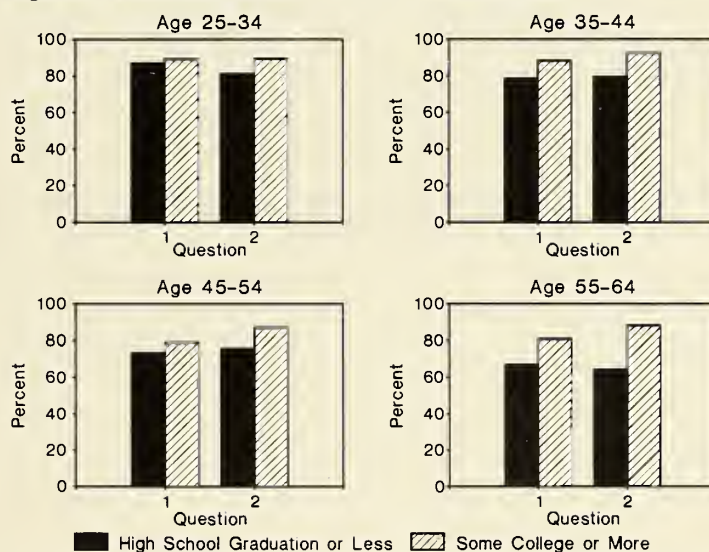
*Question number 1: Percentage who responded "very likely" or "likely" to the question "How likely do you think it is that you will avoid or decrease serious health problems from smoking if you quit?"
Question number 2: Percentage who responded "strongly disagree" or "disagree" to the statement "If a person has smoked for more than 20 years, there is little health benefit to quitting."
[†]Bellingham and Longview/Kelso, Washington; Albany/Corvallis and Medford/Ashland, Oregon; Vallejo and Hayward, California; Santa Fe and Las Cruces, New Mexico; Cedar Rapids and Davenport, Iowa; Raleigh and Greensboro, North Carolina; Paterson and Trenton, New Jersey; Yonkers, New Rochelle, Utica, and Binghamton/Johnson City, New York; and Lowell and Fitchburg/Leominster, Massachusetts.

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Part Two: Youth Initiation and Prevalence

Bidi Use Among Urban Youth — Massachusetts, March–April 1999

Tobacco use is the leading preventable cause of death in the United States. Bidis are small, brown, hand-rolled cigarettes primarily made in India and other southeast Asian countries *(1)* consisting of tobacco wrapped in a tendu or temburni leaf (*Diospyros melanoxylon*). In the United States, bidis are purchased for $1.50–$4.00 for one package of 20 and are available in different flavors (e.g., cherry, chocolate, and mango). Anecdotal reports indicate that bidi use was first observed during the mid-1990s and seems to be widespread among youth and racial/ethnic minority adolescents. This report summarizes preliminary data collected from a convenience sample of adolescents surveyed during March and early April 1999 in Massachusetts on the prevalence of bidi use among urban youth; these data indicate that of 642 youth surveyed, 40% had smoked bidis at least once during their lifetimes and 16% were current bidi smokers.

The Massachusetts Tobacco Control Program conducted a pilot study to assess adolescents' knowledge and use of bidis. A convenience sample included a school- and community-based survey of youth from a large metropolitan area in Massachusetts. Peer leaders from a local tobacco-use prevention program and their adult advisors were granted access to three middle schools and seven high schools through professional networks (e.g., contact with the principal, health teacher, and nurse). Participants were given a set of standardized instructions and informed consent was obtained. Students surveyed in school were from health, science (e.g., biology, chemistry, and computer science), language (e.g., English or English as a second language), and history classes. After completing the surveys, participants were briefed about the intent of the survey. Peer leaders also assessed youth who attended local schools in several community neighborhoods. Data gathered in the community were from areas frequented by students (i.e., neighborhood stores, after-school programs, and bus and subway stations).

Community respondents were compared with school respondents. A greater proportion of community respondents reported heavy and past-month bidi use than school respondents. Community respondents also were more likely to be Hispanic and less likely to be white than school respondents. Analyses conducted by grade and race/ethnicity on two results (current and heavy bidi use) indicated no significant differences.

A total of 822 respondents participated in the study; 108 surveys with incomplete or inconsistent responses were eliminated. Of those 642 participants whose self-reported grade was seven through 12 (Table 1), 342 (55%) girls and 282 (45%) boys completed surveys (18 respondents did not report sex); 341 (53%) were surveyed in schools and 299 (47%) were surveyed in the community (two surveys were missing setting information); 232 (36%) were Hispanic, 220 (34%) were black (non-Hispanic), 82 (13%) were white (non-Hispanic), and 108 (17%) were other.*

Current bidi users were defined as having "smoked more than one bidi in the last 30 days." Lifetime bidi smokers were defined as having "smoked a bidi, even just one or two puffs." Heavy bidi smokers were defined as having "smoked more than 100 bidis in their lifetime." Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 7.5. Prevalence of bidi use was compared by sex, race/ethnicity, grade, and overall (Table 1).

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* When presented separately, numbers for other racial/ethnic groups were too small for meaningful analysis.

TABLE 1. Percentage of middle and high school students surveyed who reported bidi use, by sex, race/ ethnicity, and grade -- Massachusetts, 1999

Characteristics	No.	Lifetime* No.	Lifetime* (%)	Current No.	Current (%)	Heavy§ No.	Heavy§ (%)
Sex							
Female	342	121	(35)	43	(12)	18	(5)
Male	282	127	(45)	54	(19)	32	(11)
Race/Ethnicity							
White, non- Hispanic	82	32	(39)	9	(11)	5	(6)
Black, non-Hispanic	220	88	(40)	30	(14)	17	(8)
Hispanic	232	95	(41)	49	(21)	21	(9)
Other¶	108	41	(38)	12	(11)	7	(6)
Grade							
7	92	29	(31)	13	(14)	1	(1)
8	113	39	(34)	21	(19)	10	(9)
9	138	61	(44)	19	(14)	11	(8)
10	182	76	(42)	23	(13)	14	(8)
11	90	39	(43)	18	(20)	10	(11)
12	27	12	(44)	6	(22)	4	(15)
Overall	**642**	**256**	**(40)**	**100**	**(16)**	**50**	**(8)**

* Smoked at least once in lifetime (ever smoked, even one or two puffs).

† Smoked one or more in the last 30 days.

§ Smoked ≥100 in lifetime.

¶ When presented separately, numbers for other racial/ethnic groups were too small for meaningful analysis.

Two hundred fifty-six (40%) of the respondents had ever smoked bidis, 100 (16%) were current bidi users, and 50 (8%) were heavy bidi users. There were no significant differences in bidi use by sex, grade, or race/ethnicity. Responses (n=280) to the question why bidis were smoked instead of cigarettes included bidis tasted better (63 [23%]), were cheaper (49 [18%]), were safer (37 [13%]), and were easier to buy (33 [12%]). Other reasons included "just to try it" (20 [7%]), "to improve my mood" (17 [6%]), "it makes me look cool" (16 [6%]), "my friends smoke them" (four [1%]), "smoke them in place of cigarettes or marijuana" (four [1%]), "like the flavor" (three [1%]), and other (34 [12%]).

Reported by: C Celebucki, PhD, DM Turner-Bowker, PhD, G Connolly, DMD, HK Koh, MD, Massachusetts Dept of Public Health; Tobacco Control Program, Boston, Massachusetts. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: When tested on a standard smoking machine, bidis produced higher levels of carbon monoxide, nicotine, and tar than cigarettes (1–3); one study found that bidis produced approximately three times the amount of carbon monoxide and nicotine and approximately five times the amount of tar than cigarettes (4). Because of low combustibility of the tendu leaf wrapper, bidi smokers inhale more often and more deeply, breathing in greater quantities of tar and other toxins than cigarette smokers (2– 6). Like all tobacco products, bidis are mutagenic and carcinogenic (6). Bidi smokers risk coronary heart disease (7), cancers of the oral cavity, pharynx, larynx (1), lung (8,9), esophagus, stomach, and liver (1). Perinatal mortality is also associated with bidi use during pregnancy (10).

The findings in this report are subject to at least five limitations. First, the external validity of this study may be limited by convenience sampling and may not represent the prevalence of bidi use among all students in these schools and communities. More representative surveys are needed to develop precise estimates of bidi use and to monitor trends over time. Second, participants surveyed in the community may have been subject to selection bias; peer leaders may have been more likely to approach those similar to them in age and race/ethnicity. Because most peer leaders were racial/ethnic minorities aged <16 years, the convenience sample surveyed in the community reflects these demographics. Third, the extent of underreporting and overreporting of bidi use cannot be determined. Fourth, the number or characteristics of students who refused to participate is not known. Finally, the sample was drawn from

one large metropolitan area and may not represent persons from other urban areas in Massachusetts or the rest of the United States.

This investigation was the first in the United States to estimate the prevalence of bidi smoking among students in grades seven through 12. Preliminary findings from this study support the need for additional research on bidis, particularly on smoking prevalence among youth from differing geographic, educational, and socioeconomic backgrounds. The knowledge, attitudes, and behavioral patterns of bidi smokers also must be assessed to understand this phenomenon and to curtail use. Research should assess the psychosocial and contextual factors affecting bidi use, the influence of peer pressure, how bidis are smoked (as an initiation to smoking or following cigarette smoking), and whether bidis are smoked instead of cigarettes or to mask the use of other substances.

Adolescents in this study reported their preference for the taste of bidis over cigarettes and their belief that bidis are less expensive, easier to buy, and safer than cigarettes. The findings on prevalence, knowledge, and attitudes, especially if they are replicated in other communities, may demonstrate the need for actions to curtail youth access to bidis similar to measures for limiting access to cigarettes and smokeless tobacco. Adolescents should be alerted to the high toxicity of bidis to dispel the notion that bidis are safer to smoke than cigarettes. Additional research is needed to assess other factors affecting the use of novel tobacco products such as bidis, including how restrictions on access and advertising are being enforced, how pricing affects use of these products, the application of federal and state excise taxes, and appropriate labeling of these products with the Surgeon General's health warnings regarding tobacco use.

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Cigarette Smoking Among High School Students — 11 States, 1991–1997

Tobacco use is the single leading preventable cause of death in the United States *(1)*. Preventing initiation of tobacco use is a public health priority. Approximately 80% of persons who use tobacco begin before age 18 years *(1)*, and the prevalence of cigarette smoking among high school students nationwide increased during the 1990s *(2)*. This report presents findings of a study that examined trends in cigarette smoking among high school students in 11 states that collected Youth Risk Behavior Survey (YRBS) data during the 1990s. In six of the 11 states, the prevalence of current smoking and frequent smoking increased among high school students.

The Youth Risk Behavior Surveillance System measures the prevalence of health-risk behaviors among adolescents through biennial representative school-based surveys conducted separately at the national, state, and local levels. In 1997, 39 states conducted YRBS. This report presents YRBS results from 11 state surveys conducted by state education and health agencies where representative data were obtained (i.e., a scientifically selected sample, an overall response rate of $\geq$60%, and appropriate survey documentation) in 1997 and in at least two additional years since 1991. The 1991, 1993, 1995, and 1997 state surveys used a two-stage cluster sample design to produce representative samples of 9th- to 12th-grade students in each participating state. Data were available from 1991 to 1997 in Alabama, South Carolina, South Dakota, and Utah and from 1993 to 1997 in Hawaii, Massachusetts, Mississippi, Montana, Nevada, Vermont, and West Virginia. Across all sites and years, sample sizes ranged from 1192 to 8636, school response rates ranged from 70% to 100%, student response rates ranged from 61% to 91%, and overall response rates ranged from 60% to 87%.

For each of the cross-sectional surveys, students completed an anonymous self-administered questionnaire that included questions about cigarette smoking. The wording of these questions was identical in each survey. Lifetime cigarette smoking was defined as having ever smoked cigarettes, even one or two puffs. Current cigarette smoking was defined as smoking on $\geq$1 of the 30 days preceding the survey, and frequent cigarette smoking was defined as smoking on $\geq$20 of the 30 days preceding the survey. Students were asked at what age they first smoked a whole cigarette. Beginning in 1993, students were asked whether they smoked cigarettes on school property on $\geq$1 of the 30 days preceding the survey.

Data were weighted to provide estimates generalizable to all public school students in grades 9–12 in each state. The relative percentage change in behavior from the earliest survey conducted (baseline) to 1997 was calculated as the 1997 prevalence minus the baseline prevalence divided by the baseline prevalence. SUDAAN was used for all data analysis. Secular trends were analyzed using logistic regression analyses that controlled for sex, grade, and race/ethnicity (except in Vermont, where students were not asked about race/ethnicity) and that simultaneously assessed linear and higher order (i.e., quadratic) time effects *(3)*. Quadratic trends suggest a significant but nonlinear trend in the data over time. When the trend includes significant linear and quadratic components, the data demonstrate some nonlinear variation (e.g., leveling off or change in direction) in addition to a linear effect. In 1993, Alabama did not ask students about lifetime, current, or frequent smoking or the age at which students smoked their first cigarette; therefore, only linear trend analyses were performed for Alabama for those variables.

In South Carolina, South Dakota, and Vermont, lifetime smoking among high school students significantly increased linearly from baseline to 1997 (Table 1). The percentage increase in these states

TABLE 1. Percentage of high school students who reported lifetime cigarette use* — selected states, Youth Risk Behavior Survey, 1991–1997[†]

State	1991		1993		1995		1997	
	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)
Alabama	74.2	(±1.7)			73.2	(±3.0)	74.9	(±2.5)
Hawaii			65.5	(±3.0)	68.8	(±4.2)	67.4	(±5.2)
Massachusetts			67.8	(±2.8)	71.5	(±2.5)	69.1[¶]	(±2.6)
Mississippi			75.9	(±3.1)	74.4	(±4.1)	71.4	(±3.3)
Montana			69.7	(±2.9)	72.8	(±2.3)	73.4	(±2.4)
Nevada			68.2	(±3.4)	72.8	(±3.0)	68.6[¶]	(±3.7)
South Carolina	73.9	(±2.1)	72.2	(±2.3)	76.6	(±1.6)	75.1**	(±1.3)
South Dakota	69.4	(±4.0)	70.6	(±3.5)	70.8	(±6.7)	74.8**	(±3.1)
Utah	48.8	(±4.4)	46.4	(±2.5)	47.8	(±4.3)	41.6	(±5.2)
Vermont			69.4	(±1.9)	74.0	(±2.5)	72.7**	(±2.2)
West Virginia			76.8	(± 2.0)	76.4	(±3.0)	75.4	(±2.9)

* Ever tried cigarette smoking, even one or two puffs.
[†] Trend analyses were adjusted for demographics, including sex, grade, and race/ethnicity (except in Vermont where race/ethnicity was not assessed), and higher order time effects. Prevalence estimates were not standardized for demographics.
[§] Confidence interval.
[¶] Significant quadratic effect (p<0.05).
** Significant linear effect (p<0.05).

was 2%, 8%, and 5%, respectively. Massachusetts and Nevada showed significant quadratic trends, with the highest prevalence occurring in 1995.

The prevalence of current smoking significantly increased linearly in Alabama, Massachusetts, Mississippi, Montana, South Carolina, and South Dakota (Table 2) with percentage increases of 29%, 14%, 13%, 24%, 51%, and 42%, respectively. Massachusetts also showed a significant quadratic trend, with leveling between 1995 and 1997. South Carolina showed a significant quadratic trend, with leveling between 1991 and 1993 followed by increases in 1995 and 1997.

In Alabama, Massachusetts, Montana, South Carolina, South Dakota, and Vermont frequent smoking significantly increased linearly from baseline to 1997 (Table 2) with percentage increases of 26%, 19%, 52%, 39%, 49%, and 21%, respectively. Vermont also showed a significant quadratic trend, with leveling between 1995 and 1997.

The proportion of students who reported smoking a whole cigarette before age 13 years significantly decreased linearly from baseline to 1997 in Nevada and Utah (Table 3). The percentage decrease was 17% in Nevada and 32% in Utah. Utah also showed a significant quadratic trend, with leveling between 1993 and 1995 before a decline in 1997.

In Alabama, Mississippi, South Carolina, and South Dakota, smoking on school property among high school students significantly increased linearly from 1993 to 1997. Percentage increases were 24%, 45%, 36%, and 32%, respectively.

Reported by: Div of Adolescent and School Health and Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: For all five behaviors, trends among high school students in most of the 11 states were consistent with trends from the national YRBS.* From baseline to 1997, the prevalence of students reporting lifetime smoking remained stable in six states and across the nation *(4)*, although in three states, lifetime smoking increased. The prevalence of current and frequent smoking increased in six states and remained stable in five states; in 1995, current smoking peaked in Massachusetts and frequent smoking leveled in Vermont. Across the nation, from 1991 to 1997, current smoking *(2)* and frequent smoking increased 32% *(4)*; from 1993 to 1997, current smoking increased 19%, and frequent smoking increased 21% *(4)*. The percentage of students who reported smoking before age 13 years remained stable in nine states and across the nation *(4)* and decreased in two states. Smoking on school property remained stable in six states and across the nation *(4)* and increased in four states.

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* The national YRBS is representative of high school students nationwide but does not provide state-specific estimates.

TABLE 2. Percentage of high school students who reported current cigarette use* and frequent cigarette use† — selected states, Youth Risk Behavior Survey, 1991–1997§

	Current cigarette use								Frequent cigarette use							
	1991		1993		1995		1997		1991		1993		1995		1997	
State	%	(95% CI¶)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Alabama	27.8	(±2.3)			31.0	(±3.0)	35.8**	(±2.8)	13.3	(±1.5)			13.7	(±2.2)	16.8**	(±2.3)
Hawaii			28.2	(±3.3)	32.4	(±4.6)	29.2	(±3.2)			13.3	(±2.0)	16.9	(±3.0)	14.5	(±1.6)
Massachusetts			30.2	(±2.9)	35.7	(±2.8)	34.4**,††	(±2.6)			15.5	(±2.2)	18.2	(±2.7)	18.4**	(±2.8)
Mississippi			27.6	(±3.9)	35.0	(±4.6)	31.3**	(±4.6)			13.6	(±3.0)	13.9	(±3.5)	13.8	(±2.8)
Montana			30.7	(±3.4)	34.8	(±2.7)	38.1**	(±2.7)			12.7	(±2.1)	16.8	(±2.4)	19.3**	(±2.3)
Nevada			29.9	(±3.3)	32.9	(±3.4)	29.4	(±3.2)			14.0	(±2.5)	15.8	(±2.7)	14.5	(±2.9)
South Carolina	25.6	(±1.6)	26.7	(±2.6)	32.6	(±2.4)	38.6**,††	(±2.3)	13.1	(±1.3)	12.8	(±1.9)	15.4	(±1.5)	18.2**	(±2.1)
South Dakota	30.9	(±4.6)	36.7	(±3.4)	38.0	(±8.1)	44.0**	(±3.7)	16.3	(±4.5)	18.0	(±4.1)	17.5	(±4.7)	24.3**	(±3.7)
Utah	16.8	(±3.5)	17.4	(±2.0)	17.0	(±3.8)	16.4	(±3.0)	8.3	(±3.2)	8.2	(±1.7)	8.1	(±3.1)	7.3	(±1.9)
Vermont			33.5	(±3.1)	40.0	(±3.5)	38.3	(±4.1)			17.4	(±2.0)	21.8	(±1.9)	21.0**,††	(±2.7)
West Virginia			38.9	(±2.7)	43.0	(±3.5)	41.9	(±4.2)			19.9	(±2.2)	24.6	(±3.0)	24.1	(±3.6)

* Smoked cigarettes on ≥1 of the 30 days preceding the survey.
† Smoked cigarettes on ≥20 of the 30 days preceding the survey.
§ Trend analyses were adjusted for demographics, including sex, grade, and race/ethnicity (except in Vermont where race/ethnicity was not assessed), and higher order time effects. Prevalence estimates were not standardized for demographics.
¶ Confidence interval.
** Significant linear effect (p< 0.05).
†† Significant quadratic effect (p< 0.05).

TABLE 3. Percentage of high school students who reported smoking a whole cigarette before age 13 years and smoking cigarettes on school property* — selected states, Youth Risk Behavior Survey, 1991–1997 †

State	Smoked a whole cigarette before age 13 years								Smoked cigarettes on school property §					
	1991		1993		1995		1997		1993		1995		1997	
	%	(95% CI¶)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Alabama	28.2	(±1.6)			27.8	(±2.3)	27.9	(±3.1)	10.4	(±1.4)	10.2	(±1.6)	12.9**	(±2.0)
Hawaii			28.8	(±4.2)	28.2	(±2.2)	25.6	(±2.9)	15.4	(±3.1)	18.3	(±3.6)	16.0	(±2.4)
Massachusetts			24.4	(±2.0)	23.9	(±2.3)	24.3	(±2.7)	17.7	(±2.4)	18.9	(±2.4)	18.9	(±2.7)
Mississippi			27.5	(±3.2)	26.9	(±4.7)	23.1	(±4.3)	9.1	(±2.5)	9.4	(±3.5)	13.2**	(±4.0)
Montana			26.7	(±2.2)	26.0	(±2.4)	26.1	(±1.7)	11.9	(±2.2)	15.4	(±2.4)	15.3	(±2.1)
Nevada			28.2	(±3.0)	28.7	(±2.4)	23.4**	(±2.6)	15.1	(±2.5)	17.3	(±2.8)	14.8	(±3.1)
South Carolina	29.4	(±1.4)	30.4	(±2.2)	28.9	(±2.2)	26.5	(±1.8)	12.1	(±1.9)	14.8	(±1.8)	16.5**	(±2.0)
South Dakota	22.8	(±3.2)	28.7	(±4.2)	24.7	(±4.2)	25.6	(±3.6)	14.8	(±2.3)	16.2	(±5.4)	19.5**	(±3.0)
Utah	18.6	(±2.9)	17.9	(±1.9)	17.7	(±2.8)	12.6**,††	(±2.1)	8.7	(±1.6)	8.5	(±3.2)	6.5	(±2.2)
Vermont			27.5	(±1.4)	27.1	(±2.8)	27.0	(±2.3)			21.5	(±2.8)	18.0§§	(±3.8)
West Virginia			35.4	(±2.6)	33.2	(±2.9)	31.7	(±3.7)	18.1	(±1.8)	21.8	(±2.6)	21.0	(±3.4)

* On ≥1 of the 30 days preceding the survey.
† Trend analyses were adjusted for demographics, including sex, grade, and race/ethnicity (except in Vermont where race/ethnicity was not assessed), and higher order time effects. Prevalence estimates were not standardized for demographics.
§ No state asked this question in 1991.
¶ Confidence interval.
** Significant linear effect (p< 0.05).
†† Significant quadratic effect (p< 0.05).
§§ No trend analyses were conducted because this question was not asked in 1993.

Additional research is needed to understand the variations between state and national trends. Differences in sociodemographic factors, efforts to prevent tobacco use, tobacco use policies, and enforcement of access laws may account for these variations. The tobacco industry's promotional strategies, such as reducing cigarette wholesale prices in Massachusetts following the January 1993 excise tax increase *(5)*, also may have influenced state-specific trends.

The findings in this report are subject to at least three limitations. First, these data apply only to adolescents who attend public high school. In 1996, in the states for which data were available, high school dropout rates ranged from 2.9% to 9.6% *(6)*. Second, the extent of underreporting or overreporting in YRBS cannot be determined, although the survey questions demonstrate good test-retest reliability *(7)*. Finally, although the data for each state are representative of the students in that state, the states that were examined in this study may not be representative of all states.

To reduce tobacco use among youth, CDC recommends that states establish and sustain comprehensive tobacco-control programs *(8)*. Although many states are allocating resources to tobacco control, no state is implementing all recommended program components. Comprehensive tobacco-control programs should reduce the appeal of tobacco products, implement youth-oriented mass media campaigns, increase tobacco excise taxes, and reduce youth access to tobacco products *(1)*. CDC's "Guidelines for School Health Programs to Prevent Tobacco Use and Addiction" recommends school-based tobacco-use prevention programs in grades K–12, with intensive instruction in grades 6–8 *(9)*. In support of this recommendation, CDC identifies evidence-based curricula to prevent tobacco use and addiction through its Research-to-Classroom program. These programs are most effective when linked to communitywide programs involving families, peers, and community organizations *(9)*. The guidelines also recommend tobacco-free school-sponsored functions and tobacco-free school buildings, property, and vehicles. Consistent with these recommendations, the Pro-Children Act of 1994 requires smoke-free environments in schools receiving federal funds *(10)*. However, most schools lack comprehensive prohibitions identified in the guidelines *(10)*, and smoking on school property is increasing in some states.

The Youth Risk Behavior Surveillance System provides an important mechanism to track state progress in reducing tobacco use and other important health risk behaviors among youth. CDC provides support to every state to collect and use YRBS data. States also can conduct the Youth Tobacco Survey to obtain additional information about tobacco use and related factors *(11)*. If these efforts are expanded and maintained, all states could obtain data essential for planning and monitoring tobacco-use prevention programs for youth.

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Tobacco Use Among Middle and High School Students — Florida, 1998 and 1999

Tobacco use is the single leading preventable cause of death in the United States *(1)*, and an estimated $2 billion is spent annually in Florida to treat disease caused by smoking *(2)*. Florida appropriated $23 million in fiscal year 1997 and $70 million in fiscal year 1998 to fund the Florida Pilot Program on Tobacco Control to prevent and reduce tobacco use among Florida youth. To determine the prevalence of cigarette, cigar, and smokeless tobacco (i.e., chewing tobacco and snuff) use among Florida middle and high school students in public schools, the Florida Department of Health conducted the Florida Youth Tobacco Survey (FYTS) in February 1998 and February 1999. The purpose of these surveys was to establish baseline parameters and monitor the progress of the pilot program, which began in April 1998. This report summarizes advance data from the surveys, which indicate that, from 1998 to 1999, the percentage of Florida public middle and high school students who smoked cigarettes decreased significantly and that the percentage of middle school students who smoked cigars and used smokeless tobacco products decreased significantly.

The 1998 FYTS used a two-stage cluster sample design within each of seven geographic regions (i.e., selecting schools within a region and classrooms within schools) for public middle schools (grades 6–8) and for public high schools (grades 9–12) to obtain a representative sample of 11,865 middle and 10,675 high school students. The 1999 survey was conducted in 242 of the 255 schools that participated in the 1998 survey sample, among a representative sample of 11,724 middle and 9254 high school students. The middle school response rates for 1998 and 1999 were 97% and 93%, respectively; the student response rates were 82% and 88%, respectively; and the overall response rates were 80% and 82%, respectively. For the high school surveys, school response rates for 1998 and 1999 were 95% and 89%, respectively; the student response rates were 76% and 79%, respectively; and the overall response rates were 72% and 70%, respectively. Data were weighted to provide estimates that can be generalized to all public school students in grades 6–12 in the seven regions and in the state. Survey data were analyzed and point estimates were generated using SAS software, and variance estimates and 95% confidence intervals were calculated using SUDAAN.

Students completed a self-administered questionnaire that included questions about tobacco use (cigarette, cigar, and smokeless tobacco), exposure to environmental tobacco smoke, minors' ability to purchase or otherwise obtain tobacco products, knowledge and attitudes about tobacco, familiarity with pro- and antitobacco media messages, and tobacco-use curriculum in schools. Current tobacco use prevalence data are presented in this report; data on other findings and survey methodology are available from the Florida Department of Health *(3)*. Current cigarette, cigar, and smokeless tobacco users were students who reported product use on ≥ 1 of the 30 days preceding the survey.

From 1998 to 1999, the prevalence of current cigarette use among middle school students declined from 18.5% to 15.0% (p<0.01) (Table 1); among high school students, use declined from 27.4% to 25.2% (p=0.02) (Table 2). Among middle school students, declines in current cigarette use were significant for both males and females; among high school students, the decline was statistically significant among females. Among both middle and high school students, the declines were most pronounced among non-Hispanic white students: from 22.0% to 16.1% (p<0.01) among middle school students and from 34.8% to 31.3% (p=0.02) among high school students. The change in prevalence of current cigarette use among non-Hispanic black or Hispanic students at the middle or high school level was not statistically significant.

TABLE 1. Percentage of public middle school students who used cigarettes, cigars, or smokeless tobacco, by sex, race/ethnicity, and grade — Florida Youth Tobacco Survey, 1998 and 1999

Characteristic	Current cigarette use*					Current cigar use†					Current smokeless tobacco use§				
	1998 (n=11,031)		1999 (n=10,268)		p value	1998 (n=11,535)		1999 (n=10,890)		p value	1998 (n=11,633)		1999 (n=10,919)		p value
	%	(95% CI¶)	%	(95% CI)		%	(95% CI)	%	(95% CI)		%	(95% CI)	%	(95% CI)	
Sex															
Female	18.1	(±1.5)	14.9	(±1.8)	<0.01	10.3	(±1.0)	9.4	(±1.4)	0.26	4.4	(±0.6)	2.8	(±0.6)	<0.01
Male	18.9	(±1.7)	15.0	(±1.4)	<0.01	17.6	(±1.3)	14.2	(±1.3)	<0.01	9.3	(±1.1)	6.8	(±0.9)	<0.01
Race/Ethnicity**															
Non-Hispanic white	22.0	(±1.8)	16.1	(±1.7)	<0.01	14.5	(±1.2)	11.1	(±1.4)	<0.01	7.6	(±1.1)	4.8	(±0.8)	<0.01
Non-Hispanic black	9.5	(±1.4)	8.5	(±1.5)	0.34	13.0	(±1.6)	12.3	(±1.9)	0.55	5.3	(±1.1)	4.4	(±1.4)	0.27
Hispanic	16.8	(±2.1)	16.1	(±2.6)	0.51	13.6	(±1.7)	12.9	(±2.3)	0.53	5.5	(±1.3)	3.6	(±1.1)	0.02
Grade															
6	10.5	(±1.4)	8.0	(±1.3)	0.01	7.8	(±0.9)	6.7	(±1.2)	0.16	6.0	(±1.0)	3.9	(±0.9)	<0.01
7	19.3	(±2.1)	16.6	(±2.5)	0.07	14.2	(±1.7)	11.4	(±1.8)	0.02	7.0	(±1.2)	5.2	(±1.0)	0.01
8	25.0	(±2.3)	19.5	(±2.5)	<0.01	19.5	(±1.7)	16.8	(±2.2)	0.06	7.1	(±1.1)	4.8	(±1.0)	<0.01
Total	**18.5**	**(±1.4)**	**15.0**	**(±1.3)**	**<0.01**	**14.1**	**(±1.0)**	**11.9**	**(±1.1)**	**<0.01**	**6.9**	**(±0.7)**	**4.9**	**(±0.6)**	**<0.01**

* Smoked cigarettes on ≥1 of the 30 days preceding the survey.
† Smoked cigars on ≥1 of the 30 days preceding the survey.
§ Used smokeless tobacco on ≥1 of the 30 days preceding the survey.
¶ Confidence interval.
** Numbers for other racial/ethnic groups were too small for meaningful analysis.

TABLE 2. Percentage of public high school students who used cigarettes, cigars, or smokeless tobacco, by sex, race/ethnicity, and grade — Florida Youth Tobacco Survey, 1998 and 1999

| Characteristic | Current cigarette use* | | | | | Current cigar use† | | | | | Current smokeless tobacco use§ | | | | |
| | 1998 (n=9,991) | | 1999 (n=9,991) | | | 1998 (n=10,473) | | 1999 (n=9,099) | | | 1998 (n=10,202) | | 1999 (n=9,041) | | |
	%	(95% CI¶)	%	(95% CI)	p value	%	(95% CI)	%	(95% CI)	p value	%	(95% CI)	%	(95% CI)	p value
Sex															
Female	28.3	(±1.9)	25.9	(±2.0)	0.04	14.1	(±1.2)	14.1	(±1.6)	0.96	2.1	(±0.5)	2.4	(±0.7)	0.59
Male	26.5	(±1.9)	24.6	(±2.4)	0.16	27.0	(±1.8)	24.7	(±1.9)	0.08	11.2	(±1.6)	10.3	(±1.6)	0.26
Race/Ethnicity**															
Non-Hispanic white	34.8	(±1.8)	31.1	(±2.0)	0.02	22.7	(±1.6)	21.4	(±2.2)	0.24	8.7	(±1.5)	8.0	(±1.7)	0.32
Non-Hispanic black	9.8	(±1.5)	9.4	(±1.9)	0.61	17.1	(±2.1)	14.8	(±1.9)	0.09	3.5	(±1.1)	2.8	(±0.7)	0.24
Hispanic	24.8	(±2.6)	24.2	(±2.8)	0.70	17.9	(±2.1)	18.5	(±2.4)	0.82	2.9	(±0.8)	4.4	(±1.2)	0.07
Grade															
9	25.9	(±2.6)	23.3	(±2.8)	0.17	19.3	(±2.3)	18.8	(±2.7)	0.78	6.5	(±1.4)	6.8	(±1.7)	0.74
10	25.9	(±2.8)	24.4	(±2.8)	0.50	19.5	(±2.2)	19.1	(±2.2)	0.76	7.0	(±1.7)	5.9	(±1.5)	0.38
11	29.8	(±2.5)	27.0	(±2.4)	0.08	23.2	(±2.5)	19.2	(±2.2)	0.01	7.3	(±1.4)	5.3	(±1.1)	0.02
12	29.8	(±2.9)	27.8	(±4.0)	0.32	21.5	(±2.7)	21.2	(±2.8)	0.86	6.4	(±1.3)	7.1	(±1.7)	0.47
Total	**27.4**	**(±1.6)**	**25.2**	**(±1.8)**	**0.02**	**20.7**	**(±1.2)**	**19.5**	**(±1.5)**	**0.14**	**6.7**	**(±1.0)**	**6.4**	**(±0.9)**	**0.22**

* Smoked cigarettes on ≥1 of the 30 days preceding the survey.
† Smoked cigars on ≥1 of the 30 days preceding the survey.
§ Used smokeless tobacco on ≥1 of the 30 days preceding the survey.
¶ Confidence interval.
** Numbers for other racial/ ethnic groups were too small for meaningful analysis.

Prevalence of current cigarette use in these groups was lower than that among non-Hispanic whites in both 1998 and 1999.

Current cigar use declined significantly only among middle school students, from 14.1% in 1998 to 11.9% in 1999 (p<0.01). This overall decline was almost entirely accounted for by the decline among males, from 17.6% to 14.2%. Among racial/ethnic groups at the middle school level, the decline in current use of cigars was statistically significant only among non-Hispanic white students.

Current smokeless tobacco use declined among middle school students from 6.9% in 1998 to 4.9% in 1999. The decline occurred among male and female middle school students and among non-Hispanic white and Hispanic middle school students. Students at every grade in middle school were significantly less likely to use smokeless tobacco in 1999 than in 1998. Current use of smokeless tobacco products remained unchanged among high school students from 1998 to 1999.

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Editorial Note: Nationwide, the prevalence of cigarette smoking among adolescents has increased during the 1990s *(4,5)*; however, smoking prevalence rates among adolescents may have peaked and could be starting to decline *(6)*. National data for comparison with the Florida data for 1998 and 1999 are unavailable, but the significant decline from 1998 to 1999 in Florida is larger than any annual decline observed nationally among youth since 1980 *(5,6)*. In California and Massachusetts, which have initiated comprehensive tobacco prevention and education efforts, annual smoking rate increases among youth appear to have slowed, but no decline similar to that reported in Florida has been observed *(7,8)*.

The Florida Pilot Program on Tobacco Control implements activities to combat tobacco use among youth aged <18 years and tobacco's attractiveness to youths. The program's major component is a youth-oriented, counter-marketing media campaign developed to reduce the allure of smoking. Community partnerships in all 67 Florida counties, an education and training initiative, and enhanced enforcement of youth tobacco access laws are the other program components. The FYTS is a key instrument to assess the program's effectiveness; however, more direct assessments are needed to determine how much of the decline in tobacco use can be attributed to the various pilot program activities and how much may be a result of cigarette price increases that occurred during the study period. Additional evaluation of program activities can be used to strengthen the program's effectiveness for diverse populations such as non-Hispanic black and Hispanic students, among whom no statistically significant declines in cigarette use were observed.

The findings described in this report are subject to at least four limitations. First, these data apply only to youth who attend public middle or high school and, therefore, are not representative of all persons in this age group. During the 1997–98 school year in Florida, 5.9% of persons aged ≥16 years had left a high school program and had not completed high school (M.J. Butler, Florida Department of Education, personal communication, 1999). In addition, approximately 11% of middle and high school students are enrolled in private schools. Second, in both survey years, tobacco use is based on self-report. Third, trend analysis is limited to 2 years and will be enhanced by additional data collection. Finally, data are not available to fully assess the impact of recent cigarette price increases and program activities on the decline in tobacco use in Florida.

Comparisons between the significant decline in tobacco use among middle and high school students in Florida and trends in the United States overall will enable the findings in this report to be assessed more fully. However, if the observed declines in youth tobacco use are sustained over time, programs similar to the Florida Pilot Program on Tobacco Control or program components should be considered by other states to reverse the nationwide increase in youth smoking observed during the 1990s *(4,5)*.

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Incidence of Initiation of Cigarette Smoking — United States, 1965–1996

Tobacco use is the single leading preventable cause of death in the United States, and the risk for smoking-attributable disease increases the earlier in life smoking begins (1). Trends in the initiation of cigarette smoking are important indicators for directing and evaluating prevention activities (2). CDC and the Substance Abuse and Mental Health Services Administration (SAMHSA) analyzed self-reported data from the National Household Survey on Drug Abuse (NHSDA) for 1994–1997 to study the incidence of initiation of first cigarette smoking and of first daily smoking in the United States during 1965–1996 among persons aged ≤66 years and to estimate the number of new smokers aged <18 years. The findings from the analysis indicated that, during 1988–1996 among persons aged 12–17 years, the incidence of initiation of first use increased by 30% and of first daily use increased by 50%, and 1,226,000 persons aged <18 years became daily smokers in 1996.

The NHSDA samples households, noninstitutional group quarters (e.g., shelters, rooming houses, and dormitories), and civilians living on military bases (3). The surveys for 1994–1997 were administered to a multistage area probability sample (n=78,330) of the U.S. population aged ≥12 years. The overall response rates for specific years ranged from 73% to 76%. Data were weighted to provide national estimates, and confidence intervals (CIs) were calculated using SUDAAN®* (4).

Respondents completed the questionnaire that included questions about cigarette use. To estimate age of first use, respondents were asked, "How old were you the first time you smoked a cigarette, even one or two puffs?" To estimate age of first daily use, respondents were asked, "How old were you when you first started smoking cigarettes every day?" The year of initiation of first use and of first daily use were calculated by subtracting each respondent's date of birth from the interview date and then adding the age of first use or first daily use. Estimates of the number of new smokers for a given year during 1965–1995 (for first use) and 1965–1996 (for first daily use) were calculated by combining data on all respondents and applying sample weights; age-specific estimates for any given year used only data for persons in the respective age ranges during the year (2). Because the calculation of initiation of first use for 1996 would have excluded data on persons aged ≤11 years, estimates of the incidence of first use were not made for 1996. Age-specific (i.e., 5–11 years, 12–17 years, 18–25 years, and 26–34 years) incidence of initiation estimates for a given year were calculated using weighted estimates of the number of persons who were in the relevant age group and who first smoked or first smoked daily during that year divided by the number of persons who were in the relevant age group and who were exposed to risk for first use during the year (weighted by their estimated exposure time measured in years) (2). Incidences are expressed as per 1000 person-years (PY) of exposure.[†]

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*Differences between estimates were considered statistically significant if the 95% CIs did not overlap. Use of trade names and commercial sources is for identification only and does not imply endorsement by CDC or the U.S. Department of Health and Human Services.

[†] For example, a 34-year-old person who was surveyed in 1994 and first smoked a cigarette at age 15 years in 1975 would have been 5 years old in 1965 and would have contributed person-years from 1965 to 1975. From 1965 through 1974, exposure time was 1 for each year. For 1975, exposure time was 0.5 (this assumes that persons initiate, on average, midway through the year). For subsequent years, exposure time was 0.

Among persons aged 12–17 years, the incidence of first cigarette use decreased from 1974 (132.2) to 1987 (98.6) and increased from 1988 (107.0) to 1995 (139.1) (Table 1). For persons aged 18–25 years, first use decreased from the late 1960s through the late 1980s and increased during the 1990s. For persons aged 5–11 years and 26–34 years, first use was <23 throughout the study period.

Among persons aged 12–17 years, the incidence of first daily cigarette use fluctuated from 1966 (42.6) to 1983 (43.8) and gradually increased from 1988 (51.2) to 1996 (77.0) (Table 1). For persons aged 18–25 years, first daily use generally decreased from the 1960s through the early 1990s and then stabilized. First daily use among persons aged 12–17 years was equivalent to that of persons aged 18–25 years during the late 1980s. Among persons aged 26–34 years, first daily use decreased from 1974 (23.7) to 1996 (7.5). During 1965–1988, first daily use was <4.3 for persons aged 5–11 years.

The number of new smokers in the United States increased from the 1980s to 1995 and 1996. The number of persons aged <18 years who first smoked a cigarette was 1,929,000 (95% CI=±153,000) in 1988, 2,175,000 (95% CI=±180,000) in 1993, 2,392,000 (95% CI=±231,000) in 1994, and 2,441,000 (95% CI=±298,000) in 1995. The number of persons aged <18 years who first smoked daily was 708,000 (95% CI=±84,000) in 1988, 897,000 (95% CI=±100,000) in 1993, 1,056,000 (95% CI=±112,000) in 1994, 1,174,000 (95% CI=±163,000) in 1995, and 1,226,000 (95% CI=±196,000) in 1996. In 1995, 3,263,000 persons of all ages first smoked a cigarette; of these, 2,441,000 (74.8%) were aged <18 years. In 1996, 1,851,000 persons of all ages became daily smokers; of these, 1,226,000 (66.2%) were aged <18 years. If the incidence of initiation had not increased during 1988–1996, approximately 1,492,000 fewer persons aged <18 years would have been daily smokers by 1996.

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Editorial Note: The findings in this report indicate that, during 1988–1996 among persons aged 12–17 years, the incidence of initiation of first use increased by 30% and of first daily use increased by 50%, more than 6000 persons aged <18 years try a cigarette each day, and more than 3000 persons aged <18 years become daily smokers each day. These findings are consistent with previous studies that suggest significant increases in smoking prevalence among U.S. adolescents since 1991 (*5,6*). Overall, these data show that public health gains observed during the 1970s and 1980s are being reversed.

The magnitude and patterns of the incidence calculated from the mid-1960s through the mid-1980s are generally consistent with those observed from a previous study (*2*). An estimated 1.1 million persons aged 20 years were regular smokers in 1985 (*7*), consistent with data from this study that showed 1.0 million persons aged <20 years became daily smokers in 1985

The findings of this report are subject to at least three potential limitations. First, differential mortality could have influenced the results for the earlier years of the study period because persons who become smokers, especially at a young age, experience higher death rates than persons who do not (*2*). Second, some persons either may have forgotten that they had ever smoked or reported that initiation occurred more recently than it actually did (*2*). Third, some persons (especially younger respondents

TABLE 1. Estimated annual age-specific incidence* of first use and of first daily use of cigarettes among persons aged 12–17 years and 18–25 years, by year and age group — United States, 1965–1996

| | First use | | | | First daily use | | | |
| | 12–17 years | | 18–25 years | | 12–17 years | | 18–25 years | |
Year	Incidence	(95% CI†)	Incidence	(95% CI)	Incidence	(95% CI)	Incidence	(95% CI)
1965	101.3	(±14.9)	112.9	(±27.2)	44.0	(±14.1)	106.2	(±22.7)
1966	88.3	(±14.3)	125.4	(±28.4)	42.6	(± 9.6)	117.0	(±27.2)
1967	112.9	(±14.5)	114.6	(±21.8)	48.1	(±11.6)	100.8	(±25.3)
1968	101.6	(±16.5)	114.6	(±22.0)	49.7	(±11.6)	155.2	(±28.4)
1969	111.0	(±15.5)	122.3	(±24.3)	57.1	(±12.2)	116.4	(±24.3)
1970	113.7	(±17.8)	112.9	(±22.1)	52.5	(±10.0)	101.9	(±20.6)
1971	119.3	(±15.3)	102.1	(±21.6)	58.0	(±11.0)	117.9	(±23.7)
1972	129.6	(±14.7)	107.9	(±19.8)	57.7	(±10.0)	95.4	(±17.6)
1973	114.8	(±13.5)	87.2	(±15.1)	65.3	(±13.1)	106.5	(±19.4)
1974	132.2	(±15.9)	84.3	(±19.4)	66.2	(±11.8)	109.2	(±21.0)
1975	125.0	(±15.1)	95.7	(±18.8)	49.4	(± 7.8)	87.1	(±18.0)
1976	124.8	(±14.5)	87.6	(±19.4)	54.8	(± 8.2)	93.1	(±16.5)
1977	126.9	(±11.8)	87.8	(±18.4)	66.8	(±10.0)	108.0	(±22.5)
1978	112.0	(± 9.4)	72.7	(±12.9)	59.6	(± 7.6)	88.1	(±15.1)
1979	111.0	(±11.2)	83.8	(±17.4)	54.7	(±17.8)	92.5	(±13.7)
1980	105.1	(± 9.6)	70.0	(±12.9)	51.6	(± 6.7)	81.7	(±13.5)
1981	107.0	(±10.2)	66.7	(±12.5)	56.4	(± 7.6)	73.3	(±14.5)
1982	102.4	(± 9.2)	67.2	(±12.9)	49.2	(± 6.7)	73.3	(±15.3)
1983	106.0	(±10.4)	64.5	(± 9.4)	43.8	(± 6.3)	73.9	(±12.0)
1984	99.4	(± 9.0)	71.1	(±11.2)	52.3	(± 7.1)	65.4	(± 7.8)
1985	111.3	(±10.2)	69.4	(± 7.8)	50.2	(± 7.4)	66.2	(±10.0)
1986	107.0	(±11.2)	77.2	(±11.2)	56.7	(± 7.6)	69.5	(± 9.0)
1987	98.6	(± 9.6)	66.1	(± 9.2)	51.8	(± 9.2)	68.0	(± 9.8)
1988	107.0	(±10.0)	58.6	(± 9.0)	51.2	(± 7.4)	60.8	(± 8.8)
1989	99.5	(± 9.4)	60.9	(± 8.6)	53.8	(± 6.9)	61.4	(± 8.8)
1990	101.6	(± 8.0)	71.3	(±10.2)	57.8	(± 7.1)	63.6	(± 8.6)
1991	100.5	(± 8.8)	66.4	(±11.0)	57.6	(± 7.4)	58.0	(± 8.4)
1992	115.0	(± 8.2)	64.7	(± 8.8)	61.9	(± 7.8)	69.1	(± 8.2)
1993	121.4	(± 9.8)	70.1	(± 9.6)	58.7	(± 6.3)	60.0	(± 8.4)
1994§	131.0	(±12.9)	82.0	(±14.3)	67.7	(± 7.3)	68.9	(±11.6)
1995¶	139.1	(±17.8)	85.8	(±19.8)	71.8	(± 8.8)	62.3	(±12.7)
1996**	NA††		NA		77.0	(±13.7)	68.4	(±15.3)

*Per 1000 person-years of exposure.
†Confidence interval.
§Estimated using 1995, 1996, and 1997 data only.
¶Estimated using 1996 and 1997 data only.
**Estimated using 1997 data only.
††Not available.

Source: Substance Abuse and Mental Health Services Administration, National Household Survey on Drug Abuse for 1994–1997 (*3*).

[*8*]) may not have disclosed smoking behavior because of concerns about social acceptability or fear of disclosure.

If trends continue, approximately 5 million persons aged <18 years will die eventually from a smoking-attributable disease (*9*). Data on the comprehensive tobacco prevention and control programs in California and Massachusetts indicate that the recent pattern of increases in youth smoking rates can be attenuated (*10*). Efforts to reduce smoking initiation can be enhanced by further research on the interactions of factors such as tobacco product marketing, distress, and the drug effects of nicotine. Although primary prevention is the major goal of programmatic efforts, immediate cessation is critically important for adolescents (*8*). Tobacco-use prevention activities should include increasing tobacco prices; reducing the access to, and appeal of, tobacco products; conducting mass media campaigns and school-based tobacco use prevention programs; increasing provision of smoke-free indoor air; decreasing tobacco use by parents, teachers, and influential role models; developing and disseminating effective youth smoking cessation programs; and increasing support and involvement from parents and schools (*8*).

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Selected Cigarette Smoking Initiation and Quitting Behaviors
Among High School Students — United States, 1997

The continuum of smoking behavior among children and adolescents can be described in stages of preparation, trying, experimentation, regular smoking, and nicotine dependence or addiction (*1*). Persons who have smoked can discontinue at any stage, but quitting becomes more difficult as smokers progress through the continuum and become increasingly dependent on nicotine (*1,2*). Nicotine addiction is characterized by a physiologic need for nicotine, including a tolerance for nicotine, withdrawal symptoms if an attempt is made to quit, and a high probability of relapse after quitting (*1*). To determine the prevalence of selected cigarette smoking initiation and quitting behaviors among youth, CDC analyzed data from the 1997 Youth Risk Behavior Survey (YRBS). Findings indicate that among U.S. high school students in 1997, 70.2% had tried cigarette smoking. Among students who had ever tried cigarette smoking, 35.8% went on to smoke daily. Among those who had ever smoked daily, 72.9% had ever tried to quit smoking and 13.5% were former smokers.

YRBS, a component of CDC's Youth Risk Behavior Surveillance System (*3*), biennially measures the prevalence of priority health risk behaviors among youth through representative national, state, and local surveys. The 1997 national YRBS used a three-stage cluster-sample design to obtain a representative sample of 16,262 students in grades 9–12 in the 50 states and the District of Columbia. The school response rate was 79%, the student response rate was 87%, and the overall response rate was 69%. Data were weighted to provide national estimates, and SUDAAN®* was used to calculate standard errors for determining 95% confidence intervals (CIs). Students completed a self-administered questionnaire that included questions about lifetime and current cigarette use, ever-daily cigarette use, and attempts to quit smoking. Lifetime smokers were defined as students who had ever tried smoking cigarettes, even one or two puffs. Current smokers were defined as students who smoked cigarettes on ≥1 of the 30 days preceding the survey. Ever-daily smokers were defined as students who reported that they had "ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days." Quit attempts were determined from the question "Have you ever tried to quit smoking cigarettes?" Former cigarette smokers were defined as ever-daily smokers who were not current smokers. The number of persons from racial/ethnic groups other than non-Hispanic black, non-Hispanic white, and Hispanic was too small for meaningful analysis.

The prevalence of lifetime smoking was 70.2% (95% CI=±1.9) overall and did not vary by sex, race/ethnicity, or grade in school (Table 1). More than one third of students (35.8%) who had tried cigarette smoking reported ever smoking daily (Table 1). Ever-daily smoking was highest among white students (41.7%), followed by Hispanic students (24.5%), and black students (14.9%).

Almost three fourths (72.9% [95% CI=±2.7]) of ever-daily smokers had tried to quit smoking (Table 1). Among ever-daily smokers, females (77.6%) were more likely than males (68.7%) and white students (76.0%) were more likely than Hispanic students (61.9%) to report ever having tried to quit. Among ever-daily smokers, 13.5% were former smokers (Table 1).

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*Use of trade names and commercial sources is for identification only and does not imply endorsement by CDC or the U.S. Department of Health and Human Services.

TABLE 1. Percentage of high school students* who reported selected cigarette smoking initiation and quitting behaviors, by sex, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 1997

Category	Lifetime smokers†		Lifetime smokers who have ever smoked daily§		Ever-daily smokers who have ever tried to quit smoking¶		Former smokers**	
	%	(95% CI††)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Sex								
Male	70.9	(±1.9)	34.7	(±2.6)	68.7	(± 5.5)	13.0	(±3.0)
Female	69.3	(±2.6)	37.1	(±4.1)	77.6	(± 2.6)	14.0	(±3.4)
Race/Ethnicity§§								
White, non-Hispanic	70.4	(±2.3)	41.7	(±2.4)	76.0	(± 2.3)	13.4	(±3.4)
Black, non-Hispanic	68.4	(±4.4)	14.9	(±2.6)	64.8	(± 9.0)	16.9	(±6.0)
Hispanic	75.0	(±2.7)	24.5	(±3.5)	61.9	(± 8.3)	14.3	(±5.4)
Grade								
9	67.7	(±5.1)	35.7	(±5.3)	66.1	(±11.5)	17.8	(±4.1)
10	70.0	(±3.9)	34.9	(±4.5)	77.3	(± 5.7)	14.6	(±5.6)
11	68.8	(±3.1)	37.1	(±4.4)	73.2	(± 6.2)	10.0	(±3.7)
12	73.7	(±4.1)	35.5	(±3.9)	74.4	(± 4.2)	12.4	(±2.9)
Total	**70.2**	**(±1.9)**	**35.8**	**(±2.6)**	**72.9**	**(± 2.7)**	**13.5**	**(±2.8)**

*N=16,262.
†Ever tried cigarette smoking, even one or two puffs.
§Ever tried cigarette smoking, even one or two puffs, and have ever smoked at least one cigarette every day for 30 days.
¶Have ever smoked at least one cigarette every day for 30 days and have ever tried to quit smoking. Excludes data from 55 students who reported that they had never tried to quit, but did not smoke on any of the 30 days preceding the survey.
**Have ever smoked at least one cigarette every day for 30 days and did not smoke on any of the 30 days preceding the survey. Excludes data from 55 students who reported that they had never tried to quit, but did not smoke on any of the 30 days preceding the survey.
††Confidence interval.
§§Numbers for racial groups other than whites and blacks were too small for meaningful analysis.

Reported by: Office on Smoking and Health, and Div of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: As with other drug addictions, nicotine dependence is a progressive, chronic, and relapsing disorder (1). The optimal public health strategy is to prevent tobacco use completely or to intervene as early in the smoking behavior continuum as possible. Once adolescents have established a pattern of regular use, their behavior is usually compelled by nicotine dependence as well as social factors. Efforts are needed to help youth break the cycle of addiction and prevent the disability and death associated with tobacco use.

Initiation and quitting behaviors suggest areas for intervention and research. For example, the incidence of lifetime ever smoking among adolescents declined in the mid-1970s and early 1980s, but increased from 1991 to 1994 (4), suggesting that this

behavior is modifiable. Cigarette advertising and promotion, smoking by adults and older siblings, access to cigarettes, price of cigarettes, peer pressure, and the degree of exposure to effective counteradvertising and school-based prevention programs can influence patterns of initiation (*1,2*).

The findings in this report are consistent with previous studies that indicate approximately 33%–50% of persons who try smoking cigarettes escalate to regular patterns of use (*1*). The 1990–1992 National Comorbidity Survey estimated that 23.6% of persons aged 15–24 years who ever used cigarettes progressed to the final stage in the smoking behavior continuum (i.e., nicotine dependence). This conversion rate (i.e., from any use to dependence) was similar to conversion rates for use of cocaine (24.5%) and heroin (20.1%) (*5*). Although indicators of dependence increase with the frequency of smoking among youth, many less-than-daily smokers experience symptoms of nicotine withdrawal when they attempt to quit (*6*).

Differences described in this report in the rate of conversion from trying a cigarette to daily use may explain some of the racial/ethnic differences in current smoking prevalence estimates among youth (*7,8*). Black adolescents who try cigarette smoking may experience greater social disapproval regarding their smoking behavior than white adolescents (*8*). Among ever-daily smokers, white students were more likely than Hispanics students and female students were more likely than male students to have attempted to quit smoking during high school. Investigation of the influence of early quit attempts on long-term success is needed.

The findings in this report are subject to at least three limitations. First, these data apply only to youth who attend high school and, therefore, are not representative of all persons in this age group. In 1996, 6% of persons aged 16–17 years were not enrolled in a high school program and had not completed high school (*7*). Second, more detailed measures of cessation (i.e., current interest in quitting, recent quit attempts, and longest time abstinent from cigarettes) could not be examined because they were not included in the survey. Third, a cross-sectional survey can measure only the prevalence of various stages in the smoking behavior continuum. Transitions through the stages of smoking behavior are best studied with a longitudinal research design.

Most young persons who smoke regularly are already addicted to nicotine, and the experience of addiction is similar to that among adults (*1*). Although approximately 70% of adolescent smokers regret ever starting (*9*), success rates have been low in the few cessation programs designed for young persons that have reported quit rates at follow-up (13%) (*10*). Adolescents are difficult to recruit for formal cessation programs and, when enrolled, are difficult to retain in the programs (*1*). In September 1997, CDC conducted the first Workgroup on Youth Tobacco Use Cessation to discuss strategies to stimulate research on tobacco-use cessation programs. Tobacco-use cessation programs are being evaluated in schools, health-maintenance organizations, and state health departments and feature adolescent team competitions, pharmacologic agents, telephone counseling, and cooperative learning. Evaluations of these efforts will assist in developing tobacco-use cessation programs for youth that can be used nationwide.

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Tobacco Use Among High School Students — United States, 1997

Tobacco use is the single leading preventable cause of death in the United States (*1*). Approximately 80% of tobacco use occurs for the first time among youth aged <18 years (*2*), and the prevalence of cigarette smoking among adolescents increased during the early 1990s (*3*). To determine prevalence rates of cigarette, smokeless tobacco (chewing tobacco or snuff), and cigar use for U.S. high school students, CDC analyzed data from the 1997 Youth Risk Behavior Survey (YRBS). This report summarizes the results of the analysis, which indicate that the prevalence of current cigarette smoking among U.S. high school students increased from 27.5% in 1991 to 36.4% in 1997 and that, in 1997, 42.7% of students used cigarettes, smokeless tobacco, or cigars during the 30 days preceding the survey.

YRBS, a component of CDC's Youth Risk Behavior Surveillance System (*4*), biennially measures the prevalence of priority health-risk behaviors among youth through representative national, state, and local surveys. The 1997 national YRBS used a three-stage cluster sample design to obtain a representative sample of 16,262 students in grades 9–12 in the 50 states and the District of Columbia. The school response rate was 79.1%, the student response rate was 87.2%, and the overall response rate was 69.0%. Data were weighted to provide national estimates, and SUDAAN® (Software for the Statistical Analysis of Correlated Data) was used to calculate standard errors for determining 95% confidence intervals.*

Students completed a self-administered questionnaire that included questions about cigarette, smokeless tobacco, and cigar use. Lifetime cigarette smokers were defined as students who had ever smoked cigarettes, even one or two puffs. Current cigarette, smokeless tobacco, and cigar users were defined as students who reported product use on ≥1 of the 30 days preceding the survey. Frequent cigarette use was defined as smoking cigarettes on ≥20 of the 30 days preceding the survey. Any current tobacco use was defined as use of cigarettes, smokeless tobacco, or cigars on ≥1 of the 30 days preceding the survey. Data are presented only for non-Hispanic black, non-Hispanic white, and Hispanic students because the numbers of students from other racial/ethnic groups were too small for meaningful analysis.

Prevalence of Cigarette Use

The overall prevalences of lifetime, current, and frequent cigarette use were 70.2%, 36.4%, and 16.7%, respectively (Table 1). The prevalence of lifetime cigarette smoking was higher among Hispanic male students (76.9%) than among white male students (70.4%). The prevalence of current cigarette smoking was higher among white students (39.7%) than Hispanic (34.0%) and black (22.7%) students, and Hispanic students (34.0%) were more likely to report current cigarette smoking than black students (22.7%). Among males, the prevalence of current cigarette smoking was higher among white students (39.6%) than black students (28.2%). Among females, the prevalence of current cigarette smoking was higher among white students (39.9%) than Hispanic (32.3%) and black (17.4%) students, and Hispanic female students (32.3%) were more likely to report current cigarette smoking than black female stu-

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*Differences between prevalence estimates were considered statistically significant if the 95% confidence intervals did not overlap. Use of trade names and commercial sources is for identification only and does not imply endorsement by CDC and the U.S. Department of Health and Human Services.

TABLE 1. Percentage of high school students* who used cigarettes, smokeless tobacco, or cigars, by sex, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 1997

| Category | Cigarette use | | | | | | Current smokeless tobacco use** | | Current cigar use†† | | Any current tobacco use§§ | |
| | Lifetime† | | Current§ | | Frequent¶ | | | | | | | |
	%	(95% CI¶¶)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Sex												
Male	70.9	(±1.9)	37.7	(±2.7)	17.6	(±2.7)	15.8	(±3.7)	31.2	(±2.3)	48.2	(±2.8)
Female	69.3	(±2.6)	34.7	(±2.8)	15.7	(±2.1)	1.5	(±0.7)	10.8	(±2.4)	36.0	(±2.8)
Race/Ethnicity***												
White, non-Hispanic	70.4	(±2.3)	39.7	(±2.4)	19.9	(±2.2)	12.2	(±2.5)	22.5	(±2.6)	46.8	(±1.9)
Male	70.4	(±2.4)	39.6	(±3.8)	19.8	(±3.3)	20.6	(±4.0)	32.5	(±2.1)	51.5	(±2.4)
Female	70.3	(±3.3)	39.9	(±3.2)	20.1	(±3.2)	1.6	(±0.9)	9.6	(±2.6)	40.8	(±3.1)
Black, non-Hispanic	68.4	(±4.4)	22.7	(±3.8)	7.2	(±1.8)	2.2	(±1.1)	19.4	(±3.2)	29.4	(±3.0)
Male	70.1	(±4.7)	28.2	(±5.5)	10.1	(±3.1)	3.2	(±1.7)	28.1	(±5.3)	37.6	(±4.7)
Female	66.8	(±5.2)	17.4	(±3.9)	4.3	(±1.8)	1.3	(±1.2)	11.0	(±2.9)	21.5	(±4.2)
Hispanic	75.0	(±2.7)	34.0	(±2.7)	10.9	(±2.6)	5.1	(±2.3)	20.3	(±4.4)	36.8	(±3.4)
Male	76.9	(±3.6)	35.5	(±3.6)	13.2	(±3.7)	8.4	(±3.3)	26.3	(±7.0)	41.3	(±5.0)
Female	72.7	(±3.9)	32.3	(±3.7)	8.1	(±2.7)	1.2	(±1.0)	13.0	(±2.8)	31.4	(±3.8)
Grade												
9	67.7	(±5.1)	33.4	(±5.1)	13.1	(±3.8)	9.7	(±2.7)	17.3	(±2.9)	38.0	(±5.3)
10	70.0	(±3.9)	35.3	(±4.1)	15.0	(±1.9)	6.8	(±1.7)	22.3	(±3.4)	40.9	(±4.1)
11	68.8	(±3.1)	36.6	(±3.6)	18.9	(±2.8)	10.0	(±2.5)	24.2	(±2.9)	44.2	(±3.1)
12	73.7	(±4.1)	39.6	(±4.9)	19.4	(±3.1)	10.5	(±3.6)	23.8	(±4.2)	47.0	(±6.1)
Total	70.2	(±1.9)	36.4	(±2.3)	16.7	(±1.9)	9.3	(±2.2)	22.0	(±2.1)	42.7	(±2.3)

* N=16,262.
† Ever tried cigarette smoking, even one or two puffs.
§ Smoked cigarettes on ≥1 of the 30 days preceding the survey.
¶ Smoked cigarettes on ≥20 of the 30 days preceding the survey.
** Used smokeless tobacco on ≥1 of the 30 days preceding the survey.
†† Smoked cigars on ≥1 of the 30 days preceding the survey.
§§ Smoked cigarettes, used smokeless tobacco, or smoked cigars on ≥1 of the 30 days preceding the survey.
¶¶ Confidence interval.
*** Numbers for other racial/ethnic groups were too small for meaningful analysis.

dents (17.4%). Among black students, males (28.2%) were more likely than females (17.4%) to report current cigarette smoking.

The prevalence of frequent cigarette smoking was higher among white students (19.9%) than among Hispanic (10.9%) and black (7.2%) students. Among males, the prevalence of frequent cigarette smoking was higher among white students (19.8%) than black students (10.1%). Among females, the prevalence of frequent cigarette smoking was higher among white students (20.1%) than Hispanic (8.1%) and black (4.3%) students. Among black students, males (10.1%) were more likely than females (4.3%) to report frequent cigarette smoking.

Trend analyses of current cigarette smoking found significantly increasing trends overall and among all racial/ethnic subgroups (p<0.001). The overall prevalence of current cigarette smoking increased from 27.5% in 1991 to 36.4% in 1997. Among white students, current cigarette smoking increased from 30.9% in 1991 to 39.7% in 1997. Among black students, current cigarette smoking increased from 12.6% in 1991 to 22.7% in 1997. Among Hispanic students, current cigarette smoking increased from 25.3% in 1991 to 34.0% in 1997.

Prevalence of Smokeless Tobacco Use

The overall prevalence of current smokeless tobacco use was 9.3% (Table 1). The prevalence of current smokeless tobacco use was higher among male students (15.8%) than female students (1.5%) and among white students (12.2%) than black (2.2%) and Hispanic (5.1%) students. White male students (20.6%) were more likely than any other subgroup to report current smokeless tobacco use; Hispanic male students (8.4%) were more likely than black male students (3.2%) to report this behavior. Among Hispanic students, males (8.4%) were more likely than females (1.2%) to report current smokeless tobacco use.

Prevalence of Cigar Use

The overall prevalence of current cigar use was 22.0% (Table 1). Male students (31.2%) were more likely to use cigars than female students (10.8%). This difference held within each racial/ethnic subgroup. Ninth-grade students (17.3%) were less likely than 11th-grade students (24.2%) to use cigars.

Prevalence of Any Current Tobacco Use

The overall prevalence of any current tobacco use was 42.7% (Table 1). Male students (48.2%) were more likely to report any current tobacco use than female students (36.0%), and this difference held within each racial/ethnic subgroup. The prevalence of any current tobacco use was higher among white students (46.8%) than Hispanic (36.8%) and black (29.4%) students. These differences held for both male and female students. The prevalence of any current tobacco use was higher among Hispanic students (36.8%) than black students (29.4%) overall and among female students (31.4% of Hispanic females and 21.5% of black females).

Reported by: Office on Smoking and Health, and Div of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: This report is the first to include cigarette, smokeless tobacco, and cigar use in a measure of current tobacco use and the first to report on past-month cigar use among a nationally representative sample of high school students. The increasing prevalence of cigarette smoking since 1991, the high rate of smokeless

tobacco and cigar use, and the high rate of any tobacco use suggest that a major proportion of U.S. youth already have or are at risk for nicotine addiction (*5,6*) and the subsequent health problems caused by tobacco use (*2,6*).

In 1997, the prevalence of current cigarette smoking was 32% higher than in 1991; current cigarette smoking increased 80% among black students, 34% among Hispanic students, and 28% among white students. The reasons for the large differences in overall prevalence of current cigarette smoking and the increases in cigarette smoking among students in all the racial/ethnic groups are unclear and require further investigation. CDC is conducting research to help explain these differences and the reasons for continued increases in tobacco use among all youth.

The findings in this report are subject to at least two limitations. First, these data apply only to youth who attend high school and, therefore, are not representative of all persons in this age group. In 1996, only 6% of persons aged 16–17 years were not enrolled in a high school program and had not completed high school (*7*). Second, the measure of any current tobacco use described in this report might be an underestimate, because it does not include measures of pipe and "roll-your-own" tobacco smoking.

In 1994, CDC recommended that school-based tobacco-use prevention programs begin in elementary school and continue through 12th grade, with intensive instruction for students in grades six through eight (i.e., up to 10 smoking-focused sessions each year) (*8*). Data from the 1994 School Health Policies and Programs Study indicated that only 55% of middle/junior high and 47% of senior high school health education teachers taught tobacco-use prevention as a major topic (*9*). Of these teachers, 43% of middle/junior high and 42% of senior high school teachers taught only one or two classes on the topic. Additional research findings indicate that school-based tobacco-use prevention programs are most effective when supported by communitywide programs that involve parents, peers, mass media, and community organizations (*2*).

Tobacco-use prevention activities should be designed to prevent the use of all tobacco products. Such activities should include increasing tobacco prices, reducing access (e.g., by implementing and adequately enforcing minors' access restrictions), reducing the appeal of tobacco products (e.g., by restricting advertising and promotion), and conducting youth-oriented mass media campaigns and school-based tobacco-use prevention programs (*2,10*). Establishing health-oriented social norms (e.g., by increasing provision of smoke-free indoor air and decreasing modeling of tobacco use by parents, teachers, and celebrities) and increasing support and involvement from parents and schools also will contribute to prevention (*2*).

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MMWR 1998;47(12):229–33

Cigar Smoking Among Teenagers —
United States, Massachusetts, and New York, 1996

Cigar smoking can cause cancers of the oral cavity, larynx, esophagus, and lung (1) and chronic obstructive pulmonary disease (2). In addition, cigars contain substantial levels of nicotine, an addictive drug (3). Despite these health risks, total cigar consumption in the United States was approximately 4.5 billion cigars in 1996, and consumption of larger cigars increased by 44.5% from 1993 through 1996 (from 2,138 million cigars to 3,090 million cigars, respectively) (4). This report presents estimates of the prevalence of cigar smoking among youth based on analyses of data from the Robert Wood Johnson Foundation's (RWJF) 1996 National Study of Tobacco Price Sensitivity, Behavior, and Attitudes Among Teenagers and Young Adults; a 1996 survey by the Massachusetts Department of Public Health (MDPH) of high school and junior high school students; and the Roswell Park Cancer Institute's 1996 Survey of Alcohol, Tobacco, and Drug Use in two New York counties (5). The analyses indicate that, during the year before being surveyed, 26.7% of U.S. and 28.1% of Massachusetts high school students reported having smoked at least one cigar and that 13%–15% of ninth grade students in two New York counties reported having smoked cigars during the previous 30 days.

National Survey

The RWJF survey employed a three-stage cluster sample design to produce a nationally representative sample of students in grades 9–12. Within the selected sample of 200 counties (primary sampling units), schools were randomly selected, with the probability of selection proportional to enrollment size. Four alternate high schools were simultaneously selected, matching the original school in size, type, location, and the race/ethnicity and socioeconomic status of the students. An alternate was substituted when the first school chosen for the study could not participate. A total of 202 schools (representing 146 [73%] of the 200 primary sampling units) participated in the study. Within each school, one class per grade was chosen randomly. All students in the selected classes were eligible to participate; 80% of the students enrolled in the sample of selected classes participated. A total of 16,556 students aged 14–19 years completed the survey; however, 139 were excluded from these analyses because of missing information on sex. Participants were asked, "How many cigars, if any, have you smoked in the past year?" Annual cigar smokers were defined as any student who reported smoking a cigar during the previous year; frequent cigar smokers were defined as any student who reported smoking ≥50 cigars during the previous year. Data were weighted by age, race/ethnicity, sex, and region* to provide national estimates. Confidence intervals (CIs) were calculated using SUDAAN.

In 1996, an estimated 6.0 million (26.7% [95% CI=±1.7%]) 14–19-year-olds reported having smoked a cigar during the previous year (4.3 million [37.0% (95% CI=±2.4%)]

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*The four regions were *Northeast* (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont), *Midwest* (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), *South* (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia), and *West* (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming).

males and 1.7 million [16.0% (95% CI=1.3%)] females) (Table 1). Cigarette smokers were more than three times as likely as noncigarette smokers to report having smoked a cigar (54.1% [95% CI=±2.4%], compared with 14.2% [95% CI=±1.2%], respectively). Among the 68.8% of students who did not smoke cigarettes, males were more likely than females to have reported smoking a cigar during the previous year (20.4% [95% CI=±1.8%] versus 7.8% [95% CI=±1.1%], respectively). Users of smokeless tobacco were more than three times as likely as nonusers to report having smoked cigars (73.4% [95% CI=±3.4%], compared with 22.6% [95% CI=±1.4%], respectively). Cigar smoking did not vary substantially by region or race/ethnicity, although prevalence was greatest among white, non-Hispanic males (41.6% [95% CI=±2.7%]).

Massachusetts Survey

The MDPH survey sample comprised two subsamples of students in grades 6–12: a statewide random sample, proportionately stratified by area and grade, and a separate random sample of five urban areas in the state, stratified by percentage of nonwhite students in each grade. These five urban areas were selected to oversample communities with racial/ethnic minorities to ensure adequate representation for analysis. Of the 191 schools meeting eligibility criteria, 171 (90%) participated in this survey. Of the 8236 students eligible to participate in the survey, 6844 (83.1%) participated. Data were collected during November 1996–January 1997. School and class selection was random, participation was voluntary, and all responses were anonymous. The questionnaires were self-administered. All students were asked "How often have you smoked cigars in your lifetime?"; "How often have you smoked cigars during the last 12 months?"; and "How often have you smoked cigars during the last 30 days?" The response categories were never, one to two times, three to five times, six to nine times, 10–19 times, 20–39 times, and ≥40 times.

Among the 1020 students in grade 6, 9.9% (95% CI=±1.8%) reported having ever smoked a cigar, 5.0% (95% CI=±0.8%) smoked a cigar during the previous year, and 2.0% (95% CI=±0.9%) smoked a cigar during the previous month. Among 1942 students in grades 7 and 8, 22.3% (95% CI=±1.8%) reported having ever smoked a cigar, 14.1% (95% CI=±1.5%) smoked a cigar during the previous year, and 7.6% (95% CI=±1.2%) smoked a cigar during the previous month. Among the 3873 high school students in grades 9–12, 38.9% (95% CI=±1.5%) reported having ever smoked a cigar, 28.1% (95% CI=±1.4%) smoked a cigar during the previous year, and 14.5% (95% CI=±1.1%) smoked a cigar during the previous month.

High school students who had used other tobacco products during the previous month were also more likely to have smoked cigars during the previous month. Among students in grades 9–12, 30.3% (95% CI=±2.5%) of those who had smoked cigarettes during the previous month also reported having smoked a cigar, compared with 3.4% (95% CI=±6.6%) of those who had never smoked a cigarette; among those who had used smokeless tobacco during the previous month, 60.7% (95% CI=±6.6%) also reported having smoked a cigar during the previous month, compared with 8.3% (95% CI=±1.0%) of those who had never used smokeless tobacco.

New York Survey

The Roswell Park Cancer Institute survey was conducted in Erie (predominantly urban) and Chautauqua (predominantly rural) counties in New York during the fall of

1996. The survey was administered to 9916 ninth grade students in 57 of the 60 public and parochial high schools in Erie County (81% of the 12,216 ninth grade students in the 60 schools) and to 1677 ninth grade students in 16 of the 18 public schools in Chautauqua County (80% of the 2102 ninth grade students in the 18 schools). Of the students who participated in the survey in Erie County, 79% were non-Hispanic white, 12% were non-Hispanic black, 3% were Hispanic, and 5% were of other racial/ethnic groups. Of those students who participated in the survey in Chautauqua County, 89% were non-Hispanic white. The median age of all students was 14 years. Students completed a self-administered questionnaire with three questions on cigar use and purchasing: "In the past 30 days, did you smoke a cigar?"; "Have you ever bought cigars for yourself?"; and "When you try to buy cigars, how often are you asked about your age?"

Response patterns were similar for the two counties (Table 2). In Erie County, of the 9916 students, 1253 (12.7%) of 9862 students who responded to the question reported having smoked a cigar during the previous 30 days (937 [19.5%] of 4810 boys and 304 [6.1%] of 4983 girls). In Chautauqua County, of the 1677 students, 246 (14.8%) of 1657 students who responded reported having smoked a cigar during the previous 30 days (201 [24.0%] of 836 boys and 43 [5.3%] of 809 girls). In comparison, 29.0% of students in Erie County and 30.6% of students in Chautauqua County reported having smoked cigarettes during the previous 30 days. Cigarette smokers also were more likely than noncigarette smokers to report having smoked a cigar during the previous 30 days (Table 2). The prevalence of reported smokeless tobacco use during the previous 30 days was 3.5% in Erie County and 7.3% in Chautauqua County. Among smokeless tobacco users, reported rates of cigar smoking were 62.4% (217 of 348 students who responded) in Erie County and 63.0% (75 of 119 students who responded) in Chautauqua County (Table 2).

Among students who reported ever purchasing a cigar for themselves, most (63.7% in Erie and 77.0% in Chautauqua) also reported having smoked a cigar during the previous 30 days. Among those who had ever purchased a cigar, 76.6% in Erie County and 71.7% in Chautauqua County reported that they were "rarely" or "never" asked about their age when purchasing a cigar. In comparison, 59.0% in Erie County and 67.7% in Chautauqua County reported that they were "rarely" or "never" asked about their age when purchasing cigarettes.

Reported by: NJ Kaufman, SL Emont, CR Trimble, CT Orleans, The Robert Wood Johnson Foundation, Princeton, New Jersey. N Briton, T Clark, M Krakow, Health and Addictions Research, Inc, Boston; C Celebucki, D Cullen, G Connolly, Massachusetts Dept of Public Health. A Hyland, J Perla, KM Cummings, Roswell Park Cancer Institute, New York State Dept of Health, Buffalo; A Abdella, K Tippens, Chautauqua County Dept of Health, Mayville, New York. Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: This report is the first to estimate the prevalence of cigar smoking among youth in the United States and documents the level of access to and use of cigars. The risk for several cancers is higher for cigar smokers than for nonsmokers. Therefore, if cigar consumption continues to increase (*4*), cigar-related morbidity and mortality can be expected to increase.[†]

[†]The National Cancer Institute has announced that it will publish a comprehensive monograph on cigar smoking by the end of 1997 titled "Cigar Smoking in the U.S.: Health Effects and Trends."

TABLE 1. Percentage of students aged 14–19 years who reported having smoked at least one cigar during the previous year, by selected characteristics — United States, National Study of Tobacco Price Sensitivity, Behavior, and Attitudes Among Teenagers and Young Adults, 1996

Characteristic	Annual cigar use*						Frequent cigar use[†]					
	Female		Male		Total		Female		Male		Total	
	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Race/Ethnicity												
White, non-Hispanic	16.0	(± 1.8%)	41.6	(±2.7%)	28.9	(±2.1%)	1.2	(±0.4%)	3.4	(±0.8%)	2.3	(±0.5%)
Black, non-Hispanic	13.4	(± 2.9%)	25.2	(±3.7%)	19.3	(±2.9%)	1.6	(±0.6%)	5.6	(±2.0%)	3.6	(±1.1%)
Hispanic	20.0	(± 3.0%)	32.3	(±3.0%)	26.2	(±2.1%)	1.8	(±0.8%)	3.2	(±0.9%)	2.5	(±0.6%)
Other[¶]	14.5	(± 2.7%)	28.5	(±4.3%)	22.2	(±2.9%)	0.5	(±0.7%)	5.8	(±2.4%)	3.4	(±1.3%)
Age group (yrs)												
14–16	16.8	(± 1.8%)	32.1	(±2.4%)	24.4	(±1.7%)	1.3	(±0.4%)	2.9	(±0.7%)	2.1	(±0.4%)
17–18	14.9	(± 1.8%)	43.9	(±3.2%)	29.8	(±2.4%)	1.1	(±0.5%)	5.2	(±1.1%)	3.2	(±0.7%)
19	14.9	(± 6.7%)	35.5	(±7.8%)	27.5	(±5.3%)	3.1	(±3.0%)	4.9	(±2.6%)	4.2	(±2.1%)
Region**												
Northeast	12.4	(± 2.1%)	33.7	(±5.2%)	23.2	(±3.4%)	0.8	(±0.5%)	3.0	(±1.0%)	1.9	(±0.5%)
Midwest	16.9	(± 2.6%)	42.3	(±4.2%)	29.8	(±3.4%)	1.3	(±0.7%)	4.9	(±1.5%)	3.2	(±0.9%)
South	17.2	(± 2.2%)	37.1	(±3.7%)	27.3	(±2.4%)	1.5	(±0.5%)	4.3	(±1.3%)	3.0	(±0.9%)
West	16.4	(± 3.4%)	34.5	(±5.4%)	25.6	(±4.2%)	1.1	(±0.5%)	3.0	(±1.0%)	2.1	(±0.5%)
Education of parents[††]												
Completed college	16.0	(± 2.0%)	38.7	(±3.1%)	27.9	(±2.2%)	1.0	(±0.4%)	3.5	(±0.9%)	2.3	(±0.5%)
Did not complete college	16.0	(± 1.5%)	37.0	(±3.3%)	26.1	(±2.1%)	1.3	(±0.4%)	4.0	(±0.8%)	2.6	(±0.5%)
School performance												
Better or much better than average	12.5	(± 1.6%)	31.2	(±2.9%)	21.5	(±2.0%)	0.7	(±0.3%)	3.2	(±0.8%)	1.9	(±0.4%)
Average	19.2	(± 1.8%)	40.9	(±3.0%)	30.1	(±2.1%)	1.6	(±0.5%)	4.3	(±1.0%)	3.0	(±0.6%)
Below average	28.6	(± 6.0%)	54.7	(±5.4%)	45.1	(±4.2%)	3.5	(±1.9%)	5.4	(±2.1%)	4.7	(±1.6%)
Household smoker												
Present	19.1	(± 1.7%)	41.2	(±3.1%)	30.1	(±2.1%)	1.8	(±0.5%)	4.9	(±1.1%)	3.4	(±0.6%)
Not present	13.0	(± 1.7%)	33.0	(±2.8%)	23.2	(±1.9%)	0.7	(±0.4%)	3.0	(±0.6%)	1.8	(±0.4%)
Cigarette use[§§]												
Smoker	34.0	(± 2.6%)	73.9	(±2.6%)	54.1	(±2.4%)	3.0	(±0.8%)	9.4	(±1.7%)	6.2	(±0.9%)
Nonsmoker	7.8	(± 1.1%)	20.4	(±1.8%)	14.2	(±1.2%)	0.3	(±0.2%)	1.5	(±0.4%)	0.9	(±0.2%)

Smokeless tobacco use

User¶¶	50.1	(±12.0%)	75.9	(±3.6%)	73.4	(±3.4%)	3.3	(±3.5%)	8.4	(±2.4%)	7.9	(±2.2%)
Nonuser	15.5	(± 1.3%)	30.6	(±1.9%)	22.6	(±1.4%)	1.2	(±0.3%)	3.2	(±0.6%)	2.1	(±0.3%)
Total	**16.0**	**(± 1.3%)**	**37.0**	**(±2.4%)**	**26.7**	**(±1.7%)**	**1.2**	**(±0.3%)**	**3.9**	**(±0.6%)**	**2.6**	**(±0.4%)**

* Smoked one or more cigars during the previous year.
† Smoked ≥50 cigars during the previous year.
§ Confidence interval.
¶ Numbers for other races were too small for meaningful analysis.
** Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
†† Highest level of education of either parent.
§§ Smoked during the previous 30 days.
¶¶ Used chewing tobacco or snuff during the previous 30 days.

TABLE 2. Number and percentage of ninth grade students who reported having smoked cigars during the previous 30 days or who purchased cigars for their own use, by selected characteristics — Erie and Chautauqua counties, New York, Survey of Alcohol, Tobacco, and Drug Use, 1996

Category/Characteristic	Erie County*			Chautauqua County[†]		
	Total responses[§]	Smoked or purchased		Total responses[§]	Smoked or purchased	
		No.	(%)		No.	(%)
SMOKED CIGAR						
Sex						
Male	4810	937	(19.5)	836	201	(24.0)
Female	4983	304	(6.1)	809	43	(5.3)
Cigarette use						
Never smoked	6977	323	(4.6)	1147	56	(4.9)
Occasionally smoked[¶]	1708	458	(26.8)	288	91	(31.6)
Regularly smoked**	1148	469	(40.9)	218	99	(45.4)
Smokeless tobacco use						
Not used during previous 30 days	9469	1032	(10.9)	1532	170	(11.1)
Used during previous 30 days	348	217	(62.4)	119	75	(63.0)
Marijuana use						
Never used	6918	360	(5.2)	1126	58	(5.2)
Ever used	2899	885	(30.5)	521	187	(35.9)
Used during previous 30 days	*1523*	*606*	*(39.8)*	*293*	*134*	*(45.7)*
Total	**9862**	**1253**	**(12.7)**	**1657**	**246**	**(14.8)**
PURCHASED CIGAR						
Sex						
Male	4800	608	(12.7)	831	114	(13.7)
Female	4969	166	(3.3)	813	21	(2.6)
Cigarette use						
Never smoked	6957	210	(3.0)	1147	31	(2.7)
Occasionally smoked[¶]	1705	237	(13.9)	288	35	(12.2)
Regularly smoked**	1147	331	(28.9)	217	70	(32.3)
Total	**9839**	**779**	**(7.9)**	**1657**	**136**	**(8.2)**

*n=9916.
[†]n=1677.
[§]May not equal county totals because of missing data about cigar use and/or purchasing.
[¶]Smoked on 1–19 days during the previous 30 days.
**Smoked on 20–30 days during the previous 30 days.

Although the findings from New York and from Massachusetts were from local surveys, they are consistent with the results from the national survey. However, a potential limitation to these data is that they represent the cigar use of only those adolescents attending school and, therefore, may not be representative of all adolescents.

Although federal law requires states to enact laws prohibiting the sale of cigars and other tobacco products to minors (*6*), young persons in New York reported being able to purchase cigars easily. These findings, especially if replicated in other communities,

may warrant actions to curtail youth access to cigars that are consistent with measures for limiting access to cigarettes and smokeless tobacco (e.g., Food and Drug Administration regulations) (7). The findings from the surveys in this report also indicate that cigar smoking, once primarily an activity among older men (8), is now an activity of both male and female teenagers. Therefore, priorities include the need to further characterize the use of cigars in the United States, determine the prevalence of cigar smoking among adults, and continue monitoring the prevalence of cigar use among youth. Although the Surgeon General's health warning is legally mandated for some tobacco products, the law does not include cigars (9). Therefore, teenagers and other users of cigars may be unaware of the health risks of cigar smoking. Immediate efforts should be made to publicize the health risks of cigar smoking; deglamorize the product in magazines, movies, and television programs; and protect nonsmokers from secondhand cigar smoke.

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Prevalence of Cigarette Smoking
Among Secondary School Students — Budapest, Hungary, 1995

Because of the high prevalence of tobacco use in countries of Central and Eastern Europe, public health officials in many of these countries have designated as a priority the prevention of smoking initiation among youth. In 1995, a nationally representative survey in the Republic of Hungary documented that 35.8% of 16-year-old students in that country had smoked cigarettes during the preceding 30 days (*1*). To better characterize smoking among youth in Hungary, the Field Epidemiology Training Program, Hungarian Ministry of Welfare, conducted a cross-sectional survey in Budapest (1995 population: 1,906,798) among secondary school students aged 14–18 years. Specific objectives of the survey were to assess the prevalence of cigarette smoking among these students, determine factors associated with higher prevalences, and describe the smoking habits of current cigarette smokers. This report summarizes the findings, which indicate that one third of all students smoked; half of all 18-year-olds smoked; and of those students who smoked, 41% most frequently smoked an imported, internationally recognized cigarette brand.

Among the 105,209 Budapest students aged 14–18 years, approximately 80% attended traditional public high schools, and 20% attended public vocational/technical schools. A sample of students was selected from a stratified sample of the 199 secondary schools in Budapest. Twenty (80%) traditional high schools and five (20%) vocational/technical schools were selected with a probability proportional to their size. Classrooms in these 25 schools were then randomly selected. During 3 weeks in January 1995, all 2878 students in attendance completed a pretested, standardized questionnaire that included questions translated from the U.S. Youth Risk Behavior Survey (*2*) and that asked about culturally relevant factors possibly associated with smoking. Current smokers were defined as students who reported having smoked at least one cigarette during the preceding 30 days. Of the 2878 students, 79 (2.7%) were excluded because their smoking status could not be determined. Epi Info 6.02 was used for data analysis that accounted for the stratification and clustering of students within classrooms; 95% confidence intervals (CIs) were calculated using SUDAAN (*3*).

Among the 2799 students, 987 (35.3%) (95% CI=30.6%–39.9%) reported current smoking (Table 1). Although the prevalences were similar among male and female students (prevalence odds ratio [POR]=1.0; 95% CI=0.8–1.5), students aged 18 years were more likely to smoke than students aged 14 years (47.9% and 23.8%, respectively [POR=2.9; 95% CI=1.3–6.6]). The prevalences of current smoking also were higher among vocational/technical students than traditional high school students (53.1% and 31.0%, respectively [POR=2.5; 95% CI=1.6–3.9]); among students whose friends smoked than those whose friends did not smoke (42.6% and 6.8%, respectively [POR=10.1; 95% CI=7.5–13.7]); among students who reported that they had seen a teacher smoking during the school year than those who had not seen a teacher smoking (37.3% and 19.0%, respectively [POR=2.5; 95% CI=1.8–3.6]); and among students with a family member who smoked than students whose family members abstained from smoking (40.7% and 27.0%, respectively [POR=1.9; 95% CI=1.6–2.1]). The prevalences of smoking were similar among students who received instruction at

TABLE 1. Number and percentage of current smokers* among secondary school students aged 14–18 years, by selected characteristics — Budapest, Hungary, 1995

| Characteristic | Sample size† | Current smokers | | |
		No.	(%)	(95% CI§)
Sex				
Male	1470	525	(35.7)	(28.5%–42.9%)
Female	1324	461	(34.8)	(32.2%–37.5%)
Age (yrs)				
14	168	40	(23.8)	(23.0%–24.7%)
15	720	191	(26.5)	(20.5%–32.6%)
16	806	286	(35.5)	(27.6%–43.4%)
17	696	274	(39.4)	(34.6%–44.2%)
18	399	191	(47.9)	(32.9%–62.9%)
School type				
Vocational/ technical	537	285	(53.1)	(46.7%–59.5%)
Traditional high school	2262	702	(31.0)	(26.2%–35.9%)
Total	2799	987	(35.3)	(30.6%–39.9%)

*Defined as students who reported having smoked at least one cigarette during the preceding 30 days.
†For some characteristics, the sample size may not equal 2799 because of missing data.
§Confidence interval.

school about the harmful health effects of smoking and among those who did not receive such instruction (POR=1.0; 95% CI=0.9–1.1).

Among current smokers, during the preceding 30 days, 17.3% smoked ≥11 cigarettes daily, 38.0% smoked daily, and approximately half (51.0%) smoked on school property on at least 1 day (Table 2). Approximately 60% of current smokers smoked a variety of brands of cigarettes. Current smokers reported that the brands they most frequently smoked were Hungarian brands (Multifilter [57%] and Sopianae [33%]) and a U.S. brand (Marlboro [41%]).

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Editorial Note: The findings of the survey described in this report indicate that in 1995, a substantial proportion (35%) of secondary school students in Budapest reported smoking cigarettes. This prevalence is identical to that among U.S. students in grades 9–12 during 1995 (2); however, the findings for the United States reflected a national sample of persons who resided in urban and rural areas, and the findings for Hungary reflected a sample of persons who resided in one large urban area. The prevalence of smoking in Budapest increased directly with age and was 48% among 18-year-old students. Worldwide, about half of persons who initiate smoking during their teenage years and continue to smoke cigarettes regularly will die as a result of a tobacco-

TABLE 2. Number and percentage of secondary school students aged 14–18 years who were current smokers*, by selected characteristics — Budapest, Hungary, 1995[†]

Characteristic	Current smokers		
	No.[§]	(%)	(95% CI[¶])
No. cigarettes smoked per day			
1	223	(23.3)	(20.3%–26.2%)
2–10	569	(59.4)	(57.3%–61.5%)
≥11	166	(17.3)	(14.1%–20.5%)
No. days used			
1– 2	201	(20.4)	(17.3%–23.5%)
3– 9	148	(15.0)	(12.1%–17.9%)
10–29	263	(26.6)	(23.2%–30.1%)
30	375	(38.0)	(34.7%–41.3%)
No. days used on school property			
0	469	(49.0)	(42.6%–55.3%)
1– 2	98	(10.2)	(7.5%–13.0%)
3– 9	109	(11.4)	(8.6%–14.2%)
≥10	282	(29.4)	(24.7%–34.2%)

*Defined as students who reported having smoked at least one cigarette during the preceding 30 days.
[†] n=987.
[§] For each characteristic, the sample size does not equal 987 because of missing data.
[¶] Confidence interval.

related disease (*4*). The death rates for diseases attributable to smoking are higher in Hungary than in most other developed countries (*4,5*).

A survey of the prevalence of smoking among adolescents in European countries during 1993–1994 indicated that among five countries in central and eastern regions (Czech Republic, Hungary, Republic of Poland, Russian Federation, and Slovak Republic), approximately 10% of adolescents reported smoking cigarettes at least weekly. However, the overall prevalence of cigarette smoking for all age groups in Hungary is among the highest of all countries in central and eastern Europe. Each year from 1976 through 1990, annual average per capita cigarette consumption in Hungary was higher than the combined average for all central and eastern European countries (*5*).

The finding that most current smokers varied the brand of cigarette they smoked may reflect the ease with which students can purchase individual cigarettes at newsstands and other stores in Hungary. Students may vary the brand of cigarette they smoke based on the availability and cost of individual cigarettes. In general, in Budapest, imported western brand-name cigarettes are more expensive than central and eastern European brand-name cigarettes.

To decrease the initiation and prevalence of smoking in Hungary, health officials are developing a population-based tobacco education campaign that will include a pre- and postintervention smoking prevalence survey to evaluate the impact of the program. In addition, a pilot intervention project is being planned in a large city (Szekesfehérvár) to decrease exposure to passive smoke (environmental tobacco

smoke); this project will include both a general media campaign and a program to educate kindergarten children and their parents about the hazards of passive and active smoking. Public health officials in Budapest also have recommended that teachers who smoke do so in restricted areas that are out of sight of students.

Although cigarette advertising that actively promotes the purchase of cigarettes is prohibited in Hungary, such advertising is common in many public locations, including sports arenas, large city squares, housing complexes, and busy traffic intersections. Public health officials also have recommended stronger enforcement of the ban on cigarette advertising (E. Morava, Hungarian Ministry of Welfare, personal communication, 1996).

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Tobacco Use and Usual Source of Cigarettes
Among High School Students — United States, 1995

Approximately 90% of all initiation of tobacco use occurs among persons aged ≤18 years, and the prevalence of tobacco use among adolescents is increasing (*1,2*). Despite laws prohibiting the sale of tobacco to minors in all states and the District of Columbia, most minors are able to purchase tobacco products (*1,3*). To determine current prevalences of the use of cigarettes and smokeless tobacco products (i.e., chewing tobacco and snuff) by high school students, the usual source of cigarettes among those who smoked, and the percentage of students who were asked to show proof of age when buying cigarettes, CDC analyzed data from the 1995 Youth Risk Behavior Survey (YRBS). This report summarizes the results of the analysis, which indicate a higher prevalence of smoking among high school students in 1995 than in 1993 and 1991, a doubling of the prevalence of current smoking among non-Hispanic black male students during 1991–1995, and that most high school students aged ≤17 years who buy cigarettes from stores are not asked to show proof of age.

YRBS, a component of CDC's Youth Risk Behavior Surveillance System (*4*), biennially measures the prevalence of priority health-risk behaviors among youth through representative national, state, and local surveys. The 1995 national YRBS used a three-stage sample design to obtain a representative sample of 10,904 students in grades 9–12 in the 50 states and the District of Columbia. The school-response rate was 70%, and the student-response rate was 86%. Data were weighted to provide national estimates, and SUDAAN was used to calculate standard errors for determining 95% confidence intervals.

Students completed a self-administered questionnaire about the number of days during the 30 days preceding the survey they had smoked cigarettes or used smokeless tobacco. Current cigarette and smokeless tobacco users were defined as students who reported product use on ≥1 of the 30 days preceding the survey. Frequent cigarette users were defined as students who reported cigarette use on ≥20 of the 30 days preceding the survey. Students also were asked "During the past 30 days, how did you usually get your own cigarettes?" and "When you bought cigarettes in a store during the past 30 days, were you ever asked to show proof of age?" Data were presented only for blacks, whites, and Hispanics because numbers for other racial/ethnic groups were too small for meaningful analysis.

Prevalence of Cigarette Use

The overall prevalences of current cigarette use and frequent cigarette use were 34.8% and 16.1%, respectively. The prevalence of current cigarette use was higher among non-Hispanic white (38.3%) and Hispanic students (34.0%) than among non-Hispanic black students (19.2%) (Table 1). Among non-Hispanic black students, males were more than twice as likely (27.8%) to be current smokers than were females (12.2%). The prevalence of current smoking was higher among students in grade 12 (38.2%) than in grade 9 (31.2%). Frequent cigarette smoking was more common among non-Hispanic white students (19.5%) than among non-Hispanic black (4.5%) or Hispanic students (10.0%); however, non-Hispanic black male students were approximately six times more likely (8.5%) than non-Hispanic black female students (1.3%) to be frequent smokers.

Prevalence of Smokeless Tobacco Use

The overall prevalence of current smokeless tobacco use was 11.4% (Table 1). The prevalence of current smokeless tobacco use was higher among male students (19.7%) than among female students (2.4%) and among non-Hispanic white students (14.5%) than non-Hispanic black (2.2%) or Hispanic students (4.4%). Non-Hispanic white male students were more likely (25.1%) than any other subgroup to report smokeless tobacco use.

Usual Source of Cigarettes

Among students aged ≤17 years in grades 9–12 who were current smokers, 38.7% reported that they usually bought cigarettes in a store and 2.2%, from vending machines (Table 2). One third (32.9%) reported that they usually borrowed cigarettes from someone else; 15.8%, that they usually gave "someone else money to buy them for me"; and 4.2%, that they usually stole cigarettes during the 30 days preceding the survey. Non-Hispanic white students were more likely (41.3%) than non-Hispanic

TABLE 1. Percentage of high school students who used cigarettes or smokeless tobacco, by sex, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 1995*

| | Cigarette use | | | | Current smokeless tobacco use¶ | |
| | Current† | | Frequent§ | | | |
Category	%	(95% CI**)	%	(95% CI)	%	(95% CI)
Sex						
Female	34.3	(±3.1%)	15.9	(±3.0%)	2.4	(±1.3%)
Male	35.4	(±2.4%)	16.3	(±2.8%)	19.7	(±2.5%)
Race/Ethnicity††						
White, non-Hispanic	38.3	(±2.6%)	19.5	(±3.5%)	14.5	(±1.7%)
Female	39.8	(±3.2%)	20.8	(±3.8%)	2.5	(±1.1%)
Male	37.0	(±3.3%)	18.4	(±3.7%)	25.1	(±3.0%)
Black, non-Hispanic	19.2	(±3.0%)	4.5	(±1.8%)	2.2	(±1.0%)
Female	12.2	(±3.0%)	1.3	(±0.7%)	1.1	(±1.2%)
Male	27.8	(±5.6%)	8.5	(±3.4%)	3.5	(±1.4%)
Hispanic	34.0	(±5.2%)	10.0	(±3.3%)	4.4	(±1.8%)
Female	32.9	(±5.8%)	9.3	(±4.0%)	3.1	(±3.3%)
Male	34.9	(±8.2%)	10.7	(±4.2%)	5.8	(±2.4%)
Grade						
9	31.2	(±1.7%)	9.6	(±2.7%)	11.2	(±1.7%)
10	33.1	(±3.8%)	13.3	(±3.0%)	9.6	(±2.2%)
11	35.8	(±3.6%)	19.2	(±3.1%)	13.0	(±2.7%)
12	38.2	(±3.5%)	20.9	(±4.0%)	11.2	(±2.8%)
Total	**34.8**	**(±2.2%)**	**16.1**	**(±2.6%)**	**11.4**	**(±1.7%)**

*Sample sizes: 10,473 for current or frequent cigarette use and 10,772 for current smokeless tobacco use. Sample sizes differ because of missing data.
†Smoked cigarettes on ≥1 of the 30 days preceding the survey.
§Smoked cigarettes on ≥20 of the 30 days preceding the survey.
¶Used smokeless tobacco on ≥1 of the 30 days preceding the survey.
**Confidence interval.
††Numbers for other racial/ethnic groups were too small for meaningful analysis.

TABLE 2. Percentage distribution of usual source of cigarettes during the 30 days preceding the survey and percentage asked for proof of age when buying cigarettes in a store, among high school students aged ≤17 years who currently smoked cigarettes*, by sex, race/ethnicity, grade, and frequency of cigarette smoking — United States, Youth Risk Behavior Survey, 1995

Category	Bought in a store†		Bought in a vending machine		Gave someone else money to buy		Borrowed from someone		Stole		Obtained some other way		Not asked to show proof of age when buying§	
	%	(95% CI¶)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Sex														
Female	36.5	(±5.3%)	0.9	(±0.5%)	21.9	(±5.3%)	31.7	(± 3.6%)	1.8	(±1.3%)	7.1	(±2.1%)	81.0	(±5.5%)
Male	40.8	(±5.5%)	3.4	(±1.5%)	10.1	(±2.5%)	33.9	(± 5.8%)	6.4	(±2.1%)	5.4	(±1.3%)	74.7	(±4.1%)
Race/Ethnicity**														
White, non-Hispanic	41.3	(±5.7%)	1.8	(±0.8%)	17.8	(±4.6%)	31.5	(± 5.3%)	3.7	(±1.6%)	3.8	(±1.2%)	76.5	(±5.1%)
Black, non-Hispanic	27.2	(±7.6%)	6.1	(±4.4%)	7.3	(±5.7%)	41.0	(±10.1%)	7.9	(±3.9%)	10.4	(±3.9%)	86.0	(±6.6%)
Hispanic	32.6	(±6.3%)	2.1	(±1.4%)	11.7	(±4.9%)	33.1	(± 6.5%)	5.1	(±2.3%)	15.4	(±3.8%)	79.7	(±8.1%)
Grade														
9	22.2	(±5.1%)	3.9	(±2.2%)	16.2	(±4.5%)	43.0	(± 7.7%)	6.5	(±2.5%)	8.2	(±2.9%)	83.2	(±7.3%)
10	34.6	(±6.3%)	2.0	(±1.5%)	19.4	(±4.3%)	32.9	(± 5.7%)	3.3	(±2.0%)	7.8	(±2.6%)	75.3	(±5.5%)
11	50.8	(±6.5%)	1.6	(±1.2%)	13.2	(±4.5%)	27.2	(± 4.5%)	3.1	(±2.1%)	4.0	(±2.0%)	76.1	(±3.4%)
12	50.4	(±7.0%)	1.0	(±1.7%)	13.3	(±7.8%)	26.9	(± 6.7%)	4.1	(±3.2%)	4.4	(±4.2%)	77.9	(±9.7%)
Frequency of cigarette smoking††														
1– 5	15.9	(±3.4%)	1.9	(±1.4%)	6.6	(±3.4%)	63.1	(± 5.3%)	3.1	(±2.3%)	9.4	(±3.0%)	88.2	(±6.7%)
6–19	35.2	(±5.5%)	1.6	(±0.8%)	19.9	(±4.7%)	34.8	(± 4.6%)	2.3	(±1.7%)	6.3	(±2.9%)	81.9	(±6.9%)
≥20	60.9	(±7.8%)	2.4	(±1.5%)	21.9	(±6.8%)	6.6	(± 2.0%)	5.1	(±2.0%)	3.2	(±2.0%)	71.1	(±5.6%)
Total	**38.7**	**(±4.6%)**	**2.2**	**(±0.9%)**	**15.8**	**(±3.6%)**	**32.9**	**(± 4.0%)**	**4.2**	**(±1.4%)**	**6.2**	**(±1.6%)**	**77.5**	**(±4.0%)**

* Smoked cigarettes on ≥1 of the 30 days preceding the survey (n=2989).
† Convenience store, supermarket, or gas station.
§ Among students who ever bought cigarettes in a store during the 30 days preceding the survey (n=1904).
¶ Confidence interval.
** Numbers for other racial/ethnic groups were too small for meaningful analysis.
†† Number of days of the 30 days preceding the survey on which cigarettes were smoked.

black students (27.2%) to report usually obtaining cigarettes by buying them in stores. Students in grades 11 and 12 were more likely (50.8% and 50.4%, respectively) to usually buy cigarettes in stores than were students in grades 9 and 10 (22.2% and 34.6%, respectively), and students who smoked on ≥20 of the 30 days preceding the survey were more likely (60.9%) to usually buy cigarettes in stores than were students who smoked on 1–5 days (15.9%) or 6–19 days (35.2%) of the 30 days preceding the survey.

Male students were more likely than female students to report usually buying cigarettes from a vending machine (3.4% and 0.9%, respectively). Female students were more likely (21.9%) to obtain cigarettes by giving someone else money to buy them than were male students (10.1%), non-Hispanic white students more likely (17.8%) than non-Hispanic black students (7.3%), and students who smoked on ≥20 of the 30 days preceding the survey more likely (21.9%) than students who smoked on 1–5 of the 30 days preceding the survey (6.6%).

Students in grade 9 were more likely (43.0%) to report borrowing as their usual source of cigarettes than were students in grades 11 or 12 (27.2% and 26.9%, respectively), and students who smoked on 1–5 of the 30 days preceding the survey were more likely (63.1%) to report borrowing than were students who smoked on ≥20 of the 30 days preceding the survey (6.6%). Male students were more likely (6.4%) to report stealing as a usual source of cigarettes than were female students (1.8%).

Among students aged ≤17 years who were current smokers, 77.5% reported never being asked for proof of age when buying cigarettes in a store during the 30 days preceding the survey.

Reported by: Office on Smoking and Health, and Div of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report extend findings of a previous report (2) and indicate that current cigarette smoking among students in grades 9–12 increased from 27.5% in 1991 (1) to 30.5% in 1993 (4) to 34.8% in 1995. In addition, the prevalence of current smoking among non-Hispanic black male students nearly doubled from 1991 (14.1%) (1) to 1995 (27.8%), but among non-Hispanic black female students remained stable (11.3% in 1991 [1] and 12.2% in 1995). Although reasons for differences in the prevalence of smoking among non-Hispanic black males and females are unknown, CDC is funding research activities to help explain these differences.

Differences in the prevalence of tobacco use and sources of cigarettes among racial/ethnic groups underscore the need to assess potential contributing factors such as attitudes of minors, parents, and vendors; enforcement of laws; community norms; marketing practices; and mass media exposure. For example, the finding in this report that non-Hispanic white high school students are more likely to smoke than non-Hispanic black students may be associated with several factors: black youth are less concerned than white youth about the potential weight-controlling effects of cigarette smoking; black parents may be more likely than white parents to advise their children not to smoke; and black community leaders may have responded to the targeting of their communities by tobacco marketing efforts with counter-messages and activities (5).

These YRBS findings also are consistent with previous documentation of the sources of the cigarettes obtained by minors and the high percentage of minors who have not been asked for proof of age when purchasing cigarettes (1,3,6,7; CDC, unpublished data, 1995). The low proportion of current smokers who usually obtained

cigarettes from vending machines may have reflected the generally higher price of cigarettes sold from vending machines, the ease of purchase from over-the-counter sources, and the classification categories used in the questionnaire (*1,3,6*). Stealing has been reported previously as an important source of cigarettes for some minors (*1,6,7*) and is more common in stores that use industry-promoted self-service displays than in stores that use only behind-the-counter vendor-assisted displays (*6,7*; R. Kropp, North Bay Health Center, unpublished data, 1995; K.M. Cummings, personal communication, 1996; M. Caldwell, personal communication, 1996).

Vendors requiring proof of age is an important method of preventing tobacco sales to minors (*1,6,7*; CDC, unpublished data, 1994). However, in 1995, most (77.5%) students who were current smokers reported that they had not been asked to show proof of age when buying cigarettes during the 30 days preceding the survey.

All states have enacted laws to restrict the access to tobacco products by youth, and most adults support enforcement of these laws. However, enforcement of these laws varies by jurisdiction and, in general, needs to be strengthened (*8*). Federal law (i.e., Synar Amendment*) and implementing regulations require states to develop a strategy and a time frame for achieving an inspection failure rate of ≤20% (*9*).

In August 1995, the Food and Drug Administration (FDA) proposed regulations to reduce for minors both access to and the appeal of cigarettes and smokeless tobacco products (*10*). The FDA is reviewing public comments on the proposed regulations, which would 1) require retailers to verify the age of persons who want to purchase cigarettes or smokeless tobacco products; 2) eliminate "impersonal" methods of sale and distribution that do not readily allow age verifications (e.g., mail orders, self-service displays, free samples, and vending machines); 3) limit advertising in publications with substantial youth readership to a text-only format; 4) ban outdoor advertising of tobacco products within 1000 feet of schools and playgrounds and limit remaining outdoor advertising to a text-only format; 5) prohibit the sale or distribution of all brand-identifiable nontobacco items and services; 6) prohibit the sponsorship of all events using tobacco brand names; and 7) establish an industry-funded education campaign.

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Trends in Smoking Initiation Among Adolescents and Young Adults — United States, 1980–1989

The evaluation of efforts to prevent tobacco use among adolescents requires accurate surveillance of both smoking prevalence and smoking initiation rates. Although several surveillance systems provide timely data about adolescent smoking prevalence (*1*), data characterizing rates of smoking initiation among adolescents have been limited. To improve characterization of trends in smoking initiation among young persons, data from the Tobacco Use Supplement of the 1992 and 1993 Current Population Surveys (CPS) (*2*) were used to estimate smoking initiation rates for persons who were adolescents (aged 14–17 years) or young adults (aged 18–21 years) during 1980–1989. This report summarizes the results of that analysis.

The CPS are monthly surveys of the U.S. civilian, noninstitutionalized population aged ≥15 years (*2*). Approximately 56,000 households are surveyed each month; one household respondent provides information about all household members aged ≥15 years. Questions about tobacco use were added to the September 1992, January 1993, and May 1993 monthly surveys. The response rates for the three surveys were 84.7%, 84.9%, and 82.0%, respectively (N=293,543 household members). To minimize biases that could result from discrepancies between self reports and proxy reports of smoking behavior (*3*), this analysis used data from self-respondents only (82% of total sample). Ever smokers were defined as respondents who answered "yes" to the question, "Have you smoked at least 100 cigarettes in your entire life?" Ever smokers were asked, "How old were you when you started smoking cigarettes fairly regularly?" To restrict the analysis to persons who were adolescents or young adults for some period during 1980–1989, only respondents aged 17–34 years at interview were included. The final sample consisted of 71,321 persons, of whom 27,768 (38.9%) were ever smokers.

Using the age of respondents at the time of the interview and the age they reported starting smoking, the age of respondents and their smoking status were calculated for each year during the 1980s. The denominator for the initiation rate for a given year was the number of respondents at risk for initiating smoking during that year (persons already smoking were eliminated from the denominator for that year). The numerator was the number of respondents who reported initiating smoking during that year. Data were weighted by age, sex, and race/ethnicity to provide national estimates.

Among adolescents, the smoking initiation rate decreased slightly from 1980 (5.4%) through 1984 (4.7%) and then increased through 1989 (5.5%); the largest annual increase occurred in 1988 (Figure 1). In comparison, among young adults, initiation rates decreased throughout the 1980s (Figure 1). For both age groups, initiation rates and trends were similar for males and females.

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Editorial Note: The findings in this report indicate an increase in the rate of initiation of cigarette smoking among adolescents from 1985 through 1989, a period during which the rate among young adults declined and overall prevalence of smoking among adults decreased steadily (*4*). One important consequence of the increased rate of initiation among adolescents will be the increased future burden of tobacco-related disease. In particular, because of the increase in initiation since 1984,

an additional 600,000 adolescents began to smoke during 1985–1989.* Of those adolescents who continue to smoke regularly, approximately 50% will die from smoking-attributable disease (5).

Potential reasons for an increase in smoking initiation rates among adolescents include a decreased real price of cigarettes, increased levels of disposable income, increased acceptability of smoking, and intensified cigarette marketing (1). However, because the real price of cigarettes increased steadily during 1985–1989 and the real average weekly income among high school seniors remained stable during this period, cigarettes were less affordable to young persons (1,6) (Table 1). In addition, the acceptability of smoking among high school seniors did not increase: during this period there were increases in the percentages of high school seniors who believed cigarettes are harmful, smoking is a "dirty habit," and becoming a smoker reflects poor judgment, and who reported they "mind being around people who are smoking" and would prefer to date nonsmokers (1).

The increase in rates of smoking initiation among adolescents during 1985–1989 may reflect increased real expenditures for cigarette advertising and promotion. The increase in rates occurred during a period when real expenditures for total cigarette advertising and promotion† doubled, and expenditures for cigarette promotion more

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*Based on the assumption that the initiation rate during 1985–1989 remained stable at the 1984 rate, and by multiplying the Bureau of the Census population estimates for persons aged 14–17 years for each year from 1985 through 1989 by the difference between the adolescent smoking initiation rate in 1984 and the rate for each year.

†Based on data from the Federal Trade Commission (7), advertising expenditures include costs to advertise outdoors (e.g., billboards), in newspapers or magazines, and on transportation (e.g., buses); promotional expenditures include costs of promotional allowances, distribution of samples or specialty items (e.g., key chains, lighters, T-shirts, caps, and calendars), public entertainment, direct mail, coupons, retail value-added promotions (e.g., specialty items distributed at the point of sale), and point-of-sale promotions (e.g., store displays).

FIGURE 1. Smoking initiation rate among adolescents and young adults,* by year — United States, 1980–1989
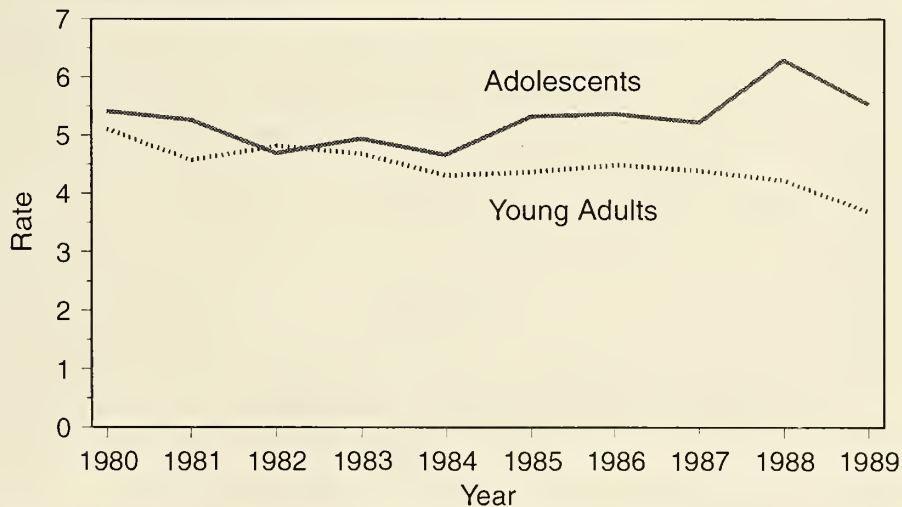
*Per 100 adolescents (aged 14–17 years) or young adults (aged 18–21 years).

than quadrupled (*7*) (Figure 2): from 1980 to 1989, total annual advertising and promotional expenditures (in 1993 dollars) increased from $2.1 billion to $4.2 billion, while promotional expenditures alone increased from $771 million (37% of total expenditures) to $3.2 billion (76%) (Figure 2). Promotional efforts have been highly effective among adolescents. For example, among persons aged 12–17 years in 1992,

TABLE 1. Real* cigarette price per pack, real weekly income of high school seniors, and real price per pack as a percentage of real weekly income among high school seniors — United States, 1980–1989

Year	Real average cigarette price per pack (cents)[†]	Real average weekly income (dollars)[§]	Real price of cigarette pack as percentage of real weekly income
1980	72.8	NA[¶]	NA
1981	69.3	NA	NA
1982	72.2	52.83	1.4
1983	82.2	51.26	1.6
1984	91.1	52.00	1.7
1985	90.9	51.84	1.7
1986	95.3	53.63	1.8
1987	96.8	55.15	1.8
1988	103.3	53.53	1.9
1989	102.8	53.13	1.9

*Real prices and incomes were obtained by dividing the actual prices and incomes by the National Consumer Price Index, using the average of 1982–1984 as the reference.
[†]Source: The Tobacco Institute.
[§]Source: CDC.
[¶]Not available.

FIGURE 2. Cigarette advertising and promotional expenditures* — United States, 1980–1989
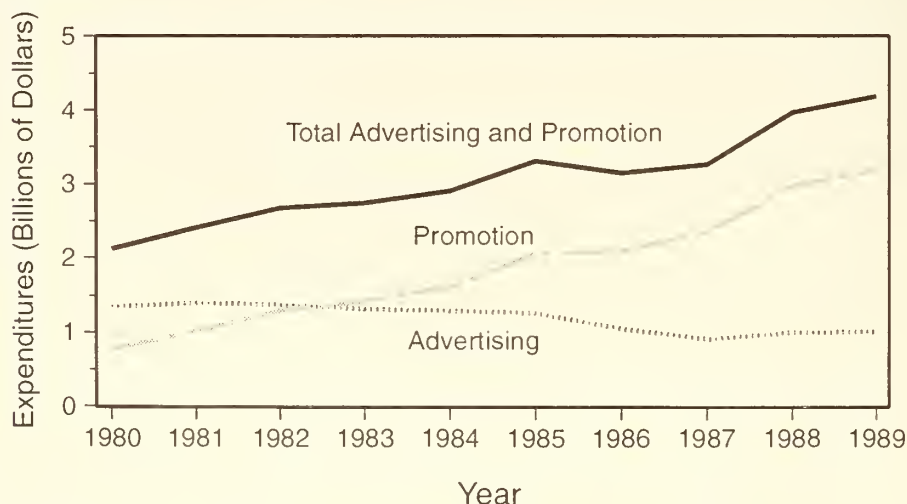
*Expenditures were converted to 1993 dollars, using the Consumer Price Index.
Source: Federal Trade Commission.

approximately 50% of smokers and 25% of nonsmokers reported having received pro-motional items from tobacco companies (*1*).

An association between overall cigarette marketing expenditures and initiation rates for smoking among adolescents is plausible for at least four reasons. First, brand loyalty is usually established with the first cigarette smoked (*8*); therefore, ciga-rette companies have an economic incentive to encourage first-time smokers to smoke their brands. Second, adolescents are exposed to cigarette advertising and promotions that employ themes and images that appeal to young persons (*1*). Third, advertising directly influences brand awareness and attitudes toward smoking among adolescents (*1*). Specifically, adolescents smoke the most heavily advertised brands, and changes in brand preferences among young persons are associated with changes in brand-specific advertising expenditures (*9*). For example, the Joe Camel campaign introduced nationally in 1988 was associated with an increase in the market share of that specific brand among adolescents (*1,9*). Finally, consumer research suggests that younger persons (i.e., aged 14–17 years) aspire to be young adults (*10*); therefore, advertising and promotional efforts targeted toward young adults may have greater appeal to adolescents because of their age aspirations.

Although current estimates of smoking initiation rates among adolescents are not available, from 1991 through 1993, the national prevalence of smoking increased among eighth- and 10th-grade students (*6*). To reverse the trend of increasing smok-ing initiation rates among adolescents and to achieve the national health objective for the year 2000 of reducing the initiation of cigarette smoking by youth (no more than 15% should become regular smokers by age 20) (objective 3.5) (*4*), prevention efforts that focus on young persons should be intensified. Such efforts could include making cigarettes less affordable by either increasing their real price (*1*) or by limiting sales to cartons rather than individual packs, enforcing laws prohibiting the sale and distribu-tion of cigarettes to young persons (*4*), conducting mass media campaigns to discourage tobacco use (*1*), and eliminating or severely restricting all forms of to-bacco product advertising and promotion to which young persons are likely to be exposed (*4*).

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Reasons for Tobacco Use
and Symptoms of Nicotine Withdrawal Among Adolescent
and Young Adult Tobacco Users — United States, 1993

Cigarettes and other forms of tobacco are addictive because of the presence of nicotine (1). Among adults in the United States who have ever smoked daily, 91.3% tried their first cigarette and 77.0% became daily smokers before age 20 years (2). Among high school seniors who had ever tried smokeless tobacco (SLT), 73% did so by the ninth grade (2). To further characterize the development of nicotine addiction among persons aged 10–22 years, CDC analyzed data from the 1993 Teenage Attitudes and Practices Survey (TAPS-II). This report summarizes the results of that analysis and focuses on assessments of reasons for using tobacco and symptoms of nicotine withdrawal.

For TAPS-II, data about knowledge, attitudes, and practices of tobacco use were collected by telephone interviews; persons who could not be contacted by telephone were contacted in person. The TAPS-II sample for this analysis had two components: 1) of the 9135 respondents (aged 12–18 years) to the 1989 TAPS telephone interview*, 7960 (87.1%) participated in TAPS-II (these respondents were aged 15–22 years); and 2) an additional 4992 persons from a new probability sample of 5590 persons aged 10–15 years (89.3% response rate) participated in TAPS-II. Data were weighted to provide national estimates, and 95% confidence intervals (CIs) were calculated using SUDAAN (3).

Persons who had smoked cigarettes (n=2121) or who had used SLT (n=470) during the 30 days preceding the survey were asked if they used tobacco because "it relaxes or calms me" and if they used it because "it's really hard to quit" (either answer indicates an influence of the psychopharmacologic properties of nicotine [1]). Smokers who had tried to quit and persons who had quit smoking (n=1925)† were asked, "When you quit/tried to quit did you feel a strong need or urge to have a cigarette; feel more irritable; find it hard to concentrate; feel restless; feel hungry more often; feel sad, blue, or depressed?" SLT users who had tried to quit and persons who had discontinued use (n=1216) were asked similar questions adapted to SLT use.

Lifetime history of tobacco use was assessed through three categories for cigarette smoking (20 or fewer cigarettes smoked during lifetime, 21–98 cigarettes smoked, and 100 or more cigarettes smoked) and with two categories for SLT use (never used regularly versus ever used regularly). Frequency of use was measured by the number of days on which cigarettes were smoked or SLT was used during the preceding month (0, 1–14, 15–29, or 30 days). Intensity of use was measured by the average number of cigarettes smoked per day during the preceding 7 days (five or fewer, 6–15, or 16 or more) and by the number of times SLT was used on the days it was used (1–2, or three or more).

For persons who had smoked during the preceding 30 days and for those who had used SLT during the preceding 30 days, the frequency of reporting that tobacco was used because it is relaxing or because it is hard to quit increased in relation to increasing lifetime use, frequency of use, and intensity of use (Table 1); this pattern

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*TAPS respondents who completed the survey by mail questionnaire were not eligible for TAPS-II. TAPS-II included household interviews of persons who did not respond by telephone.
†Persons who reported that they had never smoked regularly were excluded from these analyses.

TABLE 1. Prevalence of selected reasons for using cigarettes and smokeless tobacco, by age group and use history — United States, Teenage Attitudes and Practices Survey, 1993

| | "It relaxes or calms me" | | | | | | "It's really hard to quit" | | | | | |
| | 10–18 yrs | | 19–22 yrs | | 10–22 yrs | | 10–18 yrs | | 19–22 yrs | | 10–22 yrs | |
Tobacco product/Use history	%	(95% CI*)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Cigarettes												
Lifetime use†												
≤ 20 cigarettes	30.5	(± 7.5)	18.1	(±10.0)	26.9	(± 6.1)	8.2	(± 4.7)	3.8	(± 6.1)	7.0	(±3.8)
21–98 cigarettes	48.7	(± 9.1)	39.5	(± 9.8)	45.0	(± 6.8)	21.1	(± 7.3)	10.4	(± 6.0)	16.7	(±5.2)
≥100 cigarettes	66.8	(± 3.4)	69.2	(± 3.0)	68.1	(± 2.2)	63.1	(± 4.1)	64.8	(± 3.3)	64.1	(±2.7)
Frequency of use§												
1–14 days	40.6	(± 5.0)	37.8	(± 5.7)	39.4	(± 3.8)	17.7	(± 4.0)	18.3	(± 4.8)	18.0	(±3.2)
15–29 days	60.8	(± 7.2)	75.7	(± 6.6)	68.2	(± 5.0)	50.5	(± 7.8)	56.2	(± 8.2)	53.4	(±5.5)
30 days	73.3	(± 4.2)	72.4	(± 3.7)	72.8	(± 2.8)	74.3	(± 4.4)	73.5	(± 3.3)	73.8	(±2.7)
Intensity of use¶												
≤ 5 cigarettes	57.3	(± 5.1)	61.5	(± 5.7)	59.1	(± 3.8)	39.6	(± 5.4)	34.6	(± 6.2)	37.4	(±4.1)
6–15 cigarettes	69.7	(± 5.8)	74.4	(± 4.8)	72.4	(± 3.8)	72.4	(± 5.9)	73.4	(± 4.6)	73.0	(±3.7)
≥16 cigarettes	75.4	(± 7.0)	71.1	(± 5.9)	72.5	(± 4.4)	82.6	(± 6.8)	78.8	(± 4.8)	80.1	(±3.9)
Smokeless tobacco												
Lifetime use**												
Never regular user	10.5	(± 6.2)	19.3	(±12.8)	13.8	(± 6.0)	5.0	(± 4.2)	1.7	(± 2.5)	3.8	(±2.9)
Ever regular user	43.2	(± 8.7)	55.1	(± 7.3)	49.7	(± 6.0)	47.5	(± 8.7)	54.2	(± 8.1)	51.2	(±5.2)
Frequency of use††												
1–14 days	17.7	(± 6.8)	33.4	(±10.1)	24.5	(± 5.6)	10.0	(± 5.4)	12.9	(± 6.0)	11.2	(±4.0)
15–29 days	41.5	(±15.7)	56.6	(±15.2)	48.5	(±11.7)	31.9	(±14.3)	38.5	(±13.2)	35.0	(±9.6)
30 days	49.4	(±13.4)	56.8	(± 9.4)	53.8	(± 8.7)	74.4	(± 9.6)	74.0	(± 9.2)	74.2	(±6.5)
Intensity§§												
1–2 times	22.3	(± 7.0)	39.2	(± 9.3)	29.4	(± 5.9)	13.3	(± 5.8)	15.3	(± 6.9)	14.1	(±4.1)
≥3 times	43.1	(±11.0)	52.9	(± 8.8)	48.6	(± 7.5)	56.7	(±10.3)	61.9	(± 9.3)	59.7	(±6.3)

* Confidence interval.
† Lifetime number of cigarettes smoked. Sample sizes (n=2042–2047) are for persons aged 10–22 years. Sample sizes for the 10–18-year category and the 19–22-year category are approximately half of the total sample size. Sample sizes vary because of variation in missing values for each item.
§ Days smoked during preceding 30 days; n=2072–2079.
¶ Cigarettes smoked per day. Samples (n=1634–1637) exclude persons who smoked during the preceding 30 days but not during the preceding 7 days.
** Based on responses to the questions, "Are you now a regular user of chewing tobacco or snuff?" and "Was there ever a time when you considered yourself to be a regular user of chewing tobacco or snuff?"; n=458–467.
†† Days used during preceding 30 days; n=457–466.
§§ Times used per day; n=452–460.

characterized the overall sample and persons in both age categories (10–18 years and 19–22 years). The percentages of persons who reported smoking cigarettes or using SLT for these two reasons also were similar across age groups. Among smokers and SLT users with the greatest lifetime use or intensity of use, the proportions who reported using tobacco to relax were similar to those who reported using it because it was hard to quit. Among those with the lowest lifetime use or frequency or intensity of use, relaxation was more commonly cited as a reason for use than was difficulty quitting. For every category of usage frequency, cigarette smokers were more likely to report use for relaxation than were SLT users. Regardless of age, approximately three fourths of daily cigarette smokers (73.8%) and daily SLT users (74.2%) reported that one of the reasons they used tobacco was because it was hard to quit.

The likelihood of reporting symptoms of nicotine withdrawal increased in relation to frequency (Table 2) and intensity (Figure 1) of use. Younger and older smokers were equally likely to report increasing nicotine withdrawal symptoms as exposure to nicotine increased (Table 2). The same pattern characterized SLT users among both age groups combined (group-specific analyses are not presented because of limitations in sample sizes of persons who used SLT during the preceding 30 days). Among persons aged 10–22 years, those who smoked cigarettes and those who used SLT on a daily basis were equally likely to report symptoms of nicotine withdrawal (with the exception of depression, which was less prevalent among SLT users). Among persons who reported using tobacco on 1–14 days during the preceding 30 days, those who smoked cigarettes were generally more likely to report symptoms of nicotine withdrawal than were persons who used SLT. At least one symptom of nicotine withdrawal was reported by 92.4% of daily cigarette smokers and 93.3% of daily SLT users who had previously tried to quit. Persons who smoked six or more cigarettes per day were more likely than those who smoked five or fewer cigarettes per day to report difficulty concentrating, feeling more irritable, and craving cigarettes during a previous quit attempt; however, among persons who smoked five or fewer cigarettes per day, 28.7% reported difficulty concentrating; 47.5%, feeling more irritable; and 56.9%, craving cigarettes during a previous quit attempt (Figure 1).

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Editorial Note: This analysis of TAPS-II underscores the relation between use of tobacco and reasons for using tobacco—a relation that reflects the psychopharmocologic properties of nicotine. In addition, the frequency of smoking and of using SLT strongly correlated with self-reported symptoms of nicotine withdrawal. These findings are consistent with previous studies that indicated high prevalences of symptoms of nicotine addiction among adolescent and adult smokers (2,4,5).

Previous reports indicate that adolescents initially tried cigarettes for reasons related to social norms, advertising, social pressure, and curiosity (2,6). However, once the behavior becomes established, regular smokers are more likely than beginning smokers to report that they smoke for pleasure and because they are addicted (2,6). Among students who were high school seniors during 1976–1986, a total of 44% of daily smokers believed that in 5 years they would not be smoking; however, follow-up indicated that 5–6 years later, 73% of these persons remained daily smokers (2). This finding suggests that many of these persons could not overcome the social,

TABLE 2. Percentage of cigarette smokers and smokeless tobacco users who reported experiencing symptoms of nicotine withdrawal during previous attempts to discontinue use, by age group and frequency of use — United States, Teenage Attitudes and Practices Survey, 1993

Tobacco user/ Age group	Find it hard to concentrate		Feel hungry more often		Feel more irritable		Strong need/urge to smoke/chew		Feel restless		Feel sad, blue, or depressed		Any indicator	
	%	(95% CI*)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Cigarette smokers†														
Frequency§														
10–18 yrs (n=943–967)														
0	11.8	(± 3.3)	24.4	(± 4.9)	21.4	(± 4.1)	21.9	(± 4.7)	17.0	(± 4.2)	9.3	(±3.1)	44.4	(± 5.4)
1–14	22.8	(± 6.6)	35.4	(± 7.5)	36.5	(± 8.1)	36.3	(± 7.8)	30.3	(± 7.2)	17.9	(±6.0)	66.0	(± 7.6)
15–29	39.2	(± 9.5)	43.0	(± 9.6)	55.8	(± 9.4)	71.2	(± 8.7)	49.9	(± 9.9)	24.4	(±8.2)	88.1	(± 6.0)
30	46.1	(± 5.9)	49.0	(± 6.6)	77.0	(± 5.1)	81.6	(± 4.8)	62.6	(± 6.0)	28.6	(±5.6)	93.3	(± 3.3)
19–22 yrs (n=931–951)														
0	14.6	(± 3.9)	30.0	(± 5.3)	29.2	(± 4.9)	28.1	(± 4.9)	27.2	(± 4.8)	11.7	(±3.8)	50.0	(± 5.5)
1–14	16.9	(± 6.7)	40.5	(± 8.6)	32.5	(± 8.6)	43.8	(± 8.7)	32.2	(± 8.6)	11.5	(±5.4)	68.7	(± 8.2)
15–29	26.9	(± 9.5)	52.8	(±10.1)	49.9	(±11.0)	63.4	(±10.1)	54.6	(±10.6)	18.5	(±8.2)	86.0	(± 7.0)
30	47.3	(± 4.9)	50.5	(± 5.1)	70.9	(± 4.6)	78.1	(± 4.0)	60.8	(± 4.9)	23.1	(±4.3)	91.7	(± 2.8)
10–22 yrs (n=1880–1918)														
0	13.0	(± 2.3)	26.8	(± 3.7)	24.7	(± 3.2)	24.6	(± 3.4)	21.3	(± 3.2)	10.3	(±2.4)	46.8	(± 4.0)
1–14	20.5	(± 5.0)	37.4	(± 5.6)	35.0	(± 6.0)	39.2	(± 6.0)	31.0	(± 5.6)	15.4	(±4.2)	67.0	(± 5.7)
15–29	32.8	(± 6.6)	48.0	(± 7.2)	52.7	(± 7.5)	67.2	(± 6.9)	52.4	(± 7.6)	21.3	(±6.0)	87.0	(± 5.0)
30	46.8	(± 3.8)	49.9	(±10.9)	73.5	(± 3.2)	79.6	(± 3.0)	61.6	(± 3.8)	25.5	(±3.4)	92.4	(± 2.1)
Smokeless tobacco users														
Frequency¶														
10–22 yrs (n=1199–1213)														
0	5.4	(± 1.6)	7.7	(± 1.9)	8.0	(± 1.9)	8.5	(± 2.0)	6.0	(± 1.7)	3.3	(±1.2)	17.6	(± 2.9)
1–14	10.2	(± 5.3)	12.4	(± 6.4)	8.5	(± 5.1)	20.5	(± 7.6)	11.2	(± 5.4)	3.1	(±3.5)	35.4	(± 8.6)
15–29	23.9	(±11.7)	48.6	(±13.0)	47.1	(±13.7)	44.5	(±13.4)	34.8	(±12.7)	10.5	(±9.0)	72.6	(±12.3)
30	41.1	(±10.0)	38.9	(±10.9)	62.9	(± 9.6)	85.4	(± 7.0)	55.2	(±10.3)	9.0	(±6.4)	93.3	(± 4.2)

* Confidence interval.
† Excludes persons who voluntarily reported that they had never smoked regularly.
§ Days smoked during preceding 30 days. Sample sizes vary because of variation in missing values for each item.
¶ Days used during preceding 30 days. Sample sizes vary because of variation in missing values for each item.

FIGURE 1. Percentage of cigarette smokers* aged 10–22 years who reported experiencing difficulty concentrating, feeling more irritable, and craving cigarettes† during previous attempts to quit smoking, by mean number of cigarettes smoked per day — United States, Teenage Attitudes and Practices Survey, 1993
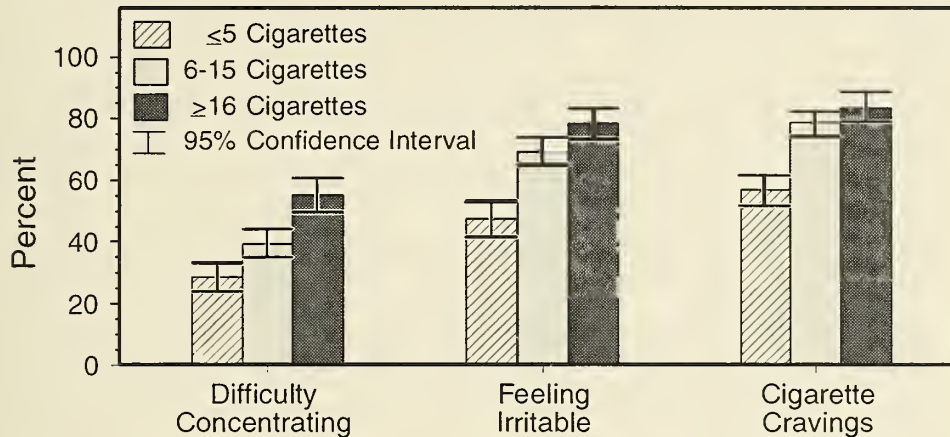
*Persons who smoked during the preceding 7 days.
†Feeling a strong need or urge to have a cigarette.

psychological, and chemical influences that maintain or advance the smoking behavior once it is established (*2*) and indicates that many adolescents do not understand the personal risks of smoking, including nicotine addiction (*7*).

The findings in this report are subject to at least two limitations. First, because of small sample sizes, the prevalence of SLT withdrawal symptoms could not be analyzed in relation to lifetime history of cigarette smoking; however, SLT users who tried to quit were probably less likely to experience symptoms of nicotine withdrawal if they concurrently smoked cigarettes (*1*). Second, the relation of nonpharmacologic (e.g., social and psychological) influences on tobacco use were not quantified; however, the findings are consistent with previous reports documenting the psychopharmacologic effects of nicotine on tobacco use and tobacco withdrawal (*1,2,4*).

In 1992, approximately two thirds of adolescent smokers reported that they wanted to quit smoking, and 70% indicated that they would not have started smoking if they could choose again (*8*). Most adults probably could be prevented from becoming tobacco users if they could be kept tobacco-free during adolescence (*2*). Four strategies that may assist in supporting tobacco-free adolescence include 1) strict enforcement of the prohibition of sales to minors (sales to persons aged <18 years are illegal in all 50 states), 2) reduction of advertising and promotion practices that stimulate demand, 3) increases in the real (i.e., inflation-adjusted) prices of tobacco products, and 4) school health education programs that are reinforced by media-based and other community programs (*2*).

The Institute of Medicine recently published recommendations for a comprehensive national strategy to prevent nicotine addiction among youth (*9*). These recommendations especially address tobacco-free policies; restrictions on tobacco

advertising and promotion; tobacco taxation; enforcement of youth access laws; regulation of the labeling, packaging, and contents of tobacco products; further research on nicotine addiction and on prevention and cessation programs; and the coordination of policies and research. Copies of this report can be purchased from National Academy Press, telephone (800) 624-6242 or (202) 334-3313.

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Tobacco, Alcohol, and Other Drug Use
Among High School Students — United States, 1991

In the United States, use of tobacco, alcohol, and other drugs is associated with the leading causes of morbidity and mortality (e.g., motor-vehicle crashes, homicide, suicide, and cancer [1]), with lower educational achievement, and with school dropout (2–5). This report presents self-reported data about the prevalence of tobacco, alcohol, marijuana, and cocaine use among students in grades 9–12 from two school-based components of the Youth Risk Behavior Surveillance System (6): 1) state and local Youth Risk Behavior Surveys (YRBSs) conducted by departments of education in 23 states and 10 cities during the spring of 1991 and 2) the national YRBS conducted during the same period.

The 33 state and local sites drew probability samples from well-defined sampling frames of schools and students in grades 9–12. Seventeen sites had adequate school- and student-response rates, which allowed computation of weighted results of known precision; 16 sites had overall response rates below 60% or unavailable documentation, which precluded making estimates of known precision. The national survey used a three-stage sample design to obtain a sample of 12,272 students representative of students in grades 9–12 in the 50 states and the District of Columbia.

For the state and local surveys, school-response rates ranged from 48% to 100%; student-response rates ranged from 44% to 96% (7). State and local sample sizes ranged from 369 to 5834 students. Students in most samples were distributed evenly across grades and between sexes. The racial/ethnic characteristics of the samples varied. The school-response rate for the national survey was 75%, and the student-response rate was 90%.

Students were asked whether they had used tobacco, alcohol, marijuana, or any form of cocaine during their lifetime and during the 30 days preceding the survey. Students also were asked whether they had used chewing tobacco or snuff during the 30 days preceding the survey, whether they had had five or more drinks of alcohol on one occasion during the 30 days preceding the survey (i.e., episodic heavy drinking), and whether they had taken steroid pills or steroid shots without a doctor's prescription during their lifetime.

Among the state and local surveys, cigarette smoking varied considerably (Table 1): 49%–82% of students (median: 71%) reported having tried cigarette smoking during their lifetime; 6%–31% of students (median: 24%) reported smoking at least one cigarette during the 30 days preceding the survey; and 2%–17% of students (median: 12%) reported frequent cigarette use* during the 30 days preceding the survey. Rates of lifetime, current, and frequent cigarette use were similar for male and female students in almost all sites.

Use of smokeless tobacco also varied among sites: 2%–20% of students (median: 11%) reported using smokeless tobacco during the 30 days preceding the survey. Rates of smokeless tobacco use were higher for male than female students in all sites.

Among the state and local surveys, rates of alcohol consumption showed similar variation (Table 2): 50%–87% of students (median: 77%) reported having consumed alcohol during their lifetime; 24%–60% of students (median: 46%) reported that they

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*Smoking on 20 or more of the 30 days preceding the survey.

TABLE 1. Percentage of high school students who used tobacco, by sex — United States and selected U.S. sites, Youth Risk Behavior Surveys, 1991

Site	Lifetime cigarette use*			Current cigarette use†			Frequent cigarette use§			Smokeless tobacco use¶		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
WEIGHTED DATA												
National survey	70	71	70	27	28	28	12	13	13	1	19	10
State surveys												
Alabama	70	79	74	24	32	28	11	16	13	2	31	16
Georgia	66	72	69	22	26	24	10	12	11	2	22	12
Idaho	56	65	61	22	24	23	12	14	13	3	24	14
Nebraska	70	75	72	28	30	29	15	15	15	2	26	14
New Mexico	82	81	82	30	30	30	13	14	15	4	27	16
New York**	72	70	71	32	28	30	13	17	17	2	19	11
Puerto Rico††	46	54	50	13	18	16	18	5	4	0	5	2
South Carolina	72	76	74	25	26	26	3	13	13	2	20	11
South Dakota	68	71	69	32	30	31	13	16	16	10	29	20
Utah	43	55	49	16	18	17	17	8	8	2	12	7
Local surveys												
Chicago	72	73	72	13	20	16	4	7	6	2	5	3
Dallas	70	76	73	11	16	14	4	4	4	1	7	4
Ft. Lauderdale	65	65	65	18	13	16	10	6	8	1	9	4
Jersey City	73	70	72	17	16	16	4	4	4	1	6	3
Miami	66	66	66	12	17	15	4	8	6	1	6	3
Philadelphia	82	70	76	22	17	20	11	8	10	2	6	4
San Diego	64	71	68	18	18	18	7	7	7	1	7	4
UNWEIGHTED DATA												
State surveys												
Colorado**	73	74	74	28	27	27	13	14	14	6	32	19
District of Columbia††	70	60	65	5	7	6	2	2	2	2	5	4
Hawaii	70	70	70	27	25	26	12	13	13	2	14	8
Iowa§§	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Montana	68	71	69	24	24	24	13	12	12	7	33	20
New Hampshire	71	71	71	28	27	27	16	15	15	4	22	13
New Jersey**	67	61	64	NA	NA	NA	NA	NA	NA	2	14	7
Oregon	63	65	64	22	22	22	9	10	9	5	28	16
Pennsylvania**	69	73	71	28	28	28	16	15	15	2	29	16
Tennessee	72	75	74	30	30	30	16	16	16	1	34	17
Virgin Islands††	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wisconsin	72	73	73	30	32	31	16	17	16	3	19	11
Wyoming	70	74	72	27	28	28	15	17	16	5	31	19
Local surveys												
Boston	68	68	68	15	16	15	6	9	7	1	5	3
New York City	76	68	72	26	16	21	12	6	9	1	5	3
San Francisco	61	63	62	14	15	14	7	6	6	2	6	4

*Ever tried cigarette smoking, even one or two puffs.
†Smoked cigarettes on 1 or more of the 30 days preceding the survey.
§Smoked cigarettes on 20 or more of the 30 days preceding the survey.
¶Used chewing tobacco or snuff on 1 or more of the 30 days preceding the survey.
**Surveys did not include students from the largest city.
††Categorized as a state for funding purposes.
§§Not available; survey did not include these questions.

had consumed alcohol at least once during the 30 days preceding the survey. Episodic heavy drinking among students varied from 12% to 43% (median: 27%). Rates of lifetime and current alcohol consumption were similar for male and female students within most sites; however, in every site, male students reported higher rates of episodic heavy drinking than female students.

Lifetime and current use of marijuana (Table 3) varied considerably among the state and local surveys: 8%–41% of students (median: 26%) reported lifetime use of marijuana, and 4%–18% of students (median: 11%) reported having used marijuana at least once during the 30 days preceding the survey. In almost all sites, rates of marijuana use were higher for male than female students. Lifetime and current use of cocaine and lifetime use of steroids also varied among sites: 2%–9% of students (median: 5%) reported lifetime use of cocaine, 1%–4% of students (median: 2%) reported current use of cocaine, and 2%–5% of students (median: 4%) reported lifetime use of steroids.

TABLE 2. Percentage of high school students who consumed alcohol, by sex — United States and selected U.S. sites, Youth Risk Behavior Surveys, 1991

Site	Lifetime alcohol use*			Current alcohol use[†]			Episodic heavy drinking[§]		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
WEIGHTED DATA									
National survey	81	82	82	49	53	51	26	36	31
State Surveys									
Alabama	75	82	78	40	53	47	23	38	30
Georgia	74	80	77	44	50	47	22	31	27
Idaho	67	72	69	41	43	42	28	31	30
Nebraska	82	84	83	51	55	53	34	40	37
New Mexico	85	87	86	57	62	60	39	46	43
New York[*]	84	84	84	58	57	57	32	40	36
Puerto Rico**	57	72	64	33	44	38	12	25	18
South Carolina	77	79	78	43	51	47	21	33	27
South Dakota	83	84	84	58	58	58	40	42	41
Utah	48	53	50	25	28	27	14	19	17
Local surveys									
Chicago	75	75	75	40	44	42	14	24	19
Dallas	77	80	79	40	49	44	18	28	23
Ft. Lauderdale	79	80	79	47	49	48	17	28	22
Jersey City	75	80	77	44	52	48	15	25	20
Miami	74	79	77	41	45	43	14	20	17
Philadelphia	76	78	77	41	48	44	16	25	20
San Diego	70	78	74	43	47	45	23	28	26
UNWEIGHTED DATA									
State surveys									
Colorado[*]	88	87	87	56	61	59	35	47	41
District of Columbia**	71	69	70	35	38	36	12	17	14
Hawaii	73	73	73	39	42	41	20	27	24
Iowa	NA[††]	NA	NA	NA	NA	NA	NA	NA	NA
Montana	84	86	85	53	54	54	38	39	38
New Hampshire	85	84	84	56	56	56	31	37	34
New Jersey[*]	NA	NA	NA	52	52	52	NA	NA	NA
Oregon	79	79	79	46	46	46	30	32	31
Pennsylvania[*]	81	83	82	47	53	50	22	35	29
Tennessee	75	77	76	42	47	45	26	33	29
Virgin Islands**	NA	NA	NA	20	27	24	NA	NA	NA
Wisconsin	86	83	85	57	55	56	32	37	35
Wyoming	82	83	83	50	52	51	33	39	36
Local surveys									
Boston	65	72	68	35	41	38	14	22	18
New York City	71	73	72	40	45	42	17	25	21
San Francisco	61	60	60	28	30	29	10	14	12

*Ever used alcohol.
[†]Consumed at least one drink of alcohol during the 30 days preceding the survey
[§]Consumed five or more drinks of alcohol on at least one occasion during the 30 days preceding the survey.
[*]Surveys did not include students from the largest city.
**Categorized as a state for funding purposes.
[††]Not available; survey did not include these questions.

TABLE 3. Percentage of high school students who used marijuana, cocaine, or steroids, by sex — United States and selected U.S. sites, Youth Risk Behavior Surveys, 1991

Site	Lifetime marijuana use*			Current marijuana use†			Lifetime cocaine use§			Current cocaine use¶			Lifetime steroid use**		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
WEIGHTED DATA															
National survey	30	33	31	12	17	15	4	7	6	1	2	2	1	4	3
State surveys															
Alabama	21	29	25	7	12	10	3	5	4	1	2	2	2	7	4
Georgia	20	28	24	9	13	11	2	4	3	1	1	1	1	4	3
Idaho	22	28	25	9	12	10	6	7	7	2	3	2	2	5	4
Nebraska	20	25	22	9	12	10	3	6	5	1	2	2	1	4	2
New Mexico	38	43	41	15	20	18	6	11	9	2	4	3	2	6	4
New York††	30	34	32	15	18	16	5	6	5	2	2	2	2	5	3
Puerto Rico§§	4	12	8	1	6	4	2	6	4	1	4	2	1	5	3
South Carolina	23	30	27	9	15	12	4	6	5	1	4	2	2	6	4
South Dakota	21	22	22	10	9	10	4	7	5	1	2	2	2	6	4
Utah	17	21	19	7	10	9	4	6	5	1	3	2	1	5	3
Local surveys															
Chicago	22	32	27	8	15	12	2	7	4	1	4	2	2	6	4
Dallas	24	35	29	8	13	11	5	7	6	1	2	2	2	5	4
Ft Lauderdale	26	29	27	12	16	14	3	3	3	0	1	1	1	5	3
Jersey City	13	24	18	7	11	9	2	8	4	1	3	2	3	5	4
Miami	17	26	22	6	13	10	4	7	6	1	4	2	1	6	4
Philadelphia	35	40	37	14	19	16	4	6	5	1	2	2	4	6	5
San Diego	30	41	36	14	22	18	9	7	8	2	3	3	1	3	2
UNWEIGHTED DATA															
State surveys															
Colorado††	31	35	33	12	16	14	5	8	6	1	2	2	2	6	4
District of Columbia††	9	15	12	4	8	6	1	3	2	1	2	2	1	7	5
Hawaii	32	39	36	14	21	17	9	10	9	2	5	4	2	7	5
Iowa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	9	4
Montana	26	26	26	10	12	11	7	5	6	3	3	3	3	5	4
New Hampshire	34	36	35	17	18	17	5	8	6	2	4	3	2	6	4
New Jersey††	NA	NA	NA	11	14	12	NA	NA	NA	2	5	3	2	5	3
Oregon	29	35	32	11	15	13	5	8	7	1	3	2	2	6	3
Pennsylvania††	21	28	25	8	13	11	4	7	6	2	4	3	2	6	4
Tennessee	28	31	30	13	15	14	4	8	6	1	4	2	1	7	4
Virgin Islands§§	NA	NA	NA	2	8	5	NA	NA	NA	1	2	1	2	5	3
Wisconsin	22	26	24	10	14	12	3	7	5	1	2	2	2	6	4
Wyoming	25	32	29	10	16	13	6	8	7	2	3	3	2	5	3
Local surveys															
Boston	23	27	25	10	13	11	2	5	4	1	3	2	2	5	3
New York City	22	22	22	10	10	10	4	4	4	1	1	1	2	4	3
San Francisco	27	26	26	13	14	14	5	9	7	1	4	2	1	6	3

*Ever used marijuana.
†Used marijuana during the 30 days preceding the survey.
§Ever used cocaine.
¶Used cocaine during the 30 days preceding the survey.
**Ever used steroids.
††Surveys did not include students from the largest city
§§Categorized as a state for funding purposes
***Not available; survey did not include these questions.

For all behaviors, the national prevalence estimates were similar to the median prevalence estimates from the state and local surveys (Tables 1–3).

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Editorial Note: Tobacco, alcohol, and other drug use among youth causes serious public health problems in cities and states throughout the nation. Because the quality of the samples varied among the state and local surveys, data across sites may not be comparable. Nonetheless, these results can be useful in planning and evaluating broad national, state, and local interventions and monitoring progress toward achieving national education goals and national health objectives.

National education goal 6 (*8*) aims to have every school in America free of drugs and violence and offer a disciplined environment conducive to learning by the year 2000. The results presented in this report will be used in the second progress report on the status of the national education goals to be released September 30; results from similar surveys conducted during 1990 were used in the first progress report on the status of the national education goals (*8,9*).

National health objectives 3.5, 3.9, 4.5, 4.6, 4.7, 4.8, and 4.11 are to reduce the use of tobacco, alcohol, and other drugs among youth (*1*). The results presented in this report measure progress toward achieving these objectives in participating cities and states.

For example, objective 3.9 is to reduce smokeless tobacco use by males aged 12–24 years to a prevalence of no more than 4%. In 19 of the 33 sites, the prevalence of smokeless tobacco use among male students is three or more times higher than this national health objective. Objective 4.6 states that among youth aged 12–17 years the prevalence of alcohol use during the previous 30 days should be no more than 12.6%, of marijuana no more than 3.2%, and of cocaine no more than 0.6%. In all but one site, the current prevalence of alcohol use is at least two times higher than this national health objective; in all but three sites, the current prevalence of marijuana use is at least three times higher; and in all but four sites, the current prevalence of cocaine use is at least two times higher. Objective 4.7 is to reduce to no more than 28% the proportion of high school seniors engaging in recent occasions of episodic heavy drinking.

Rates of episodic heavy drinking among students in grades 9–12 are higher than this national health objective in 14 of the 33 sites. Objective 4.11 is to reduce to no more than 3% the proportion of male high school seniors who use anabolic steroids. Rates of anabolic steroid use among male students in grades 9–12 are higher than this national health objective in all but one site.

To meet the national health objectives, efforts to help youth reduce the use of tobacco, alcohol, and other drugs will need to increase among federal, state, and local education, health, and drug-control agencies, and among families, the media, legislators, community organizations, and youth.

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Selected Tobacco-Use Behaviors and Dietary Patterns Among High School Students — United States, 1991

In the United States, 30% of all cancer deaths and 87% of lung cancer deaths are attributable to tobacco use (*1*); approximately 35% of all cancer deaths are associated with diet (*2*). Because tobacco-use behaviors and dietary patterns (particularly diets high in fat and low in fruits, vegetables, and grains) established during youth may extend into adulthood and may increase the risk for cancer and other chronic diseases, these behaviors should be monitored and addressed among youth (*1,3*). This article presents self-reported data on the prevalence of selected tobacco-use behaviors and dietary patterns associated with risk for cancer and other chronic diseases among U.S. students in grades 9–12 during 1991.

The national school-based Youth Risk Behavior Survey (YRBS) is a component of CDC's Youth Risk Behavior Surveillance System (YRBSS), which periodically measures the prevalence of priority health-risk behaviors among youth through representative national, state, and local surveys (*4*). The 1991 YRBS used a three-stage sample design to obtain a sample of 12,272 students representative of students in grades 9–12 in the 50 states and the District of Columbia. Students were asked "Have

you ever tried cigarette smoking, even one or two puffs?"; "During the past 30 days, on how many days did you smoke cigarettes?"; and "During the past 30 days, did you use chewing tobacco, ... or snuff, ...?" Frequent cigarette use was defined as cigarette smoking on 20 or more of the 30 days preceding the survey. Students also were asked about foods they had consumed the previous day, including fruit; fruit juice; green salad; cooked vegetables; hamburger, hot dogs, or sausage; french fries or potato chips; and cookies, doughnuts, pie, or cake. The total number of servings* of fruit, fruit juice, green salads, and cooked vegetables was estimated by adding the number of servings of fruits and vegetables consumed during the day preceding the survey. Similarly, the total number of servings of foods typically high in fat content was estimated by adding the number of servings of hamburger, hot dogs, or sausage; french fries or potato chips; and cookies, doughnuts, pie, or cake eaten during the day preceding the survey.

Of all students in grades 9–12, 70.1% reported having tried cigarette smoking, and 12.7% reported frequent cigarette use during the 30 days preceding the survey (Table 1). The prevalence of frequent cigarette use was significantly greater among white

*Students who replied that they did not consume a particular type of food were assigned a frequency of 0; students who replied that they consumed a particular type of food "once only" were assigned a frequency of 1; and students who replied that they consumed a particular type of food "twice or more" were assigned a frequency of 2.

TABLE 1. Percentage of high school students who used tobacco, by sex, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 1991*

Category	Tried cigarettes[†]		Frequent cigarette use[§]		Smokeless tobacco use[·]	
	%	(95% CI**)	%	(95% CI)	%	(95% CI)
Sex						
Female	69.5	(±2.7)	12.4	(±2.5)	1.3	(±0.6)
Male	70.6	(±2.4)	13.0	(±2.0)	19.2	(±2.7)
Race/Ethnicity						
White	70.4	(±2.5)	15.4	(±2.5)	13.0	(±2.2)
Female	69.3	(±3.7)	15.8	(±3.5)	1.4	(±0.8)
Male	71.4	(±2.4)	15.0	(±2.2)	23.6	(±3.3)
Black	67.2	(±3.1)	3.1	(±1.2)	2.1	(±0.6)
Female	69.3	(±3.1)	1.9	(±1.0)	0.7	(±0.4)
Male	64.7	(±5.1)	4.5	(±2.2)	3.6	(±1.4)
Hispanic	75.3	(±4.7)	6.8	(±1.6)	5.5	(±2.7)
Female	74.9	(±5.3)	5.7	(±2.5)	0.6	(±0.4)
Male	75.7	(±6.3)	8.0	(±2.4)	10.7	(±5.7)
Grade						
9th	64.8	(±3.1)	8.4	(±2.2)	9.0	(±2.4)
10th	68.3	(±3.3)	11.3	(±2.5)	10.1	(±2.4)
11th	72.8	(±3.3)	15.6	(±2.9)	12.1	(±2.4)
12th	74.5	(±3.1)	15.6	(±3.3)	10.7	(±2.4)
Total	**70.1**	(±2.2)	**12.7**	(±2.2)	**10.5**	(±1.8)

*Unweighted sample size = 12,272 students.
[†]Ever tried cigarette smoking, even one or two puffs.
[§]Cigarette smoking on 20 or more of the 30 days preceding the survey.
[·]Used chewing tobacco or snuff during the 30 days preceding the survey.
**Confidence interval.

students (15.4%) than among Hispanic (6.8%) or black (3.1%) students. The percentage of students who tried cigarette smoking and used cigarettes frequently increased significantly between ninth and 12th grade; 12th-grade students were nearly twice as likely as ninth-grade students to use cigarettes frequently (15.6% and 8.4%, respectively).

Smokeless tobacco use was reported by 10.5% of all students and was significantly more likely among male students (19.2%) than female students (1.3%). White male students (23.6%) were significantly more likely than any other group to report smokeless tobacco use.

Of all students, 12.9% reported consuming five or more (range: 0–8) servings of fruits and vegetables during the day preceding the survey (Table 2). Male students (15.2%) were significantly more likely than were female students (10.5%) to consume five or more servings of fruits and vegetables during the day preceding the survey. White students (13.9%) were significantly more likely to consume five or more servings of fruits and vegetables than were Hispanic students (9.7%) or black students (6.8%).

TABLE 2. Percentage of high school students who consumed five or more servings of fruits and vegetables and no more than two servings of foods typically high in fat content* the day preceding the survey, by sex, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 1991†

Category	Fruits and vegetables§		Foods typically high in fat content*	
	%	(95%CI**)	%	(95% CI)
Sex				
Female	10.5	(±1.4)	72.9	(±1.6)
Male	15.2	(±1.6)	57.2	(±3.3)
Race/Ethnicity				
White	13.9	(±1.4)	64.4	(±2.7)
Black	6.8	(±1.4)	61.3	(±3.5)
Hispanic	9.7	(±2.0)	72.0	(±2.4)
Grade				
9th	14.7	(±3.3)	63.5	(±2.4)
10th	14.0	(±1.8)	62.1	(±4.3)
11th	12.2	(±1.4)	66.0	(±2.5)
12th	10.3	(±1.6)	68.1	(±2.7)
Total	12.9	(±1.2)	64.9	(±2.2)

*Students who replied that they did not consume a particular type of food were assigned a frequency of 0; students who replied that they consumed a particular type of food "once only" were assigned a frequency of 1; and students who replied that they consumed a particular type of food "twice or more" were assigned a frequency of 2. The number of servings of fruits and vegetables ranged from 0 through 8. The number of servings of foods typically high in fat content ranged from 0 through 6.
†Unweighted sample size = 12,272 students.
§Fruit, fruit juice, green salad, and cooked vegetables.
*Hamburger, hot dogs, or sausage; french fries or potato chips; and cookies, doughnuts, pie, or cake.
**Confidence interval.

Of all students, 64.9% reported eating no more than two (range: 0–6) servings of foods typically high in fat content during the day preceding the survey (Table 2). Female students (72.9%) were significantly more likely than male students (57.2%) to eat no more than two servings of foods typically high in fat content during the day preceding the survey.

Reported by: American Cancer Society, Atlanta. Div of Adolescent and School Health, Div of Nutrition, and Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report are consistent with results from other recent national surveys that measured tobacco-use behaviors and dietary patterns among youth (*5–7*). The YRBS data can be used by public health and education agencies, as well as by voluntary organizations, to assist in targeting priorities and in program management. For example, CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) has provided the findings in this report to the American Cancer Society (ACS), which will use these data to monitor progress toward achieving primary goals for their comprehensive school health education initiative (*8*). These goals are consistent with national health objectives for the year 2000 that address tobacco-use behaviors and dietary patterns associated with risk for cancer and other chronic diseases (objectives 2.5, 2.6, 3.5, and 3.9) (*3*).

The comprehensive school health education initiative is one of four core program initiatives (including patient resources, information, and guidance; tobacco control; and breast cancer detection) identified by ACS to reduce risk for and impact of cancer throughout the 1990s. The primary goals for the comprehensive school health education initiative are 1) reducing the proportion of ninth- and 12th-grade students who have tried cigarette smoking from 65% and 75% to 42% and 48%, respectively; 2) reducing the proportion of ninth- and 12th-grade students who smoked cigarettes on 20 or more of the last 30 days from 8% and 16%, to 4% and 8%, respectively; 3) reducing the proportion of male high school students who use chewing tobacco or snuff from 19% to 12%; 4) increasing the proportion of high school students who daily consume five or more servings of fruits and vegetables from 13% to 35%; and 5) increasing the proportion of high school students who daily eat no more than two servings of selected foods typically high in fat content from 65% to 80%.

To attain these primary goals, ACS has established the following three enabling goals: 1) to increase the proportion of states that require schools to implement comprehensive school health education; 2) increase the average proportion of the nation's school districts that require comprehensive school health education to be implemented across each grade range (i.e., kindergarten–6, 7–9, and 10–12); and 3) increase the average proportion of U.S. schools that implement comprehensive school health education across each grade range. These goals are consistent with the national health objectives for the year 2000 to increase the proportion of schools providing nutrition education (objective 2.19), tobacco-use prevention education (objective 3.10), and quality school health education (objective 8.4) (*8*).

Specific strategies ACS will implement to attain the primary and enabling goals include developing and promoting cancer prevention and control curricula for comprehensive school health education; promoting state and school district policies to require planned, sequential, comprehensive school health education that includes the cancer prevention and control curricula; increasing awareness of the need for

comprehensive school health education and the status of school health education; and promoting the adoption of comprehensive school health education among schools nationwide.

The use of YRBS data by ACS illustrates how the YRBSS can be used to help plan and implement national, state, and local health promotion programs. Additional information about the YRBSS is available from the Division of Adolescent and School Health, NCCDPHP, CDC, Mailstop K-33, 1600 Clifton Road, NE, Atlanta, GA 30333.

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Differences in the Age of Smoking Initiation Between Blacks and Whites — United States

In 1988, an estimated 434,175 premature deaths in the United States were attributed to cigarette smoking; for blacks, the rate of years of potential life lost before age 65 (YPLL) attributed to smoking (2471.8 YPLL per 100,000 population) was twice that for whites (1224.7 YPLL per 100,000 population) (*1*). In the United States, black adolescents are less likely than white adolescents to smoke (*2,3*); however, black adults are more likely than white adults to begin smoking after adolescence (*4*). This report summarizes trends in the age at initiation of regular cigarette smoking by race* and sex, through analyses by birth cohort from 1910 through 1959; the report is based on data from CDC's National Health Interview Surveys (NHISs) for 1987 and 1988.

The NHIS interviews persons aged ≥18 years selected from representative national samples of the U.S. civilian, noninstitutionalized population. Approximately 88,000 persons (44,000 each year) were interviewed during 1987 and 1988. In 1987, persons who had smoked at least 100 cigarettes were asked, "How old were you when you first started smoking cigarettes fairly regularly?"; in 1988, persons were asked, "About how old were you when you first started smoking cigarettes fairly regularly?" Those who said they had never smoked regularly were excluded. Responses from 38,906 (44%) ever regular smokers were used in this report. The data were weighted to

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*Numbers from racial groups other than white and black were too small to provide separate estimates.

provide national estimates. Ninety-five percent confidence intervals were calculated using SESUDAAN (5).

The overall proportion of persons who became regular smokers before ages 16, 18, 21, 25, and 30 years increased across successive birth cohorts (Table 1); however, among blacks, increases occurred only before ages 21, 25, and 30. More than 80% of smokers born after 1930 began smoking regularly by age 21.

The overall average age at which smokers began smoking cigarettes regularly decreased from 19.7 years among persons born from 1910 through 1919 to 17.4 years among those born from 1950 through 1959 (Table 2). Among the successive birth cohorts in this study, the average age at smoking initiation decreased 2.4 years for whites and 1.3 years for blacks. The average age at initiation decreased substantially for white and black women (5.4 and 4.6 years, respectively), decreased slightly for white men (0.5 years), and increased slightly for black men (0.7 years).

Reported by: HN Giebel, MD, Riverside General Hospital, Riverside, California. SL Mills, MD, National Cancer Institute; SE Marcus, PhD, National Institute of Dental Research, National Institutes of Health. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics; Surveillance Br, Div of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC.

TABLE 1. Percentage of ever smokers* who began smoking cigarettes regularly[†] before 16, 18, 21, 25, and 30 years of age, by birth cohort and race[§] — United States

Age (yrs) at smoking initiation/Race	Birth cohort									
	1910–1919		1920–1929		1930–1939		1940–1949		1950–1959[ʿ]	
	%	(95% CI**)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
<16										
White	23.0	(±1.5)	23.1	(±1.4)	24.9	(±1.3)	25.4	(±1.2)	28.0	(±1.1)
Black	26.0	(±4.5)	22.5	(±3.7)	24.7	(±3.6)	20.0	(±3.8)	21.8	(±2.5)
Total	23.2	(±1.4)	23.2	(±1.3)	24.9	(±1.3)	24.7	(±1.1)	27.2	(±1.0)
<18										
White	42.4	(±1.8)	44.7	(±1.6)	48.0	(±1.6)	49.9	(±1.5)	57.5	(±1.2)
Black	45.1	(±5.3)	39.0	(±4.1)	45.6	(±4.5)	42.4	(±4.8)	45.0	(±2.6)
Total	42.4	(±1.7)	44.3	(±1.5)	47.5	(±1.5)	48.8	(±1.4)	55.6	(±1.2)
<21										
White	70.4	(±1.6)	76.1	(±1.4)	80.5	(±1.3)	83.8	(±0.9)	87.4	(±0.8)
Black	67.7	(±5.1)	71.2	(±3.6)	74.3	(±4.0)	76.5	(±3.3)	77.5	(±2.5)
Total	70.0	(±1.5)	75.6	(±1.3)	79.6	(±1.3)	82.9	(±0.8)	86.1	(±0.8)
<25										
White	82.6	(±1.3)	88.4	(±1.0)	91.8	(±0.9)	94.2	(±0.6)	95.9	(±0.5)
Black	80.0	(±5.1)	83.8	(±3.0)	84.9	(±3.4)	90.2	(±2.0)	92.5	(±1.6)
Total	82.4	(±1.2)	87.9	(±0.9)	90.8	(±0.9)	93.7	(±0.6)	95.5	(±0.5)
<30										
White	90.8	(±0.9)	94.0	(±0.7)	97.2	(±0.5)	97.8	(±0.4)		
Black	89.5	(±3.7)	93.1	(±2.2)	91.3	(±3.0)	97.1	(±1.2)		
Total	90.6	(±0.9)	93.8	(±0.7)	96.5	(±0.6)	97.6	(±0.4)		

*Persons born during 1910–1959 who reported having ever smoked at least 100 cigarettes.
[†]Regular was self-defined.
[§]Numbers from racial groups other than white and black were too small to provide separate estimates; however, the totals do include all races.
[ʿ]No data reported for <30 age group because some respondents had not reached the age of 30 years when surveyed.
**Confidence interval.

Editorial Note: The findings in this analysis are consistent with previous reports that indicate smokers in the United States are smoking regularly at an earlier age (6,7); in addition, the secular patterns of age at which smoking begins have changed substantially over time by both sex and race.

One potential limitation of this analysis is that respondents were asked to recall an event (i.e., age at onset of regular smoking) that may have occurred decades earlier. In addition, since mortality is higher for smokers who begin smoking regularly at earlier ages, the average age at initiation among persons born in the earlier cohorts may be artificially inflated (1). However, the overall trend of decreasing age at initiation is evident even among those born since 1930.

Since 1976, the prevalence of cigarette smoking has decreased markedly among black high school seniors (6; J.G. Bachman, L.D. Johnston, P.M. O'Malley, University of Michigan, unpublished data, 1990)—possibly because blacks begin smoking at older ages than whites. Although the findings from NHIS are consistent with this trend, current differences in adolescent smoking by race suggest the prevalence of smoking among black adolescents as they mature will not attain the same prevalence as that among whites of the same age group. Additional efforts are needed to determine the factors that affect cigarette smoking initiation by race and sex.

Monitoring trends in age at smoking initiation and in smoking prevalence of current adolescents as they mature may enable their smoking behavior patterns in later adult life to be understood more clearly. In 1974, 38.6% of whites and 47.1% of blacks aged 20–24 years were current smokers (6); however, by 1988, the proportions of whites and blacks in this age group who were current smokers had decreased to 28.5% and 24.8%, respectively (CDC, unpublished data), with black smokers decreasing at a higher rate (22.3 percentage points) than white smokers (10.1 percentage points). Although this trend suggests smoking-related morbidity and mortality could decline among blacks, the greater likelihood of relapse among black smokers indicates that smoking-cessation efforts targeted toward black smokers need to be intensified (8).

TABLE 2. Average age at initiation of regular* smoking among adults by race,[†] sex, and birth cohort — United States

	Birth cohort									
	1910–1919		1920–1929		1930–1939		1940–1949		1950–1959	
Race/Sex	Age (yrs)	(95% CI[§])	Age (yrs)	(95% CI)	Age (yrs)	(95% CI)	Age (yrs)	(95% CI)	Age (yrs)	(95% CI)
White										
Men	17.5	(±0.3)	17.2	(±0.2)	17.1	(±0.2)	17.0	(±0.1)	17.0	(±0.1)
Women	22.9	(±0.5)	21.0	(±0.3)	19.4	(±0.2)	18.7	(±0.2)	17.5	(±0.1)
Total	19.6	(±0.2)	18.8	(±0.2)	18.1	(±0.2)	17.8	(±0.1)	17.2	(±0.1)
Black										
Men	17.4	(±0.6)	17.4	(±0.4)	18.4	(±0.9)	17.7	(±0.5)	18.1	(±0.4)
Women	23.0	(±1.8)	21.8	(±0.9)	20.4	(±0.9)	19.5	(±0.4)	18.4	(±0.3)
Total	19.6	(±0.8)	19.3	(±0.4)	19.3	(±0.6)	18.6	(±0.3)	18.3	(±0.2)
Total	19.7	(±0.2)	18.8	(±0.2)	18.2	(±0.2)	17.9	(±0.1)	17.4	(±0.1)

*Regular was self-defined.
[†]Numbers from racial groups other than white and black were too small to provide separate estimates; however, the total does include all races.
[§]Confidence interval.

The successive birth cohort data in this report suggest that the average age at which women begin smoking is continuing to decline for both blacks and whites. Persons who begin smoking at younger ages are more likely to become heavier smokers (9) and are at increased risk for smoking-attributed illness or death (6).

One of the national health objectives for the year 2000 is to reduce the initiation of cigarette smoking by children and youth so that no more than 15% have become regular smokers by age 20 years (objective 3.5). To decrease initiation of smoking among younger age groups, the following measures should be considered: 1) implementation of health education programs on tobacco use in schools (objective 3.10); 2) establishment of tobacco-free environments in schools (objective 3.10); 3) enactment and enforcement of laws prohibiting the sale and distribution of tobacco products to minors (objective 3.13); 4) elimination or restriction of tobacco product advertising to which youth are likely to be exposed (objective 3.15); and 5) increasing to 50 the number of states with plans to reduce tobacco use, especially among youth (objective 3.14) (10).

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Cigarette Smoking Among Youth — United States, 1989

In 1988, an estimated 434,000 persons in the United States died as a result of cigarette smoking (1). About three fourths of adults who have ever been regular cigarette smokers reported trying their first cigarette before their 18th birthday (National Institute on Drug Abuse (NIDA), unpublished data), and about half of them had become regular smokers by that time (2; NIDA, unpublished data). This report, based on the Teenage Attitudes and Practices Survey (TAPS), presents the prevalence of self-reported smoking among U.S. adolescents aged 12–18 years during 1989.

In 1989, the TAPS focused on adolescents' knowledge, attitudes, and practices regarding tobacco use. The sample described in this report includes all youth aged 12–18 years who were living in households. Questionnaires were administered by computer-assisted telephone interviewing and mail (for homes without telephones and for initial nonrespondents). Adolescents were sampled from households that had participated in the second half of the 1988 National Health Interview Survey (NHIS) and the first half of the 1989 NHIS. During this period, the household participation rate was 95%. Data were obtained from 9965 (82.4%) of 12,097 adolescents in the NHIS households and were adjusted to provide national estimates. Confidence intervals (CIs) were calculated by using the Software for Survey Data Analysis (*3*). Participants were asked the following questions about cigarette smoking behavior: "Think about the last 30 days. On how many of these days did you smoke?" and "Now, think carefully about the last SEVEN days. Did you smoke cigarettes on any of THOSE days?"

Respondents who were still in school or who had already graduated from high school were classified as "school attenders/high school (HS) graduates." Respondents who were not attending school at the time of the survey and who had not completed the 12th grade were classified as "dropouts." Among youth 17–18 years of age, 2355 (80.8%) were enrolled in school, 489 (16.8%) were dropouts, and 69 (2.4%) had completed high school and were not currently in school.

Overall, 15.7% of respondents reported smoking on 1 or more days during the month, and 11.5% reported smoking on 1 or more days during the week before the survey (Table 1). Patterns were similar by gender in all categories, except among persons 18 years of age. The prevalence of smoking was higher among white youth than among black youth. Although the prevalence of smoking in the past month was lower among Hispanic (11.7%) than among non-Hispanic (16.1%) youth, the prevalence of smoking in the past week was similar in each group (9.3% and 11.8%, respectively). Prevalence of smoking in the past month and in the past week increased directly by age.

Among youth 17–18 years of age, the prevalence of smoking during the previous week was substantially higher among dropouts (43.3% [95% CI=±4.9%]) than among school attenders/HS graduates (17.1% [95% CI=±1.7%]). Among school attenders/HS graduates, the prevalence of smoking during the previous week was similar by gender (males: 17.5% [95% CI=±2.3%]; females: 16.7% [95% CI=±2.3%]). However, dropouts who were male (51.7% [95% CI=±6.6%]) were more likely to report having smoked during the previous week than were dropouts who were female (33.3% [95% CI=±6.5%]). Among school attenders/HS graduates, 19.3% (95% CI=±1.9%) of whites and 5.7% (95% CI=±2.8%) of blacks reported smoking during the previous week. Similarly, dropouts who were white (46.1% [95% CI=±5.2%]) were more likely to report having smoked during the previous week than were dropouts who were black (17.1% [95% CI=±9.3%]).

TABLE 1. Percentage of youth aged 12–18 years* who reported cigarette use during the 30 days and the week preceding the survey, by gender, race, Hispanic ethnicity, and age — United States, Teenage Attitudes and Practices Survey,[†] 1989

Characteristic	Smoked during preceding 30 days		Smoked during preceding week	
	%	(95% CI[§])	%	(95% CI)
Gender				
Male	16.0	(±1.1)	11.8	(±1.0)
Female	15.3	(±1.2)	11.2	(±1.1)
Race				
White	17.6	(±0.9)	13.1	(±0.9)
Male	17.9	(±1.3)	13.4	(±1.1)
Female	17.4	(±1.3)	12.8	(±1.2)
Black	6.1	(±1.2)	3.5	(±0.8)
Male	7.2	(±1.8)	4.2	(±1.3)
Female	5.0	(±1.5)	2.7	(±1.1)
Other	12.1	(±4.7)	10.0	(±4.3)
Male	11.1	(±6.7)	8.9	(±6.7)
Female	13.4	(±5.5)	11.3	(±5.0)
Hispanic origin				
Hispanic	11.7	(±2.1)	9.3	(±2.0)
Male	11.8	(±3.0)	9.3	(±2.7)
Female	11.7	(±3.2)	9.3	(±2.9)
Non-Hispanic	16.1	(±0.9)	11.8	(±0.8)
Male	16.5	(±1.2)	12.1	(±1.0)
Female	15.8	(±1.2)	11.4	(±1.1)
Age (yrs)				
12	2.4	(±0.8)	0.7	(±0.4)
Male	2.2	(±1.0)	0.8	(±0.6)
Female	2.6	(±1.3)	0.6	(±0.5)
13	5.2	(±1.2)	2.5	(±0.9)
Male	4.6	(±1.5)	1.6	(±0.9)
Female	5.7	(±1.9)	3.5	(±1.5)
14	10.4	(±1.8)	7.1	(±1.5)
Male	9.7	(±2.3)	5.9	(±1.8)
Female	11.1	(±2.6)	8.5	(±2.4)
15	16.0	(±2.0)	11.6	(±1.8)
Male	16.4	(±2.7)	11.9	(±2.4)
Female	15.7	(±2.9)	11.3	(±2.5)
16	19.0	(±2.1)	13.7	(±1.9)
Male	18.9	(±2.8)	13.2	(±2.5)
Female	19.0	(±3.0)	14.1	(±2.7)
17	24.3	(±2.5)	17.9	(±2.1)
Male	23.6	(±3.1)	18.2	(±2.8)
Female	25.1	(±3.7)	17.5	(±3.2)
18	30.6	(±2.7)	25.4	(±2.6)
Male	34.6	(±3.8)	29.1	(±3.7)
Female	26.2	(±3.4)	21.3	(±3.2)
Total	**15.7**	**(±0.8)**	**11.5**	**(±0.7)**

*As of November 1, 1989.
[†]Estimates based on weighted data; sample size = 9965 respondents.
[§]Confidence interval.

Editorial Note: The findings in this report are consistent with findings from three other recent national surveys that measure smoking by youth: rates of smoking are similar for males and females and higher for whites than blacks (*4,5*; J.G. Bachman, L.D. Johnston, P.M. O'Malley, University of Michigan, unpublished data, 1990). In addition, the findings from TAPS confirm previous reports of higher smoking rates among dropouts (*6*) and suggest gender and racial differences in smoking prevalence among dropouts. Differences in overall prevalence estimates between surveys may be explained by the mode of data collection (i.e., household interview vs. school-based, self-administered questionnaire) (*7*), composition of the samples, varying response rates, and the wording of questions (*8*).

Cigarette use among U.S. youth appears to have declined sharply in the late 1970s and stabilized in the 1980s (*9,10*), especially among white youth (*2*). The findings from TAPS underscore the need for interventions that focus on both in-school and out-of-school youth. The national health objectives for the year 2000 have established four relevant targets for this problem:

- establish tobacco-free environments in all elementary, middle, and secondary schools and include tobacco use prevention programs in school curricula (objective 3.10);

- enact and enforce state laws nationwide prohibiting the sale and distribution of tobacco products to youth aged <19 years (objective 3.13);

- implement state plans nationwide to reduce tobacco use, especially among youth (objective 3.14); and

- eliminate or severely restrict all forms of tobacco product advertising and promotion to which youth ≤18 years of age are likely to be exposed (objective 3.15) (*11*).

To help achieve these and other smoking-related objectives, the Public Health Service has developed and implemented several programs. For example, the National Cancer Institute and the American Cancer Society have recently initiated the American Stop Smoking Intervention Study for Cancer Prevention (Project ASSIST) in 17 states. This demonstration project is designed to disseminate various interventions to prevent and stop tobacco use among adults and youth throughout the nation. CDC provides states with technical assistance to develop and conduct targeted interventions to reduce tobacco consumption among youth. During the 1990s, intensive collaborative efforts will be necessary to reduce tobacco use among U.S. youth.

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Current Tobacco, Alcohol, Marijuana, and Cocaine Use Among High School Students — United States, 1990

Patterns of tobacco, alcohol, and other drug use usually are established during youth, often persist into adulthood, contribute substantially to the leading causes of mortality and morbidity (1), and are associated with lower educational achievement and school dropout (2–5). This report presents selected data on current use of tobacco, alcohol, marijuana, and cocaine among 9th–12th grade students from two components of the Youth Risk Behavior Surveillance System (6): 1) the 1990 national school-based Youth Risk Behavior Survey (YRBS) conducted during April–May 1990 and 2) similar surveys conducted by departments of education in 22 states and four cities during the same time period.

The national survey used a three-stage sample design to obtain a probability sample of 11,631 students in grades 9–12 in the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. The 26 state and local sites used a variety of sampling schemes: 14 drew probability samples from well-defined sampling frames of schools and students, allowing computation of weighted results of known precision; nine drew probability samples of both schools and students, but either low overall response rates or unavailable documentation precluded weighting the data or making estimates of precision; and three used nonprobability samples of either schools or students (Table 1).

For the state and local surveys, school response rates ranged from 31% to 100%; student response rates ranged from 54% to 94%. Sample sizes ranged from 378 to 5675 students. Students in most samples were distributed evenly across grades and between genders. The racial/ethnic characteristics of the samples varied considerably (Table 1).

Among the state and local surveys, rates varied for current tobacco, alcohol, and drug use during the 30 days preceding the survey (Table 2): 9%–37% of students

TABLE 1. Size, response rates, and demographic characteristics of samples — selected U.S. sites and United States, Youth Risk Behavior Surveys, 1990

Site	Sample size	School response rate (%)	Student response rate (%)	Gender (%)		Grade (%)				Race/Ethnicity (%)			
				Female	Male	9	10	11	12	Black, non-Hispanic	White, non-Hispanic	Hispanic	Other
State surveys													
Alabama*	2,112	89	90	50	50	24	40	29	7	32	65	1	2
Colorado*†	1,353	63	94	48	52	26	20	31	23	4	76	12	7
District of Columbia*⁴	1,461	94	57	55	45	7	36	25	31	86	3	5	6
Georgia*	2,384	77	84	51	49	22	27	28	23	39	59	1	2
Kansas*	513	36	84	51	49	36	33	18	11	7	83	4	6
Kentucky*⁶	5,675	NA††	NA	52	48	54	1	1	44	5	92	1	3
Massachusetts*†	1,907	64	81	50	50	27	23	26	23	3	88	2	6
Mississippi*	4,494	63	83⁶⁶	52	48	24	25	26	26	50	47	1	2
Nebraska†	2,237	83	NA	50	50	30	31	18	20	6	86	4	5
New Hampshire*	1,629	100	67	51	49	32	30	22	15	1	93	1	5
New Mexico*	3,524	84	80	54	46	29	27	23	21	2	30	36	32
New York†**	3,878	64	86	50	50	21	27	25	27	6	84	2	7
North Carolina													
9th Grade*	1,871	64	88	50	50	88	5	2	4	24	71	1	4
12th Grade*	1,574	62	90	56	44	3	0	0	96	27	69	1	3
Oklahoma**	652	31	59⁴⁴	52	48	26	28	26	20	3	80	3	14
Oregon**	2,046	31	63	54	46	25	30	22	21	3	82	3	14
Pennsylvania†**	2,495	51	91	52	48	24	28	27	21	10	85	1	4
South Carolina**	5,571	57	84	51	49	29	28	22	21	41	55	1	3
South Dakota*	1,495	84	91	52	48	32	20	25	23	1	83	1	15
Tennessee**	1,891	44	78⁴⁴	51	49	22	26	33	19	25	72	1	2
Utah*	3,488	94	89	51	49	32	27	23	18	1	88	4	7
West Virginia*	1,445	80	84	49	51	40	20	21	20	7	89	0	3
Wisconsin**	1,027	39	80	50	50	34	21	29	17	8	87	1	3
Local surveys													
Dallas*	3,211	100	79	51	49	31	42	18	9	49	17	29	4
Ft. Lauderdale**	1,049	100	54	56	44	26	20	26	28	17	68	9	5
Jersey City*	378	100	80	52	48	29	22	25	24	38	13	32	16
Miami*	1,922	100	79	53	47	26	26	25	23	57	9	28	6
National survey	**11,631**	**74**	**87**	**51**	**49**	**24**	**26**	**25**	**25**	**20**	**54**	**20**	**6**

*Probability sample, weighted data.
†Survey did not include students from the largest city.
⁶Categorized as a state for funding purposes.
*Nonprobability sample, unweighted data.
**Probability sample, unweighted data.
††Not available.
⁴⁴Estimated response rate.

(median: 31%) reported smoking at least one cigarette; 1%–20% (median: 11%) reported using smokeless tobacco; 28%–64% (median: 54%) reported having at least one drink of alcohol; 17%–47% (median: 35%) reported having five or more drinks on one occasion; 3%–17% (median: 12%) reported using marijuana at least once; and 1%–4% (median: 2%) reported using any form of cocaine, including powder, crack, or freebase. At most sites, more male than female students reported these behaviors.

TABLE 2. Percentage of students reporting current use* of tobacco, alcohol, marijuana, and cocaine — selected U.S. sites and United States, Youth Risk Behavior Surveys, 1990

Site	Tobacco		Alcohol		Other drugs	
	Cigarettes	Smokeless	Any use	≥5 drinks on 1 occasion	Marijuana	Cocaine
State surveys						
Alabama[†]	33	14	50	35	7	2
Colorado[†§]	31	13	60	38	16	2
District of Columbia[††']	9	1	37	17	3	1
Georgia[†]	25	12	50	31	9	1
Kansas**	31	12	59	41	7	4
Kentucky[††]	37	15	51	35	14	2
Massachusetts[†§]	29	7	60	38	17	2
Mississippi[†]	28	11	54	37	11	2
Nebraska**	32	14	56	37	10	2
New Hampshire**	30	8	56	37	14	3
New Mexico[†]	32	13	61	45	11	3
New York[§††]	32	7	64	42	16	2
North Carolina						
9th Grade[†]	27	11	43	26	11	2
12th Grade[†]	32	8	58	41	14	2
Oklahoma[††]	34	16	62	47	14	3
Oregon[††]	NA[§§]	NA	47	30	14	3
Pennsylvania[§††]	32	13	54	33	12	2
South Carolina[††]	29	9	53	34	11	2
South Dakota[†]	34	19	62	42	12	2
Tennessee[††]	31	12	50	31	15	3
Utah[†]	20	8	28	19	8	2
West Virginia[†]	37	20	55	42	17	2
Wisconsin[††]	33	10	63	43	10	1
Local surveys						
Dallas[†]	19	3	50	31	8	2
Ft. Lauderdale[††]	24	4	56	30	14	1
Jersey City[†]	23	2	46	27	8	2
Miami[†]	14	2	47	25	9	1
National survey	**32**	**10**	59	37	14	**2**

*During the 30 days preceding the survey.
[†]Probability sample, weighted data.
[§]Survey did not include students from the largest city.
['] Categorized as a state for funding purposes.
**Nonprobability sample, unweighted data.
[††]Probability sample, unweighted data.
[§§]Not available.

The median prevalence estimates from the state and local surveys were similar to the national prevalence estimates (Table 2).

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Editorial Note: Because the quality of the samples varied among the state and local surveys, comparisons of data across sites should be made with caution. Nonetheless, these results can be useful in planning and evaluating broad national, state, and local interventions and monitoring progress toward achieving National Education Goals and health objectives. Goal 6 of the National Education Goals (7) aims to have every school in the United States free of drugs and violence and offer a disciplined environment conducive to learning by the year 2000. The results presented in this report will· be incorporated in the first progress report on the status of the National Education Goals to be released September 30, 1991.

Year 2000 national health objectives 3.5, 3.9, 4.5, 4.6, 4.7, 4.8, and 4.11 are to reduce the use of tobacco, alcohol, and other drugs among youth (8). For example, objective 4.6 states that among youth aged 12–17 the prevalence of alcohol use during the previous 30 days should be no more than 12.6%, that of marijuana use no more than 3.2%, and that of cocaine use no more than 0.6%. Prevalence rates from the national YRBS for 9th–12th grade students were four times higher for alcohol and marijuana use and three times higher for cocaine use than these objectives. Furthermore, most states and cities that conducted a YRBS have not reached these national objectives. To meet the National Education Goals and the national health objectives, efforts to help youth reduce current use of tobacco, alcohol, and other drugs will need to increase among federal, state, and local education, health, and drug-control agencies; families; media; legislators; relevant community organizations; and youth themselves.

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Tobacco Use Among High School Students — United States, 1990

Tobacco use is the single most preventable cause of death in the United States (1). Approximately half of smokers start smoking regularly before 18 years of age; however, among recent birth cohorts, age of smoking initiation has declined, especially among females (1). Data on tobacco use among adolescents help identify high-risk populations, design tobacco-prevention programs for these populations, and evaluate the effectiveness of broad efforts to prevent tobacco use among youth. This report examines the prevalence of self-reported current tobacco use and frequent cigarette smoking among U.S. students in grades 9–12 during 1990.

The national school–based Youth Risk Behavior Survey (YRBS) is a component of the Youth Risk Behavior Surveillance System, which periodically measures the prevalence of health–risk behaviors among youth through comparable national, state, and local surveys (2). The 1990 national school-based YRBS used a three-stage sample design to obtain a representative sample of 11,631 students in grades 9–12 in the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. The YRBS included the following questions on tobacco use: "On how many of the past 30 days did you smoke cigarettes?" and "On how many of the past 30 days did you use chewing tobacco or snuff?" Current tobacco use was divided into four categories: any tobacco use, cigarette use, frequent cigarette use, and smokeless tobacco use. Cigarette use was defined as smoking at any time during the 30 days preceding the survey, and frequent cigarette use was defined as smoking on more than 25 of the 30 days preceding the survey.

More than one third (36.0%) of all students in grades 9–12 reported tobacco use during the 30 days preceding the survey (Table 1). Cigarette use was the most prevalent form of tobacco use (32.3%); 10.1% of students used smokeless tobacco. The prevalence of tobacco use was significantly greater among male students (40.4%) than among female students (31.7%), especially for smokeless tobacco use (males, 19.1%; females, 1.4%). The prevalence of tobacco use also was significantly greater among white students (41.2%) than among Hispanic (32.0%) or black (16.8%) students. Tobacco use increased by grade of student, from 32.1% of 9th-grade students to 41.2% of 12th-grade students.

Thirteen percent of students used cigarettes frequently (Table 1). The differences in cigarette use between racial/ethnic groups and between grades were accentuated for frequent cigarette users. The prevalence of frequent cigarette use among white students (15.9%) was approximately seven times that among black students (2.3%) and approximately twice that among Hispanic students (7.4%). Among 12th-grade

students, the prevalence of frequent cigarette use (17.7%) was almost twice that among 9th-grade students (9.9%).

Reported by: Office on Smoking and Health, and Div of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Two of the national health promotion and disease prevention objectives for the year 2000 are to "reduce the initiation of cigarette smoking by children and youth so that no more than 15 percent have become regular cigarette smokers by age 20" (objective 3.5) and to "reduce smokeless tobacco use by males aged 12 through 24 to a prevalence of no more than 4 percent" (objective 3.9) (*3*). To achieve these objectives, programs for preventing tobacco use should be provided in all elementary, middle, and secondary schools—ideally, as part of quality school health education efforts and in conjunction with the establishment of tobacco-free environments on school premises (objective 3.10) (*3*). Carefully designed and implemented school-based programs for preventing tobacco use have proven effective in delaying onset of smoking among students (*4*). The National Cancer Institute has developed a guide for implementing effective school-based programs to prevent smoking (*5*).*

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*One to three copies can be obtained from the National Cancer Institute (NCI); telephone (800) 422-6237 ([800] 4-CANCER). For four or more copies, write NCI, Building 31, Room 10A-24, 9000 Rockville Pike, Bethesda, MD 20892.

TABLE 1. Percentage of current tobacco use among high school students, by gender, race/ethnicity, and grade — United States, Youth Risk Behavior Survey, 1990*

Category	Any tobacco use		Cigarette use[†]		Frequent cigarette use[§]		Smokeless tobacco use	
	%	(95% CI[¶])	%	(95% CI)	%	(95% CI)	%	(95% CI)
Gender								
Female	31.7	(±3.1)	31.3	(±3.1)	12.5	(±2.3)	1.4	(±0.5)
Male	40.4	(±5.1)	33.2	(±4.9)	13.0	(±3.6)	19.1	(±5.1)
Race/Ethnicity								
White	41.2	(±4.2)	36.4	(±3.9)	15.9	(±3.1)	12.6	(±3.5)
Female	36.5	(±3.1)	36.0	(±3.1)	16.6	(±2.7)	1.5	(±0.6)
Male	46.0	(±6.1)	36.8	(±5.6)	15.2	(±4.1)	23.9	(±6.9)
Black	16.8	(±2.9)	16.1	(±2.9)	2.3	(±1.0)	1.9	(±0.9)
Female	15.9	(±4.8)	15.7	(±4.8)	1.8	(±0.9)	0.8	(±0.6)
Male	18.0	(±3.3)	16.8	(±3.6)	3.0	(±1.8)	3.1	(±1.8)
Hispanic	32.0	(±4.5)	30.8	(±4.3)	7.4	(±1.6)	5.7	(±2.3)
Female	27.4	(±5.9)	27.2	(±5.8)	5.5	(±2.4)	1.0	(±1.0)
Male	37.3	(±6.3)	34.7	(±6.1)	9.6	(±2.6)	10.9	(±4.6)
Grade								
9th	32.1	(±4.9)	29.5	(±4.4)	9.9	(±3.4)	7.8	(±3.0)
10th	33.9	(±4.5)	30.0	(±3.9)	10.8	(±2.4)	10.9	(±2.8)
11th	36.7	(±4.3)	32.8	(±4.6)	12.6	(±2.9)	9.5	(±2.2)
12th	41.2	(±5.6)	36.7	(±5.4)	17.7	(±4.3)	11.9	(±4.3)
Total	**36.0**	**(±3.7)**	**32.3**	**(±3.7)**	**12.8**	**(±2.7)**	**10.1**	**(±2.5)**

*Unweighted sample size=11,631 students.
†Smoking cigarettes at any time during the 30 days preceding the survey.
§Smoking cigarettes on more than 25 of the 30 days preceding the survey.
¶Confidence interval.

In addition to school-based programs, the national objectives call for the enactment and enforcement of laws prohibiting the sale and distribution of tobacco products to persons <19 years of age (objective 3.13) (*3*). By June 1991, 47 states and the District of Columbia had enacted laws restricting the sale of tobacco products to minors (CDC, unpublished data, 1991); however, these laws rarely are enforced (*6*). Other effective strategies may include raising state excise taxes on tobacco products (*1*), restricting tobacco-product advertising and promotion that target youth <18 years of age (objective 3.15) (*3*), and banning the sale of cigarettes through vending machines (*7,8*). A recent survey in 10 communities indicated widespread support for policies that limit minors' access to, and use of, tobacco products (*9*). The reduction of tobacco use among adolescents will require cooperative efforts by local and state health and education officials, parents, physicians, media, legislators, regulatory agencies, and community youth organizations to implement these strategies.

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Part Three: Tobacco-Attributable Morbidity and Mortality

Determination of Nicotine, pH, and Moisture Content of Six U.S. Commercial Moist Snuff Products — Florida, January–February 1999

The use of smokeless tobacco (moist snuff and chewing tobacco) can cause oral cancer and precancerous oral lesions (leukoplakia) and is a risk factor for cardiovascular diseases and nicotine addiction *(1)*. Despite these adverse effects, smokeless tobacco is used commonly in the United States by young people, especially male high school students *(2)*. Officials in Florida requested CDC assistance in analyzing six moist snuff products to measure three factors that affect their nicotine dose: pH, nicotine content, and moisture content. This report summarizes the results of the analysis, which indicate that the pH, amount of nicotine, and moisture vary widely among brands.

During January 5–February 7, 1999, University of Miami staff and affiliated persons bought six smokeless tobacco products from stores in Daytona Beach, Fort Myers, Miami, Orlando, Tallahassee, and Tampa/St. Petersburg, Florida. These products were Copenhagen Snuff, Skoal Bandits Straight, Skoal Bandits Wintergreen, Skoal Long Cut Wintergreen, Kodiak Wintergreen, and Hawken Wintergreen,* and were chosen to reflect a cross-section of products from the five leading U.S. moist snuff brands sold in the United States during 1997 *(3)*.

The pH, nicotine, and total moisture content in samples of the six products were analyzed at CDC using a federal standard protocol[†] *(4)*. Samples were stored in their original containers at −95.8 F (−71 C) until tested. The pH was obtained by suspending 2 g of moist snuff in 10 mL distilled water. Total moisture content (water and tobacco constituents that are volatile at 211.1 F [99.5 C]) was obtained by calculating the weight difference in 5 g of tobacco before and after 3 hours of oven drying at 211.1 F (99.5 C). Nicotine was extracted from moist snuff by using methyl*tert*-butyl ether, and tobacco extracts were analyzed by gas chromatography to determine the nicotine content. The nicotine extraction and pH measurements were conducted at room temperature. The percentage of free (unprotonated) nicotine, which is dependent on the pH, was calculated according to the Henderson-Hasselbalch equation and by using a pK_a value of 8.02 for nicotine *(5)*. Free nicotine content then was calculated by multiplying the percentage of free nicotine by the total nicotine content (percentage of free nicotine x nicotine content). The tests were not blinded to the brands being tested, and all analyses were done in triplicate. Statistical analyses were performed using Statistical Analysis System (SAS) software.

The mean total moisture content ranged from 48.9% to 54.1%, except Hawken Wintergreen, which had a mean total moisture content of 24.7%; the mean nicotine content varied from 7.11 mg/g to 11.04 mg/g, except Hawken Wintergreen, which had a mean nicotine content of 3.37 mg/g; the mean pH varied from 5.24 (Hawken Wintergreen) to 8.35 (Kodiak Wintergreen). The mean amount of nicotine per dry tobacco weight ranged from 0.45% (Hawken Wintergreen) to 2.41% (Skoal Long Cut Wintergreen). Mean free nicotine levels varied from 0.01 mg/g (Hawken Wintergreen) to 6.23 mg/g (Copenhagen Snuff). The percentage of free nicotine varied from a mean value of 0.23% (Hawken Wintergreen) to 68.14% (Kodiak Wintergreen) (Table 1).

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* Use of trade names and commercial sources is for identification only and does not imply endorsement by U.S. Department of Health and Human Services or CDC.

[†] The protocol for determining pH, total moisture, and nicotine content used in this analysis was published as a notice to solicit public comment on the protocol in the Federal Register (62 FR 24116, May 2, 1997). The final version of the protocol was published in the Federal Register on March 23, 1999. The differences between the two protocols are minor and would not affect the results of this study; however, the sampling of the products for this study is different from that required by the protocol.

TABLE 1. Mean values of nicotine, total moisture, and pH of six moist snuff products* — Florida, January–February 1999†

Product	Place of purchase	Total moisture (%)	pH	Nicotine content (mg/g)§	Nicotine dry weight (%)	Free nicotine (mg/g)§	Free nicotine (%)
Copenhagen Snuff	Daytona Beach	54.8	8.21	10.76	2.38	6.546	60.81
	Fort Myers	53.4	7.99	10.32	2.21	4.982	48.27
	Miami	52.7	8.05	10.62	2.25	5.471	51.53
	Tampa/St. Petersburg	55.1	8.48	10.66	2.37	7.920	74.33
	Overall mean	**54.0**	**8.18**	**10.59**	**2.30**	**6.229**	**58.74**
	SD¶	± 1.0	±0.20	±0.17	±0.08	±1.178	±10.56
Skoal Bandits Straight**	Orlando	49.4	5.47	8.00	1.58	0.022	0.28
	Tampa/St. Petersburg	47.3	5.57	8.05	1.53	0.029	0.35
	Tallahassee	50.1	5.51	7.71	1.55	0.024	0.31
	Overall mean	**48.9**	**5.52**	**7.92**	**1.55**	**0.025**	**0.31**
	SD	± 1.2	±0.05	±0.16	±0.02	±0.003	± 0.03
Skoal Bandits Wintergreen**	Daytona Beach	50.6	6.91	7.12	1.44	0.515	7.24
	Orlando	49.3	6.88	7.42	1.47	0.502	6.77
	Tampa/St. Petersburg	49.8	6.86	7.05	1.40	0.456	6.47
	Tallahassee	49.7	6.74	6.83	1.36	0.341	4.99
	Overall mean	**49.9**	**6.85**	**7.11**	**1.42**	**0.454**	**6.37**
	SD	± 0.5	±0.07	±0.22	±0.04	±0.072	± 0.88
Skoal Long Cut Wintergreen	Daytona Beach	54.9	7.87	11.10	2.46	4.627	41.68
	Miami	54.4	7.80	10.95	2.40	4.121	37.64
	Orlando	54.2	7.94	10.79	2.35	4.895	45.36
	Tampa/St. Petersburg	53.1	7.53	11.33	2.42	2.775	24.48
	Overall mean	**54.1**	**7.79**	**11.04**	**2.41**	**4.105**	**37.29**
	SD	± 0.7	±0.16	±0.21	±0.04	±0.853	± 8.23
Kodiak Wintergreen	Daytona Beach	53.5	8.34	9.01	1.94	6.078	67.46
	Orlando	53.0	8.34	8.46	1.80	5.724	67.67
	Tallahassee	53.8	8.47	8.23	1.78	6.058	73.63
	Tampa/St. Petersburg	52.7	8.27	8.54	1.80	5.448	63.79
	Overall mean	**53.2**	**8.35**	**8.56**	**1.83**	**5.827**	**68.14**
	SD	± 0.4	±0.08	±0.30	±0.07	±0.272	± 3.68
Hawken Wintergreen	Orlando	28.0	5.45	3.00	0.42	000.8	0.27
	Tallahassee	25.1	5.61	3.17	0.42	0.012	0.39
	Tampa/St. Petersburg	20.9	4.65	3.93	0.50	0.002	0.04
	Overall mean	**24.7**	**5.24**	**3.37**	**0.45**	**0.007**	**0.23**
	SD	± 3.1	±0.45	±0.43	±0.04	±0.005	± 0.15

*Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services or CDC.
†Mean values for three replicated samples.
§Units for nicotine and free nicotine content are milligrams of nicotine (or free nicotine) per gram of tobacco (mg/g).
¶Standard deviation.
**Skoal Bandits come in 0.5 g sachets. Each sachet provides half the nicotine indicated.

Reported by: Univ of Miami; Florida Office of Tobacco Control, Florida Dept of Health. Air Toxicants Br, Div of Laboratory Sciences, National Center for Environmental Health; Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report indicate that substantial differences exist in the pH, the amount of moisture and nicotine, and the percentage of free nicotine among six commonly used U. S. smokeless tobacco products bought at several locations in Florida. The nicotine dose smokeless tobacco users receive may be controlled by adjusting the concentration of nicotine, varying the size of tobacco cuttings, and altering the pH *(6)*. The pH in tobacco strongly affects nicotine absorption through the nose and mouth, especially free nicotine, the chemical form most readily absorbed across the buccal mucosa into the bloodstream *(1)*. Although pH is a determinant of nicotine absorption, other factors can modulate the absorption rate (e.g., amount of moist snuff used and behavioral and physiologic factors unique to each user); however, these factors probably have little effect on the nicotine absorption rate *(7)*. Among the 562 compounds reported on the smokeless tobacco ingredient list *(8)*, several salts (e.g., ammonium, sodium, and potassium) may alter the pH of smokeless tobacco. The findings in this report confirm that products with high nicotine content and high pH have a high percentage of free nicotine.

The findings in this report are subject to at least two limitations. First, the analysis did not use a sales-weighted or representative sample of all U.S. brands or manufacturers; the moist snuff products tested were six leading products manufactured by the two industry leaders. Second, the findings for any specific brand could have been affected by factors unique to the sample delivered to each city surveyed, such as the retailers' duration and conditions of storage (e.g., humidity and temperature) and manufacturing dates.

This study is a new federal analysis of pH, moisture, and nicotine content of smokeless tobacco that quantifies a wide range of nicotine dosing capabilities in moist snuff products. These findings are consistent with other studies *(6,9)* that have found a wide variation in the nicotine dosing capabilities of these products. The Food and Drug Administration previously found that smokeless tobacco contains components intended to control the delivery of nicotine to the body *(10)*. Smokeless tobacco users who dip or chew eight to 10 times a day may be exposed to the same amount of nicotine as persons who smoke 30 to 40 cigarettes a day *(1)*. In addition, smokeless tobacco contains known cancer-causing agents: nitrosamines, polycyclic aromatic hydrocarbons, and radioactive polonium *(1)*. These findings underscore the need for intensive efforts to prevent children and adolescents from using any tobacco product, including smokeless tobacco, and to educate young users about the risks associated with smokeless tobacco.

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Medical-Care Expenditures Attributable to Cigarette Smoking During Pregnancy — United States, 1995

An estimated 26% of women of reproductive age (i.e., 18–44 years) smoked in 1993 (*1*), and approximately 19%–27% of women smoke during pregnancy (*2,3*). Smoking during pregnancy is causally associated with an annual estimated 32,000–61,000 low-birthweight infants and 14,000–26,000 admissions to neonatal intensive-care units (*3*). The estimated smoking-attributable direct medical-care costs for chronic conditions in 1993 were $50.0 billion (*4*); however, this estimate omitted the direct medical costs of tobacco exposure for infants and children and most of these costs for pregnant women. To derive 1995 estimates of the smoking-attributable costs for direct medical expenditures (i.e., inpatient, physician, hospital outpatient, and emergency department costs) related to pregnancy outcomes, the University of California at Berkeley and CDC analyzed data from the 1987 National Medical Expenditures Survey (NMES-2). This report summarizes the findings, which indicate substantial smoking-attributable direct medical expenditures for pregnant women and newborns.

The NMES-2 is managed by the Agency for Health Care Policy and Research and is a population-based longitudinal survey of the civilian, noninstitutionalized U.S. population (*5*). The data are nationally representative and provide cost estimates based on amounts paid by all insurers and by persons paying out-of-pocket for health care. During February 1987–May 1988, data were obtained through a questionnaire administered to a cohort of 35,000 persons in 14,000 households during personal interviews. Of those initially screened, 80% participated in NMES-2. Data were collected about socioeconomic factors, health insurance coverage, use of medical care, and medical-care expenditures. The Medical Provider Use and Expenditure Survey, one supplement of NMES-2, confirmed self-reported medical-care costs and provided information about costs that survey respondents were unable to report. The Adult Self-Administered Questionnaire Household Survey (ASAQHS), also a supplement to NMES-2, provided data about self-reported health status and health-risk behaviors (e.g., smoking, safety-belt use, and obesity). The NMES-2 data indicated that health-care costs for respondents to the smoking question in ASAQHS were lower than those for nonrespondents, indicating response bias. The Heckman two-stage statistical approach (*6*) was used to adjust the data.

In this analysis, never smokers were compared with current smokers. Never smokers were defined as persons who smoked <100 cigarettes during their lifetimes, and current smokers, as persons who smoked ≥100 cigarettes during their lifetimes and who smoked at the time of the interview. Respondents to NMES-2 who were pregnant during 1987 were categorized by pregnancy outcome: miscarriage or stillbirth, uncomplicated birth, or complicated birth. A complicated birth was one for which the respondent indicated that the delivery had not been normal or the provider indicated the mother or the infant had been hospitalized under a diagnosis code indicating pregnancy complications (e.g., hemorrhage from placenta previa, maternal infection, fetal distress, or malposition of the fetus). Using multivariate analyses, the probability of each of these pregnancy outcomes and the expected expenditures for each were estimated based on sociodemographic factors (i.e., region of residence, age, race/ethnicity, income categories, marital status, education level, and insurance coverage), receipt and timing of prenatal care, and smoking status.

Analysis of the 1987 data indicated that the probabilities of miscarriage or stillbirth (0.23) and complicated birth (0.25) were the same for smokers and nonsmokers. The estimated expenditure for an uncomplicated birth also was the same for smokers and nonsmokers—$3805 in 1987 dollars. However, the estimated cost of a complicated birth in 1987 was significantly higher for smokers than for nonsmokers ($10,894 versus $6544; p<0.01).

When extrapolated to the nation, the medical-care expenditures attributable to smokers with complicated births was an estimated $791 million in 1987 dollars, representing 11% of the total medical expenditures for all complicated births ($7 billion). These national estimates of smoking-attributable costs for complicated births were derived by using the probability of having a complicated birth (0.25), the number of live-born infants in 1987 (3.8 million) (7), an estimated smoking prevalence during pregnancy of 19%, and the smoking-attributable difference in the expected expenditures for complicated births determined from NMES-2. When a smoking prevalence during pregnancy of 27% (3) was used in the calculation, the estimated smoking-attributable costs were $1.1 billion (15%).

The smoking-attributable costs of complicated births were updated to 1995 by accounting for medical-care cost inflation* and the number of live-born infants in 1995 (3.9 million) (7). The total smoking-attributable costs were an estimated $1.4 billion (11% of costs for all complicated births) in 1995 dollars, based on a smoking prevalence during pregnancy of 19%, and an estimated $2.0 billion (15%), based on a smoking prevalence of 27%.

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Editorial Note: The findings in this report underscore the substantial and preventable economic impact of complicated births among smokers on the medical-care system in the United States: in 1987, the estimated direct medical cost of a complicated birth for a smoker was 66% higher than that for nonsmokers. Despite the magnitude of this difference, in this analysis, three factors probably resulted in underestimates of the smoking-attributable costs associated with pregnancy and delivery during 1987. First, in contrast to previously published reports (3), this analysis did not establish a positive relation between smoking during pregnancy and the probability of miscarriage and stillbirth or complicated births; this finding may reflect the small NMES-2 sample of births for which all data were available (n=490). Second, the smoking-attributable costs in this report did not include costs associated with the transfers of newborns to other hospitals or readmissions during the first year of life for medical conditions associated with smoking during pregnancy. Finally, the indirect costs related to infant mortality (e.g., years of productive life lost) and to maternal or infant morbidity (e.g., days lost at work) were excluded from this analysis.

The 1995 estimate of smoking-attributable costs also omits these costs. In addition, the precision of the 1995 estimate is affected by whether the probability of having a complicated birth increased or decreased during 1987–1995 and by changes in medi-

*Adjustments for inflation were calculated using the medical services component of the Consumer Price Index.

cal treatment patterns. For example, if complicated births were treated more intensively (i.e., with costlier medical technologies) in 1995 than in 1987, the methodology used to project 1995 expenditures probably would underestimate the 1995 smoking-attributable costs of complicated births.

The finding that the costs of complicated births for smokers exceeded those for nonsmokers may reflect greater severity of complications and, therefore, more intense treatment (e.g., longer hospital stays for the mother, more neonatal intensive-care unit days for the infant, and greater use of specialists as well as other personnel). Further analysis is needed to clarify the specific sources of these differences.

Smoking-cessation programs are an important strategy for preventing the adverse outcomes and related costs of smoking during pregnancy. For example, a meta-analysis of randomized trials of prenatal smoking-cessation programs using biochemical validation indicated a 50% increase in cessation over usual practice (*8*). Despite the effectiveness of this approach, many health-care providers do not offer such programs. To reduce smoking during pregnancy, patients must be more effectively educated about the health consequences of smoking during pregnancy both for them (e.g., placental complications) and for their unborn children (e.g., low birthweight), and health-care providers should be encouraged to provide this information (*9*). CDC is collaborating with a Robert Wood Johnson Foundation national program (Smoke-Free Families: Innovations to Stop Smoking During and Beyond Pregnancy), which supports the efforts of 10 grantees to develop, test, and evaluate innovative programs to assist childbearing-aged women in quitting smoking before, during, and after pregnancy and to maintain a smoke-free environment for their children.

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Filter Ventilation Levels in Selected U.S. Cigarettes, 1997

Cigarette brands that deliver ≤15 mg of tar in official smoking-machine tests accounted for 72.7% of total cigarette sales in 1995 (1). Many of these brands use ventilated filters—a system with small perforations around the filter that are designed to draw in additional air during smoking. In brands with ventilated filters, air introduced through the vents dilutes the amounts of tar, nicotine, carbon monoxide (CO), and other hazardous constituents of cigarette smoke (2). This report summarizes results of tests conducted by researchers at The Pennsylvania State University during July 1997 to measure the percentage of air drawn through the filter vents of 32 brands of U.S. cigarettes that have tar yields rated by the Federal Trade Commission (FTC) as ranging from 1 mg–18 mg; the report also examines the correlation between the degree of filter ventilation and tar yield. The findings indicate that 30 (94%) of 32 brands tested were ventilated and that percentage filter ventilation varied inversely with standard tar, nicotine, and CO yields.

Testing conditions simulated consumer use of a freshly opened pack of cigarettes. One pack each of 32 commercially available cigarette brands was purchased from retail stores in State College, Pennsylvania, during July 1997. Each pack was opened, and 20 unlit cigarettes were tested within 10 minutes with an FDT Ventilation Tester (Fidus Instrument Corporation, Richmond, Virginia)*, which measured the percentage of additional air drawn into a puff through the filter vents (i.e., percentage filter ventilation[†]). The testing conditions were maintained at an ambient air temperature of 72 F (22 C) (range: 68 F–75 F [20 C–24 C]) and a relative humidity of 60% (range: 55%–65%). Because of the potential for smokers to knowingly or inadvertently block filter ventilation holes with their lips or fingers (3), the location of these holes was determined for each of the 32 brands by selecting one cigarette from each pack to be measured to the nearest 0.5 mm by two technicians.

The ventilation percentage for the 32 brands ranged from 0 to 83% (Table 1). Based on four categories of tar yield, there was a linear association between ventilation percentage and tar yield (Figure 1). Standard tar yields varied inversely with percentage filter ventilation ($r=-0.93$ [degrees of freedom=31]). In addition, ventilation percentage varied inversely with nicotine yield ($r=-0.90$) and CO yield ($r=-0.95$ [degrees of freedom=29]) (Table 1). The distance of filter vents from the mouth end of the filter ranged from 11 mm–15 mm (Table 1).

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Editorial Note: From 1954 to 1994, sales-weighted tar yields of cigarettes declined from an estimated average of 37 mg tar to 12 mg tar, respectively (2,4). Despite this decline in tar yields—attributable, in part, to the increased use of filter ventilation—the relative risk for lung cancer has increased, even when accounting for the delayed onset of mortality from tobacco-linked lung cancer (5). Factors potentially associated

*Use of trade names and commercial sources is for identification only and does not imply endorsement by CDC or the U.S. Department of Health and Human Services.
[†]The percentage of a standard puff (35-mL volume and 2-second duration) that is air taken into the puff through the filter vents. A cigarette with no filter ventilation would produce a puff undiluted by air from filter vents; a cigarette with 80% filter ventilation would produce a puff that is 80% air from vents and 20% smoke undiluted by air from vents.

TABLE 1. Selected U.S. cigarette brands*, by tar, nicotine, and carbon monoxide (CO) yields†; by distance of closest vents from the mouth end of the filter; and by percentage of filter ventilation§ — State College, Pennsylvania, 1997

Brand¶	Yield			Closest vents (mm)	Ventilation	
	Tar (mg)	Nicotine (mg)	CO (mg)		%	(SEM**)
Carlton SP	1	0.1	2	15.0	77.6	(±0.32)
Carlton 100 HP	1	0.1	1	14.5	82.5	(±0.29)
Merit Ultima SP	1	0.1	3	11.0	64.4	(±1.45)
Carlton 100 SP	2	0.2	3	15.0	78.6	(±0.48)
Now 100 SP	2	0.2	3	12.5	66.3	(±0.59)
Doral UL SP	4	0.4	6	13.0	56.7	(±0.47)
Benson & Hedges Deluxe UL 100 HP	5	0.5	7	12.0	52.6	(±0.61)
Virginia Slims UL 100 HP	5	0.5	5	12.0	55.6	(±0.72)
Cambridge UL 100 SP	5	0.4	8	12.5	53.1	(±0.38)
Merit UL SP	5	0.5	6	11.5	49.0	(±0.54)
GPC UL SP	6	0.5	7	15.0	47.9	(±0.67)
Winston UL SP	6	0.5	8	13.0	48.1	(±0.64)
Merit HP	7	0.6	9	11.0	34.1	(±0.71)
Virginia Slims L 100 HP	8	0.7	8	12.0	39.7	(±0.46)
Doral L SP	8	0.6	10	12.5	18.9	(±0.59)
Newport L SP	9	0.7	11	14.0	21.8	(±0.62)
Red Kamel L HP††	10	0.8	NA	12.5	20.2	(±0.87)
Winston L SP	10	0.7	11	12.0	24.8	(±0.56)
Marlboro L SP	10	0.8	11	12.0	22.5	(±0.60)
Basic L HP	10	0.7	12	12.0	11.1	(±0.40)
GPC L SP	10	0.7	11	15.0	23.7	(±0.34)
Camel L HP	11	0.9	13	12.0	22.3	(±0.58)
Kool Milds SP	11	0.8	11	15.0	25.4	(±0.46)
Marlboro Mediums 100 SP	12	1.0	13	12.5	19.1	(±0.31)
Virginia Slims FF 100 SP	14	1.1	12	12.0	19.9	(±0.87)
Doral FF SP	14	0.9	15	12.0	12.6	(±0.27)
Kool Filter HP	15	1.0	14	—	0	
Winston FF SP	15	1.2	13	15.0	11.7	(±0.87)
Marlboro FF SP	16	1.1	15	12.5	10.2	(±0.26)
Newport FF HP	16	1.2	16	—	0	
Red Kamel FF HP††	17	1.3	NA	15.0	21.8	(±0.99)
Camel FF SP	18	1.4	20	14.5	5.1	(±0.22)

*Use of trade names and commercial sources is for identification only and does not imply endorsement by CDC or the U.S. Department of Health and Human Services.
†Source: reference 4.
§A system with small perforations around the filter that are designed to draw in additional air during smoking.
¶UL=ultra-light; L=light; FF=full flavor; SP=soft pack; HP=hard pack. Brand is king size unless designated 100.
**Standard error of the mean.
††Tar and nicotine yields were attained from advertisements; CO level was not available.

FIGURE 1. Percentage filter ventilation* of cigarettes based on tar yields rated by the Federal Trade Commission — State College, Pennsylvania, 1997
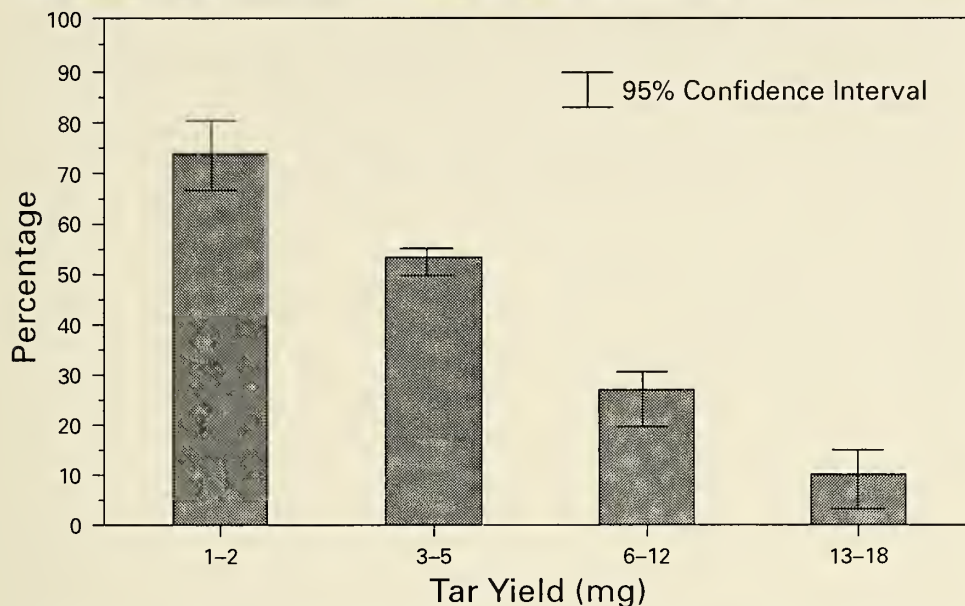
*The percentage of a standard puff (35-mL volume and 2-second duration) that is air taken into the puff through the filter vents. A cigarette with no filter ventilation would produce a puff undiluted by air from filter vents; a cigarette with 80% filter ventilation would produce a puff that is 80% air from vents and 20% smoke undiluted by air from vents.

with the increase in smoking-related mortality are an increase in the number of cigarettes smoked (and therefore, tar exposure) by persons who use reduced-tar brands, inhaling more deeply, and an increased frequency of puffing (2). In addition, smokers who use reduced-tar cigarettes may be blocking some of the filter vents with their fingers or lips, therefore increasing their exposure to the carcinogens in cigarette smoke (3). Compensatory changes in smoking behaviors among persons who smoke reduced-tar cigarettes could be associated with changes in the risk, histology, and site of lung cancers (6).

Blocking even a portion of the filter vents can markedly increase a smoker's exposure to the harmful components of cigarette smoke. Smokers can inadvertently block filter vents because filter vents often are invisible to the unaided eye and the filters do not include a marking (e.g., a colored band) to indicate the presence of vents. Blocking with the lips would more likely occur with the brands with filter vents closer to the mouth end of the filter (7) and blocking with the fingers would more likely occur with brands with filter vents further away from the mouth end of the filter (Table 1). One study has estimated that 58% of persons who smoke cigarettes with ≤4 mg tar are blocking some filter vents (3). In tests conducted on cigarette smoking machines, blocking half of the ventilation holes on a cigarette with standard yields of 4 mg tar, 0.5 mg nicotine, and 5 mg CO increased FTC-rated tar yields by 60%, nicotine by 62%,

and CO by 73% (*8*). In addition, one study by the tobacco industry (*7*) estimated that, when smoking an ultra-light cigarette (2.2 mg tar), 45% of smokers blocked vents to some degree with their lips: 21% of smokers (or nearly half of those who blocked vents) increased tar yields to at least 3.3 mg tar (i.e., by ≥50%); overall, approximately one in 10 smokers (approximately 25% of those who blocked vents) were estimated to at least double their tar yields from blocking with their lips alone.

This study is subject to at least four limitations. First, although the cigarette brands tested reflected the range of tar yields for filter cigarettes, the analysis did not use a sales-weighted or representative sample of all available brands. For example, although cigarettes with <3 mg of tar were included in this study, such cigarettes accounted for only approximately 2% of sales in 1995 (*1*). Second, the findings for any specific brand could have been affected by factors unique to the sample of cigarettes delivered to the State College area, including, for example, manufacturing dates and retailers' storage conditions (e.g., temperature and humidity). Third, cigarettes were not maintained at standard temperature and humidity conditions for 24 hours before testing; this was done to simulate use of a freshly opened pack of cigarettes by a consumer. Finally, although the analysis used 1994 data on tar yields (*1,4*) (the most recent available), brand formulations may have changed since 1994.

Many smokers who block filter vents probably are exposed to substantially higher levels of hazardous smoke than the FTC-rated levels for those brands. The FTC recognizes that their machine-measured yields of tar and nicotine are poor predictors of exposure to toxic smoke products by smokers (*2*) and invites comments (until January 20, 1998) on proposed changes to its testing and reporting system (FTC file number P944509; additional information is available from the FTC's Bureau of Consumer Protection by contacting C. Lee Peeler, telephone [202] 326-3090, or Shira Modell, telephone [202] 326-3116). To identify cigarette brands in which vent-blocking probably is a problem, all cigarette testing should include measurement of filter ventilation.

An estimated two thirds of U.S. smokers either are unaware of the presence of vents on cigarettes or do not know that tar yields increase when vents are blocked (*9*). Filter vents can be difficult to see, which may account for the high proportion of smokers (80%) of "light" (6–15 mg tar) and "ultra-light" (1–5 mg tar) cigarettes who are unaware of the presence of vents on the brands they smoke (*10*). These findings underscore the need for intensified efforts to educate smokers about the risks associated with smoking reduced-tar cigarettes.

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As part of its commemoration of CDC's 50th anniversary, MMWR *is reprinting se-*
lected MMWR *articles of historical interest to public health, accompanied by a current*
editorial note. Reprinted below is the report published October 30, 1987, which ana-
lyzed smoking-attributable mortality and years of potential life lost for 1984, followed
by a contemporary editorial note.

Perspectives in Disease Prevention and Health Promotion

Smoking-Attributable Mortality and Years of Potential Life Lost — United States, 1984

Cigarette smoking has been identified as the chief avoidable cause of death in the United States (*1*). Several estimates of mortality attributable to cigarette smoking have been reported, including 270,000 deaths for 1980 (*2*) and 314,000 deaths for 1982 (*3*). Published estimates vary considerably because of changing mortality rates, decreasing smoking rates, and differences in methods used. Smoking-attributable mortality and years of potential life lost (YPLL) for 1984 are analyzed in this report.

Relative risk (RR) estimates for smoking-related diseases and prevalence estimates of current, former, and never smokers among adults ≥20 years of age were used to calculate the smoking-attributable fraction (SAF) and smoking-attributable mortality for 19 underlying causes of death (*2*) (Table 1).* Age-, sex-, and race-specific mortality data for 1984 were obtained from National Center for Health Statistics reports. Age-, sex-, and race-specific smoking prevalence rates were obtained from the 1985 Current Population Survey (Supplement) of the Bureau of the Census (Office on Smoking and Health, CDC, unpublished data). Years of potential life lost were calculated to age 65 according to previously described methods (*6*). Age-adjusted smoking-attributable mortality and YPLL rates were calculated by the direct method, with the 1984 U.S. population used as the standard.

For deaths among adults, the disease-specific SAFs are derived from RR estimates for current and former smokers that are weighted averages from four prospective studies (*7–10*). RR estimates for women based on these studies may be lower than the current RRs for many of the specific smoking-related diseases among women. However, the SAF for lung cancer among women (0.75) has been updated based on RR estimates from more recent mortality data (*11*). Race-specific RR estimates for smoking-attributable diseases were not available.

For four pediatric diagnoses, the mortality attributed to maternal smoking during pregnancy for children <1 year of age was determined. These calculations used RR estimates from McIntosh (*12*) and current smoking prevalence among women 20–64 years of age as a proxy for the percentage of pregnant women who smoke. The RR (1.50) for sudden infant death syndrome from McIntosh (*12*) was used, but the RR (1.76) for total infant mortality reported by McIntosh was used to calculate the SAF for

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*The equation for calculating the smoking-attributable fraction of each disease category is: $SAF=[p_0 + p_1(RR_1) + p_2(RR_2)] - 1/[p_0 + p_1(RR_1) + p_2(RR_2)]$ where p_0=percentage of never smokers, p_1=percentage of current smokers, p_2=percentage of former smokers, RR_1=relative risk for current smokers (relative to never smokers), and RR_2=relative risk for former smokers (relative to never smokers) (*4*). This formula is derived from the standard attributable risk (AR) formula (*5*): $AR=p(RR - 1)/[p(RR - 1) + 1]$.

only three specific infant death categories (short gestation/low birthweight, respiratory distress syndrome, and other respiratory conditions).

An estimated 315,120 deaths and 949,924 YPLL before age 65 years resulted from cigarette smoking in 1984 (Table 2). The smoking-attributable mortality rate among men is more than twice the rate among women, and the rate among blacks is 20% higher than the rate among whites (Table 3). The smoking-attributable YPLL rate among men is more than twice the rate among women, and the rate among blacks is more than twice the rate among whites (Table 3).

TABLE 1. Total mortality, weighted smoking-attributable fractions (SAF), and smoking-attributable mortality (SAM), by disease category and sex — United States, 1984

Disease Category*		Males			Females			Total SAM[†]
		Deaths	SAF	SAM	Deaths	SAF	SAM	
Adults ≥20 years old								
Neoplasms:								
140-149	Lip, oral cavity, pharynx	5,754	0.688	3,958	2,689	0.413	1,110	5,068
150	Esophagus	6,310	0.589	3,717	2,345	0.536	1,257	4,974
151	Stomach	8,468	0.172	1,455	5,772	0.254	1,467	2,922
157	Pancreas	11,513	0.300	3,459	11,634	0.142	1,653	5,112
161	Larynx	2,959	0.806	2,385	664	0.413	274	2,660
162	Trachea, lung, bronchus	82,459	0.796	65,659	36,227	0.750	27,170	92,829
180	Cervix uteri	0	0.0	0	4,562	0.369	1,685	1,685
188	Urinary bladder	6,597	0.371	2,447	3,114	0.274	853	3,299
189	Kidney, other urinary	5,424	0.243	1,319	3,403	0.118	403	1,722
Circulatory diseases:								
401-405	Hypertension	13,464	0.156	2,099	17,855	0.148	2,645	4,744
410-414	Ischemic heart disease <age 65	78,340	0.285	22,362	27,000	0.181	4,892	27,253
410-414	Ischemic heart disease ≥age 65	211,003	0.159	33,461	224,756	0.075	16,816	50,276
427.5	Cardiac arrest	19,392	0.399	7,745	17,296	0.344	5,950	13,695
430-438	Cerebrovascular disease	59,185	0.096	5,692	88,285	0.139	12,228	17,920
440	Arteriosclerosis	9,235	0.238	2,200	15,216	0.315	4,797	6,996
441	Aortic aneurysm	10,323	0.624	6,444	4,791	0.468	2,244	8,689
Respiratory Diseases:								
480-487	Pneumonia, influenza	28,774	0.208	5,986	28,935	0.093	2,679	8,664
491-492	Chronic bronchitis, emphysema	10,708	0.850	9,097	5,517	0.694	3,831	12,928
496	Chronic airways obstruction	31,240	0.850	26,541	16,625	0.694	11,545	38,085
Digestive diseases:								
531-534	Ulcers	3,251	0.479	1,556	3,365	0.445	1,497	3,053
Pediatric diseases, <1 year old								
765	Short gestation, low birthweight	1,729	0.182	314	33	0.182	279	593
769	Respiratory distress syndrome	2,178	0.182	396	1,379	0.182	251	647
770	Other respiratory conditions of newborn	1,982	0.182	360	1,515	0.182	275	636
798.0	Sudden infant death syndrome	3,176	0.128	405	2,069	0.128	264	669
Total[†]				209,057			106,063	315,120

* International Classification of Disease, ninth revision.
[†] Sums may not equal total because of rounding.

TABLE 2. Estimated smoking-attributable mortality and years of potential life lost (YPLL)*, by race and sex — United States, 1984

	Mortality			YPLL		
	Males	Females	Total[†]	Males	Females	Total[†]
Whites	184,296	95,340	279,636	489,827	199,590	689,418
Blacks	22,647	10,131	32,779	129,952	63,473	193,425
Total population[§]	209,057	106,063	315,120	661,651	288,273	949,924

*YPLL before age 65.
[†]Sums may not equal total because of rounding.
[§]Includes whites, blacks, and racial category "other."

TABLE 3. Age-adjusted smoking-attributable mortality rates* and years of potential life lost (YPLL) rates[†], by race and sex — United States, 1984

	Mortality rate			YPLL		
	Males	Females	Total[†]	Males	Females	Total
Whites	189.7	64.2	119.0	5.56	2.17	3.81
Blacks	236.5	75.5	143.2	12.07	4.85	8.14
Total population[§]	192.6	68.0	133.2	6.53	2.71	4.56

*Per 100,000 persons (population data from 1984 U.S. Census).
[†]YPLL before age 65/1,000 persons <65 years (population data from 1984 U.S. Census).
[§]Includes whites, blacks, and racial category "other."

Reported by: Office on Smoking and Health, Center for Health Promotion and Education, CDC.

Editorial Note: The total smoking-attributable mortality and YPLL reported here is similar to that cited in previous reports (*2,3*), showing that the disease impact of smoking in the United States continues to be enormous despite recent declines in the prevalence of smoking. These figures do not include mortality and YPLL due to peripheral vascular disease (for which specific RR estimates are generally lacking), cancer at unspecified sites, cigarette-caused fires, or involuntary (passive) smoking. In 1984, an estimated 1,570 deaths were attributed to cigarette-initiated fires (*13*); an estimated 3,825 nonsmokers per year die from lung cancer attributed to involuntary smoking (*14*). When the figures for fires and involuntary smoking are included, the estimated total of smoking-attributable deaths in the United States in 1984 is 320,515, or 15.7% of all (2,039,369) U.S. deaths. Total smoking-attributable YPLL (949,924) represents 8.1% of all (11,761,000) U.S. YPLL before age 65 (excluding YPLL due to cigarette-caused fires or involuntary smoking).

Among blacks, the smoking-attributable mortality (32,779) represents 13.9% of total 1984 mortality (235,884), whereas the smoking-attributable mortality for whites (279,636) was 15.7% of total 1984 mortality (1,781,897), excluding deaths due to fires or involuntary smoking. However, the smoking-attributable mortality rate and YPLL rate were higher among blacks than among whites. These differences in rates reflect a higher prevalence of smoking and a higher mortality rate from smoking-related diseases among blacks. Higher YPLL rates among blacks may also reflect more smoking-attributable deaths at earlier ages. Because blacks tend to smoke fewer ciga-

rettes per day than whites (15,16), the difference in smoking-attributable mortality and YPLL rates between blacks and whites may be slightly overestimated. On the other hand, the RR of smoking-related diseases among blacks may be higher than the RR estimates used here because of increased interactions between smoking and other risk factors, different tar and nicotine exposures, or different smoking patterns. Still, these findings support previously cited concerns regarding the increased burden of smoking-related disease among blacks (17).

Smoking prevalence for 1985 was used to calculate the SAFs in this study. However, the 1984 smoking-related mortality is a result of a higher smoking prevalence during the 1950s, '60s, and '70s, the decades during which these diseases were developing. Therefore, the SAFs used here are conservative.

CDC has examined YPLL before age 65 years since 1979 (6). In this study, most smoking-related deaths (218,691, or 69.4%) occurred among persons ≥65 years of age. Thus, the smoking-attributable YPLL among persons <65 reported here (949,924) is substantially lower than the 3.6 million smoking-attributable YPLL calculated when the average life expectancy in the United States is used for calculating YPLL for 1984.

Group-specific calculations such as these are possible for states and other defined populations if mortality and smoking prevalence data for those populations are available. A computer program has recently been developed to aid in calculating mortality and YPLL attributed to cigarette smoking (18). CDC is now collaborating with all 50 state health departments, Puerto Rico, and the District of Columbia to perform similar studies. Results from this project will be reported in 1988.

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Editorial Note—1997: In 1987, CDC published the preceding report that provided a detailed and comprehensive estimate of the number of deaths attributed to cigarette smoking in the United States. Using the attributable fraction, which measures the magnitude of a public health problem accounted for by an etiologic agent, CDC was able to quantify the impact of smoking. This method established that smoking was the leading cause of preventable deaths in the United States (*1*). As a result, increased emphasis was placed on decreasing the health burden caused by tobacco use and on reducing cigarette smoking. Since this SAM estimate was published in 1987, continued research has increased understanding of the health risks associated with tobacco use, including nicotine addiction and the recognition that addiction begins in childhood. Public health programs have responded by focusing on preventing tobacco use among adolescents, assisting in tobacco-use cessation, and protecting nonsmokers from environmental tobacco smoke. This contemporary editorial note reviews previous SAM estimates, presents new SAM estimates for 1990–1994, and discusses future implications.

SAM and YPLL estimates for the United States published since the first estimate for 1984 include 390,000 deaths for 1985, 434,000 deaths and 6 million YPLL before age 85 for 1988, and 418,000 deaths and 5 million YPLL to life expectancy for 1990 (*2*). SAM and YPLL also have been estimated for all 50 states and the District of Columbia for 1985 and for 1990 (*3*). Although all estimates were calculated by the same equation used for the SAF, the data sources, study populations, and causes of death have changed. The Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAM-MEC) software program has also been used for calculating these estimates (*2*).

Since 1989, RR estimates for calculating SAM and YPLL have been obtained from the American Cancer Society's Cancer Prevention Study II (CPS-II) for 1982–1986 (*4*). The CPS-II was selected, in part, because it is the largest prospective U.S. study that has collected data on the relation between smoking and mortality (*4*). Recent SAM estimates for adults have been limited to persons aged ≥35 years because the CPS-II study population was restricted to this age range. Deaths from stomach cancer and ulcers were dropped from the calculation of SAM because a causal relation has not been established (*4*). Conversely, the cardiovascular and respiratory disease categories were expanded to include the *International Classification of Diseases, Ninth Revision* [ICD-9], codes 390–398, 415–417, 420–429, 442–448, 010–012, and 493. The CPS-II data also enabled the calculation of the RR for smoking and cerebrovascular disease, which declines with age (*4*), for two age groups (35–64 years and ≥65 years).

Cigarette smoking remains the leading preventable cause of death in the United States. The same methods and data sources that were used to calculate the 1990 SAM and YPLL (2)[†] were used for the 1990–1994 calculations, which indicated that 2,153,700 deaths (1,393,200 men and 760,400 women; total annual average: 430,700 deaths) were attributed to smoking (19.5% of all deaths). A total of 906,600 of these deaths resulted from cardiovascular diseases; 778,700, from neoplasms; 454,800, from nonmalignant respiratory diseases; 7900, from diseases among infants; and 5500, from smoking-related fires. Lung cancer (616,800 deaths), ischemic heart disease (IHD) (490,000 deaths), and chronic airway obstruction (270,100 deaths) accounted for most deaths. During 1990–1994, cigarette smoking resulted in 5,732,900 YPLL before age 65 years and in 28,606,000 YPLL to life expectancy.

During 1990–1994, estimates of SAM were higher among men than among women, reflecting their longer duration and higher prevalence of smoking and greater numbers of cigarettes smoked per day (6). Annual SAM rates will probably remain stable if current trends in smoking prevalence among adults continue. Although the prevalence of smoking among persons aged ≥35 years decreased from 1985 to 1990 (28.4% to 24.1%), during 1990–1994, smoking prevalence remained relatively constant—at 23.6%–24.8% (CDC, unpublished data). However, the prevalence of smoking among U.S. adolescents has been increasing since 1992 (7). If these smoking patterns continue into adulthood, SAM and YPLL are expected to increase. Assuming that one third of adult smokers, 10% of former smokers, and 5.3 million persons aged <18 years die from smoking and that current smoking patterns continue, an estimated 25 million persons alive today will die prematurely from smoking-related illnesses (7,8).

Lung cancer has been and probably will continue to be the leading cause of SAM because, although lung cancer death rates are decreasing among men, rates are continuing to increase among women (9). Among women, death rates for lung cancer have surpassed those for breast cancer since 1987 (9). In addition, because recent trends indicate a slowing of the decline in IHD mortality, IHD will probably remain a major contributor to SAM (9).

SAM and YPLL may be underestimated for several reasons (2); recent studies have addressed two of these reasons. First, SAM and YPLL estimates are based on the prevalence of current and former smokers in the current year; however, the deaths that occur during a given year are primarily among persons who began smoking 30–50 years earlier (10), many of whom have quit smoking (10). Including these persons in the prevalence estimates of former smokers may decrease the SAF because the summary measure of risk for former smokers does not reflect their increased likelihood of dying from a smoking-related disease (4). Among whites, expanding the classification of smoking to include information on duration and number of cigarettes smoked per day resulted in 10% larger SAM estimates for IHD than SAM estimates in which smoking was categorized as current, former, and never (10). Second, the SAM estimates do not include mortality caused by cigar smoking, pipe smoking, or smokeless tobacco use. Approximately 1000 deaths were attributable to pipe smoking in 1991 (11).

[†] Except for the prevalence of smoking among pregnant women in the United States for 1992 through 1994, which was estimated from the 1992–1993 National Pregnancy and Health Survey (5).

Although SAM and YPLL estimates are not adjusted for confounders (*2–4*), a recent study has documented little change in SAM estimates after adjustment for confounders (*12*). Among whites, SAM estimates for the combined disease categories of lung cancer, IHD, bronchitis/emphysema, chronic airway obstruction, and cerebrovascular disease were 2% higher than age-adjusted estimates after adjustment for relevant confounders including age, education, alcohol intake, diabetes, and hypertension (*12*).

Cigarette smoking has resulted in approximately 10 million deaths since the first Surgeon General's report on smoking and health in 1964 (2,4,13). In 1993, $50 billion in medical costs were attributable to smoking (*14*). The human and economic costs of smoking will continue to accumulate until the completely effective implementation of public health efforts to prevent initiation, to promote cessation, and to protect non-smokers from the adverse effects of environmental tobacco smoke. Examples of such efforts include Food and Drug Administration regulations to restrict youth access to tobacco and to reduce the appeal of cigarette advertising to youth (*7*); comprehensive state-based efforts, including tax increases and earmarked funding for tobacco-use prevention and mass media campaigns similar to those in Massachusetts and California (*15*); physician adherence to the Agency for Health Care Policy and Research's smoking cessation guidelines (*8*); institutional adoption of the Guidelines for School Health Programs to Prevent Tobacco Use and Addiction (*16*); and clean indoor-air policies that protect nonsmokers.

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Ingestion of Cigarettes and Cigarette Butts by Children —
Rhode Island, January 1994–July 1996

During 1995, the American Association of Poison Control Centers (AAPCC) received 7917 reports of potentially toxic exposures to tobacco products among children aged ≤6 years in the United States (*1*). Most cases of nicotine poisoning among children result from their ingestion of cigarettes or cigars (*2*). Acute nicotine poisoning is characterized by rapid onset of symptoms that may be severe when large amounts have been ingested (*2*). During January 1994–July 1996, the Rhode Island Poison Control Center (RIPCC) received 146 reports of ingestion of products containing nicotine by children aged ≤6 years. To characterize risk factors for and outcomes associated with ingestion of cigarettes and cigarette butts among children aged ≤6 years, the Rhode Island Department of Health (RIDH) analyzed data from the RIPCC and the 1996 Rhode Island Health Interview Survey (RIHIS). This report summarizes the findings of the study, which indicate that ingestion of cigarettes and cigarette butts by children aged ≤6 years resulted in minor toxic effects and occurred more frequently in households where smoking was permitted in the presence of children and where cigarettes and cigarette wastes were accessible to children.

Information about toxic exposures reported to the RIPCC is recorded on standardized forms published by the AAPCC. RIDH identified reports of ingestion of products containing nicotine among children aged ≤6 years during January 1994–July 1996. Data abstracted included age, sex, type of nicotine-containing product ingested, time of report, relationship between the person who made the report and the child, location where the ingestion occurred, symptoms, and whether the child visited a health-care facility (i.e., emergency department, doctor's office, or health maintenance organization [HMO] clinic). For reports with follow-up information (collected by Certified Specialists in Poison Information within 4 hours of the initial report), RIDH attempted to interview parents by telephone to obtain more detailed information about the household.

To identify risk factors for ingestion of cigarettes and cigarette butts, RIDH conducted a case-control study. Controls were determined using the 1996 RIHIS (a representative stratified random-digit–dialed survey of telephone-equipped households in Rhode Island) and included persons in households with at least one cigarette smoker (i.e., smoked cigarettes now) and at least one child aged ≤6 years. Factors assessed included history of ingestion of toxic substances, types of tobacco products used in the household, storage of cigarettes, location of ashtrays, household smoking policies, and type of child care. Of 123 parents identified as control sources, 67 (55%) completed a telephone interview. Odds ratios (ORs) and 95% confidence intervals (CIs) were used to measure the association between categorical variables and the ingestion of cigarettes or cigarette butts.

Of the 146 reports of children who ingested products containing nicotine, follow-up information was available for 90 (62%) and involved the ingestion of cigarettes or cigarette butts (an additional report with follow-up information involved the ingestion of pipe tobacco). The mean age of the 90 children was 11.7 months (range: 6–24 months); of these, 69 (77%) were aged 6–12 months (Table 1), and 48 (53%) were males. Fifty (56%) had ingested cigarettes, and 40 (44%) had ingested cigarette butts. Of the 50 children who had ingested cigarettes, 36 (72%) had ingested less than a

whole cigarette. Of the 40 children who had ingested cigarette butts, 22 (55%) ingested less than a whole cigarette butt. A total of 32 (36%) of the episodes occurred during 7 a.m. to 10 a.m. (Table 1), but all reports were made within 30 minutes of either the onset of symptoms or when the reporting person recognized that a child had ingested cigarettes or cigarette butts. Most (81 [90%]) of the exposures were reported by parents, and 88 (98%) of the exposures occurred in the child's home (Table 1). Symptoms were reported in 30 (33.3%) of the children and included spontaneous vomiting (up to four episodes) (26 [87%]), nausea (two [7%]), pale or flushed appearance (two [7%]), lethargy (one [3%]), and gagging (one [3%]). Thirteen (14%) of the

TABLE 1. Number and percentage of cigarette and cigarette butt ingestions by children aged ≤6 years, by selected characteristics — Rhode Island, January 1994–July 1996

Characteristic	No. children	(%)
Age group (mos)*		
6–12	69	(76.7)
13–19	16	(17.8)
20–24	5	(5.6)
Sex		
Female	42	(46.7)
Male	48	(53.3)
Type of substance		
Cigarette	50	(55.6)
Cigarette butt	40	(44.4)
Hour of day occurred†		
7 a.m.–10 a.m.	32	(35.6)
11 a.m.– 2 p.m.	17	(18.9)
3 p.m.– 6 p.m.	24	(26.7)
7 p.m.–10 p.m.	15	(16.7)
10 p.m.– 1 a.m.	2	(2.2)
Source of report		
Mother	71	(78.9)
Father	10	(11.1)
Other relative	3	(3.3)
Health-care worker	5	(5.6)
Rescue worker	1	(1.1)
Site of exposure		
Own residence	88	(97.8)
Other residence	1	(1.1)
Public park	1	(1.1)
Clinical symptoms		
Yes	30	(33.3)
No	60	(66.7)
Visited health-care facility		
Yes	13	(14.4)
No	77	(85.6)
Total	90	(100.0)

*No cases were reported among children aged ≥25 months.
†No calls were made during 1 a.m.–7 a.m.

children had been taken to a health-care facility. All 30 children recovered fully within 12 hours.

Telephone interviews were completed with the parents of 35 (39%) of the 90 children (the parents of other children either could not be contacted or refused to participate). Based on these interviews and those of controls, children who ingested cigarettes or cigarette butts were more likely to live in homes where smoking occurred in the presence of children (25 [83%] versus 27 [52%]) (OR=4.6, 95% CI=1.4–17.6) or in which cigarettes (28 [80%] versus 22 [37%]) (OR=6.6, 95% CI=2.3–21.0) or ashtrays (30 [86%] versus 25 [45%]) (OR=7.3, 95% CI=2.3–27.6) were located within the children's reach. Smoking in the presence of children remained a significant risk factor for the ingestion of cigarettes or cigarette butts after controlling for the location of cigarettes (adjusted OR=7.8, 95% CI=2.0–30.2) and ashtrays (adjusted OR=5.9, 95% CI=1.6–22.6) within the household.

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Editorial Note: The investigation in Rhode Island documented ingestion of cigarettes or cigarette butts by children aged 6–24 months, an age range during which children are actively exploring their environment and are at increased risk for ingesting toxic substances (3). These ingestions were associated with only minor toxic clinical effects; however, previous reports have described severe toxicity among children who ingested cigarettes, cigarette butts, or snuff, including depressed respiration, cardiac arrhythmia, and convulsions (4–6). In Rhode Island, ingestion also was associated with smoking in the presence of children and easy accessability to cigarettes and cigarette butts, reflecting careless placement of these objects and/or lack of parent's knowledge about the potential toxicity of ingested tobacco products.

The findings in this report are subject to at least three limitations. First, the number of episodes most likely was underestimated because asymptomatic ingestions may not have been reported, ingestion was successfully treated by a health-care provider, or because some parents were unaware of the RIPCC. Second, the response rate for the case-control study was low; because children in homes where parents did not participate may have been more likely to have access to cigarettes or cigarette butts than children in homes of study participants, risk may have been underestimated. Finally, the study could not identify risk factors for the ingestion of other tobacco products because the use of tobacco products other than cigarettes was not included in the RIHIS.

The findings in this report will be used by RIDH and other public health agencies to develop approaches for decreasing exposures to cigarettes and cigarette butts among young children. These approaches may include public education about the potential toxicity of tobacco products, the health benefits of not smoking in the presence of children (i.e., the toxic effects of environmental tobacco smoke), and the safe storage and disposal of tobacco products (i.e., use of child-resistant containers). Tobacco products should be kept out of reach of children. However, if ingestion does occur, a poison-control center should be consulted to assess the risks for serious toxicity and review measures for appropriate treatment. In addition to preventing nicotine poison-

ings, avoiding the use of tobacco products in the presence of children should decrease the risk for infections from respiratory diseases in children (7); the risk that children will smoke in the future (8); and children's access to lighted cigarettes, matches, and cigarette lighters, thereby reducing fires started by children—the leading cause of fire-related deaths among children aged <5 years (9).

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Projected Smoking-Related Deaths Among Youth —
United States

On August 23, 1996, the Food and Drug Administration (FDA) issued a regulation restricting the sale and distribution of cigarettes and smokeless tobacco to children and teenagers to reduce the number of youth who use these products and to reduce the life-threatening consequences associated with tobacco use (*1*). Despite widespread efforts to educate U.S. youths about the health consequences associated with smoking (*2*), the prevalence of smoking among this group has been increasing since 1992 (*3*). To assess the need for continued public health efforts to prevent nicotine addiction, CDC used a model including data from the Behavioral Risk Factor Surveillance System (BRFSS) to project the future impact of smoking on the health of children and teenagers. This report presents the findings of the analysis, which indicate that, if current tobacco-use patterns persist, an estimated 5 million persons who were aged 0–17 years in 1995 will die prematurely from a smoking-related illness.

State-specific data on the prevalence of current smoking among adults aged 18–30 years in all 50 states and the District of Columbia were obtained from the BRFSS for 1994 and 1995 (*4*). Current smokers were respondents who reported having smoked 100 cigarettes during their lifetimes and who reported currently smoking. Because the prevalence of smoking in a birth cohort peaks during early adulthood (*2*), the average prevalence of smoking among adults aged 18–30 years for each state during 1994–1995 was used to estimate the future prevalence of smoking during early adulthood for the birth cohorts currently aged 0–17 years. The number of persons aged 0–17 years in 1995 in each state was obtained from U.S. census reports (*5*) and was multiplied by the estimated prevalence of future smoking to calculate the estimated number of youths who may become regular smokers in each state. Overall, the estimated number of future smokers among the cohort of persons who were aged 0–17 years in 1995 was 16,620,878 for the United States (range: 15,398 [District of Columbia] to 1,446,550 [California]) (Table 1).

The projected number of smoking-related deaths among youth smokers was based on the combined estimates of young adult smokers who continue to smoke throughout their lifetimes and estimates of premature death attributable to smoking among continuing smokers (*6*) and among those who quit after age 35 years (*7*). Based on data from the 1986 National Mortality Followback Survey (NMFS), 55% (95% confidence interval [CI]=±1%) of persons who had ever smoked ≥100 cigarettes during their lifetimes continued to smoke until 1 year before their deaths, and 45% (95% CI=±1%) quit smoking earlier in their adult lives (CDC, unpublished data, 1995). Based on data from long-term cohort studies, an estimated 50% of deaths among continuing smokers will be attributable to smoking (*6*). Although estimates of the number of smoking-attributable deaths among former smokers range from 10% to 37%, a conservative estimate of 10% was used in this analysis (*7*; CDC, unpublished data, 1996). The future probability of smoking-attributable mortality (PSAM) among youth was computed to be PSAM=[(0.55 × 0.5)+(0.45 × 0.1)]=0.32. Estimates for the variance of the two smoking-attributable fractions (50% and 10%) within the PSAM were computed from the Cancer Prevention Study II (*8*). These two variances were combined with the variances for the probabilities of continued smoking or quitting using a Taylor Series approximation method, which yielded an estimate of 0.00422 of the relative

TABLE 1. Prevalence of current smoking among adults aged 18–30 years* and projected number of persons aged 0–17 years who will become smokers† and die prematurely as adults because of a smoking-related illness, by state — United States, 1995

| State | Prevalence of current smoking among persons aged 18–30 years | | Persons aged 0–17 years | | | |
	%	(95% CI§)	No.¶	Projected smokers No.	(95% CI)	Projected no. deaths
Alabama	24.1	(±3.4%)	1,080,145	260,639	(± 36,465)	83,404
Alaska	29.7	(±4.8%)	189,253	56,246	(± 9,006)	17,999
Arizona	25.8	(±4.6%)	1,193,270	307,864	(± 54,337)	98,516
Arkansas	24.0	(±3.5%)	649,521	155,690	(± 22,994)	49,821
California	16.5	(±2.0%)	8,793,616	1,446,550	(±176,420)	462,896
Colorado	27.7	(±3.6%)	981,200	271,694	(± 35,093)	86,942
Connecticut	22.0	(±3.5%)	797,733	175,501	(± 27,690)	56,160
Delaware	29.0	(±3.3%)	178,826	51,806	(± 5,968)	16,578
District of Columbia	13.4	(±4.3%)	114,652	15,398	(± 4,887)	4,927
Florida	27.5	(±2.8%)	3,371,328	928,464	(± 93,582)	297,108
Georgia	21.3	(±3.0%)	1,923,594	409,726	(± 57,900)	131,112
Hawaii	20.9	(±3.0%)	309,262	64,574	(± 9,353)	20,664
Idaho	21.9	(±3.0%)	347,924	76,230	(± 10,517)	24,394
Illinois	26.0	(±3.2%)	3,125,894	813,670	(± 99,723)	260,374
Indiana	30.0	(±3.1%)	1,487,359	439,515	(± 46,329)	140,645
Iowa	23.1	(±2.7%)	724,511	167,507	(± 19,326)	53,602
Kansas	22.2	(±3.5%)	692,761	153,862	(± 23,936)	49,236
Kentucky	28.2	(±3.3%)	972,708	274,303	(± 32,116)	87,902
Louisiana	26.7	(±3.5%)	1,239,214	331,366	(± 43,742)	106,037
Maine	32.0	(±4.9%)	304,895	97,536	(± 14,792)	31,211
Maryland	21.1	(±2.0%)	1,271,966	267,876	(± 25,759)	85,720
Massachusetts	23.1	(±3.4%)	1,431,854	330,186	(± 48,366)	105,659
Michigan	28.6	(±3.1%)	2,519,455	721,572	(± 78,357)	230,903
Minnesota	24.3	(±2.2%)	1,245,492	303,153	(± 27,294)	97,009
Mississippi	20.0	(±3.5%)	761,909	152,610	(± 26,343)	48,835
Missouri	26.9	(±4.3%)	1,381,552	372,052	(± 59,197)	119,057
Montana	19.9	(±4.3%)	236,134	47,014	(± 10,151)	15,045
Nebraska	25.0	(±3.6%)	443,297	110,913	(± 15,842)	35,492
Nevada	24.8	(±3.4%)	398,586	98,770	(± 13,716)	31,606
New Hampshire	25.2	(±4.0%)	294,969	74,303	(± 11,886)	23,777
New Jersey	21.6	(±3.8%)	1,963,523	423,728	(± 74,663)	135,593
New Mexico	20.9	(±4.1%)	500,099	104,271	(± 20,422)	33,367
New York	26.0	(±3.1%)	4,536,862	1,179,584	(±141,545)	377,467
North Carolina	28.8	(±3.0%)	1,799,119	517,786	(± 53,965)	165,692
North Dakota	22.5	(±3.2%)	170,445	38,350	(± 5,367)	12,272
Ohio	31.2	(±4.6%)	2,859,848	891,129	(±131,262)	285,161
Oklahoma	22.7	(±5.2%)	878,039	199,490	(± 45,586)	63,837
Oregon	24.1	(±2.9%)	797,040	191,688	(± 23,220)	61,340
Pennsylvania	29.5	(±2.9%)	2,909,302	857,371	(± 84,342)	274,359
Rhode Island	30.9	(±5.9%)	237,611	73,446	(± 13,931)	23,503
South Carolina	22.0	(±3.0%)	944,384	208,142	(± 28,621)	66,606
South Dakota	22.1	(±3.3%)	206,436	45,705	(± 6,715)	14,626
Tennessee	25.1	(±2.9%)	1,310,297	329,147	(± 38,256)	105,327
Texas	21.5	(±3.6%)	5,400,417	1,158,389	(±192,545)	370,685
Utah	16.1	(±2.5%)	674,618	108,883	(± 16,797)	34,843
Vermont	26.3	(±3.4%)	146,760	38,613	(± 4,914)	12,356
Virginia	26.3	(±3.5%)	1,612,527	423,288	(± 56,079)	135,452
Washington	23.8	(±2.5%)	1,418,404	336,871	(± 34,770)	107,799
West Virginia	28.6	(±3.3%)	421,868	120,443	(± 13,970)	38,542
Wisconsin	27.0	(±3.8%)	1,353,205	365,907	(± 51,333)	117,090
Wyoming	23.2	(±4.3%)	136,268	31,669	(± 5,812)	10,134
Total	**NA**	**NA**	**68,739,952**	**16,620,878**	**(±219,091)**	**5,318,681**

*Obtained from Behavioral Risk Factor Surveillance System data for 1994 and 1995, except for Rhode Island for 1995 and the District of Columbia for 1994.

†Based on 1995 population data and the prevalence of current smoking among adults aged 18–30 years.

§Confidence interval.

¶Obtained from 1995 census data.

error of the PSAM. To reflect the uncertainty of the multiple assumptions about future smoking and mortality patterns, this error estimate for the PSAM was increased by a factor of 2.5, yielding an estimated standard error of 0.0106.

Based on application of this PSAM to the state-specific estimates of potential smokers, the overall number of potential future smoking-attributable deaths among persons aged 0–17 years during 1995 was 5,318,681 for the United States (range: 4927 [District of Columbia] to 462,896 [California]) (Table 1). Based on the estimated PSAM variance and the state-specific sampling errors from the BRFSS estimates of smoking prevalence, the estimated number of smoking-related deaths for the United States overall was predicted to vary by ≤160,000 deaths.

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Editorial Note: The findings in this report indicate that, if current patterns of smoking behavior persist, an estimated 5 million U.S. persons who were aged 0–17 years in 1995 could die prematurely from smoking-related illnesses. These projected patterns of smoking and smoking-related deaths could result in an estimated $200 billion (in 1993 dollars) in future health-care costs (i.e., $12,000 per smoker) (*9*) and approximately 64 million years of potential life lost (i.e., 12–21 years per smoking-related death) (*6,9,10*), underscoring the need for intensifing efforts to prevent smoking initiation among youth.

The projection method used in this analysis is subject to at least three limitations. First, although this method has been recommended for estimating future tobacco-related deaths in developed countries (*6*), alternative methods may be more precise (e.g., life-table procedures used to project future disease-specific outcomes, particularly lung cancer). Second, this method assumes that future smoking patterns and smoking-related disease rates will be similar to those observed in recent generations. However, future patterns may differ: for example, the estimates of future smoking prevalence in this analysis may be underestimated because smoking prevalences among teenagers have been increasing in recent years (*3*). Third, the estimated risks for smoking-attributable death and the smoking-attributable fractions among quitters (i.e., 10%) and continuing smokers (i.e., 50%) are based on studies of adults who began smoking during the mid 1900s (*6,7*). More recent data indicate that relative risks of smoking for more recent birth cohorts of both men and women have been increasing rather than decreasing (*8*). Factors related to changes in the intensity and duration of smoking may account in part for the substantial increase in the relative risks of

smoking from the 1960s to the 1980s (e.g., relative risks of lung cancer increased from 11.4 to 22.4 for men and from 2.7 to 11.9 for women) (8). These increases in risk occurred despite changes in the composition of tobacco products commonly smoked, including the widespread adoption of filter-tipped, potentially lower "tar" cigarettes (8). While future changes in tobacco products could reduce health risks associated with smoking, smoking intensity and duration are likely to remain the major predictors of future risk (8). Therefore, unless U.S. persons who were aged 0–17 years during 1995 and who are current or potential smokers alter their future smoking behavior relative to patterns of previous generations (e.g., smoke fewer cigarettes per day or quit earlier in life), the relative risks of smoking probably will remain high.

FDA has issued regulations to restrict youth access to tobacco and to reduce the appeal of cigarette advertising among youths and has issued a proposal to require a program to educate youths about the health consequences associated with tobacco use (1). Because smoking-related deaths are preventable (1,9), public health efforts should emphasize both prevention of smoking initiation in the youngest birth cohorts (2) and cessation as early as possible among youth who already have started smoking (6,7).

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Recall of Philip Morris Cigarettes, May 1995–March 1996

On May 26, 1995, Philip Morris U.S.A.* announced a voluntary recall of 36 cigarette product lines (approximately 8 billion cigarettes) because, during production, the company detected unusual tastes and peculiar odors and identified methyl isothiocyanate (MITC) in the cigarette filters. During June 6–8, 1995, public health officials in Minnesota, Oregon, and Texas requested CDC's assistance in investigating consumer health complaints associated with smoking Philip Morris cigarettes near the time of the recall. This report summarizes CDC's ongoing investigation, which suggests that prolonged cigarette smoking caused most of the health complaints; in addition, the investigation has not identified a distinguishing chemical characteristic of the recalled cigarettes.

Reports of cases of illness near the time of the recall were identified through passive surveillance by direct telephone calls to CDC. CDC used a standardized form to interview persons who reported illness and, when possible, collected cigarette samples. To verify self-reported data, a medical records review was conducted. Cigarettes included in the recall had been manufactured during May 13–22. Philip Morris U.S.A. provided CDC with samples of recalled cigarettes (manufactured on May 19, 1995) and, for comparative analyses, provided samples of cigarettes manufactured before (on March 3, 1995) and after (on June 12, 1995) the recall.

Reports of Illness

During June–July 1995, CDC received reports of illness from 72 persons in 27 states who had smoked Philip Morris cigarette brands on or after May 13, 1995. The 72 persons comprised 36 men and 36 women; the mean age of these persons was 40 years (range: 15 years–67 years). A total of 41 (57%) persons reported onsets of illness before the recall, and 31 (43%) reported onsets after the recall. Of the 72 persons, 51 (71%) reported no preexisting health conditions; 42 (58%) reported experiencing serious health problems from smoking near the time of the recall. A case definition could not be developed because no common pattern of symptoms was identified; however, the most frequently reported manifestation was at least one respiratory or nasopharyngeal symptom (61 [85%]); other frequently reported symptoms included headache (18 [25%]), dizziness (15 [21%]), and ophthalmologic problems (15 [21%]). A total of 59 (82%) persons sought medical treatment for their symptoms; 14 (19%) were hospitalized.

All 72 persons reported smoking cigarettes manufactured by Philip Morris the day they became ill. Most persons (43 [60%]) smoked Marlboro brand cigarettes. The average duration of smoking was 20 years (range: <1 year–45 years), and the average number of cigarettes smoked per day was 23 (range: <1 cigarette–50 cigarettes).

Medical Records Review

Because a case definition could not be specified, further investigation was restricted to 29 persons who reported no preexisting health conditions and who reported experiencing serious health problems associated with smoking near the time of the recall. Of these persons, medical records were obtained for 20. Based on review

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of these records, the conditions most frequently diagnosed in these persons near the time of the recall were pneumonia (four persons), exacerbation of asthma (four), bronchitis (three), chronic obstructive pulmonary disease (three), eosinophilic pneumonitis (two), and laryngitis (two). The review suggested that most (18 [90%]) of these illnesses were associated with cigarette smoking, preexisting medical conditions resulting from prolonged cigarette smoking, or infectious agents.

Laboratory Analyses

CDC analyzed cigarette samples using high-resolution gas chromatography/high-resolution mass spectrometry. MITC was detected in samples of filter and samples of tobacco and paper obtained from prerecall, recall, and postrecall cigarettes provided by Philip Morris. MITC levels were higher in cigarettes packaged in hard packs than in soft packs (e.g., 102 ng per filter versus 15 ng per filter, p<0.01, n=21 [14 hard packs and seven soft packs]). MITC also was detected in Philip Morris cigarettes produced at least 1 year before the recall. Seven packs of cigarettes from five other manufacturers were purchased at local stores in Atlanta; MITC was detected in cigarettes from each of these packs.

Cigarettes obtained from Philip Morris were analyzed for the eight compounds reported by Philip Morris[†] to have caused the taste and odor problems. Of the eight compounds, three (butyric acid; 1,2-propanediol diacetate; and 2-ethylhexyl acetate) were detected in prerecall, recall, and postrecall cigarettes; the other five compounds were not detected. Compared with prerecall and postrecall cigarettes, there was no distinctive increase in one or more of these compounds in the recall cigarettes.

Cigarette samples also were analyzed to identify a unique chemical profile that distinguished the recall cigarettes from the prerecall or postrecall cigarettes. Analysis of volatile organic compounds from the filter and from the tobacco and paper of these cigarettes did not identify such a profile. In addition, analysis of cigarette smoke from recall cigarettes did not contain a unique chemical pattern.

Laboratory analysis is ongoing of cigarettes obtained from the 72 persons who reported illnesses. However, as of March 22, 1996, no unique chemical pattern had been identified.

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Editorial Note: Based on the medical records review and laboratory analyses in this report, prolonged cigarette smoking—rather than smoking contaminated cigarettes—caused most of the health complaints from persons reporting illness associated with smoking Philip Morris cigarette brands near the time of the recall. Smoking is the leading preventable cause of diseases associated with premature death in the United States; in 1990, approximately 419,000 deaths were attributed to smoking (1). The

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[†]Butyric acid; methanediol diacetate; 1,1-ethanediol diacetate; 1,2-ethanediol diacetate; 1,2-propanediol diacetate; 2-ethylhexyl acetate; 1,2-butanediol diacetate; and 1,3-propanediol diacetate in one lot of plasticizer (a substance sprayed on cigarette filters) (M. Firestone, Philip Morris U.S.A., personal communication, June 30, 1995).

estimated number of compounds in tobacco smoke exceeds 4000, including many that are pharmacologically active, toxic, mutagenic, and carcinogenic (*2*).

Although Philip Morris reportedly recalled cigarettes in part because of the recent detection of MITC, the laboratory analyses in this report indicate that MITC was present in cigarettes manufactured by Philip Morris up to 1 year before the recall and in cigarettes from other manufacturers. MITC is a decomposition product of 3,5-dimethyl-1,3,5,2H-tetrahydrothiadizine-2-thione, which is used as a preservative in the manufacture and coating of paperboard[§] and as a pesticide (dazomet) that can be used as a soil fumigant on tobacco plants, turf, and ornamental plants (*3*). MITC also is a decomposition product of sodium N-methyldithiocarbamate, a pesticide with uses similar to dazomet (*3*). Although adverse health effects from MITC exposure (e.g., mucosal irritation of the respiratory and gastrointestinal tracts, conjunctival irritation, and neurologic symptoms) have been documented (*4,5*), there have been no assessments of the possible health effects of burned and inhaled tobacco that contains the levels of MITC detected in this investigation or of inhaling heated MITC found in filters.

The findings of this investigation are subject to at least four limitations. First, reports of illness were identified by passive surveillance; therefore, persons with health problems who contacted CDC may not be representative of all persons who smoked Philip Morris cigarettes near the time of the recall and who may have incurred related adverse effects. Second, the recalled cigarettes provided by Philip Morris may not be representative of all the cigarettes eligible for recall. Third, because of the protracted time between the occurrence of clinical manifestations and the delivery of cigarette samples to CDC, some of the volatile components may have evaporated from the cigarettes. Fourth, identification of possible contaminants was complicated by lack of access to the manufacturer's cigarette brand ingredients. Although Section 7 of the Cigarette Labeling and Advertising Act of 1965, as amended[¶], requires that cigarette companies annually submit to the Secretary of the U.S. Department of Health and Human Services confidential lists of ingredients added to tobacco in the manufacture of cigarettes, the law does not require companies to provide brand-specific information about additives or information about the quantity of each additive used in the manufacture of cigarettes. Therefore, CDC could not compare the standard brand ingredients with those in recalled cigarettes; the identification of either unusual chemicals or unusual quantities was based on comparisons between the recalled cigarettes and samples of cigarettes produced before or after the recall.

Other than the well-established health risks associated with smoking, this investigation did not detect additional health problems related to smoking cigarettes recalled by Philip Morris. Laboratory analyses of potential contaminants in cigarettes is ongoing. However, smoking cessation is the only effective strategy to reduce the risks associated with cigarette smoking.

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smoking-attributable deaths and YPLL-65 among men and women were associated with cardiovascular diseases, chronic obstructive pulmonary disease, and lung cancer.

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Editorial Note: The findings in this report document the substantial impact of cigarette smoking on premature mortality in adults in Mexico. Death rates from the leading causes of smoking-related deaths have nearly tripled since 1970 in Mexico. Based on this analysis, the proportion of deaths attributable to smoking in Mexico is 9%, compared with 32% in the United States for the same categories of deaths considered in this report. These differences may be attributable to lower cigarette consumption in Mexico compared with the United States. However, as the population of Mexico ages and the average duration of smoking increases, the number of smoking-attributable deaths probably will increase.

The estimates of the total number of smoking-attributable deaths and YPLL-65 in Mexico during 1992 probably are low for at least three reasons. First, baseline lung cancer rates for U.S. never smokers probably reflect effects of occupational or environmental exposures and, therefore, may have produced lower estimates of excess risk in Mexico. Second, estimates of smoking-attributable mortality in Mexico do not include deaths from burns, stillbirths, and sudden infant death syndrome or deaths occurring during the perinatal period because these risks are unknown and could not be extrapolated from known risks in the United States. Third, smoking-attributable mortality estimates for 1992 reflect the lower prevalences of smoking in previous decades and may not fully capture increases in mortality resulting from recent changes in smoking patterns. In addition, because this study used adjusted smoking-attributable fractions, the association between smoking-related behaviors (i.e., duration and amount of smoking, depth of inhalation, or use of filtered-tip cigarettes) and smoking-related diseases could not be examined. Ongoing examination of the relation between smoking and disease in Mexico will improve the accuracy of future estimates.

In Mexico, because chronic diseases (including neoplasms and cardiovascular disease) are emerging as leading causes of death (*4*), the prevention of tobacco use is a major priority. The findings in this report will assist in refining policies to reduce the prevalence of cigarette smoking and risks for associated diseases and to counter the impact of increased tobacco advertising and other marketing strategies (*8*). Priority measures may include preventing the initiation of cigarette smoking among children and adolescents, increasing smoking cessation among adult smokers, developing health education programs, and establishing legislative policies (e.g., regulating and restricting the advertisement and promotion of tobacco products, restricting or banning tobacco sales to minors, and increasing tobacco taxes and prices [*9*]).

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Medical-Care Expenditures
Attributable to Cigarette Smoking —
United States, 1993

Cigarette smoking is the most important preventable cause of morbidity and pre-mature mortality in the United States; however, approximately 48 million persons aged ≥18 years are smokers (1), and approximately 24 billion packages of cigarettes are purchased annually (2). Each year, approximately 400,000 deaths in the United States are attributed to cigarette smoking (3) and costs associated with morbidity attributable to smoking are substantial (4). To provide estimates for 1993 of smoking-attributable costs for selected categories of direct medical-care expenditures (i.e., prescription drugs, hospitalizations, physician care, home-health care, and nursing-home care), the University of California and CDC analyzed data from the 1987 National Medical Expenditures Survey (NMES-2) and from the Health Care Financing Admini-stration (HCFA). This report summarizes the results of the analysis.

The NMES-2 is a population-based longitudinal survey of the civilian, noninstitu-tionalized U.S. population (5). A cohort of 35,000 persons in 14,000 households was selected for face-to-face interviews four times during February 1987–May 1988. Re-spondents provided data about sociodemographic factors, health insurance coverage, use of medical care, and medical-care expenditures. Information also was collected about self-reported health status and health-risk behaviors including smoking, safety-belt nonuse, and obesity. The Medical Provider Survey, a supplement to NMES-2, provided confirmation of self-reported medical-care costs and supplied information about costs that survey respondents were unable to report.

To estimate costs attributable to smoking, respondents were categorized as never smokers, former smokers with less than 15 years' exposure, former smokers with 15 or more years' exposure, and current smokers. First, the effect of smoking history on the presence of smoking-related medical conditions (i.e., heart disease, emphy-sema, arteriosclerosis, stroke, and cancer) was determined. Second, for each of the medical-care expenditure categories, the probability of having any expenditures and the level of expenditures were estimated as a function of smoking, medical conditions, and health status (6). All models controlled for age, race/ethnicity, poverty status, marital status, education level, medical insurance status, region of residence, safety-belt nonuse, and obesity. Data were weighted to project the estimated costs of smoking-attributable medical care to the noninstitutionalized U.S. population. These costs were then adjusted for 1993 by applying the category-specific smoking-attributable percentages to national health-care expenditure data for 1993 reported by HCFA (7). Nursing-home costs were estimated by applying the smoking-attributable percentage of hospital expenditures for persons aged ≥65 years to total nursing-home expenditures reported by HCFA. Costs of smoking-attributable medical care also were categorized by source of payment (i.e., self pay, private insurance, Medicare, Medi-caid, other federal, other state, and other).

In 1987, the total medical-care expenditures for the five expense categories reported on NMES-2 was $308.7 billion; of this total, an estimated $21.9 billion (7.1%) was attributable to smoking (Table 1). Hospital expenses accounted for most ($11.4 billion) costs attributable to smoking, followed by ambulatory physician care*

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*Includes hospital-based outpatient and emergency care and care in physicians' offices.

($6.6 billion) and nursing-home care ($2.2 billion). Public funding (i.e., Medicare, Medicaid, and other federal and state sources) paid for 43.3% of the medical-care expenditures attributable to smoking (Table 2). The distribution of expenditures by source of payment varied substantially by age group. For persons aged ≥65 years, public funding accounted for 60.6% of smoking-attributable costs, compared with 31.2% for persons aged <65 years.

When the smoking-attributable percentages derived from NMES-2 were applied to HCFA national health-care expenditure data (6), estimated smoking-attributable costs for medical care in 1993 were $50.0 billion. Of these costs, $26.9 billion were for hospital expenditures, $15.5 billion for physician expenditures, $4.9 billion for nursing-home expenditures, $1.8 billion for prescription drugs, and $900 million for home-health–care[†] expenditures.

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Editorial Note: The findings in this report indicate that cigarette smoking accounts for a substantial and preventable portion of all medical-care costs in the United States. For each of the approximately 24 billion packages of cigarettes sold in 1993, approximately $2.06 was spent on medical care attributable to smoking. Of the $2.06, approximately $0.89 was paid through public sources.

From 1987 to 1993, the more than twofold increase in estimated direct medical-care costs attributable to smoking primarily reflect the substantial increase in medical-care expenditures during this period (7). In addition, the 1993 HCFA estimate of national health-care expenditures included expenses not covered by NMES-2 (e.g., hospitalization and other medical-care costs for persons too ill to respond to NMES-2).

This analysis controlled for potential confounders such as sociodemographic status, health insurance status, and risk behaviors other than smoking. Previous estimates assumed the difference in medical-care use between smokers and nonsmokers was primarily attributable to smoking and did not account for other associated risk factors that may result in excessive medical expenditures (4).

The smoking-attributable costs described in this report are underestimated for two reasons. First, the cost estimates do not include all direct medical costs attributable to cigarette smoking (e.g., burn care resulting from cigarette-smoking–related fires, perinatal care for low-birthweight infants of mothers who smoke, and costs associated with diseases caused by exposure to environmental tobacco smoke). Second, the indirect costs of morbidity (e.g., due to work loss and bed-disability days) and loss in productivity resulting from the premature deaths of smokers and former smokers were not included in these estimates. In 1990, estimated indirect losses associated with morbidity and premature mortality were $6.9 billion and $40.3 billion, respectively (3); these estimates suggest that the total economic burden of cigarette smoking is more than twice as high as the direct medical costs described in this report.

[†]In 1993, HCFA excluded all but Medicare- and Medicaid-certified care in this category.

TABLE 1. Amount* and percentage of total medical-care expenditures attributable to cigarette smoking, by age group and expenditure category — United States, 1987[†]

Age group (yrs)	Physician[§]		Prescription drugs		Hospital		Home-health care[¶]		Nursing-home care		Total	
	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)
19–64	$5,185	(8.3)	$224	(1.8)	$ 6,995	(8.2)	$ 371	(4.9)	NA**	—	$12,775	(7.6)
≥65	$1,439	(5.9)	$303	(3.9)	$ 4,358	(6.6)	$ 861	(8.6)	$2,156	(6.6)	$ 9,117	(6.5)
Total	$6,624	(7.7)	$527	(2.6)	$11,353	(7.5)	$1,232	(7.0)	$2,156	(6.6)	$21,892	(7.1)

* In millions. Based on reported medical-care expenditures of $308.7 billion during 1987.
[†] Weighted data.
[§] Includes hospital-based outpatient and emergency care and care in physicians' offices.
[¶] Includes Medicare- and Medicaid-certified services and other reported services.
** Not applicable.

TABLE 2. Amount* and percentage of total medical-care expenditures attributable to cigarette smoking, by age group and source of payment — United States, 1987[†]

Age group (yrs)	Self pay		Private insurance		Medicare		Medicaid		Other federal		Other state		Other		Total	
	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)
19–64	$2,274	(17.8)	$6,119	(47.9)	$ 728	(5.7)	$1,086	(8.5)	$1,571	(12.3)	$600	(4.7)	$396	(3.1)	$12,775	(100)
≥65	$2,325	(25.5)	$1,185	(13.0)	$3,756	(41.2)	$1,158	(12.7)	$ 520	(5.7)	$ 91	(1.0)	$ 82	(0.9)	$ 9,117	(100)
Total[§]	$4,599	(21.0)	$7,304	(33.4)	$4,485	(20.4)	$2,244	(10.2)	$2,091	(9.5)	$692	(3.2)	$478	(2.2)	$21,892	(100)

* In millions.
[†] Weighted data.
[§] Numbers may not add to totals because of rounding.

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Mortality Trends for Selected Smoking-Related Cancers and Breast Cancer — United States, 1950–1990

During 1990, nearly 419,000 deaths (approximately 20% of all deaths) in the United States were attributed to smoking, including more than 150,000 deaths from neoplasms (*1*). Cigarette smoking remains the single most preventable cause of premature death in the United States (*2*). Based on current and past smoking patterns, the public health burden of smoking-related cancers is expected to continue during the next several decades. The death rate for smoking-related cancers varies by race; race reflects differing distributions of several risk factors for smoking-related cancers (e.g., high-risk behaviors) and is useful for identifying groups at greatest risk for smoking-related cancers. This report describes mortality trends for cancers (i.e., lung, oral cavity and pharynx, esophagus, and larynx) that are at least 70% attributable to smoking and other tobacco use (*2*) by race and sex. In addition, because lung cancer recently surpassed breast cancer as the leading cause of cancer deaths among women, death rates for lung cancer are compared with those for breast cancer.

Race- and sex-specific cancer deaths during 1950–1990 were determined using underlying cause-of-death data compiled by CDC's National Center for Health Statistics. Denominators for rates were derived from U.S. census population estimates for intercensal years and census enumerations for decennial years. Rates were standardized to the 1970 age distribution of the U.S. population and are presented for whites and blacks only because numbers for other racial/ethnic groups were too small for meaningful analysis.

From 1950 to 1990, the overall age-adjusted death rate for lung cancer increased from 13.0 to 50.3 per 100,000 population; for men and women, death rates increased approximately fourfold and sevenfold, respectively (Table 1). Death rates for men were consistently higher than those for women. The rate of increase in lung cancer mortality was higher for black men than for white men, and death rates for black men first surpassed those for white men in 1963. The rate of increase for men began to slow during the early 1980s, while the rate for women continued to increase sharply. The rate for lung cancer first surpassed that for breast cancer among white women in 1986 (27.5 versus 27.3, respectively) and among black women in 1990 (32.0 versus 31.7, respectively) (Figure 1).

From 1950 to 1990, the overall age-adjusted death rate for cancers of the oral cavity and pharynx decreased from 4.0 to 3.0 (Table 1). For white men, the rate decreased. However, for black men, the oral cancer death rate increased rapidly from 1950 through 1980 and subsequently decreased slightly; from 1980 through 1990, the rate was approximately twice as high as that for white men. Oral cancer death rates for women increased slightly over the 41-year period.

The overall age-adjusted death rate for cancer of the esophagus increased from 2.9 in 1950 to 3.5 in 1990 (Table 1). For white men, the rate increased 20%; for black men, the rate increased twofold during 1950–1980, then decreased slightly in 1990. The rate for black men was approximately three times higher than that for white men from the mid-1960s through 1990. During 1950–1990, the esophageal cancer death rate remained stable for white women and doubled for black women.

TABLE 1. Age-adjusted death rates* for selected smoking-related cancers, by sex and race† — United States, selected years, 1950–1990

Type of cancer	1950	1955	1960	1965	1970	1975	1980	1985	1990
LUNG§									
Male									
White	21.9	30.4	38.2	47.3	57.7	64.8	70.4	71.8	73.6
Black	15.7	24.3	37.9	47.8	66.1	80.6	93.3	97.9	107.7
Total¶	21.6	30.0	38.2	47.4	58.2	65.8	71.9	73.4	75.6
Female									
White	4.9	5.1	5.6	7.5	11.1	15.5	21.1	26.8	32.1
Black	3.8	5.2	5.6	7.2	11.7	15.4	21.6	25.7	32.0
Total¶	4.8	5.1	5.6	7.5	11.1	15.4	21.0	26.4	31.8
Total¶	13.0	17.1	21.0	25.8	32.1	37.4	42.7	46.4	50.3
ORAL CAVITY AND PHARYNX**									
Male									
White	6.6	6.2	6.0	5.7	6.0	5.6	5.1	4.5	4.2
Black	4.8	4.7	7.4	6.4	7.6	8.7	11.0	9.4	9.8
Total¶	6.5	6.1	5.9	5.8	6.1	5.9	5.6	4.9	4.7
Female									
White	1.5	1.5	1.6	1.5	1.8	1.9	1.9	1.7	1.6
Black	1.9	1.6	1.4	1.9	2.2	2.2	2.4	2.2	2.2
Total¶	1.6	1.5	1.6	1.6	1.9	2.0	1.9	1.8	1.7
Total¶	4.0	3.7	3.7	3.5	3.7	3.7	3.5	3.2	3.0
ESOPHAGUS††									
Male									
White	4.4	4.5	4.3	4.4	4.2	4.5	4.6	4.7	5.3
Black	7.6	7.9	10.0	11.9	12.6	15.0	16.1	15.1	14.4
Total¶	4.7	4.7	4.8	5.0	4.9	5.4	5.6	5.6	6.0
Female									
White	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Black	1.9	2.0	2.6	2.9	3.1	3.7	4.4	3.7	3.9
Total¶	1.2	1.2	1.2	1.3	1.3	1.4	1.5	1.4	1.5
Total¶	2.9	2.9	2.9	3.0	2.9	3.2	3.3	3.3	3.5
LARYNX§§									
Male									
White	2.6	2.7	2.7	2.7	2.9	2.7	2.5	2.3	2.3
Black	1.9	2.4	3.2	3.3	3.8	4.4	5.0	4.9	5.0
Total¶	2.6	2.7	2.8	2.7	2.9	2.8	2.7	2.5	2.5
Female									
White	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4
Black	0.3	0.3	0.4	0.4	0.5	0.7	0.8	0.8	1.0
Total¶	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.5
Total¶	1.4	1.4	1.4	1.4	1.5	1.5	1.4	1.3	1.3

*Per 100,000 population, standardized to the 1970 age distribution of the U.S. population.
†Estimates are presented for whites and blacks only because numbers for other racial/ethnic groups were too small for meaningful analysis.
§Includes malignancies of the lung, trachea, and broncus. *International Classification of Diseases, Sixth Revision* (ICD-6; 1950–1957), codes 162, 163; *Seventh Revision* (ICD-7; 1958–1967), codes 162, 163; *Eighth Revision, Adapted for Use in the United States* (ICDA-8; 1968–1978), code 162; *Ninth Revision* (ICD-9; 1979–1990), code 162.
¶Includes races other than black and white.
**Includes malignancies of the lip, oral cavity, and pharynx (ICD-6 and ICD-7, codes 140–148; ICDA-8 and ICD-9, codes 140–149).
††ICD-6, ICD-7, ICDA-8, and ICD-9, code 150.
§§ICD-6, ICD-7, ICDA-8, and ICD-9, code 161.

Mortality Trends for Selected Smoking-Related Cancers
and Breast Cancer — United States, 1950–1990

During 1990, nearly 419,000 deaths (approximately 20% of all deaths) in the United States were attributed to smoking, including more than 150,000 deaths from neo-plasms (*1*). Cigarette smoking remains the single most preventable cause of premature death in the United States (*2*). Based on current and past smoking patterns, the public health burden of smoking-related cancers is expected to continue during the next several decades. The death rate for smoking-related cancers varies by race; race reflects differing distributions of several risk factors for smoking-related cancers (e.g., high-risk behaviors) and is useful for identifying groups at greatest risk for smoking-related cancers. This report describes mortality trends for cancers (i.e., lung, oral cavity and pharynx, esophagus, and larynx) that are at least 70% attributable to smoking and other tobacco use (*2*) by race and sex. In addition, because lung cancer recently surpassed breast cancer as the leading cause of cancer deaths among women, death rates for lung cancer are compared with those for breast cancer.

Race- and sex-specific cancer deaths during 1950–1990 were determined using underlying cause-of-death data compiled by CDC's National Center for Health Statistics. Denominators for rates were derived from U.S. census population estimates for inter-censal years and census enumerations for decennial years. Rates were standardized to the 1970 age distribution of the U.S. population and are presented for whites and blacks only because numbers for other racial/ethnic groups were too small for meaningful analysis.

From 1950 to 1990, the overall age-adjusted death rate for lung cancer increased from 13.0 to 50.3 per 100,000 population; for men and women, death rates increased approximately fourfold and sevenfold, respectively (Table 1). Death rates for men were consistently higher than those for women. The rate of increase in lung cancer mortality was higher for black men than for white men, and death rates for black men first surpassed those for white men in 1963. The rate of increase for men began to slow during the early 1980s, while the rate for women continued to increase sharply. The rate for lung cancer first surpassed that for breast cancer among white women in 1986 (27.5 versus 27.3, respectively) and among black women in 1990 (32.0 versus 31.7, respectively) (Figure 1).

From 1950 to 1990, the overall age-adjusted death rate for cancers of the oral cavity and pharynx decreased from 4.0 to 3.0 (Table 1). For white men, the rate decreased. However, for black men, the oral cancer death rate increased rapidly from 1950 through 1980 and subsequently decreased slightly; from 1980 through 1990, the rate was approximately twice as high as that for white men. Oral cancer death rates for women increased slightly over the 41-year period.

The overall age-adjusted death rate for cancer of the esophagus increased from 2.9 in 1950 to 3.5 in 1990 (Table 1). For white men, the rate increased 20%; for black men, the rate increased twofold during 1950–1980, then decreased slightly in 1990. The rate for black men was approximately three times higher than that for white men from the mid-1960s through 1990. During 1950–1990, the esophageal cancer death rate remained stable for white women and doubled for black women.

TABLE 1. Age-adjusted death rates* for selected smoking-related cancers, by sex and race† — United States, selected years, 1950–1990

Type of cancer	1950	1955	1960	1965	1970	1975	1980	1985	1990
LUNG§									
Male									
White	21.9	30.4	38.2	47.3	57.7	64.8	70.4	71.8	73.6
Black	15.7	24.3	37.9	47.8	66.1	80.6	93.3	97.9	107.7
Total¶	21.6	30.0	38.2	47.4	58.2	65.8	71.9	73.4	75.6
Female									
White	4.9	5.1	5.6	7.5	11.1	15.5	21.1	26.8	32.1
Black	3.8	5.2	5.6	7.2	11.7	15.4	21.6	25.7	32.0
Total¶	4.8	5.1	5.6	7.5	11.1	15.4	21.0	26.4	31.8
Total¶	13.0	17.1	21.0	25.8	32.1	37.4	42.7	46.4	50.3
ORAL CAVITY AND PHARYNX**									
Male									
White	6.6	6.2	6.0	5.7	6.0	5.6	5.1	4.5	4.2
Black	4.8	4.7	7.4	6.4	7.6	8.7	11.0	9.4	9.8
Total¶	6.5	6.1	5.9	5.8	6.1	5.9	5.6	4.9	4.7
Female									
White	1.5	1.5	1.6	1.5	1.8	1.9	1.9	1.7	1.6
Black	1.9	1.6	1.4	1.9	2.2	2.2	2.4	2.2	2.2
Total¶	1.6	1.5	1.6	1.6	1.9	2.0	1.9	1.8	1.7
Total¶	4.0	3.7	3.7	3.5	3.7	3.7	3.5	3.2	3.0
ESOPHAGUS††									
Male									
White	4.4	4.5	4.3	4.4	4.2	4.5	4.6	4.7	5.3
Black	7.6	7.9	10.0	11.9	12.6	15.0	16.1	15.1	14.4
Total¶	4.7	4.7	4.8	5.0	4.9	5.4	5.6	5.6	6.0
Female									
White	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Black	1.9	2.0	2.6	2.9	3.1	3.7	4.4	3.7	3.9
Total¶	1.2	1.2	1.2	1.3	1.3	1.4	1.5	1.4	1.5
Total¶	2.9	2.9	2.9	3.0	2.9	3.2	3.3	3.3	3.5
LARYNX§§									
Male									
White	2.6	2.7	2.7	2.7	2.9	2.7	2.5	2.3	2.3
Black	1.9	2.4	3.2	3.3	3.8	4.4	5.0	4.9	5.0
Total¶	2.6	2.7	2.8	2.7	2.9	2.8	2.7	2.5	2.5
Female									
White	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4
Black	0.3	0.3	0.4	0.4	0.5	0.7	0.8	0.8	1.0
Total¶	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.5
Total¶	1.4	1.4	1.4	1.4	1.5	1.5	1.4	1.3	1.3

*Per 100,000 population, standardized to the 1970 age distribution of the U.S. population.

†Estimates are presented for whites and blacks only because numbers for other racial/ethnic groups were too small for meaningful analysis.

§Includes malignancies of the lung, trachea, and broncus. *International Classification of Diseases, Sixth Revision* (ICD-6; 1950–1957), codes 162, 163; *Seventh Revision* (ICD-7; 1958–1967), codes 162, 163; *Eighth Revision, Adapted for Use in the United States* (ICDA-8; 1968–1978), code 162; *Ninth Revision* (ICD-9; 1979–1990), code 162.

¶Includes races other than black and white.

**Includes malignancies of the lip, oral cavity, and pharynx (ICD-6 and ICD-7, codes 140–148; ICDA-8 and ICD-9, codes 140–149).

††ICD-6, ICD-7, ICDA-8, and ICD-9, code 150.

§§ICD-6, ICD-7, ICDA-8, and ICD-9, code 161.

The overall age-adjusted death rate for cancer of the larynx remained stable from 1950 through 1990. Death rates remained stable for whites; however, rates increased 260% for black men and approximately 233% for black women.

Mortality from lung cancer has a substantial impact on the overall cancer death rate in the United States. From 1950 to 1990, the age-adjusted death rate for all cancers increased 10.8%, from 157.0 to 174.0. If lung cancer deaths had been excluded, however, the cancer death rate would have declined 14%, from 144.0 in 1950 to 123.7 in 1990.

Reported by: CC Boring, TS Squires, T Tong, CW Heath, MD, American Cancer Society. Div of Cancer Prevention and Control, and Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report indicate that, in the United States, the overall age-adjusted death rate for lung cancer increased nearly fourfold from 1950 to 1990; in contrast, the rates for three other smoking-related cancers (i.e., cancer of the oral cavity and pharynx, esophagus, and larynx) remained relatively stable. In addition, death rates for these three cancers were substantially lower than that for lung cancer.

The continued increase in lung cancer death rates primarily reflects patterns of cigarette smoking throughout this century (*2–4*). For white men born during 1911–1930, smoking prevalence peaked at approximately 67% in the 1940s and 1950s (*4*). Smoking prevalences for birth cohorts for later years peaked at lower levels, and overall prevalence among persons aged ≥18 years decreased sharply after 1960, reaching 27.4% in 1991 (*4,5*). For black men, smoking prevalence, while declining to 35.0% in 1991, has been higher than that for white men since 1965 (*5*). For women, smoking prevalence peaked in the 1960s at approximately 44% for the 1931–1940 birth cohort and has declined since; in 1991, prevalence was 23.7% for white women and 24.4% for black women (*4,5*). The declines in smoking prevalences have resulted in a stabilization or decline in the lung cancer death rate for men aged <55 years and for women aged <45 years, respectively (*6*). Overall, the lung cancer death rate for men is

FIGURE 1. Age-adjusted lung and breast cancer death rates* for women, by race — United States, 1950–1990
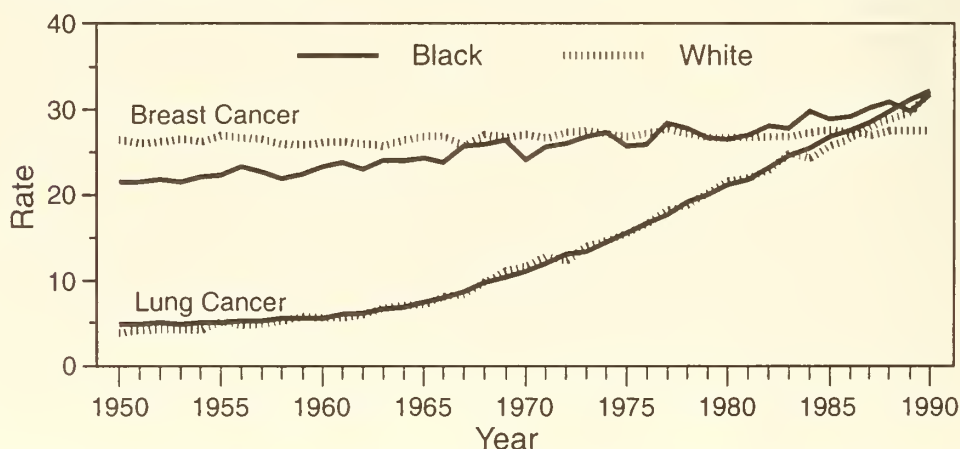
*Per 100,000 women, standardized to the 1970 age distribution of the U.S. population.

expected to peak before the year 2000, then begin to decline (*6*); for women, the rate will probably continue to increase into the next century (*6*).

Lung cancer is the principal cause of cancer deaths for both sexes (*6*), and smoking accounts for approximately 87% of lung cancer deaths (*2*). Although the annual incidence of breast cancer exceeds lung cancer among both black and white women, the 5-year survival rate for lung cancer (13.0%) is substantially lower than for breast cancer (78.0%), accounting for the higher death rate for lung cancer (*6*).

Tobacco and alcohol use are the major determinants of cancers of the oral cavity and pharynx, esophagus, and larynx (*3,7,8*). For these cancers, incidence and death rates for smokers are lower than those for lung cancer. These variations may be at least partially explained by differential sites of deposit of carcinogens in tobacco smoke: up to 90% of aerosol particles in inhaled tobacco smoke are deposited in the lung (*9*). Differences in cancer rates by sex and by race can be at least partially attributed to variations in tobacco and alcohol use and differences in consumption of fruits and vegetables (*3,7,8*).

Cigar or pipe use increases the risk for cancers of the lung, oral cavity and pharynx, esophagus, and larynx (*2*). However, the prevalence of cigar and pipe smoking among both white and black men has decreased substantially since 1970 (CDC, unpublished data). Similarly, snuff and chewing tobacco use among men aged ≥50 years declined during 1970–1985 (*10*). Although the prevalence of snuff and chewing tobacco use has increased among younger males, this trend is too recent to have any demonstrated effect on oral cancer rates (*10*).

In this analysis, the relation between socioeconomic status and race was not examined. Therefore, the extent to which the associations between race and death rates for smoking-related cancers reflect differences in distribution of socioeconomic status among the racial groups could not be determined.

Primary prevention activities that discourage tobacco-use initiation and encourage cessation can assist in preventing a substantial number of cancer deaths (*2,4,10*). Because many factors influence both smoking initiation and smoking cessation, multiple approaches are necessary (*2*), including 1) increasing comprehensive school-based health education, 2) reducing minors' access to tobacco products, 3) more extensive counseling by health-care providers about smoking cessation, 4) developing and enacting strong clean indoor-air policies and laws, 5) restricting and eliminating advertising aimed at persons aged <18 years, and 6) increasing tobacco excise taxes. In addition, reduction of alcohol use and increased consumption of fruits and vegetables can contribute to a substantial reduction in preventable cancer deaths (*3*).

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Cigarette Smoking-Attributable Mortality and Years of Potential Life Lost — United States, 1990

Cigarette smoking is the single most preventable cause of premature death in the United States (*1*). An estimated 390,000 smoking-attributable deaths in the United States occurred in 1985 (*1*), and more than 434,000 deaths occurred in 1988 (*2*); in 1988, an estimated 1,198,887 years of potential life lost (YPLL) before age 65 were attributed to smoking (*2*). To estimate the national impact of cigarette smoking on mortality and YPLL, calculations were performed using the Smoking-Attributable Mortality, Morbidity, and Economic Cost (SAMMEC) software (*3*). This report summarizes the results of this analysis.

SAMMEC uses attributable risk formulas to estimate the number of deaths from neoplastic, cardiovascular, respiratory, and pediatric diseases associated with cigarette smoking (*3*). Estimates for adults (aged ≥35 years) and infants (aged <1 year) were based on 1990 mortality data, the 1990 prevalence of cigarette smoking among adults, and 1989 data on smoking prevalence among pregnant women from CDC's National Center for Health Statistics (*4,5*; CDC, unpublished data, 1993). The number of burn deaths was obtained from the National Fire Protection Association (*6*), and estimates of lung cancer deaths from environmental tobacco smoke (ETS) among nonsmokers were obtained from an Environmental Protection Agency report (*7*). The YPLL to age 65 years and to life expectancy were calculated using standard methodology (*3*), and smoking-attributable mortality (SAM) and YPLL rates were age-adjusted to the 1980 U.S. population to allow more accurate comparisons with 1988 SAM and YPLL.

During 1990, 418,690 U.S. deaths (approximately 20% of all deaths) were attributed to smoking (Table 1). Overall, approximately twice as many deaths occurred among males as among females. A total of 179,820 of these deaths resulted from cardiovascular diseases; 151,322*, neoplasms; 84,475, respiratory diseases; and 1711, diseases

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*Includes deaths from ETS.

TABLE 1. Relative risks* (RR) for death attributed to smoking and smoking-attributable mortality (SAM) for current and former smokers, by disease category and sex — United States, 1990

Disease category (ICD-9 code)[†]	Male			Female			Total SAM
	RR			RR			
	Current smokers	Former smokers	SAM	Current smokers	Former smokers	SAM	
Adult diseases (persons aged ≥35 yrs)							
Neoplasms							
Lip, oral cavity, pharynx (140–149)	27.5	8.8	5,033	5.6	2.9	1,442	6,475
Esophagus (150)	7.6	5.8	5,668	10.3	3.2	1,616	7,284
Pancreas (157)	2.1	1.1	2,667	2.3	1.8	3,447	6,114
Larynx (161)	10.5	5.2	2,379	17.8	11.9	611	2,990
Trachea, lung, bronchus (162)	22.4	9.4	81,179	11.9	4.7	35,741	116,920
Cervix uteri (180)	NA[§]	NA	NA	2.1	1.9	1,294	1,294
Urinary bladder (188)	2.9	1.9	3,046	2.6	1.9	980	4,026
Kidney, other urinary (189)	3.0	2.0	2,866	1.4	1.2	353	3,219
Cardiovascular diseases							
Hypertension (401–404)	1.9	1.3	3,299	1.7	1.2	2,151	5,450
Ischemic heart disease (410–414)							
Persons aged 35–64 yrs	2.8	1.8	26,431	3.0	1.4	7,701	34,132
Persons aged ≥65 yrs	1.6	1.3	38,918	1.6	1.3	25,871	64,789
Other heart diseases (390–398, 415–417, 420–429)	1.9	1.3	23,295	1.7	1.2	12,019	35,314
Cerebrovascular diseases (430–438)							
Persons aged 35–64 yrs	3.7	1.4	4,557	4.8	1.4	4,114	8,671
Persons aged ≥65 yrs	1.9	1.3	10,421	1.5	1.0	4,189	14,610
Atherosclerosis (440)	4.1	2.3	3,737	3.0	1.3	2,675	6,412
Aortic aneurysm (441)	4.1	2.3	5,913	3.0	1.3	1,382	7,295
Other arterial disease (442–448)	4.1	2.3	2,032	3.0	1.3	1,115	3,147
Respiratory diseases							
Pneumonia and influenza (480–487)	2.0	1.6	11,292	2.2	1.4	7,881	19,173
Bronchitis, emphysema (491–492)	9.7	8.8	9,324	10.5	7.0	5,541	14,865
Chronic airway obstruction (496)	9.7	8.8	30,385	10.5	7.0	18,597	48,982
Other respiratory diseases (010–012, 493)	2.0	1.6	787	2.2	1.4	668	1,455
Pediatric diseases (persons aged <1 yr)							
Short gestation, low birth weight (765)		1.8	285		1.8	222	507
Respiratory distress syndrome (769)		1.8	219		1.8	141	360
Other respiratory conditions of newborn (770)		1.8	214		1.8	160	374
Sudden infant death syndrome (798)		1.5	288		1.5	182	470
Burn deaths[¶]			863			499	1,362
Environmental tobacco smoke deaths**			1,055			1,945	3,000
Total			276,153			142,537	418,690

*Relative to never smokers.
[†] *International Classification of Diseases, Ninth Revision.*
[§] Not applicable.
[¶] Source: National Fire Protection Association, 1993 (*6*).
**Deaths among nonsmokers from lung cancer attributable to environmental tobacco smoke (Environmental Protection Agency, 1992 [*7*]).

among infants. Lung cancer (119,920 deaths*), ischemic heart disease (98,921 deaths), and chronic airway obstruction (48,982 deaths) accounted for the most deaths; combined, these conditions were responsible for 64.0% of all SAM.

Cigarette smoking resulted in 1,152,635 YPLL before age 65 years and 5,048,740 YPLL to life expectancy (Table 2). Compared with SAM and YPLL during 1988 (*2*), SAM declined by 3.6% and YPLL to age 65 years by 3.9% during 1990. SAM rates, total YPLL, and YPLL rates were higher for males than for females.

Reported by: Public Health Practice Program Office; Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The slight decline in SAM during 1990 compared with 1988 primarily reflects the 10.4% decline in deaths from cardiovascular disease. The rate of these deaths in the United States has decreased substantially since 1968 (*8*). In contrast, deaths from lung cancer increased by 4.4% and deaths from chronic obstructive pulmonary disease by 4.8%. SAM from these two conditions continue to increase because of the long latency period between the onset of smoking and the development of disease.

The higher SAM and larger number of YPLL among males is consistent with previous reports (*1,2*). Men in the United States are more likely to smoke and to smoke more cigarettes per day than women (*1,4*). However, the smoking prevalence among men has declined substantially since 1965 (*1*). The smoking prevalence among women, after increasing in the 1960s, also has declined since the late 1970s (*1*). Therefore, future estimates of SAM and YPLL will most likely indicate a smaller difference between men and women.

The SAM and YPLL described in this report may be underestimated for at least four reasons. First, these estimates are based on current smoking prevalence data, whereas most smoking-attributable deaths during 1990 resulted from the higher smoking prevalence during earlier decades (*2*). Second, the SAM estimate for infants may be substantially underestimated because previous research suggests that approximately 10% of the 38,351 infant deaths that occurred during 1990 may be attributable to smoking (*1,9*). Third, the SAM estimates do not include deaths from other conditions, such as leukemia (*2*) and peptic ulcer disease (*1*), that also may be associated with smoking. Finally, these estimates do not include mortality caused by cigar smoking, pipe smoking, or smokeless tobacco use. The SAM and YPLL estimates in this report are not adjusted for confounders (e.g., alcohol), which may lower the estimates for laryngeal and certain upper gastrointestinal cancers (*1*).

The decrease in the prevalence of cigarette smoking since the 1960s has contributed to the decline in SAM (*1,4*). Maintaining this decline will require continued reduction in the prevalence of smoking. The human and economic costs associated with smoking require continued vigorous efforts to prevent the initiation of smoking, to encourage smoking cessation, and to protect nonsmokers from the adverse effects of ETS. Because many factors influence both smoking initiation and smoking cessation, multiple approaches are necessary (*1*) including 1) school-based health education; 2) reducing minors' access to tobacco products; 3) more extensive counseling by health-care providers about smoking cessation; 4) developing and enacting

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*Includes deaths from ETS.

TABLE 2. Estimated number and age-adjusted rates* of smoking-attributable mortality (SAM) and smoking-attributable years of potential life lost (YPLL), by sex and age† — United States, 1990§

Category	SAM		Smoking-attributable YPLL before age 65 yrs		Smoking-attributable YPLL to life expectancy	
	Estimated no.	Rate	Estimated no.	Rate	Estimated no.	Rate
Men	275,147	527.8	732,389	1,919.1	3,124,208	6,233.7
Women	141,832	224.8	308,801	764.6	1,797,024	3,070.7
Infants	1,711	NA¶	111,445	NA	127,508	NA
Total	418,690	364.5	1,152,635	1,325.8	5,048,740	4,541.3

* Per 100,000 persons aged ≥35 years, adjusted to the 1980 U.S. population.
† Men and women=aged ≥35 years; infants=aged <1 year.
§ SAM rates and YPLL estimates and rates do not include 3000 deaths from passive smoking because such data were not available.
¶ Not available.

strong, clean indoor air policies and laws; 5) restricting or eliminating advertising targeted toward persons aged <18 years (*10*); and 6) increasing tobacco excise taxes.

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Green Tobacco Sickness in Tobacco Harvesters — Kentucky, 1992

Green tobacco sickness (GTS) is an illness resulting from dermal exposure to dissolved nicotine from wet tobacco leaves; it is characterized by nausea, vomiting, weakness, and dizziness and sometimes fluctuations in blood pressure or heart rate (*1–3*). On September 14, 1992, the Occupational Health Nurses in Agricultural Communities (OHNAC) project of Kentucky* received reports of 27 cases of GTS. The cases occurred among tobacco harvesters who had sought treatment in several hospital emergency departments in south-central Kentucky during the preceding 2 weeks. This report summarizes the findings of the investigation of these cases.

On September 15, OHNAC staff initiated a review of inpatient and emergency department medical records from May 1 through October 2 at five hospitals in the Bowling Green and Elizabethtown areas. The review identified 55 persons in whom GTS, nicotine poisoning, or other illnesses compatible with GTS symptomatology had been diagnosed. On September 25, industrial hygienists from CDC's National Institute for Occupational Safety and Health (NIOSH) observed the tobacco-harvesting process. Worker's hands, forearms, thighs, and backs received the most dermal exposure to

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*OHNAC is a national surveillance program conducted by CDC's National Institute for Occupational Safety and Health (NIOSH) that has placed public health nurses in rural communities and hospitals in 10 states (California, Georgia, Iowa, Kentucky, Maine, Minnesota, New York, North Carolina, North Dakota, and Ohio) to conduct surveillance of agriculture-related illnesses and injuries that occur among farmers and their family members. These surveillance data are used to reduce the risk for occupational illness and injury in agricultural populations.

wet tobacco. Dew from tobacco leaves often saturated workers' clothing within minutes of beginning field work.

To evaluate possible risk factors associated with GTS, NIOSH investigators and occupational health nurses from the OHNAC project conducted a case-control study. A case was defined as an emergency department diagnosis of GTS or nicotine poisoning in a person whose recorded work history included tobacco harvesting at the time of illness. Forty-nine persons met the case definition, with episodes occurring from July 25 through September 19, 1992; two cases were subsequently excluded from analysis because illness onset coincided with exposure to pesticides (which can induce similar symptoms). Median age of the 47 case-patients was 29 years (range: 14–54 years); 41 (87%) were male. Controls were 83 asymptomatic tobacco harvesters referred by case-patients or local agricultural extension agents. Their median age was 39 years (range: 16–70 years); 72 (87%) were male.

Twelve (26%) case-patients were hospitalized for 1–2 days; of these, two (4%) required intensive-care treatment for hypotension and bradycardia. All case-patients were initially treated in emergency departments with antiemetic drugs, and 35 (74%) received intravenous fluids.

Forty of 47 case-patients and 83 controls were administered a questionnaire by telephone. Respondents were asked about the types of jobs performed during the tobacco growing season, use of protective clothing, exposure to wet tobacco leaves, work in wet clothing, work duration, and personal tobacco use.

Among the 40 case-patients who completed interviews, the median time from starting work to onset of illness was 10 hours (range: 3–17 hours); most frequently reported symptoms included weakness (100%), nausea (98%), vomiting (91%), dizziness (91%), abdominal cramps (70%), headache (60%), and difficulty breathing (60%). The mean duration of illness was 2.4 days. Thirty-six (90%) had previous work experience with tobacco. Of these, 14 (39%) had previously sought medical care for symptoms suggestive of GTS. Seventeen (85%) of 20 case-patients aged ≥30 years attributed their illness to working in wet tobacco, compared with 12 (60%) case-patients aged <30 years.

Age <30 years was a risk factor for illness (odds ratio [OR]=3.1; 95% confidence interval [CI]=1.4–7.0). All case-patients and 69 (83%) controls had worked in fields of wet tobacco where their clothes became wet (OR=infinite; lower confidence limit=1.8). Current use of personal tobacco products (i.e., cigarettes, snuff, chewing tobacco, pipe, or cigars) appeared to be weakly protective, but the estimate was not statistically significant (OR=0.7; 95% CI=0.3–1.5). Sex and work duration (i.e., number of hours per day or number of days per week) were not associated with illness. The reported use of protective clothing was similar for case-patients and controls; for case-patients and controls combined, reported use of protective items worn at least once during the growing season was 5% for waterproof clothing and 32% for gloves.

Representative hospital costs were calculated for three levels of care received by 31 case-patients treated at two participating hospitals. Fees averaged $250 for outpatient treatment, $566 for hospital admission, and $2041 for intensive-care treatment.

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Editorial Note: Before 1992, no cases of GTS had been reported to Kentucky public health agencies. Increased surveillance of adverse health events in persons working in agriculture and increased awareness of the condition may explain the reports in Kentucky during this harvest season (i.e., late summer). Before the NIOSH investigation was initiated, OHNAC occupational health nurses had supplied emergency department physicians with literature about GTS. In addition, rainfall during the 1992 season was uncharacteristically heavy, potentially increasing exposure to wet tobacco and incidence of GTS.

The lower risk for GTS among older workers may result from work practices developed over time that reduce contact with wet tobacco. In addition, workers likely to develop symptoms of GTS may leave this work force at a young age. One potential limitation to these findings is that the age distribution of controls may not reflect the local population of tobacco workers.

Personal use of tobacco products may be weakly protective, probably because of development of tolerance to the effects of nicotine among regular tobacco users. Tolerance may not be protective if dermal absorption substantially exceeds the user's customary nicotine intake (4), which may have occurred in this outbreak because of heavier than usual rains.

Approximately 60,000 persons harvest tobacco annually in Kentucky at least part-time (5). The estimated crude 2-month incidence rate of hospital-treated GTS among tobacco workers in the five-county study area was 10 per 1000 workers.[†] Statewide extrapolation of this incidence rate suggests as many as 600 persons in Kentucky could have sought emergency department care for the condition. However, this figure may underestimate the true incidence of GTS because many affected persons may not seek hospital treatment (2).

Use of protective clothing (e.g., water-resistant clothing and rubber gloves) reduces the amount of nicotine absorbed by workers in contact with green tobacco (6,7). Tobacco farm owners should inform their employees of the hazards associated with harvesting wet tobacco and the importance of safe work practices in preventing GTS; discuss routes of exposure and symptoms associated with the disease; advise workers to change into clean, dry clothing and boots during the work day if these become wet; and allow flexible work hours to avoid work during or immediately after a rainfall. Health-care providers in areas where tobacco is harvested should consider GTS in workers who present with symptoms similar to those reported here.

To determine whether GTS regularly occurs or whether this outbreak was due to an unusually wet growing season, the OHNAC project of Kentucky will continue active surveillance for GTS in local hospitals and clinics during tobacco growing seasons. The Kentucky Department for Health Services will disseminate information on GTS to health-care professionals and institutions statewide. Workers will be informed about

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[†] The denominator for this rate is based on an estimate of 78.8 person-hours worked per acre during tobacco harvest, the number of acres planted with tobacco, and an estimate of 256 harvest-hours worked annually per worker (the median value reported in the Kentucky GTS case-control study). These figures generated an estimate of 4730 tobacco-harvest workers in the five affected counties, of whom 47 sought medical treatment at local hospitals.

the condition and preventive measures through the Cooperative Extension Service and through press releases to community newspapers.

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Preliminary Data: Exposure of Persons Aged ≥4 Years to Tobacco Smoke — United States, 1988–1991

The recent report of the U.S. Environmental Protection Agency on the respiratory health effects of passive smoking (*1*) and the known adverse effects of active smoking emphasize the need to quantify the exposure of the U.S. population to tobacco smoke. Measurements of cotinine (a nicotine metabolite) in serum, urine, and saliva have been used effectively to quantify exposure to tobacco smoke (*2–10*). As part of the Third National Health and Nutrition Examination Survey (NHANES III), CDC's National Center for Environmental Health and National Center for Health Statistics is measuring serum levels of cotinine to assess exposure to tobacco smoke by persons in the United States aged ≥4 years. This report presents preliminary findings on the first 800 persons in this survey of tobacco-smoke exposure.

NHANES III is being conducted from 1988 through 1994 in 81 counties throughout the United States and consists of two national probability samples: one from October 1988 through October 1991 and the second from October 1991 through October 1994. For the two national samples in NHANES III, CDC is measuring serum cotinine levels for approximately 23,000 persons. NHANES III also includes questionnaire data on individual smoking and smokeless tobacco habits, smoking habits of persons in the household, and exposure to tobacco smoke at work.

CDC developed an isotope dilution-liquid chromatography-tandem mass spectrometry method (CDC, unpublished data) to measure serum cotinine at levels as low as 0.030 nanograms per milliliter (ng/mL). No known substances interfere with the analysis of cotinine using the tandem mass spectrometry procedure (i.e., the specificity of the analytic procedure for serum cotinine is extremely high). This analytic method allows quantitative measurement of both low levels of tobacco-smoke exposure from environmental tobacco smoke (ETS) and higher levels of exposure from active smoking.

Serum samples have been analyzed for cotinine for 800 persons aged 4–91 years in the NHANES III survey. All (100%) of the 800 persons tested had measurable levels of cotinine in their serum. The frequency distribution of these serum cotinine levels appears bimodal, with one group of persons having cotinine levels greater than 10–15 ng/mL and a second group with levels below 10–15 ng/mL. For the 800 persons tested, serum cotinine levels ranged from 0.030 to 650 ng/mL, a span of more than four orders of magnitude.

Reported by: Div of Health Examination Statistics, National Center for Health Statistics; Div of Environmental Health Laboratory Sciences, National Center for Environmental Health, CDC.

Editorial Note: Cotinine in serum results from exposure to nicotine. The most common sources of nicotine exposure are active smoking and exposure to ETS. Appropriate interpretation of serum cotinine levels must also consider other nicotine sources including nicotine gum, nicotine dermal patches, chewing tobacco, and snuff.

The presence of cotinine in the serum of all 800 persons indicates at least some exposure to nicotine in each of the survey participants. Other investigators (*7–9*) have found that levels of serum cotinine greater than approximately 10–15 ng/mL characterize smokers, and serum cotinine levels less than this amount characterize nonsmokers. Serum cotinine levels below 10–15 ng/mL have been attributed to exposure to ETS (*7–10*). Further interpretation of these NHANES III serum cotinine levels must await analysis of the smoking questionnaire data in the survey.

The new analytic method for measuring serum cotinine and its application in NHANES III affords a rare opportunity to obtain objective estimates of exposure to tobacco smoke in a representative sample of the U.S. population aged ≥4 years. In addition, substantial samples of persons in different racial/ethnic and age groups and persons of differing socioeconomic status in NHANES III will provide important data on exposure in these population groups.

Comparison of serum cotinine results of the first national sample in NHANES III with the second national sample in NHANES III and subsequent NHANES surveys will help in assessing the effectiveness of public health efforts to reduce exposure to tobacco smoke in the United States. CDC is continuing to analyze NHANES III serum samples for cotinine and will publish results of these analyses when the first national probability sample is completed.

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Smoking-Attributable Mortality
and Years of Potential Life Lost — United States, 1988

Smoking is a leading cause of diseases associated with premature mortality in the United States; in 1985, these diseases accounted for an estimated 390,000 premature deaths (1). In this report, mortality data and estimates of smoking prevalence for 1988 are used to calculate smoking-attributable mortality (SAM), years of potential life lost (YPLL), and age-adjusted SAM and YPLL rates for the United States (2).

Calculations were performed using Smoking-Attributable Mortality, Morbidity, and Economic Cost (SAMMEC II) software (2), which includes relative risk estimates for 22 adult (i.e., ≥35 years of age) smoking-related diseases and relative risk estimates for four perinatal (i.e., <1 year of age) conditions (Table 1). Age-, sex-, and race-specific mortality data for 1988 were obtained from CDC's National Center for Health Statistics. Data on burn deaths caused by cigarettes were obtained from the Federal Emergency Management Agency (3). The estimated number of deaths among nonsmokers from lung cancer attributable to passive smoking was obtained from a report of the National Academy of Sciences (4). Age-, sex-, and race-specific current and former smoking prevalence rates in 1988 for adults aged ≥35 years and for women aged 18–44 years were estimated by linear extrapolation using National Health Interview Survey data for 1974–1987 (1,5).

YPLL before age 65 and before age 85 were calculated according to standard methods (2). Age-adjusted SAM and YPLL rates were calculated by the direct method and standardized to the 1980 U.S. population. YPLL estimates do not include deaths related to passive smoking.

Based on these calculations, in 1988, approximately 434,000 deaths and 1,199,000 YPLL before age 65 (6,028,000 before age 85) were attributable to cigarette smoking (Tables 1 and 2). Although SAM for blacks represented 11% of total SAM, the SAM rate for blacks was 12% higher than for whites. The SAM for men was 66% of total SAM, and the SAM rate for men was more than twice the rate for women (Tables 2 and 3). In addition, the rate of smoking-attributable YPLL before age 65 for blacks was twice that for whites, and the smoking-attributable YPLL rate for men was almost three times that for women. For YPLL before age 85, the rate for blacks was 52% higher than for whites, and for men, more than twice that for women (Table 3).

Reported by: JM Shultz, PhD, Univ of Miami School of Medicine, Miami, Florida. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: For 1988, total estimated smoking-attributable deaths (434,000) were substantially higher than for 1985 (390,000) (1). Although SAM from ischemic heart

TABLE 1. Relative risks* (RR) for death attributed to smoking and smoking-attributable mortality (SAM) for current and former smokers, by disease category and sex — United States, 1988

Disease category (ICD-9)	Men RR Current smokers	Men RR Former smokers	Men SAM	Women RR Current smokers	Women RR Former smokers	Women SAM	Total SAM
Adult diseases (≥35 yrs of age)							
Neoplasms							
Lip, oral cavity, pharynx (140–149)	27.5	8.8	4,942	5.6	2.9	1,460	6,402
Esophagus (150)	7.6	5.8	5,478	10.3	3.2	1,609	7,087
Pancreas (157)	2.1	1.1	2,775	2.3	1.8	3,345	6,120
Larynx (161)	10.5	5.2	2,401	17.8	11.9	589	2,990
Trachea, lung, bronchus (162)	22.4	9.4	78,932	11.9	4.7	33,053	111,985
Cervix uteri (180)	NA	NA	0	2.1	1.9	1,246	1,246
Urinary bladder (188)	2.9	1.9	2,951	2.6	1.9	963	3,914
Kidney, other urinary (189)	3.0	2.0	2,729	1.4	1.2	363	3,092
Cardiovascular diseases							
Hypertension (401–404)	1.9	1.3	3,441	1.7	1.2	2,254	5,695
Ischemic heart disease (410–414)							
Persons aged 35–64 yrs	2.8	1.8	29,263	3.0	1.4	9,105	38,368
Persons aged ≥65 yrs	1.6	1.3	41,821	1.6	1.3	27,990	69,811
Other heart diseases (390–398, 415–417, 420–429)	1.9	1.3	27,503	1.7	1.2	14,638	42,141
Cerebrovascular disease (430–438)							
Persons aged 35–64 yrs	3.7	1.4	5,121	4.8	1.4	4,504	9,625
Persons aged ≥65 yrs	1.9	1.3	11,554	1.5	1.0	5,134	16,688
Atherosclerosis (440)	4.1	2.3	4,644	3.0	1.3	3,612	8,256
Aortic aneurysm (441)	4.1	2.3	5,798	3.0	1.3	1,435	7,233
Other arterial disease (442–448)	4.1	2.3	1,874	3.0	1.3	1,111	2,985
Respiratory diseases							
Pneumonia, influenza (480–487)	2.0	1.6	11,580	2.2	1.4	8,098	19,678
Bronchitis, emphysema (491–492)	9.7	8.8	9,670	10.5	7.0	5,269	14,939
Chronic airways obstruction (496)	9.7	8.8	29,838	10.5	7.0	16,884	46,722
Other respiratory diseases (010–012, 493)	2.0	1.6	828	2.2	1.4	690	1,518
Pediatric diseases (<1 yr of age)							
Short gestation, low birth weight (765)	1.8		344	1.8		261	605
Respiratory distress syndrome (769)	1.8		351	1.8		233	584
Other respiratory conditions of newborn (770)	1.8		384	1.8		277	661
Sudden infant death syndrome (798)	1.5		422	1.5		280	702
Burn deaths[†]			850			453	1,303
Passive smoking deaths[§]			1,330			2,495	3,825
Total			286,824			147,351	434,175

*Relative to never smokers.

[†]Data from the Federal Emergency Management Agency, 1990 (*3*).

[§]Deaths among nonsmokers from lung cancer attributable to passive smoking (National Academy of Sciences, 1986 [*4*]).

TABLE 2. Estimated smoking-attributable mortality (SAM) and smoking-attributable years of potential life lost (YPLL), by race, sex, and age* — United States, 1988

Race	SAM				Smoking-attributable YPLL before age 65				Smoking-attributable YPLL before age 85			
	Men	Women	Pediatric	Total[†]	Men	Women	Pediatric	Total[†]	Men	Women	Pediatric	Total[†]
White	248,241	128,801	1,615	378,657	573,044	236,776	104,122	913,943	3,440,682	1,444,823	136,408	5,021,914
Black	32,781	14,011	900	47,692	144,481	65,899	58,057	268,437	606,297	257,438	76,059	939,794
Other	2,967	994	36	3,997	10,207	3,987	2,313	16,507	46,623	16,486	3,030	66,138
Unknown[§]	1,330	2,495		3,825								
Total[†]	285,319	146,301	2,551	434,175	727,732	306,662	164,492	1,198,887	4,093,602	1,718,747	215,497	6,027,846

* Men and women, ≥35 years of age; pediatric, <1 year of age.
[†] Sums may not equal total because of rounding.
[§] Deaths among nonsmokers from lung cancer attributable to passive smoking; estimates were available by sex but not by race (4). The YPLL associated with these deaths are unknown and are not included in this table.

disease declined between 1985 and 1988, SAM from lung cancer and chronic obstruc-
tive pulmonary disease was higher. Several heart disease categories (*International
Classification of Diseases, Ninth Revision* [ICD-9] rubrics 390–398, 415–417, 420–429)
were included in the calculations for 1988 but not for 1985, contributing to the higher
SAM estimate for 1988.

The higher SAM rates for blacks underscore concerns about the higher burden of
smoking-related diseases among blacks than among whites. For example, the aver-
age lung cancer death rate from 1980 through 1987 for blacks was 2.3 times higher
than for whites (*6*). In addition, the larger racial disparity in smoking-attributable YPLL
suggests that onset of smoking-attributable disease occurs at younger ages among
blacks than among whites.

In this report, the SAM estimate for the United States represents a conservative
estimate because it is based on 1988 prevalence data, whereas smoking-attributable
diseases in 1988 actually are caused by higher rates of smoking in the 1950s, 1960s,
and 1970s. For persons aged ≥55 years who smoked during those decades, lung can-
cer incidence and death rates and the chronic obstructive pulmonary disease death
rate are increasing (*6,7*).

The SAM described in this report also represents a conservative estimate because
the calculations did not include deaths from cardiovascular disease that may have
been attributable to passive smoking and deaths from cancers at unspecified sites (*1*),
leukemia (*8*), and ulcers (*9*)—all of which may also be associated with cigarette smok-
ing. A recent analysis estimated that each year passive smoking is associated with
37,000 deaths from heart disease (*10*).

Despite declines in the prevalence of smoking in the United States, the absolute
numbers of deaths caused by smoking-related diseases may increase for several
years. This trend is due partly to the increase in absolute numbers of smokers among
the post-World War II generation (i.e., persons aged 25–44 years), who will soon attain
the ages at which smoking-related diseases occur (*5*). Persons in this age group and
in older age groups will continue to develop chronic diseases associated with smoking
unless widespread cessation efforts are successful. However, because of the declining
prevalence of smoking in the United States, death rates of lung cancer (*11*) and of

TABLE 3. Age-adjusted smoking-attributable mortality (SAM) rates* and smoking-
attributable years of potential life lost (YPLL) rates, by race[†] and sex — United States,
1988

Race	SAM			Smoking-attributable YPLL (before age 65 yrs) rate			Smoking-attributable YPLL (before age 85 yrs) rate		
	Men	Women	Both	Men	Women	Both	Men	Women	Both
White	555.8	244.2	389.3	1,773.8	699.1	1,224.7	8152.0	3,063.8	5,472.8
Black	702.9	231.5	437.3	3,776.4	1,397.8	2,471.8	13,152.0	4,443.0	8,311.6
Other	186.8	54.0	115.0	843.1	290.8	549.3	3,177.0	968.4	1,981.5
Total	558.6	240.7	387.8	1,926.9	761.0	1,326.0	8,436.4	3,140.5	5,631.0

*Per 100,000 persons aged ≥35 years (adjusted to the 1980 U.S. population).
[†]Race-specific rates for SAM and all rates for smoking-attributable YPLL do not include passive
 smoking-related deaths.

coronary heart disease (*12*) among younger men and women have already begun to decline. Because smoking cessation is associated with a decreased risk for premature death at any age (*9*), efforts to support cessation must be further encouraged in the elderly and other groups (e.g., women and minorities) characterized by higher smoking prevalences or slower rates of decline in smoking.

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Trends in Lung Cancer Incidence and Mortality — United States, 1980–1987

Lung cancer is the most common fatal malignant neoplasm in the United States. Based on current smoking patterns, the substantial public health burden of smoking-related lung cancer will continue during the next several decades. This report describes trends in lung cancer incidence from 1980 through 1986 and lung cancer mortality from 1980 through 1987.

Incident cases* for 1980–1986 were determined using data from the Surveillance, Epidemiology, and End Results program of the National Cancer Institute (NCI). Deaths[†] for 1980–1987 were identified using total mentions from the multiple cause-of-death data files compiled by CDC's National Center for Health Statistics. The

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*International Classification of Diseases for Oncology, rubric 162, which includes trachea, bronchus, and lung.
[†]International Classification of Diseases, Ninth Revision, rubric 162, which includes malignant neoplasm of the trachea, bronchus, and lung.

denominators for both rates were derived from intercensal population estimates (*1*). Rates were standardized to the 1970 age distribution of the U.S. population. Race-specific rates are not reported for races other than white and black because appropriate denominators were not available.

From 1980 through 1986, the age-adjusted lung cancer incidence rate per 100,000 persons increased from 52.4 to 55.5 (Table 1).[§] Although rates fluctuated for males, for females, they increased steadily from 28.4 to 36.3 per 100,000. Incidence in males was higher among blacks than whites; rates for females did not differ by race (Table 1).

Trends for lung cancer death rates paralleled those for incidence rates. From 1980 through 1987, the age-adjusted death rate per 100,000 persons increased from 46.2 to 52.1. Although death rates for males did not change substantially, rates were consistently higher for blacks than for whites. For females, the rates increased steadily but did not differ by race.

For males, lung cancer death rates were higher for older age groups but did not change substantially for any age group. For women aged ≥55 years, death rates increased consistently for both blacks and whites (Figure 1). The greatest difference by race occurred for men aged 35–44 years; for this age group, the death rate was 2.3 times higher for blacks than for whites (Figure 2).

Reported by: Chronic Disease Surveillance Br, Office of Surveillance and Analysis and Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Lung cancer is the second leading cause of death among black males (after coronary heart disease) (*2*). The excess morbidity and mortality from lung cancer among black men compared with white men is greatest for the 35- to 64-year age group (*3*).

Cigarette smoking accounts for approximately 85% of lung cancer cases (*4*). Since 1974 national surveys have consistently shown that the prevalence of smoking has been higher in black men than in white men (*5*); in addition, blacks tend to use brands with higher tar and nicotine content (*6,7*). However, black men and women initiate smoking at slightly older ages than white men and women (*4*) and smoke fewer cigarettes per day. The extent to which these differences in smoking patterns or other

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[§]Rates reported here may not correspond to those published by NCI because of additional data recoding by NCI.

TABLE 1. Age-adjusted incidence of lung cancer per 100,000 persons, by sex and race — Surveillance, Epidemiology, and End Results program, 1980–1986

Year	Male		Female		Total
	White	Black	White	Black	
1980	82.4	131.6	28.4	34.9	**52.4**
1981	83.5	126.0	31.5	33.5	**53.9**
1982	84.0	123.5	33.8	31.8	**55.0**
1983	82.4	130.6	34.6	34.9	**55.0**
1984	84.1	139.1	35.2	40.3	**56.7**
1985	81.6	129.7	35.9	40.9	**55.6**
1986	80.2	130.2	37.2	43.3	**55.5**

host or environmental factors contribute to the difference in lung cancer mortality is unknown.

The higher prevalence of smoking among black men and women reflects a decreased likelihood of quitting rather than a difference in initiation; this decreased likelihood is characteristic of all socioeconomic levels and ages (*5,6*). Smoking-cessation programs that recognize the smoking patterns of black men and women may be more effective and ultimately assist in lowering the lung cancer death rate.

For both black and white females, the similar increases in age-specific lung cancer incidence and death rates are consistent with historically increasing trends in smoking

FIGURE 1. Age-specific lung cancer death rates,* by race — United States, 1980–1987
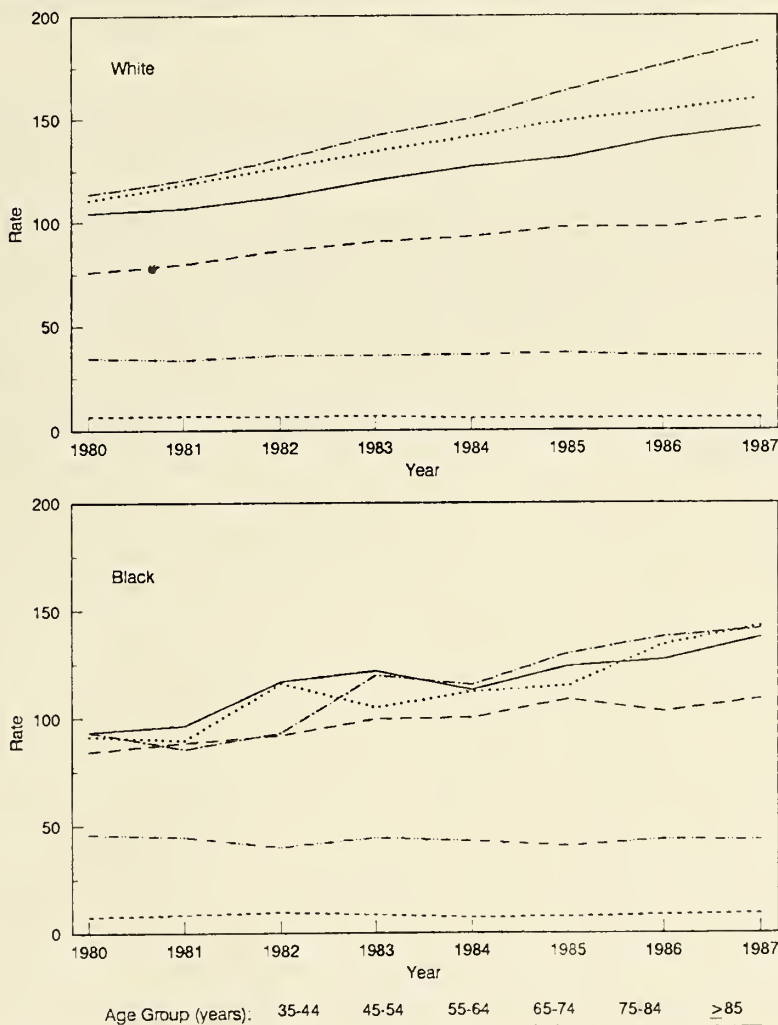
*Per 100,000 women.

prevalence. Based on these trends, the increases in lung cancer incidence and mortality for females are not projected to plateau until after the year 2013 (*8*).

Epidemiologic and clinical studies have provided extensive information on the health benefits of smoking cessation (*9*). For example, after 10 years of smoking cessation, the risk for lung cancer is reduced to 30%–50% of the risk among continuing smokers (*9*). The national health objectives for the year 2000 include reducing the prevalence of cigarette smoking among adults to ≤15%, from a 1987 baseline of 29% (*10*). Recent declines in smoking prevalence, especially among black males, are encouraging. However, continued progress in both smoking-prevention and smoking-cessation efforts is essential to achieving this objective and protecting the population from the health hazards of tobacco use. These efforts must take into account the adverse effects of marketing strategies by the tobacco industry that target high-risk groups.

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FIGURE 2. Average annual black-to-white death rate ratio, by age and sex — United States, 1980–1987
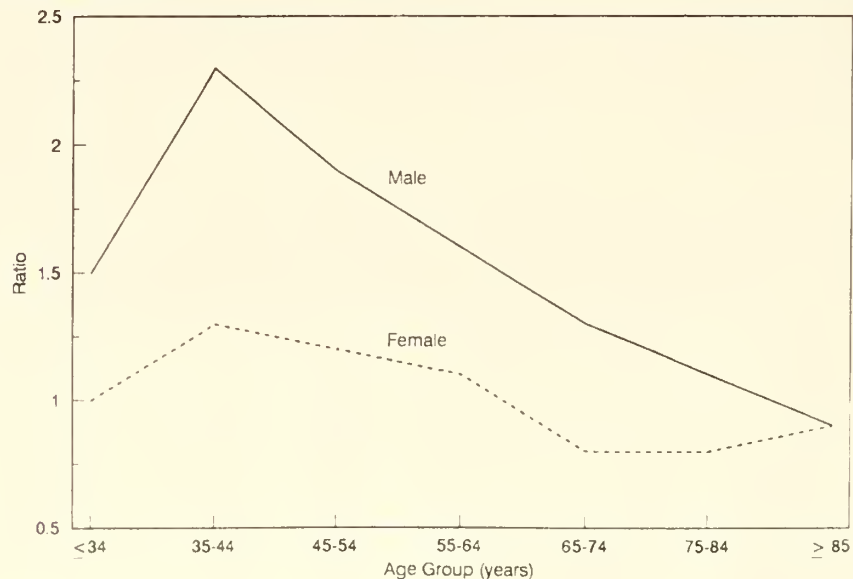
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Smoking-Attributable Mortality — Kentucky, 1988

Smoking is the single most important preventable cause of death in the United States (*1*). Among states participating in the Behavioral Risk Factor Surveillance System (BRFSS), Kentucky has consistently ranked at or near the top in prevalence of smoking (*2*). In 1988, the BRFSS indicated that 34% of adults in Kentucky were current smokers, compared with a median prevalence of 24% for all states surveyed (*3*). To better characterize the public health burden of smoking in Kentucky, the Kentucky Department for Health Services recently estimated smoking-attributable mortality (SAM) and years of potential life lost (YPLL) in that state during 1988. This report summarizes results from that analysis.

SAM and YPLL were calculated using SAMMEC II (Smoking-Attributable Mortality, Morbidity, and Economic Costs) computer software (*4*). Calculations were made for 22 smoking-related diseases among adults aged ≥35 years (Table 1). The analysis also included smoking-related burn fatalities for persons of all ages and four perinatal conditions related to maternal smoking (*5*). Age- and sex-specific mortality data for 1988 were obtained from the state's vital records system. Age- and sex-specific smoking prevalence rates for 1988 were obtained from the state's BRFSS. YPLL were calculated to life expectancy using 1985 data from CDC's National Center for Health Statistics (*6*).

The smoking-attributable fraction (SAF) was derived from age- and sex-specific relative risks of death (based on the American Cancer Society's Cancer Prevention Study II [*1*]) and prevalence data for current and former smokers from the 1988 BRFSS. Total SAM was calculated by multiplying the number of deaths in each disease category by the specific SAF. Total smoking-attributable YPLL was calculated by multiplying the age-specific SAM by YPLL for each premature death.

In 1988, 8230 deaths in Kentucky were attributable to smoking, accounting for 22% of all deaths in the state during the year. Fifty-three percent of smoking-attributable deaths were from lung cancer and ischemic heart disease (Table 1). Sixty-eight percent of SAM occurred among men (Table 2). Sixty-seven percent of deaths occurred in persons ≥65 years of age. However, when smoking-attributable deaths were calculated as a percentage of total deaths, persons aged 45–64 years had a higher percentage of deaths caused by smoking than did persons aged ≥65 years (Figure 1). For men aged 55–64 years, 41% of all deaths were attributable to smoking. When considered as a separate cause of death, SAM was the most common cause of death

in men, the third most common cause in women, and, for both sexes, the second most common cause in Kentucky (Table 2).

TABLE 1. Estimated smoking-attributable mortality (SAM),* by cause — Kentucky, 1988

Cause of death (ICD-9-CM rubric)	Age group (yrs)	No. deaths	Crude SAF[†]	SAM
Neoplasms				
Lip, oral cavity, pharynx (140–149)	≥35	120	0.80	96
Esophagus (150)	≥35	102	0.79	81
Pancreas (157)	≥35	345	0.28	96
Larynx (161)	≥35	70	0.83	58
Trachea, bronchus, lung (162)	≥35	2,718	0.86	2,338
Cervix uteri (180)	≥35	101	0.31	31
Urinary bladder (188)	≥35	177	0.42	74
Kidney, other unspecified urinary organs (189)	≥35	148	0.35	52
Cardiovascular diseases				
Rheumatic heart disease (390–398)	≥35	54	0.17	9
Hypertensive disease (401–404)	≥35	396	0.19	77
Ischemic heart disease (410–414)	≥35	8,393	0.24	2,034
Pulmonary circulation disease (415–417)	≥35	249	0.21	52
Other heart disease (420–429)	≥35	3,637	0.20	734
Cerebrovascular disease (430–438)	≥35	2,546	0.19	496
Atherosclerosis (440)	≥35	430	0.41	177
Aortic aneurysm (441)	≥35	235	0.50	118
Other arterial disease (442–448)	≥35	128	0.43	55
Respiratory diseases				
Respiratory tuberculosis (010–012)	≥35	28	0.29	8
Pneumonia, influenza (480–487)	≥35	1,324	0.28	367
Chronic bronchitis, emphysema (491–492)	≥35	300	0.82	246
Asthma (493)	≥35	54	0.28	15
Chronic airway obstruction (496)	≥35	1,132	0.82	924
Perinatal conditions				
Short gestation/low birth weight (765)	<1	70	0.21	15
Respiratory distress syndrome (769)	1	36	0.19	7
Other respiratory condition of fetus and newborn (770)	1	27	0.22	6
Sudden infant death syndrome (798.0)	1	121	0.15	18
Other conditions				
Burn deaths (E890–E899)	0	105	0.45	47
All other causes	0	14,246	0.00	0
Total	0	37,292	0.22	8,230

*Total SAM was calculated by multiplying the number of deaths in each disease category by the specific smoking-attributable fraction (SAF). Because of rounding, SAM may not equal the product of SAF times the number of deaths.
[†]Derived from age- and sex-specific relative risks of death (based on the American Cancer Society's Cancer Prevention Study II [1]) and prevalence data for current and former smokers from the 1988 Behavioral Risk Factor Surveillance System.

In 1988, 115,458 YPLL before life expectancy in Kentucky were attributable to smoking. Fifty-five percent of smoking-attributable YPLL occurred in persons aged <65 years. The mean YPLL was 14 years per smoking-attributable death.

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Editorial Note: This analysis quantifies the premature mortality caused by smoking in a state with a historically high prevalence of tobacco use. The high prevalence of smoking among middle-aged persons in Kentucky (38.4% among those aged 35–49 years and 34.9% among those aged 50–64 years) (*2*) is of special concern. The data indicate a need to intensify cessation efforts among these persons before the onset of chronic diseases associated with smoking. *The Health Benefits of Smoking Cessation:*

TABLE 2. Deaths from selected causes, including smoking, by sex — Kentucky, 1988

Underlying cause of death	Male		Female		Total	
	No.	(%)	No.	(%)	No.	(%)
Diseases of the heart*	4,950	(25.1)	5,305	(30.2)	**10,255**	(27.5)
Smoking-attributable mortality	5,589	(28.4)	2,642	(15.0)	**8,230**	(22.1)
Malignant neoplasms*	2,665	(13.5)	2,950	(16.8)	**5,615**	(15.1)
Cerebrovascular diseases*	746	(3.8)	1,404	(8.0)	**2,150**	(5.8)
Unintentional injuries*	1,201	(6.1)	552	(3.1)	**1,753**	(4.7)
Influenza and pneumonia*	431	(2.2)	581	(3.3)	**1,012**	(2.7)
All other causes*	4,132	(21.0)	4,144	(23.6)	**8,276**	(22.2)
Total	**19,714**	**(100.0)**	**17,578**	**(100.0)**	**37,292**	**(100.0)**

*Excludes smoking-attributable deaths.

FIGURE 1. Smoking-attributable deaths as a percentage of total deaths, by age and sex — Kentucky, 1988
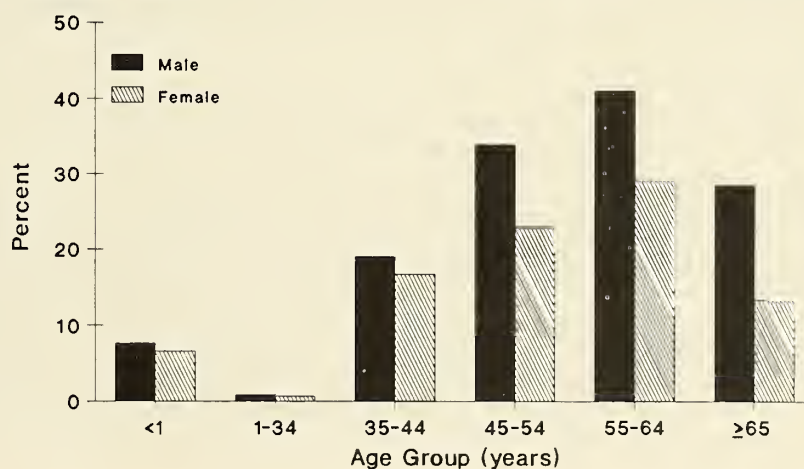
A Report of the Surgeon General, 1990, describes the important reductions in risk that may be associated with smoking cessation at any age (*7*).

To reduce the burden of SAM in Kentucky, greater efforts are also necessary to prevent smoking among young persons. During the 1990 legislative session in Kentucky, the legislature enacted a law prohibiting the sale of tobacco products to all persons <16 years of age. This law also established fines for vendors who sell tobacco products to persons aged <16 years and requires that signs stating the age limit for purchase of tobacco be posted at the point of sale. Enforcement of laws such as this is critical to reducing tobacco use (*8*).

SAMMEC II software can be used to estimate the effects of smoking and has been distributed to all 50 states and the District of Columbia. Additional state-specific estimates may be made using this software to provide public health workers and policymakers with important updated information regarding the impact of smoking in their respective states (*9*).

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Effects of Maternal Cigarette Smoking on Birth Weight and Preterm Birth — Ohio, 1989

In 1989, most states began using revised birth certificates that provide more detailed information about maternal behaviors during pregnancy and complications of pregnancy. The availability of information on cigarette smoking by mothers in Ohio permitted the Ohio Department of Health (ODH) to examine the proportion of low birth weight (LBW), very low birth weight (VLBW), and preterm births that were attributable to maternal cigarette smoking.

The ODH study included live infants born to Ohio resident mothers in Ohio hospitals from January 1 through June 30, 1989. The analysis was restricted to singleton infants of white (n=62,732) and black (n=11,407) mothers. Gestational age was

imputed in the 12% of certificates for which a direct estimate from the date of the last menstrual period was not possible; calculations were based on both birth weight and months of completed gestation (1). An infant was classified as having LBW if the birth weight was <2500 g (<5 lbs 8 oz), having VLBW if the birth weight was <1500 g (<3 lbs 4 oz), and being born preterm if the gestational age was <37 weeks. The Ohio birth certificate includes these items: "Tobacco use during pregnancy" and "Average number of cigarettes per day."

Multiple logistic regression was used to control for factors that affect the risk for LBW and preterm delivery, including mother's educational attainment (a measure of socioeconomic status), age, race, prepregnancy weight, and weight gain and alcohol consumption during pregnancy; child's birth order; the month prenatal care began; and previous terminations of pregnancy.

Odds ratios (ORs) were estimated for LBW, VLBW, and preterm birth in relation to in utero exposure to maternal cigarette smoking; these ORs represent measures of the risk for these outcomes in women who smoked compared with nonsmoking women. These findings permitted estimation of the population-attributable risk percentage (PAR%) (i.e., the proportion of all LBW, VLBW, and preterm birth attributable to maternal smoking). The PAR% was approximated as (p X[OR-1]) X 100(p X [OR-1] + 1), where p is the proportion of women in the total population who smoke and OR is estimated in the multivariate model.

Overall, 23% of Ohio mothers were reported to have smoked during pregnancy; this prevalence did not vary by race. Among smokers, white women were more likely than black women (8.8% and 4.7%, respectively) to smoke more than one pack of cigarettes per day during pregnancy. The overall rate of LBW was 5.7%: for whites it was 4.8%; for blacks, 12.1% (Table 1). Overall rates of VLBW and preterm birth were approximately 2–3 times higher for blacks than for whites. Among whites, all three outcomes were more prevalent among younger women; among black women, variation by age group was limited.

Infants born to smokers were more than twice as likely to have LBW as were infants born to nonsmokers (Table 2). In addition, among women who smoked, risk for LBW increased by level of exposure: adjusted ORs were 1.8, 2.2, and 2.4 for light (less than one half pack per day), moderate (one half pack to one pack per day), and heavy smokers (more than one pack per day), respectively. Consumption of even <10 cigarettes per day appeared to double the risk for LBW. For both blacks and whites, the risk was directly proportionate to levels of smoking.

Maternal cigarette smoking also increased the risk for VLBW and preterm birth (Table 3). However, these risks were similar for light and heavy smokers.

An estimated 20% of all LBW in the total Ohio population (i.e., smokers and nonsmokers) in the 6-month period was attributable to maternal smoking (Table 3). Similarly, more than 8% of all VLBW and more than 6% of all preterm deliveries were attributable to smoking. For each of the three outcomes, adjusted ORs and PAR% were slightly lower for blacks than for whites.

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TABLE 1. Percentage of low birth weight (LBW), very low birth weight (VLBW), and preterm birth, by mother's race and age — Ohio, January–June 1989*

Race/Age (yrs)	% LBW	% VLBW	% Preterm
White			
<20	7.8	1.6	12.6
20–34	4.4	0.7	7.5
≥35	4.6	0.7	7.4
Total	4.8	0.8	8.1
Black			
<20	11.7	2.3	19.3
20–34	12.2	2.6	17.2
≥35	14.2	3.4	18.0
Total	12.1	2.6	17.8

*Data based on Ohio birth certificate information.

TABLE 2. Low birth weight (LBW) among singleton infants, by mother's cigarette consumption and race — Ohio, January–June 1989*

Packs per day	White				Black				Odds ratio[§]
	LBW	(%)	Total	RR[†]	LBW	(%)	Total	RR	
None	1,744	(3.6)	48,427	1.0[*]	871	(9.9)	8,780	1.0[*]	1.0[*]
$<\frac{1}{2}$	223	(6.8)	3,303	1.9	167	(15.1)	1,103	1.5	1.8
$\frac{1}{2}$–1	435	(8.0)	5,459	2.2	167	(16.8)	992	1.7	2.2
>1	497	(9.0)	5,543	2.5	125	(23.5)	532	2.4	2.4
Total	2,899	(4.6)	62,732	–	1,330	(11.7)	11,407	~	–

*Data based on Ohio birth certificate information.
[†]Relative risk.
[§]Adjusted for mother's educational attainment, age, race, prepregnancy weight, and weight gain and alcohol consumption during pregnancy; child's birth order; the month prenatal care began; and previous terminations of pregnancy. Birth certificates with unknowns for any of these variables were excluded.
[*]Referent group.

TABLE 3. Crude and adjusted odds ratios and population-attributable risk percentage (PAR%)* for low birth weight (LBW), very low birth weight (VLBW), and preterm birth in relation to maternal cigarette smoking during pregnancy — Ohio, January–June 1989[†]

Measure	LBW	VLBW	Preterm birth
Crude odds ratio	2.2	1.6	1.5
Adjusted odds ratio[§]	2.1	1.4	1.3
PAR%	20.2%	8.4%	6.5%

*PAR% was approximated as (p × [OR–1]) × 100 ÷ (p × [OR–1] + 1), where p is the proportion of persons in the total population exposed to the hazard and OR is the odds ratio estimated in the multivariate model.
[†]Data based on Ohio birth certificate information.
[§]Adjusted for mother's educational attainment, age, race, prepregnancy weight, and weight gain and alcohol consumption during pregnancy; child's birth order; the month prenatal care began; and previous terminations of pregnancy. Birth certificates with unknowns for any of these variables were excluded.

Editorial Note: Smoking by mothers is an important preventable cause of adverse pregnancy outcome (*2*). In Ohio, the deleterious effects of cigarette smoking by mothers during pregnancy on the rates of LBW, VLBW, and preterm birth were substantial, even when adjusted for other risk factors identified from the birth certificates. The effect of smoking on fetal growth may be partially mediated through lower maternal weight gain. The adjustment for maternal weight gain in this multivariate model may have underestimated the ORs for LBW and VLBW and thus the PAR%. Conversely, the effects reported here could also partially reflect the impact of other factors (e.g., illegal drug use) that were not reported on the birth certificate but that are more common among smokers than nonsmokers (*3*). Under these circumstances, the PAR% may have been slightly overestimated.

This study relied on data collected during the first 6 months of use of the revised Ohio birth certificate; the reliability of the smoking-related and other data may be expected to improve over time as reporting of new information becomes routine. Nonetheless, the findings in Ohio are similar to those in other studies, some of which used different data sources (*2,4–7*).

Birth certificates are a useful surveillance tool for identifying subgroups of women who are likely to smoke during pregnancy. These subgroups can then be targeted for special prevention or cessation efforts. Birth certificate data can also be used to evaluate the success of a state's antismoking programs. In 1989, only seven states did not collect information about maternal smoking habits that was comparable to that collected in Ohio on birth certificates.

Smoking during pregnancy increases infant morbidity and mortality through effects on birth weight and preterm birth (*5,6*). In Ohio and other states, successful efforts to reduce or eliminate smoking during pregnancy could substantially reduce rates of LBW, VLBW, and preterm birth and, in turn, reduce infant morbidity and mortality and the cost of health care in the state (*8*).

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Smoking-Related Mortality Decline Among Physicians — Rhode Island

Declines in smoking in the United States have contributed to declines in heart disease, stroke, and lung cancer among white men (*1,2*). In Rhode Island, where prevalence of smoking by physicians has been monitored since 1963, the proportion of physicians aged ≥25 years who smoke declined by 73% from 1963 to 1983 (Table 1). To characterize smoking-related mortality trends among white male physicians and other white males in Rhode Island, the Rhode Island Department of Health examined vital statistics data from that state. This report summarizes the findings from that study.

For 1968–1987, death certificate information for deaths of resident Rhode Island white men aged ≥25 years was sorted by age, cause of death, and occupation. The eighth and ninth revisions of the *International Classification of Diseases* (ICD) were used to group deaths by the following categories: all causes, major smoking-related cancers (oral, larynx, pharynx, esophagus, trachea, bronchus, lung, pancreas, and bladder) and heart disease and stroke (*3,4*). Definitions from the 1970 U.S. Census were used to group deaths by occupational categories, including physicians, other professionals (professional, technical, and kindred workers), and others (*5*). ICD-8 and ICD-9 rubrics were used to aggregate deaths for 1968–1978 and 1979–1987, respectively.

Census data for 1970 and 1980 were used to estimate the populations of physicians and "others"; the population of "other professionals" could not be estimated reliably from available census data. The 1970 U.S. population was used to standardize death rates by age. Rates were calculated for persons 25–64 years of age to ensure compatibility between the two sources of data; counts of deaths included retirees, and estimates of the populations at risk did not.

Proportionate mortality ratios (PMRs) (which do not require estimates of populations at risk) were used to compare the mortality of white male physicians aged ≥25 years with that of white male nonphysicians aged ≥25 years.

From 1968 through 1987, 89,593 white males died in Rhode Island, including 420 physicians and 10,640 other professionals. Smoking-related cancers accounted for 11% of deaths, and heart disease and stroke for 50%. Among persons aged 25–64 years, mortality from all causes declined substantially (among physicians, 38%; among nonphysicians, 19%) (Table 2). Among physicians, smoking-related cancer

TABLE 1. Percentage of white men aged >25 years who smoke cigarettes, by occupation — Rhode Island and United States, circa 1965, 1975, 1985

Location/Occupation	Percentage who smoke cigarettes		
	1965	1975	1985
United States*	51	42[†]	31
Rhode Island		44	31
Physician[§]	33	19	9
Nonphysician		44	31
Professional		32	,25
Other		46	33

*Source: NCHS. Health, United States, 1989. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1990.
[†]U.S. population surveyed in 1974.
[§]Rhode Island physicians surveyed in 1963, 1973, and 1983.

mortality decreased 38%, compared with a 3% decline among nonphysicians. Mortality from heart disease and stroke declined 57% among physicians and 32% among nonphysicians. For both periods, PMRs for smoking-related cancers were <1.0 among physicians and other professionals and >1.0 among other white males (Table 3). PMRs for smoking-related cancers declined moderately among physicians and remained relatively constant among other professionals and other men. PMRs for heart disease and stroke in the earlier period were >1.0 among physicians and other professionals, decreasing over time among physicians but increasing over time among other professionals.

Reported by: HD Scott, MD, JP Fulton, PhD, JS Buechner, PhD, WJ Waters, PhD, JT Tierney, MSW, Rhode Island Dept of Health.

TABLE 2. Age-standardized death rates* (SDRs) from all causes, smoking-related cancers, and cardiovascular diseases among r̤ ̃lent white men aged 25–64 years, by occupation — Rhode Island, 1968–1978 and 1979–1987

Disease/Occupation	1968–1978		1979–1987	
	SDR	95% CI†	SDR	95% CI†
All causes				
Physician	536	414–658	331	228–434
Nonphysician	755	744–766	611	600–623
Smoking-related cancers				
Physician	74	28–120	46	9–83
Nonphysician	98	94–102	95	90–99
Cardiovascular diseases				
Physician	246	164–328	105	47–163
Nonphysician	352	344–359	241	234–249

*Per 100,000 population at risk.
†Confidence interval (calculated in the manner of Keyfitz [6]).

TABLE 3. Proportionate mortality ratios (PMRs) for smoking-related cancers and cardiovascular diseases among resident white men aged ⩾25 years, by occupation — Rhode Island, 1968–1978 and 1979–1987

Disease/Occupation	1968–1978		1979–1987	
	PMR	95% CI*	PMR	95% CI*
Smoking-related cancers				
Physician	0.83	0.51–1.36	0.70	0.46–1.06
Nonphysician				
Professional	0.87	0.78–0.97	0.84	0.76–0.93
Other	1.01	1.00–1.02	1.02	1.01–1.03
Cardiovascular diseases				
Physician	1.04	0.95–1.13	0.98	0.01–1.46
Nonphysician				
Professional	1.02	0.79–1.32	1.04	0.99–1.09
Other	1.00	1.00–1.00	1.00	1.00–1.00

*Confidence interval (calculated from Mantel-Haenszel chi-square values [7]).

Editorial Note: These findings indicate that, for the two periods compared (1968–1978 and 1979–1987), white male physicians in Rhode Island experienced greater declines in overall mortality, smoking-related cancers, and cardiovascular diseases than did white males in other occupations. However, these findings are based on relatively small numbers of deaths and denominators and reflect moderate statistical variation. In addition, other risk factors for specific diseases are not considered in this analysis and may affect the results.

The Rhode Island data suggest a method for examining the population effects of smoking cessation on mortality trends among populations whose members have quit smoking in substantial numbers. Based on the study of physicians in Rhode Island, at least half the current cardiovascular and smoking-related cancer mortality of 25–64-year-old nonphysician white men in that state may be preventable. The Rhode Island Department of Health will use these data to strengthen support for antismoking programs in the state.

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Part Four: Policy

Preemptive State Tobacco-Control Laws — United States, 1982–1998

Cigarette smoking is the leading preventable cause of death in the United States *(1)*. Environmental and policy interventions, particularly tobacco-control laws and regulations, are an important means to prevent and reduce tobacco use *(2)*. For this study, preemptive legislation was defined as legislation that prevents any local jurisdiction from enacting restrictions that are more stringent than the state law or restrictions that may vary from the state law. One of the national health objectives for 2000 is to reduce to zero the number of states with preemptive smokefree indoor air laws (objective 3.25) *(3)*; a proposed objective for 2010 is to reduce the number of states with any preemptive tobacco-control laws to zero. To document trends in preemptive tobacco-control legislation at the state level, CDC identified state preemptive provisions and their effective dates from June 1982 (the oldest provision currently in effect) to September 1998. This report summarizes the results of this analysis, which indicate an increase in the number of preemptive provisions from 1982 to 1996; no preemptive provisions in tobacco-control laws have been enacted since 1996.

CDC gathered data about state tobacco-control laws from an online legal research database to monitor such laws in four primary areas: smokefree indoor air, minors' access, marketing, and excise taxes. Data included the preemptive provisions of these laws. For this study, preemptive provisions are presented in three categories: smokefree indoor air (applying to restrictions on government or private worksites or restaurants), minors' access (addressing restrictions on sales to youth, vending machines, or distribution), and marketing (including restrictions on tobacco product sampling, display, promotion, or labeling). A multistep process was used to identify the month and year the preemptive provisions of these laws took effect. The process included identifying the history of the law by finding the records of each state's legislative session in a given year and analyzing the session laws to determine the effective date of the law's provision.

From 1982 through September 1998, 31 states incorporated preemptive provisions in their tobacco-control laws. Maine was the only state to repeal its preemptive provision (on tobacco displays, product placement, and time of sale) during the study period. Some preemptive provisions are very narrow. For example, in New York, the state government has precedence over local government restrictions on the free distribution of samples of tobacco products. Other provisions are broad. For example, in Tennessee, minors' access laws preempt local legislation of all tobacco-control areas.

The number of preemptive provisions included in state tobacco-control laws increased from 1982 through 1996 but has leveled off since 1996 (Figure 1). The results of a linear regression analyzing the number of preemptive provisions per law and the years they became effective indicated a significant increase in the number of provisions from 1993 through 1996. During the 1980s, nine states passed 11 preemptive laws covering 21 provisions. From 1993 to June 1996, 20 states passed 24 preemptive laws covering 82 different provisions. Since July 1996, no preemptive tobacco-control laws have been enacted.

Eighteen states preempt at least one provision of smokefree indoor air restrictions (e.g., government worksites, private worksites, and restaurants); since 1985, 13 states have preempted smokefree indoor air laws in all three areas. Except in South Carolina, all preemptive laws that became effective since 1990 have covered all three areas.

FIGURE 1. Cumulative number of preemptive provisions in state tobacco-control laws, by year law became effective — United States, 1982–1998.
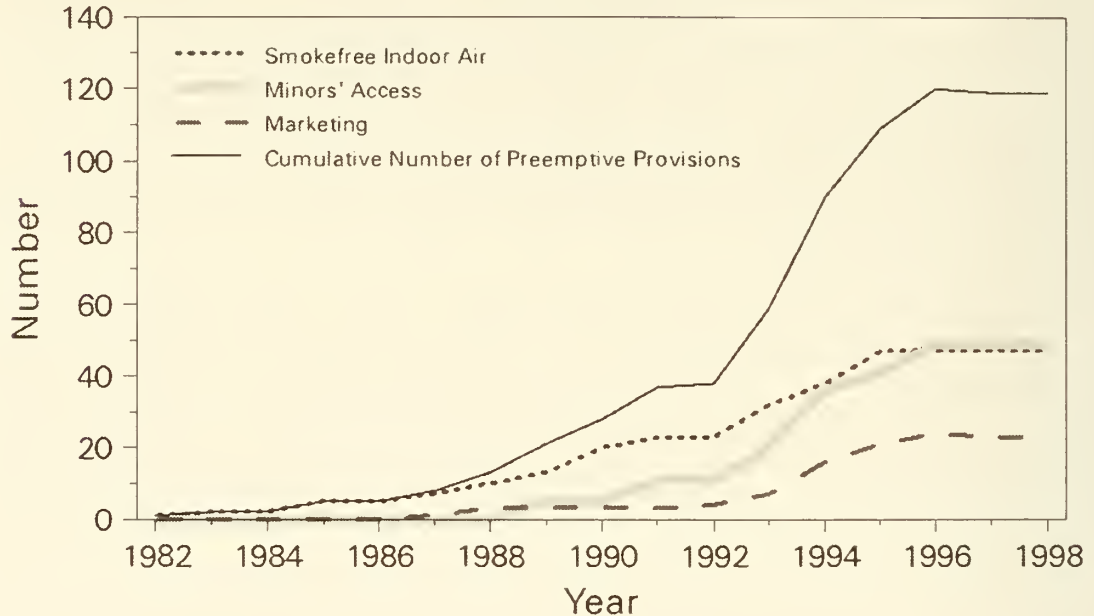
Twenty-one states preempt at least one provision of minors' access restrictions (e.g., sales to youths, vending machines, and distribution). Ten states preempt all three components of minors' access laws. Of 21 states with provisions preempting local minors' access laws, 76% became effective during July 1993–July 1996.

Seventeen states preempt localities from promulgating their own laws restricting the marketing of tobacco products. Three states (Illinois, Michigan, and West Virginia) specifically preempt restrictions on smokeless tobacco warning labels on billboards; all three of these preemptive provisions became effective during July 1987–September 1988. Fourteen states preempt laws on tobacco display, promotion, or sampling; in 93% of these states, the preemptions became effective during January 1993–July 1996.

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report indicate that most states have preemptive tobacco-control laws. Of the 30 states with such laws, 18 have preemptive provisions for smokefree indoor air. As a result, achievement of the 2000 objective is unlikely.

Tobacco-control policy occurs at the federal, state, and local level. Laws enacted by higher-level jurisdictions benefit the public health by implementing widespread standards. Unless they contain preemptive provisions, legislation at higher levels set minimum requirements and allow the continued passage and enforcement of local ordinances that may establish a greater level of protection of public health *(4–6)*. However, legislation that preempts lower-level action removes control from localities by preventing them from enacting more stringent laws or tailoring laws to address community-specific issues *(4,6,7)*. In addition, preemptive laws deter debate over local ordinances; such debate can educate the community about tobacco, potentially altering social norms about tobacco use *(8)*. Preemptive state laws also can be a barrier to local enforcement because communities not involved in the decision-making process may be less compliant *(9)*.

A 1991 Smokeless Tobacco Council memorandum outlines a strategy to oppose local ordinances and advance statewide antitobacco bills that contain preemption clauses *(4)*. In addition, a Tobacco Institute priority for 1993 was to "encourage and support statewide legislation preempting local laws, including

smoking, advertising, sales, and vending restrictions" *(10)*. A potential reason for this strategy is the passage of strong tobacco-control laws at the local level and the logistical difficulties of the tobacco industry to devote resources toward multiple local jurisdictions *(4,7)*.

One limitation of this report is that legislative language is subject to interpretation. Although a law may have been considered preemptive by the definition used in this study, it may not have been implemented as preemptive in a particular state.

Nevertheless, during 1993–1996, the number of tobacco-control laws with preemptive provisions increased significantly. The 1992 federal Synar Amendment, which required states to enact and enforce minors' access laws, resulted in the passage of new laws (many of which included preemptive provisions) in several states. This, coupled with the Tobacco Institute's 1993 stated priority to promote tobacco-control laws with preemptive provisions, may have contributed to this increase. However, since 1996, no preemptive tobacco-control laws have been passed, possibly because of an increased community awareness of the potential harmful effects of preemption and a shift in industry priorities from state to federal restrictions and ongoing litigation.

The importance of laws and policies as a component of comprehensive tobacco-control interventions has resulted in their inclusion in surveillance efforts. CDC will continue to monitor progress toward achieving national health objectives for 2000 to reduce tobacco-related morbidity and mortality.

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Response to Increases in Cigarette Prices
by Race/Ethnicity, Income, and Age Groups — United States, 1976–1993

Tobacco use, particularly cigarette smoking, remains the leading cause of preventable illness and death in the United States (*1*). Studies have shown that increases in the price of cigarettes will decrease the prevalence of smoking and the number of cigarettes smoked both by youth and adults (*1,2*). However, the potential impact of price increases on minority and lower-income populations is an important consideration (*3,4*). This report summarizes the analysis of data for 14 years from the National Health Interview Survey (NHIS), which indicates that lower-income, minority, and younger populations would be more likely to reduce or quit smoking in response to a price increase in cigarettes.

Data from the NHIS from 1976 to 1980, 1983, 1985, and 1987 to 1993 were pooled to conduct the analysis. The NHIS was administered to a nationally representative multistage probability sample of the noninstitutionalized civilian population aged ≥18 years. Smoking histories were obtained for these years in supplements to the NHIS; the overall response rate for these supplements was approximately 80%. Before 1992, participants were asked, "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" In 1992 and 1993, participants were asked, "Do you now smoke cigarettes every day, some days, or not at all?" Current smokers were persons who reported having smoked ≥100 cigarettes during their lifetimes and who currently smoked cigarettes. Current smokers were asked, "On average, how many cigarettes do you smoke per day?" Information on race/ethnicity, income, age, and other demographic factors were obtained from the core of the NHIS questionnaire. Using data reported by the Tobacco Institute (*5*), the average price of a pack of cigarettes for each state, adjusted for inflation, was merged into the NHIS data by year and state of residence. The 14 cross-sections of the NHIS have 367,106 respondents; of these, 355,246 respondents had complete demographic and price data (approximately 24,000 respondents per year).

Two types of multiple regression models were estimated. A probit (limited dependent variable) model was used with the full sample (n=355,246) to estimate the change in the probability of smoking (one for current smokers and zero for all other respondents) for a change in the inflation-adjusted price (1982–1984 dollars). An ordinary least squares model, restricted to current smokers (n=112,657) with self-reported number of cigarettes smoked per day as the dependent variable, was used to estimate the relation between inflation-adjusted price and quantity of cigarettes consumed. Both models controlled for year, region of the country (Northeast, South, Midwest, and West)*, age, sex, race/ethnicity, education, marital status, family income, and ur-

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* *Northeast*=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; *Midwest*=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; *South*=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and *West*=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. Models including state-specific controls yielded results similar to those obtained with controls for region of the country. Because sample sizes in subpopulation analyses were smaller, region of the country rather than state-specific controls were used in all models.

banicity (based on residence in a metropolitan statistical area [MSA] central city, MSA city, or rural area). Separate subpopulation models were estimated by race/ethnicity (Hispanics, non-Hispanic blacks, and non-Hispanic whites), by age group (aged 18–24, 25–39, and ≥40 years), and by income group. Self-reported family incomes from all survey years were inflation-adjusted to 1982–1984 dollars, and the sample median was computed for all respondents reporting family income data. Respondents with incomes equal to or below the median were compared with those above the median income ($33,106 in 1997 dollars). All subpopulation models included the control variables used in the full models.

For all models, the effect of price is expressed as price elasticities. Price elasticity is a standardized measure indicating the percentage change in the dependent variable (i.e., smoking prevalence or number of cigarettes consumed per day) for a 1% change in the inflation-adjusted price of cigarettes (independent variable) (6). Prevalence price elasticity, using price coefficients from the probit regression models, is the percentage reduction in the prevalence of smoking that would be predicted from a 1% price increase. Consumption price elasticity, using price coefficients from the linear regression models, is the percentage reduction in the average number of cigarettes smoked by persons who continue to smoke after a 1% price increase. Total price elasticity is the sum of smoking prevalence and cigarette consumption price elasticities.

For all respondents, the models estimated a prevalence price elasticity of –0.15 and a consumption price elasticity of –0.10, yielding a total price elasticity estimate of –0.25 (Table 1). Therefore, a 50% price increase could cause a 12.5% reduction in the total U.S. cigarette consumption (i.e., 50% X –0.25=–12.5%), or approximately 60 billion fewer cigarettes smoked per year. In the age-specific model, younger smokers were more likely than older smokers to quit smoking, and after controlling for income, education, and other nonprice variables, Hispanic smokers and non-Hispanic black smokers were more likely than white smokers to reduce or quit smoking in response to a price increase. This pattern was consistent for all age groups (Figure 1). Among both non-Hispanic blacks and Hispanics, smokers aged 18–24 years were substantially more price-responsive than smokers aged ≥40 years. Lower-income populations also were more likely to reduce or quit smoking than those with higher incomes. The total price elasticity was –0.29 for lower-income persons compared with –0.17 for higher-income persons.

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Editorial Note: The findings in this report indicate that lower-income and minority smokers would be more likely than other smokers to be encouraged to quit in response to a price increase and thus would obtain health benefits attributable to quitting. Other studies also have found that youth, young adults, and lower-income populations are the most price responsive (1,2,7). In this study, smokers with family incomes equal to or below the study sample median were more likely to respond to price increases by quitting than smokers with family incomes above the median (e.g., 10% quitting compared with 3% quitting in response to a 50% price increase). After controlling for income and education, Hispanics and non-Hispanic blacks are substantially more price responsive than other smokers. Data from this model suggest that Hispanic smokers were the most price responsive. Non-Hispanic black smokers would

TABLE 1. Prevalence, consumption, and total price elasticities* using a probit regression model and least squares model to estimate response to increases in cigarette prices[†], by selected characteristics — United States, 1976–1993

Characteristic	Probit model					Least squares model					
	No.	% Smokers	Coefficient	(95% CI[§])	Prevalence elasticity[¶]	No.	Mean no. cigarettes	Coefficient	(95% CI)	Consumption elasticity**	Total elasticity[††]
Race/Ethnicity[§§]											
White, non-Hispanic	281,482	29.4	-0.04	±0.06	-0.05	90,829	21.49	-1.90	±1.0	-0.09	-0.14
Black, non-Hispanic	43,141	32.8	-0.31	±0.15	-0.36	14,158	14.12	0.50	±1.9	0.04	-0.32
Hispanic	21,926	24.5	-0.76	±0.26	-1.31	5,736	14.00	-7.50	±4.1	-0.58	-1.89
Age group (yrs)											
18–24	46,884	29.6	-0.29	±0.15	-0.37	13,875	16.03	-3.34	±1.9	-0.21	-0.58
25–39	119,510	34.2	-0.22	±0.09	-0.25	42,177	19.49	-3.15	±1.2	-0.17	-0.42
≥40	188,521	26.2	-0.04	±0.07	-0.06	56,515	21.28	-0.73	±1.2	-0.04	-0.10
Family income[¶¶]											
≤Median income	154,602	31.7	-0.16	±0.08	-0.20	51,780	19.24	-1.65	±1.1	-0.09	-0.29
>Median income	156,940	27.5	-0.03	±0.08	-0.05	48,422	20.82	-2.50	±1.3	-0.12	-0.17
Income not reported	43,704	26.1	-0.15	±0.14	-0.23	12,365	19.64	-0.60	±2.3	-0.02	-0.25
Sex											
Male	151,711	32.4	-0.18	±0.08	-0.18	54,417	22.17	-1.91	±1.2	-0.08	-0.26
Female	203,535	26.8	-0.07	±0.07	-0.09	58,150	17.89	-1.87	±1.0	-0.10	-0.19
Total	355,246	29.3	-0.12	±0.05	-0.15	112,657	19.96	-1.94	±0.8	-0.10	-0.25

* Price elasticity is a ratio of the marginal change (i.e., per unit changes) between two variables and the average change between the same variables (7). This ratio is a standardized measure that indicates the percentage change in the dependent variable (i.e., smoking prevalence or number of cigarettes consumed per day) for a 1% change in the Consumer Price Index (CPI) adjusted price of cigarettes (independent variable).

† Cigarette prices were denominated in constant 1982–1984 dollars for all price elasticity estimates.

§ Confidence interval.

¶ Percentage reduction in prevalence of smoking for each 1% increase in the CPI adjusted price of cigarettes. The numerator (the marginal change) consists of the regression coefficient for price multiplied by the average probability (based on the regression coefficient for price and variance terms) that a person is a smoker. The denominator (the average change) is the ratio of the average number of surveyed persons who smoke (smoking prevalence) to the average sample price.

** Percentage reduction in the number of cigarettes smoked per day for each 1% increase in the CPI adjusted price of cigarettes. The numerator is the coefficient on price and the denominator is the ratio of the average number of cigarettes consumed per day to the average sample price.

†† Calculated by summing the smoking prevalence and cigarette consumption price elasticities.

§§ Data for racial/ethnic groups other than non-Hispanic whites, non-Hispanic blacks, and Hispanics were too small for meaningful analysis.

¶¶ Family income data were denominated in constant 1982–1984 dollars for all price elasticity estimates.

FIGURE 1. Percentage decline in smoking in response to a 10% price increase on cigarettes, by age and racial/ethnic group* — United States, 1976–1993
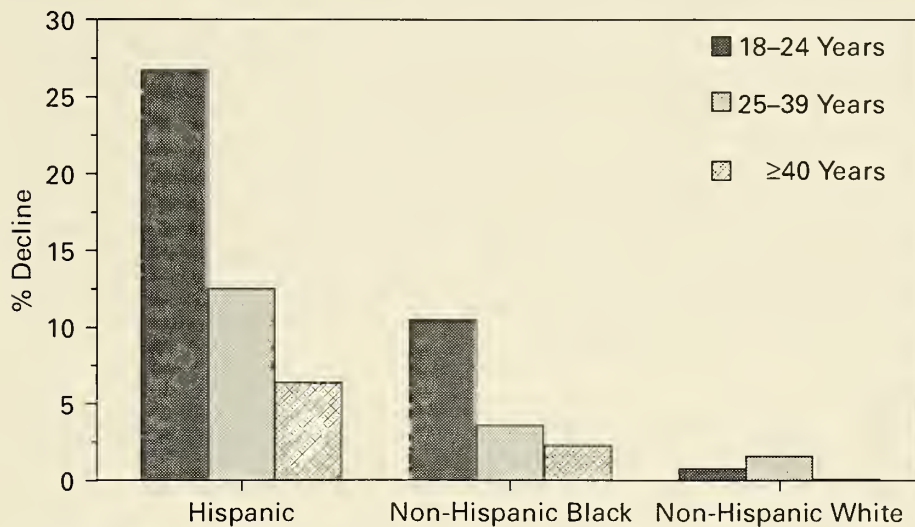
*Data for racial/ethnic groups other than non-Hispanic whites, non-Hispanic blacks, and Hispanics were too small for meaningful analysis.

respond to price increases primarily by quitting rather than reducing the number of cigarettes smoked per day.

This study is subject to at least five potential limitations. First, because the analysis is based on pooled cross-sectional surveys, the estimates of price elasticity could underestimate the long-term response to price changes that would be observed from longitudinal surveys. Second, this analysis does not control fully for other factors unrelated to price (e.g., differences between states in social and policy environments) that could reduce demand and be confounded with the state's excise tax level. Third, because not all respondents for whom price data was available reported family income, the analysis by income categories could be less representative than other subpopulation analyses. Fourth, the sample sizes in subpopulation analyses by race and age (Figure 1) are reduced and make the estimation of price elasticities within specific age groups by race less stable. Nevertheless, the pattern and magnitude of the estimated parameters are consistent with those observed in previous studies, and parameters for the control variables remained stable across models. Finally, because of the changing composition (e.g., Mexican, Cuban, or Puerto Rican) and smaller size of the Hispanic samples within the 14 NHIS samples used in this analysis, the estimates for Hispanics are subject to greater error than those for non-Hispanic blacks and non-Hispanic whites.

Comprehensive measures for promoting cessation and reducing the prevalence of smoking include increasing tobacco excise taxes, enforcing minors' access laws, restricting smoking in public places, restricting tobacco advertising and promotion, and conducting counter-advertising campaigns. Because state tax increases are more ef-

fective when combined with a comprehensive tobacco prevention and control program (*8*), price increases should be combined with such programs to increase their public health impact. Court settlements with several states and other market factors have resulted in the tobacco industry increasing the wholesale price of cigarettes by 12.2% since January 1997 (*9*). Although this and potential future industry price increases will reduce smoking prevalence and consumption—particularly among adolescents and young adults (*1*)—most adult smokers will continue to smoke and pay the higher cigarette prices. Tobacco-use prevention and cessation programs should be made available to benefit those populations paying the greatest share of the increased prices. Smoking prevention will always remain a primary public health objective, but public health efforts encouraging cessation particularly are needed for smokers aged ≥40 years, who would be the most likely group to continue smoking and paying the higher cigarette prices. In addition, tobacco-use prevention and cessation programs should be directed toward lower-income and minority populations in which the burden of tobacco-related disease is high (*10*).

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Illegal Sales of Cigarettes to Minors — Mexico City, Mexico, 1997

Because of the increasing prevalence of tobacco use among youth in the United States and Mexico (*1,2*), in 1996 the United States-Mexico Binational Commission (US-MBC) Health Working Group identified prevention of tobacco use, with an emphasis on adolescents, as one of its four priority health concerns. From 1970 to 1990, annual death rates for the leading causes of smoking-related deaths in Mexico nearly tripled and, in 1992, an estimated 10,253 persons in Mexico died as a result of smoking-related diseases, 9% of all deaths that year (*3*). In addition, from 1988 to 1993, the prevalence of current smoking among minors aged 12–17 years increased from 6.6% to 9.6%, respectively (in Mexico City, the 1993 prevalence was 12.8%), and in 1993, 72% of adult smokers in Mexico reported becoming regular smokers before age 18 years (*2,4*). Although since 1984 the General Health Law of Mexico has prohibited the sale of tobacco products to minors aged <18 years, compliance with this law has not been assessed. As part of the Mexican national program to reduce the prevalence of cigarette smoking among children and adolescents and in support of the goals of the US-MBC, during 1997 the General Directorate of Epidemiology (GDE) in the Secretariat of Health (SOH) conducted a survey of tobacco outlets in Mexico City to assess the percentage of retailers willing to sell cigarettes to minors. This report summarizes the results of the survey, which indicate that virtually no surveyed retailers asked minors attempting to purchase cigarettes about their age and that most retailers sold cigarettes to minors.

This survey, the first assessment in Mexico of illegal sales of cigarettes to minors, was conducted during March 23–April 4, 1997, in the 16 districts composing Mexico City proper (1990 population: 8.5 million, excluding the surrounding metropolitan area). Because neither commercial business lists of tobacco outlets nor tobacco licensure lists were available and because resources were not available for SOH staff to enumerate a comprehensive list of all operational tobacco outlets in the city, stores were selected as the survey teams visited socioeconomically diverse commercial and residential neighborhoods in each of the 16 districts. Survey teams visited 35 stores in each of 15 districts and 36 stores in one district. The 561 stores included in the nonsystematic sample were categorized as small neighborhood stores (302 [54%]), street stalls (137 [24%]), pharmacies (96 [17%]), convenience stores (19 [3%]), and large supermarkets (seven [1%]) (gasoline stations in Mexico are government owned and do not sell cigarettes). Chi-square tests were used to calculate statistical differences in the sales rates associated with selected variables.

The minors who participated in the survey were recruited from the families of staff at GDE and included eight boys aged 10–14 years and seven girls aged 11–15 years. The adult survey escorts were medical residents from the Field Epidemiology Training Program of GDE. Teams consisting of one medical resident, one GDE staff driver, and two minors made one purchase attempt per store using the following protocol: the medical resident entered the store shortly before one of the minors entered the store. The medical resident noted whether age-of-sale warning signs were posted inside the store and unobtrusively observed the transaction between the retailer and the minor as the minor attempted to purchase a pack of cigarettes. If asked by the retailers, the minors were instructed to truthfully state their age and that they carried no age identification. The purchase attempt was considered successful if cigarettes were

purchased and was considered unsuccessful if the sale was refused for any reason. If the attempt was successful, the minor promptly left the store with the cigarettes and gave them to the medical resident after the resident exited the store.

Of the 561 stores visited, 443 (79.0%) of the retailers sold cigarettes to the minors (Table 1). Purchase attempts by the oldest minors (aged 14–15 years) were more likely to be successful than those by the youngest minors (aged 10–11 years) (92.2% versus 66.0%, respectively [p<0.01]) and by girls than by boys (84.0% versus 72.7%, respectively [p<0.01]). Sales were transacted at all types of stores. Although the proportion of successful sales did not vary by sex of the retailer, the proportion was higher for attempts involving male clerks and girls than for those involving male clerks and boys (88.3% versus 68.1%, p<0.01). Age-of-sale warning signs were displayed in 64 (11.8%) stores; the presence of a warning sign was not associated with lower sales rates. Four (0.7%) retailers asked the minor's age; one (0.2%) asked for proof of age; and 30 (5.4%) asked for whom the cigarettes were being purchased. Of the 118 retailers who did not sell cigarettes to the participating minors, 73 (62%) indicated to the participants that they do not sell cigarettes to minors.

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TABLE 1. Number of retail businesses surveyed and number and percentage of successful attempts by minors* to purchase cigarettes, by category — Mexico City, Mexico, 1997

Category	No. retail businesses	Successful attempts		p value
		No.	(%)	
Age group (yrs) of minor				
10–11	247	163	(66.0)	<0.01
12–13	44	31	(70.5)	
14–15	270	249	(92.2)	
Sex of minor				
Male	253	184	(72.7)	<0.01
Female	308	259	(84.0)	
Type of store				
Large supermarket	7	3	(42.9)	<0.01
Convenience	19	11	(57.9)	
Small neighborhood	302	238	(78.8)	
Pharmacy	96	71	(74.0)	
Street stalls	137	120	(87.6)	
Warning sign				
Yes	64	47	(73.4)	0.25
No	497	396	(79.7)	
Sex of retailer				
Male	300	237	(79.0)	0.98
Female	261	206	(78.9)	
Total	**561**	**443**	**(79.0)**	

*Persons aged <18 years.

Editorial Note: Most of the retailers included in the sample in this survey in Mexico City illegally sold cigarettes to the participating minors. In the United States, a national health objective for 2000 is to reduce to ≤20% the proportion of retailers who sell tobacco to minors (objective 3.13) (*5*). Among 13 local U.S. studies published during 1989–1993, rates of over-the-counter cigarette sales to minors ranged from 32% to 87% (*6*). Compliance surveys estimating the overall rate of cigarette sales to minors also have been conducted in Canada (52.1% in 1995 and 39.5% in 1996) (*7*) and Adelaide, Australia (46% in 1991) (*8*).

The findings in this report are subject to at least two limitations. First, because this survey used a nonsystematic sample of retail businesses, the findings probably do not uniformly represent the patterns of tobacco sales to minors throughout Mexico City. For example, even though the survey teams visited all districts of Mexico City, some types of stores and neighborhoods at some socioeconomic levels—especially those at lower levels—may not have been included in the sample. However, it is not known whether sales rates in lower socioeconomic neighborhoods differed from those in higher socioeconomic neighborhoods. Second, the rate may have been underestimated because retailers in small neighborhood stores and street stalls in particular may have suspected that the adult team member, who entered the store or approached the stall before the minor, was accompanying the minor.

Based on current global patterns of smoking, the World Health Organization (WHO) has projected that 200–300 million persons who are aged <20 years in 1997 will die from smoking-related diseases later in life (*9*). In 1986, the World Health Assembly adopted a resolution urging member states to consider a comprehensive tobacco-control strategy containing nine elements (*10*), including one that targets the prevention of smoking by children and adolescents. However, in the early 1990s, WHO determined that only approximately 25 countries had established laws prohibiting the sale of cigarettes to minors (the age of prohibition varied from 16 to 21 years), and that among these, only a limited number had attempted to enforce the laws. To decrease cigarette sales to minors, WHO recommends that countries adopt the following four measures: 1) establish a minimum age of purchase of 18 years or older; 2) create a tobacco-sales licensing system to identify tobacco retailers and inform them of their legal responsibilities; 3) establish a graduated schedule of civil law penalties for illegal sales, ranging from warnings to license revocations; and 4) enlist the assistance of teenagers in efforts of enforcement officers to assess retailers' compliance with the prohibition of sale to minors. Other categories of legislation also may be effective in decreasing sales to minors. For example, several local studies in the United States demonstrated substantially reduced tobacco sales to minors when retailers requested photo identification or other proof of age from persons attempting to purchase tobacco products (*1*).

SOH will use the results of this survey to emphasize the need for assessing compliance of retailers in other cities with the federal law prohibiting tobacco sales to minors in Mexico and to underscore the need for resources to support increased enforcement activities. In addition to the enforcement of strong minors' access laws, a comprehensive approach for preventing initiation of smoking by youth should include provisions that reduce the appeal of cigarettes to minors through restrictions on advertising and promotion and through educational programs (*1*).

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Tobacco Tax Initiative — Oregon, 1996

In 1995, tobacco use contributed to the deaths of 6274 persons in Oregon (1995 population: 3,132,000) as reported by physicians on death certificates; annual costs in Oregon for the direct and indirect consequences of tobacco use were approximately $1 billion (State Health Division, Oregon Department of Human Resources, unpublished data, 1997). In response to the health burden associated with tobacco use in Oregon, in late 1995 a statewide coalition of health-care and tobacco-use prevention interests began a petition-driven citizen initiative, "Measure 44," to increase the tax on each pack of cigarettes from 38¢ to 68¢ and the tax on noncigarette tobacco products from 35% to 65% of wholesale price beginning February 1, 1997. This report presents findings of surveys conducted before and after the measure was approved by voters; in both surveys, respondents indicated that support for such an initiative was increased by dedicating a portion of the new revenue to tobacco-use prevention and education and to expanded insurance coverage under the Oregon Health Plan (OHP) for medically underserved persons.

The measure presented to voters on November 5, 1996, authorized 10% of the new tobacco tax revenue to be used to develop and implement statewide tobacco-use prevention and education programs managed by the State Health Division, Oregon Department of Human Resources, and 90% to be used to expand health-care coverage under the OHP. The initiative was approved by 56% to 44%. The coalition of health-care and tobacco-use prevention interests reported spending $650,000 to promote the initiative, compared with $4.8 million spent almost exclusively by the tobacco industry to oppose the initiative (*1*). Voter turnout was 71%, similar to turnouts in previous presidential election years; 97% of those voting cast a vote on this issue.

Pre-Election Survey

From September 18 through October 11, 1994, a population-based, random-digit–dialed telephone survey of persons aged ≥18 years in Oregon was conducted on tobacco excise tax policies (*2*). Respondents were asked about increasing the state tobacco excise tax with the revenue to be used to help pay for 1) a greater share of the OHP, 2) programs to reduce or prevent smoking, 3) other health programs in addition to those aimed at reducing or preventing cigarette smoking, and 4) any government purpose, not just health, health insurance, or smoking prevention. Respondents were asked whether they currently smoke every day or some days and whether they use pipes or cigars, chew tobacco, or use snuff regularly. Persons who currently used any tobacco product were classified as "tobacco users." Of the 1538 telephone numbers in the sample, 813 households were contacted; one person aged ≥18 years was randomly selected in each household for interview. A total of 631 sampled telephone numbers were excluded because they were not residences or were not in service; residential status could not be determined for 94. Completed surveys were obtained from 594 (73%) households.

Overall, 68% (95% confidence interval [CI]=±4.0%) of respondents favored an increase in tobacco taxes, including 76% (95% CI=±4.5%) of respondents who reported no current tobacco use and 44% (95% CI=±8.5%) of respondents who reported current tobacco use. However, 89% (95% CI=±2.6%) of respondents favored an increase if the funds were used for the OHP; 67% (95% CI=±4.0%), if the funds were used for

tobacco-use prevention; 67%, if the funds were used for other health programs; and 20% (95% CI=±3.5%), if the funds were added to state general funds.

    Post-Election Survey

    A 1996 post-election survey of Oregon households was conducted by the Program for Governmental Research and Education of Oregon State University to assess reasons respondents voted on items on the ballot, including Measure 44 (*3*). A sample of 1800 addresses were randomly selected from telephone directory listings that included current mailing addresses of all Oregon households with telephones. In the initial mailing, 430 addresses identified as invalid were excluded from the sample. Households that did not reply by mail were contacted by telephone. Completed surveys were obtained from 699 (51%) of 1370 households.

    Overall, 61% (95% CI=±3.6%) of respondents reported voting for the measure, and 38% (95% CI=±3.6%) reported voting against it. Reasons cited by voters who supported the initiative were consistent with goals promoted by the coalition supporting the initiative: the primary reason for 66% (95% CI=±4.5%) was "to discourage tobacco consumption," and for 27% (95% CI=±4.2%), "to expand the health plan." Of respondents voting against the initiative, 47% (95% CI=±5.9%) reported that the primary reason was "tobacco users should not be forced to pay a disproportionate share of health costs," and 36% (95% CI=±5.7%) reported that it would "lead to wasteful spending by the government"; both issues were emphasized in the "No on 44" campaign (*3*).

Editorial Note: The findings in this report suggest that, in Oregon, support for the increase in tobacco excise taxes was increased by explicit dedication of new revenue from the tax for both a new statewide tobacco-use prevention and education program and expanded insurance coverage under the OHP. Oregon is the fourth state since 1988 to pass a citizen initiative to raise tobacco taxes and dedicate a portion of the new tax revenue to prevention and education programs; others were California (in 1988), Massachusetts (1992), and Arizona (1994). Similar initiatives failed in Montana (1990) and Colorado (1994). Michigan passed a citizen initiative to increase the tobacco excise tax from 25¢ to 50¢ in March 1994 as part of a multifaceted ballot initiative to replace property tax funding of schools with other taxes. In 34 other states since 1988, legislatures have increased tobacco excise taxes (e.g., Washington [from 56.5¢ to 81.5¢ in 1994]) (*4*). Data from the surveys described in this report suggest that a desire to reduce tobacco use was prevalent among adults before the election and was a primary factor considered by voters. As in other states (e.g., Michigan), the dedication of funds to a public service objective (e.g., expanding the OHP) was viewed positively (*5*).

    Although increasing excise taxes on cigarettes has been suggested as one of the most cost-effective short-term strategies to reduce tobacco consumption among adults and prevent youth initiation of tobacco use (*6*), a tax increase combined with an antismoking campaign can be more effective in sustaining the reduction in per

capita consumption than a tax increase alone (7). With the implementation of a state-wide program, both California and Massachusetts have sustained greater declines in per capita tobacco use than the rest of the nation; from 1992 through 1996, per capita consumption declined 19.7% in Massachusetts and 15.8% in California but only 6.1% in the remaining 48 states and the District of Columbia combined (7). Although youth smoking rates have increased in both states, recent analyses suggest that the rates would have increased more rapidly in the absence of the excise tax increases and tobacco-control programs (8).

The State Health Division, with technical assistance from CDC, is developing and implementing a comprehensive tobacco-use prevention and education program incorporating components that have been effective in past research and other state-wide demonstration efforts. Based on projections for 1997–1998, the program will receive approximately $17 million per biennium. The funds raised through this tax initiative will be used for 1) active community coalitions coordinated through local health departments; 2) prevention programs targeted toward youths that incorporate comprehensive school-based programs linked to community efforts; 3) public educa-tion through paid advertising and promotional activities; 4) cessation services for adults and youths that are integrated into the existing health-care delivery systems; 5) grants for special populations, a quitter's hotline, and innovative programs and training; and 6) an evaluation system to measure program effectiveness.

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Estimates of Retailers Willing to Sell Tobacco to Minors — California, August–September 1995 and June–July 1996

The prevalence of tobacco use among adolescents is increasing, and the most common source of tobacco products for persons aged <18 years (minors) is retail stores (*1*). In 1991, an estimated 29.6 million packs of cigarettes were sold illegally to minors in California, and an estimated 255 million packs were sold illegally to minors nationwide (*2*). Federal law (i.e., the Synar Amendment*) enacted in July 1992 requires all states that receive federal funds for prevention and treatment of substance abuse to have and enforce laws prohibiting the sale or distribution of tobacco to minors, conduct annual statewide inspections of over-the-counter tobacco outlets and vending machines to assess the statewide rate of illegal tobacco sales to minors, and develop a plan to decrease the illegal sales rate to ≤20% over several years (*3*). On September 28, 1994, California enacted the Stop Tobacco Access to Kids Enforcement (STAKE) Act[†], which requires that 1) tobacco retailers (i.e., vendors) post warning signs at each point of purchase and check the identification of persons who appear aged <18 years; 2) the California Department of Health Services (CDHS) develop a statewide enforcement program and establish a toll-free telephone number for reporting observed illegal tobacco sales to minors; and 3) CDHS annually assess and report the rate of illegal sales of tobacco products to minors. This report describes the retailer education and enforcement program and summarizes the results of the first two annual assessments (Youth Tobacco Purchase Surveys [YTPSs]). The findings indicate that, from August–September 1995 to June–July 1996, among over-the-counter tobacco outlets the percentage of retailers who asked for age identification increased substantially, the percentage of stores displaying warning signs on age restrictions increased, and the percentage of retailers willing to sell tobacco products to minors decreased.

Education About and Enforcement of Youth Access Laws

In response to provisions of the STAKE Act, in August 1995 CDHS initiated an ongoing public and retailer education program before the enforcement of the law began on December 27, 1995. The education program consisted of an advertisement in a retail trade journal; a statewide press conference; paid radio and television commercials and billboard advertisements promoting a toll-free telephone number; a direct mailing of educational materials and warning signs to approximately 27,000 retailers; and educational materials provided to local government officials, retail trade groups, local health groups, chambers of commerce, and state legislators. In addition, 120 local and regional community organizations conducted educational, policy development, and media activities to stimulate compliance with youth access laws.

The STAKE Act requires that the CDHS statewide enforcement program include 15- and 16-year-old minors for unannounced inspections of tobacco retailers. Civil penalties of $200–$6000 can be levied against the business owner depending on the number of offenses during a 5-year period. During December 27, 1995–June 10, 1996 (the period before the second YTPS began), CDHS conducted 865 unannounced inspections in 22 of the state's 58 counties. As of December 16, 1996, fines totaling

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*Public Law 102-321, §1926 of the Public Health Service Act (42 USC §300x-26).
[†]Stop Tobacco Access to Kids Enforcement (STAKE) Act: SB1927, September 28, 1994. California Business and Professional Code, Sections 22950–9.

$65,550 had been paid by 258 business owners among the 286 who were in violation of the STAKE Act during December 27, 1995–June 10, 1996, and 28 business owners are involved in litigation or further administrative processing with CDHS.

Youth Tobacco Purchase Surveys

The 1995 YTPS was the first state-representative random survey in California of illegal tobacco sales to minors and was conducted during August 2–September 7, 1995. A second YTPS was conducted during June 11–July 26, 1996, after initiation of the retailer education campaign and enforcement program. The YTPS methodology was designed to permit statistically valid statewide estimates and year-to-year comparisons of over-the-counter tobacco sales to minors. The California State Board of Equalization provided a list of businesses most likely to sell tobacco over the counter, including all convenience stores, gas stations, drug stores, liquor stores, supermarkets, and cigar stores in California. Using simple random sampling, sample sizes of 405 for 1995 and 434 for 1996 were obtained after eliminating stores that were no longer in business, were not tobacco outlets, could not be located (four in 1995 and 21 in 1996), or were considered unsafe by the survey teams (none in 1995 and nine in 1996). Odds ratios and p values were calculated for the change from 1995 to 1996. The odds ratios for asking age and/or for identification, presence of warning signs, and total sales were adjusted for store type.

Newspaper advertisements and contacts in local health departments, tobacco-control organizations, and community programs were used to recruit the 63 minors aged 15–16 years (including 31 males and 32 females) who participated in the 1995 YTPS and 67 minors aged 15–16 years (including 29 males and 38 females) who participated in the 1996 YTPS. The adult escorts included staff members from local tobacco-control organizations. Teams consisting of one or two adults and two minors made one purchase attempt per store using the following protocol: an adult escort entered the store immediately before or shortly after one of the minors entered the store. The adult observed the transaction between the retailer and the minor and noted age-restriction signs posted inside the store. The minors could choose either cigarettes or smokeless tobacco. If asked by retailers, the minors were required to truthfully state their age and that they carried no age identification. Retailers were considered to be willing to sell tobacco products to minors if they recorded a sale on a cash register or placed the tobacco on the counter and asked for money. Retailers who refused to sell tobacco to the minor for any reason were considered to be not willing to illegally sell tobacco to the minor. If the retailer was willing to sell tobacco to the minor, the minor stated that he or she did not have enough money and left the store.

Overall, the percentage of retailers willing to sell tobacco to minors decreased from the assessment period in 1995 (37.0%) to 1996 (29.3%) (adjusted odds ratio [AOR], adjusted by type of store=0.7, $p<0.05$) (Table 1). Although sales to minors decreased in most types of stores, the decrease was statistically significant only for convenience stores selling gasoline (from 48.6% to 28.9%; odds ratio=0.4, $p=<0.01$). From 1995 to 1996, there were similar percentages of retailers willing to sell tobacco to minors when the retailer asked for identification (2.4% in 1995 compared with 3.5% in 1996) or when the retailer asked either the minor's age or for identification (4.4% in 1995 compared with 3.3% in 1996).

TABLE 1. Number and percentage of store visits and number and percentage of retailers willing to sell tobacco products to minors*, by category and year, August–September 1995 and June–July 1996, and percentage point change from 1995 to 1996 of retailers willing to sell tobacco to minors — California

Category	1995					1996					% Point change from 1995 to 1996		
	Store visits		Retailers willing to sell tobacco			Store visits		Retailers willing to sell tobacco					
	No.	(%)	No.	(%)	p value†	No.	(%)	No.	(%)	p value†	%	OR§	p value¶
Type of store													
Drug store/pharmacy	36	(8.9)	8	(22.2)	<0.05	31	(7.1)	7	(22.6)	NS	+ 0.4	1.0	NS**
Gas/convenience	70	(17.3)	34	(48.6)		121	(27.9)	35	(28.9)		−19.7	0.4	<0.01
Gas station only	19	(4.7)	9	(47.4)		11	(2.5)	5	(45.5)		− 1.9	0.9	NS
Liquor store	61	(15.1)	27	(44.3)		77	(17.7)	27	(35.1)		− 9.2	0.7	NS
Small grocery/convenience	133	(32.8)	49	(36.8)		141	(32.5)	42	(29.8)		− 7.0	0.7	NS
Supermarket	69	(17.0)	17	(24.6)		45	(10.4)	9	(20.0)		− 4.6	0.8	NS
Other††	17	(4.2)	6	(35.3)		8	(1.8)	2	(25.0)		−10.3	0.6	NS
Clerk asked age													
No	301	(74.3)	143	(47.5)	<0.05	337	(77.7)	124	(36.8)	<0.05	−10.7	0.6	<0.01
Yes	104	(25.7)	7	(6.7)		97	(22.4)	3	(3.1)		− 3.1	0.5	NS
Clerk asked for identification													
No	236	(58.3)	146	(61.9)	<0.05	202	(46.5)	119	(58.9)	<0.05	− 3.0	0.9	NS
Yes	169	(41.7)	4	(2.4)		232	(53.5)	8	(3.5)		+ 1.1	1.5	NS
Clerk asked age or for identification													
No	155	(38.3)	139	(89.7)	<0.05	129	(29.7)	117	(90.7)	<0.05	+ 1.0	1.1	NS
Yes	250	(61.7)	11	(4.4)		305	(70.3)	10	(3.3)		− 1.1	0.7	NS
Warning signs in the store													
No	273	(67.4)	115	(42.1)	<0.05	157	(36.2)	69	(44.0)	<0.05	+ 1.9	1.0	NS
Yes	132	(32.6)	35	(26.5)		277	(63.8)	58	(20.9)		− 5.6	0.7	NS
Total	405	(100.0)	150	(37.0)		434	(100.0)	127	(29.3)		− 7.7	0.7	<0.05

*Persons aged <18 years.
†Tests for the difference within the same year in the number of retailers willing to sell tobacco to minors between store types, whether or not retailer asked for age and/or identification, and presence or absence of warning signs.
§Odds ratio (OR) for change in number of retailers willing to sell tobacco to minors from 1995 to 1996. OR for asking age and/or asking for identification, presence of warning signs, and total number of retailers willing to sell tobacco to minors were adjusted for store type.
¶Tests for the difference from 1995 to 1996 in the number of retailers willing to sell tobacco to minors.
**Not significant.
††Includes other store types listed by the California State Board of Equalization as selling tobacco products (e.g., gift stores and cigar stores).

However, the percentage of stores in which retailers asked minors for identification increased from 41.7% to 53.5% (AOR, adjusted by type of store=1.6, p<0.05), and the percentage of stores in which the retailer asked either the minor's age or for identification increased from 61.7% to 70.3% (AOR=1.5, p<0.01). The percentage of stores that displayed age-of-sale warning signs increased from 32.6% to 63.8% (AOR=3.6, p<0.01).

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Editorial Note: The findings in this report are consistent with previous reports indicating that illegal sales to minors may be effectively decreased by the combination of increased merchant education and enforcement of laws prohibiting sales of tobacco to minors, and that the requirement of proof of age by retailers is associated with very low sales rates (4–7). In this report, sales were less likely in both years when age was asked and/or identification was requested and when warning signs were present.

The findings in this report are subject to at least two limitations. First, because comparable data are available for only 2 years, they may not indicate a trend. Second, because the STAKE Act required statewide implementation, an evaluation design using control communities was not possible, and further assessment is needed to examine the possible influences of other factors on the rate of illegal sales to minors.

The efforts of government and the private sector in California provide one model approach for reducing tobacco sales to minors. For example, the STAKE Act contains strengthening provisions that were not specifically required by the Synar Amendment. In addition, the STAKE Act was amended in 1995 to prohibit the sale of tobacco products from vending machines except those in bars not adjoining restaurants, while a different law[§] bans the sale of individual cigarettes from open packages. Despite these efforts, the findings in this report indicate that, for 1996, one third of stores did not post warning signs, minors were not asked for proof of age identification in approximately half of stores, and retailers were willing to sell tobacco to minors in almost one third of purchase attempts.

On August 28, 1996, the Food and Drug Administration (FDA) issued regulations that prohibit sales of tobacco to persons aged <18 years, require retailers to request photographic identification to verify the age of all persons aged <27 years who request tobacco, ban vending machines and self-service displays except in facilities where only adults are permitted, ban sales of single cigarettes and packages with <20 cigarettes, and eliminate free samples of cigarettes and smokeless tobacco products (8). The effective date for the provisions prohibiting tobacco sales to minors and requiring photographic identification is February 28, 1997, and the effective date for the provisions affecting sales through vending machines, self-service displays, single cigarettes sales, and distribution of free samples is August 28, 1997. The FDA rule should further enhance state and local efforts to decrease illegal sales of tobacco to minors. In addition, the Substance Abuse and Mental Health Services Administration has developed technical-assistance guidelines addressing statewide sampling methodologies, inspections (i.e., compliance checks), and interventions; these guidelines

can be used by states to develop programs that comply with requirements of the Synar Amendment (*9*).

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Accessibility to Minors of Smokeless Tobacco Products — Broward County, Florida, March–June 1996

Health consequences associated with use of smokeless tobacco (SLT) (i.e., snuff or loose-leaf or fine-cut chewing tobacco) products include halitosis, leukoplakia, and oral cancer (1). Periodontal degeneration and soft tissue lesions are early indicators of these conditions and diseases among persons who use SLT (1). Since October 1992, the sale of tobacco products to minors (i.e., persons aged <18 years) has been prohibited by law in Florida, and since May 1994, Florida law has required businesses to post warning signs stating that tobacco sales to minors are illegal and that proof of age is required to purchase tobacco products such as SLT.* To assess the impact of these laws on over-the-counter access to SLT by minors in Broward County (1990 population: 1,244,531), during March–June 1996 faculty from Florida Atlantic University's Department of Exercise Science/Wellness Education conducted a study to measure vendor compliance with tobacco minimum-age sale laws and with the sign statute. This report summarizes the findings of the assessments, which indicated that nearly one third of attempts by minors to purchase SLT products were successful.

The 1995–1996 Beverage License File maintained by the Florida Department of Business and Professional Regulation (DBPR) was used to identify five categories of businesses in the county: pharmacies, convenience stores, grocery stores, gas stations, and "smoke shops" (i.e., businesses where the predominant merchandise is tobacco or tobacco-related products) (n=1211). A map of the county was divided into 10 equally sized areas; within each of these areas, approximately 20% of the businesses were randomly selected to produce a total sample of 242 businesses. Of these 242, a total of 117 were excluded: they were not surveyed because of time constraints (67), were inaccurately surveyed (37), did not sell SLT (eight), or had closed (five). The remaining 125 businesses represented 10% of the 1211 county total and comprised 33 (13%) of the 246 pharmacies, 20 (8%) of the 268 convenience stores, 25 (7%) of the 381 grocery stores, 41 (14%) of the 297 gas stations, and six (32%) of the 19 smoke shops. The assessment employed five teams of volunteers, each comprising one minor and one adult; two of the minors were female (both aged 15 years), and three were male (one each aged 15, 16, and 17 years).

One purchase attempt was made at each of the 125 businesses. Purchase attempts used the following procedure (2): the adult member of the team entered the business first to note the presence of any clearly displayed signs stating that tobacco products would not be sold to minors. The adult then observed while the minor entered, selected an SLT product, and attempted to purchase the product. The attempt was considered successful if a sale was recorded on the cash register or the vendor placed the SLT product on the counter for purchase by the minor; the minor would then state that he or she had insufficient money for purchase and would immediately leave the store. The attempt also was considered successful if the vendor asked for age identification but was prepared to sell the SLT product.† The attempt was considered unsuccessful if the minor was denied purchase outright or asked for age verification and denied purchase. The adult member noted the vendor's reasons for refusal at the

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*Florida Revised Statutes 859.06–859.061.
†During one successful purchase attempt, the adult/minor team determined that although the minor stated that he did not have age identification, the vendor was prepared to sell the SLT product based on his placement of the SLT product on the counter and attempt to record the sale on the cash register.

time of attempted purchase; when no refusal reason was provided to the minor, the adult team member waited until the minor had departed and then asked the vendor about the reason for refusal.

Overall, minors were successful in purchasing SLT in 40 (32%) of 125 retail outlets (Table 1); of these successful purchase attempts, 14 (35%) occurred within one half mile of an elementary, middle, or high school. Success rates were similar among those aged <17 years and aged 17 years (34% [95% confidence interval (CI)=24.9%–43.3%] versus 20% [95% CI=4.3%–48.1%], respectively), and among males and females (25 [33% (95% CI=22.9%–45.2%)] of 75 attempts versus 15 [30% (95% CI=17.9%–44.6%)] of 50 attempts, respectively). For each of the five categories of stores that sold SLT, attempts were successful at 10 (30% [95% CI=15.6%–48.7%]) pharmacies, 17 (85% [95% CI=62.1%–96.8%]) convenience stores, three (12% [95% CI=2.5%–31.2%]) grocery stores, nine (22% [95% CI=10.6%–37.6%]) gas stations, and one (17% [95% CI=0.4%–64.1%]) smoke shop. Warning signs provided by the DBPR were posted and clearly visible in 96 (77%) of the 125 stores; 17 of these stores had signs provided by tobacco companies. Success rates were similar in businesses with and without signs (30 [31% (95% CI=22.2%–41.5%)] of 96 versus 10 [35% (95% CI=17.9%–54.3%)] of 29, respectively).

Single reasons specified by the vendors for 51 of the 85 unsuccessful attempts were that the minor had no proper identification (40 [47%]), the minor appeared to be underaged (nine [11%]), and that the sale of tobacco products to minors was illegal (two [2%]). Multiple reasons specified by the vendors for 34 unsuccessful attempts were that the sale of tobacco products to minors was illegal and the minor had no

TABLE 1. Number of attempts and number and percentage of successful attempts by minors* to purchase smokeless tobacco,[†] by category — Broward County, Florida, March–June 1996

Category	No. attempts	Successful attempts		
		No.	(%)	(95% CI[§])
Age (yrs)				
<17	110	37	(33.6)	(24.9%–43.3%)
17	15	3	(20.0)	(4.3%–48.1%)
Sex of minor				
Male	75	25	(33.3)	(22.9%–45.2%)
Female	50	15	(30.0)	(17.9%–44.6%)
Type of store				
Pharmacy	33	10	(30.3)	(15.6%–48.7%)
Convenience	20	17	(85.0)	(62.1%–96.8%)
Grocery	25	3	(12.0)	(2.5%–31.2%)
Gas	41	9	(22.0)	(10.6%–37.6%)
Smoke shops[¶]	6	1	(16.7)	(0.4%–64.1%)
Warning sign				
Yes	96	30	(31.3)	(22.2%–41.5%)
No	29	10	(34.5)	(17.9%–54.3%)
Total	**125**	**40**	**(32.0)**	**(23.9%–40.9%)**

*Persons aged <18 years.
[†]Snuff or loose-leaf or fine-cut chewing tobacco.
[§]Confidence interval.
[¶]Businesses where the predominant merchandise is tobacco or tobacco-related products.

proper identification (11 [13%]), that the store had a policy prohibiting sales to minors and that the minor had no proper identification (eight [9%]), that the store had a policy prohibiting sales to minors and that the minor looked too young (six [7%]), and other reasons (nine [11%]).

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Editorial Note: In 1994, a report issued by the Surgeon General indicated that approximately 20% of high school males were current users of SLT products (*1*). In 1993, approximately one half of minors aged 12–17 years who had used SLT during the previous month usually purchased their own SLT; of those who usually purchased their own SLT, most (82%) often or sometimes bought from small businesses such as convenience stores (*3*). The success rate for minors in Broward County in attempts to purchase SLT (32%) was higher than that previously reported in Kansas (15%), similar to that reported in Palm Beach County, Florida (35%), and lower than that reported in Texas (59%) (*2,4,5*).

In this assessment and in previous reports (*2,4*), minors mimicked (i.e., attempted but did not complete) over-the-counter purchase of SLT; this method has been validated as an accurate measure of vendor compliance with tobacco minimum-age sale laws (*6*). However, the findings in this report are subject to at least two limitations. First, data were obtained from the files of the DBPR for only five types of businesses because they were most likely to sell SLT. However, businesses included in the analysis probably do not differ from businesses in other categories that were excluded. Second, 28% of the selected sample was not surveyed because of time constraints. Whether purchasing SLT at businesses that were not surveyed would have been more difficult could not be determined.

The Synar Amendment and implementing regulations require all states receiving federal funds to prevent and treat substance abuse to enact and enforce a law prohibiting the sale or distribution of tobacco to persons aged <18 years and to reduce the statewide illegal sales rate to ≤20% over several years[§] (*7*). The findings of the assessment in this report may further assist tobacco-use–prevention coalitions and other organizations in developing approaches to educate parents and the public about the need to support enforcement of existing local, state, and federal laws restricting the sale of SLT and other tobacco products to minors.

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[§] Public Law 102-321, §1926 (42 USC §300x–26).

Accessibility to Minors of Cigarettes from Vending Machines —
Broward County, Florida, 1996

The sale of tobacco products to persons aged <18 years has been prohibited by law in Florida since October 1992, and since May 1994, a statewide law in Florida has required retailers or owners of businesses that sell cigarettes or other tobacco products to post a conspicuous sign stating that tobacco sales to minors are illegal and that proof of age is required to purchase tobacco products.* To assess the impact of these laws in Broward County (1990 population: 1,255,531) during February–March 1996, the Florida Atlantic University Department of Exercise Science/Wellness Education conducted studies of vendor compliance with laws enacted to prevent minors from gaining access to cigarettes through vending machines and to ensure that tobacco vendors comply with the sign statute. This report summarizes the findings of the assessment of access to cigarettes from vending machines, which indicated that approximately one third of such attempts by minors were successful.

The 1995–1996 Beverage License File maintained by the Florida Department of Business and Professional Regulation was used to identify four categories of businesses in Broward County: bars, hotels/motels, restaurants, and miscellaneous (e.g., bowling lanes, country clubs, pool halls, and amusement centers) (n=1861). A map of the county was divided into four equally sized areas; within each of these areas, approximately 20% of the businesses were randomly selected to produce a total sample of 373 businesses. Of these 373, a total of 270 were excluded because they had no cigarette vending machines on site, had closed, sold only over-the-counter cigarettes, or were bars that would not admit persons aged <21 years. The remaining 103 businesses represented 6% of the 1861 county total and constituted 64 (14%) of the 466 bars, five (5%) of the 95 hotels/motels, 27 (2%) of the 1218 restaurants, and seven (9%) of the 82 miscellaneous businesses. The assessment employed seven teams of volunteers, each comprising one minor and one adult; five of the minors were female (ages 12 years [one], 15 years [two], and 17 years [two]), and six were male (ages 13 years [two], 15 years [two], 16 years [one], and 17 years [one]).

One purchase attempt was made at each of the 103 businesses. Purchase attempts used the following procedure (1): the adult member of the team entered the business first to note the presence of any clearly displayed signs stating that tobacco products would not be sold to minors. The adult then observed while the minor entered and attempted to obtain change from a vendor to use in a cigarette vending machine. If no vendor was present, the minor went directly to a vending machine to mimic purchase of cigarettes. The attempt was considered successful if the minor received change for purchasing cigarettes and was able to insert money into a cigarette vending machine and press the coin return without interference. The attempt was considered unsuccessful if the minor was refused change, prevented from inserting money in a cigarette vending machine, or asked for age verification and denied change for purchasing cigarettes. The adult member noted the vendor's reasons for refusal at the time of the request for change; when no refusal reason was provided to the minor, the adult team member waited until the minor had departed and asked the vendor about the reason for refusal. Significance testing was performed using Pearson chi-square tests.

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*Florida Revised Statutes 859.06–859.061.

Overall, attempts by minors to obtain cigarettes from vending machines were successful in 34 (33%) of the 103 business sites (Table 1); 30 (88%) of these successes occurred after the minor received change from the vendor. At four businesses, a vendor was absent, and minors went directly to the vending machines. Twenty-five (74%) of the businesses and purchase attempts were within a radius of one half mile of an elementary, middle, or high school. Overall, success rates were similar among those aged <17 years and aged 17 years (35% [95% confidence interval (CI)=24.2%–47.5%] versus 28% [95% CI=13.8%–46.8%]); however, the rate was higher for females than males (24 [45% (95% CI=31.6%–59.6%)] of 53 attempts versus 10 [20% (95% CI=10.0%–33.7%)] of 50 attempts). Success rates were similar for each category of business, including 21 (33% [95% CI=±21.6%–45.7%]) bars, two (40% [95% CI=±5.3%–85.3%]) hotels/motels, eight (30% [95% CI=±13.8%–50.2%]) restaurants, and three (43% [95% CI=±9.9%–81.6]%) other businesses. Warning signs provided by the Florida Department of Business and Professional Regulation were posted and clearly visible in 84 (82%) of the 103 businesses; however, success rates were similar in businesses with and without signs (30 [36% (95% CI=25.6%–46.9%)] of 84 versus four [21% (95% CI=6.1%–45.6%)] of 19, respectively).

Reasons specified by the vendors for the 69 unsuccessful attempts were that the minor had no proper identification (41 [59%]), the minor appeared to be underaged (16 [23%]), and the sale of cigarettes to minors was illegal (nine [13%]); other reasons accounted for three unsuccessful attempts.

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TABLE 1. Number of successful attempts by minors* to purchase cigarettes from vending machines, by category — Broward County, Florida, February–March 1996

Category	No. attempts	Successful attempts		
		No.	(%)	(95% CI[†])
Age (yrs)				
<17	71	25	(35.2)	(24.2%–47.5%)
17	32	9	(28.1)	(13.8%–46.8%)
Sex of minor				
Male	50	10	(20.0)	(10.0%–33.7%)
Female	53	24	(45.3)	(31.6%–59.6%)
Type of store				
Bar	64	21	(32.8)	(21.6%–45.7%)
Hotel/Motel	5	2	(40.0)	(5.3%–85.3%)
Restaurant	27	8	(29.6)	(13.8%–50.2%)
Other[§]	7	3	(42.9)	(9.9%–81.6%)
Warning sign				
Yes	84	30	(35.7)	(25.6%–46.9%)
No	19	4	(21.1)	(6.1%–45.6%)
Total	**103**	**34**	**(33.0)**	**(24.1%–43.0%)**

*Persons aged <18 years.
[†]Confidence interval.
[§]Includes bowling lanes, country clubs, pool halls, and amusement centers.

Editorial Note: The assessment in Broward County indicates that, despite the enact-
ment of state laws prohibiting the sale of tobacco products to persons aged <18 years,
approximately 33% of minors aged 12–17 years were successful in attempts to pur-
chase cigarettes from vending machines. These success rates were lower than those
reported in surveys conducted in Massachusetts and Minnesota (42% and 48%, re-
spectively) (*2,3*). Study design differences (i.e., in the Florida study and one other
study [*1*], minors requested change from vendors before mimicking purchases at
vending machines) may have contributed to these discrepancies, and both studies
may have underestimated the ease of cigarette access. If minors had gone directly to
the vending machine, they might have been more successful.

The findings in this report are subject to at least one limitation. Data were obtained
from the files of the Florida Department of Business and Professional Regulation for
only four types of businesses because cigarette vending machines were most likely to
be present on the premises of these businesses. Although businesses included in the
analysis probably do not differ from businesses in other categories that were not in-
cluded, it could not be determined whether purchasing cigarettes from vending
machines at businesses that were not surveyed would have been more difficult.

The findings of this assessment will be used locally to educate the public and the
business community about the need to support local, state, and federal laws restrict-
ing the sale of tobacco to minors. For example, the Synar Amendment requires all
states receiving federal funds for prevention and treatment of substance abuse to
have and enforce a law prohibiting the sale of tobacco to persons aged <18 years and
to reduce the statewide illegal sales rate to ≤20% over several years[†] (*4*). These find-
ings provide further support for the Food and Drug Administration (FDA) regulations
that, in addition to other provisions aimed at decreasing the appeal of and access to
tobacco products by minors, ban vending machines except in facilities where only
adults are permitted (*5*). The effective date for the provision restricting sales through
vending machines is August 28, 1997. The FDA rule will further enhance state and
local efforts to decrease minors' access to tobacco.

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Cigarette Smoking Before and After
an Excise Tax Increase and an Antismoking Campaign —
Massachusetts, 1990–1996

In November 1992, residents of Massachusetts approved a ballot petition (Question 1) that increased the tax on each pack of cigarettes from 26¢ to 51¢ beginning January 1, 1993, and requested that the legislature spend the proceeds on tobacco control and health education. The Massachusetts Tobacco Control Program (MTCP), administered by the Massachusetts Department of Public Health (MDPH), was established in response to the approval of the petition. In October 1993, MTCP initiated a statewide mass-media antismoking campaign. In early 1994, the program began funding local boards of health and school health and other youth programs to promote policies to reduce public exposure to environmental tobacco smoke and to restrict youth access to cigarettes. Efforts also included support to health education programs, primary-care providers, and other services to help smokers quit. Through June 1996, MTCP expenditures totaled $116 million, including $43 million for the mass-media campaign (1). To assess the effects of the excise tax increase and the antismoking campaign on cigarette smoking in Massachusetts, CDC and MDPH analyzed data about the number of packs of cigarettes taxed per capita and the prevalence of cigarette smoking during the period preceding (1990–1992) and following (1993–1996) implementation of the ballot petition. This report summarizes the findings of the assessment and compares trends in cigarette consumption (i.e., purchases) in Massachusetts, in California (where a voter-mandated cigarette tax increase in January 1989 funded a statewide antismoking campaign that began in April 1990 [2]), and in the 48 remaining states and the District of Columbia combined. The findings suggest that the number of packs of cigarettes taxed per capita declined substantially in Massachusetts after implementation of the ballot petition.

For each full calendar year from 1990 through 1995, taxable cigarette consumption for Massachusetts, California, and the other states and the District of Columbia combined was derived from monthly reports from the Tobacco Institute on tax receipts for wholesale cigarette deliveries (3). Taxable consumption for 1996 was estimated as twice the cumulative values for January–June. Per capita rates (in packs/year) were based on the resident population aged ≥18 years in each state (4).

Data on the average retail price of a pack of cigarettes in Massachusetts at 4-week intervals during 1990–1995 were based on bar-code scanning data provided by Information Resources, Inc. (5). Data were obtained for a seven-county region (including the Boston and Worcester metropolitan areas) that represented 83% of Massachusetts residents based on 1990 census estimates. The observed retail prices of cigarettes were adjusted for inflation by using the consumer price index for urban workers in the Boston metropolitan area (6).

Data from the Behavioral Risk Factor Surveillance System (BRFSS) for 1990 through 1995 (the most recent year for which data were available) were used to estimate the annual prevalence of cigarette smoking among adults in Massachusetts, California, and the remaining participating states combined. The BRFSS is a population-based, random-digit–dialed telephone survey of the noninstitutionalized U.S. population aged ≥18 years. The District of Columbia and seven states (Alaska, Arizona, Kansas, Nevada, New Jersey, Rhode Island, and Wyoming) were excluded

because they did not participate in BRFSS 1 or more years during 1990–1995 (*7*; CDC, unpublished data, 1995). Because sampling errors for annual BRFSS estimates precluded precise year-to-year comparisons, 3-year average prevalences were estimated for 1990–1992 and 1993–1995. A current smoker was defined as any respondent who answered "yes" to the following two questions: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" Estimates were weighted based on the number of telephones per household and the age, sex, and racial/ethnic composition of the residents of the individual states. The prevalence of smoking for the remaining participating states combined was computed as a population-weighted average of the prevalences estimated for the 41 states that participated in BRFSS every year during 1990–1995. SESUDAAN was used to calculate 95% confidence intervals (CIs).

During 1990–1992, taxable per capita consumption of cigarettes by adults declined 6.4% in Massachusetts, 11.0% in California, and 5.8% in the 48 remaining states and the District of Columbia combined (Table 1). In Massachusetts, from 1992 (the year before implementation of the petition) to 1996, taxable per capita consumption declined by 19.7% (from 117 packs to 94 packs) (Table 1); in California and the remaining states, per capita consumption declined by 15.8% and 6.1%, respectively.

Immediately after the Massachusetts petition became effective on January 1, 1993, the real price of cigarettes increased sharply but subsequently declined (Figure 1). In response to increasing sales of discount brands, in April 1993 one U.S. cigarette manufacturer announced a nationwide, 40¢-per-pack price discount on its major premium brand, and in May, another manufacturer matched the discount on its major premium brands. In August, all manufacturers announced a permanent wholesale price reduction of 39¢ per pack on all premium-brand cigarettes (*8*). As a result of these nationwide price reductions, by the end of October the real price of cigarettes in Massachusetts had declined to the 1992 level (Figure 1).

The prevalence of current smoking among adults in Massachusetts was 23.5% (95% CI=±1.4%) during the 3 years before implementation of the petition (1990–1992) and 21.3% (95% CI=±1.2%) during the 3 years after implementation (1993–1995). In comparison, the prevalence of adult smoking declined 2.7% in California (from 20.1% [95% CI=±0.9%] during 1990–1992 to 17.4% [95% CI=±0.9%] during 1993–1995) and 0.8% in the 41 other BRFSS participating states combined (from 24.1% [95% CI=±0.3%] during 1990–1992 to 23.4% [95% CI=±0.2%] during 1993–1995).

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Editorial Note: The findings in this report indicate that, in Massachusetts, the number of packs of cigarettes taxed per capita decreased significantly during 1992–1996, following implementation of a ballot petition to increase the excise tax on cigarettes and initiate an antismoking campaign. This change was similar to decreases in California (*9*), the only other state to have initiated an extensive statewide antismoking campaign in conjunction with an increase in cigarette taxes. However, complexities related to the accurate measurement of changes in smoking prevalence among adults in Massachusetts require further study to determine the combined impact of the excise tax increase and antismoking campaign on adult smoking prevalence in the state.

TABLE 1. Number of packs of cigarettes purchased per adult,* by year — selected U.S. sites, 1990–1996†

Year	Massachusetts	California	48 Remaining states and the District of Columbia
1990	125	100	139
1991	120	92	134
1992	117	89	131
1993	102	88	125
1994	101	73	127
1995	98	76	125
1996§	94	75	123

*Aged ≥18 years.
†Based on reports of tax receipts for wholesale cigarette deliveries.
§Estimated as twice the cumulative values for January–June.

Source: The Tobacco Institute.

FIGURE 1. Real price of cigarettes,* by month and year — Massachusetts, 1990–1995†
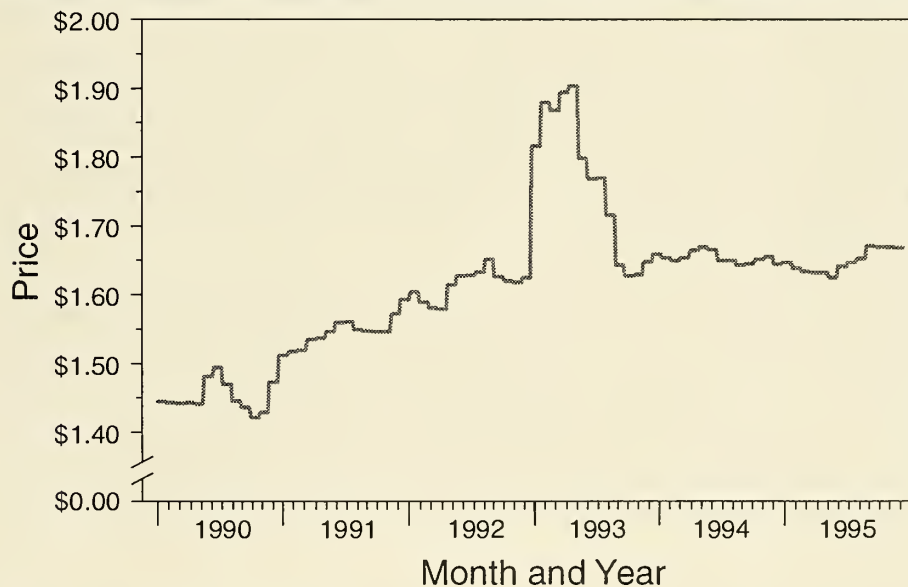
*Per pack. Adjusted to 1990 dollars.
†Based on bar-code scanning data for a seven-county region (including the Boston and Worcester metropolitan areas) that represented 83% of Massachusetts residents based on 1990 census estimates.

Source: Information Resources, Inc.

Although some smokers in states that implement increased cigarette excise taxes may attempt to avoid higher prices by purchasing cigarettes in neighboring states with lower prices, the 19.7% decline in per capita consumption of cigarettes in Massachusetts during 1992–1996 probably reflects the effects of the tax increase and anti-smoking campaign rather than increased cross-border purchases by Massachusetts smokers. During 1993–1994, cigarette excise taxes in Connecticut and Rhode Island were increased to levels comparable with those in Massachusetts; however, in New Hampshire, the real price of cigarettes declined during 1992–1993, and taxable cigarette consumption increased by 17 million packs (3). Increased taxable consumption in New Hampshire may reflect either a real upward trend in smoking by state residents or increased cross-border purchases by Massachusetts smokers. However, even if the 17 million-pack increase were attributed entirely to cross-border purchases by Massachusetts smokers, the decline in per capita consumption in Massachusetts during 1992–1996 would have been reduced to 17.0%.

The findings in this report are subject to at least two limitations. First, the estimates of per capita consumption were based on tax receipts at the wholesale level and not the actual number of cigarettes consumed. Distributors may delay or advance cigarette shipments in anticipation of announced wholesale price changes or excise tax increases. Such shifting of wholesale deliveries may produce year-to-year changes in tax receipts that do not reflect actual changes in per capita consumption. However, temporal trends in taxable consumption over a period of several years probably reflect actual consumption more accurately. Second, a decline in the number of cigarettes taxed in a single state may result in an overestimation of the actual decline in consumption if resident smokers increase their out-of-state purchases. However, the data on taxable per capita cigarette consumption in Massachusetts and three adjacent states suggest the increased purchase of cigarettes by Massachusetts smokers in neighboring New Hampshire was not a major source of the reported decline in per capita consumption in Massachusetts.

Increases in the price of cigarettes can reduce per capita consumption and the prevalence of smoking (10). In Massachusetts, however, the tax-induced increase in cigarette price was soon offset by coincidental national, industrywide price reductions that began during the spring of 1993. While real cigarette prices returned to pre-1993 levels, per capita consumption in Massachusetts continued to decline. This finding suggests that a tax increase combined with an antismoking campaign can be more effective in reducing per capita consumption than a tax increase alone. MTCP plans additional evaluations of this preliminary finding, including changes in smoking prevalence among adults and further comparisons with findings from California and other states.

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Accessibility of Tobacco Products to Youths Aged 12–17 Years — United States, 1989 and 1993

Although the sale of tobacco products to minors is illegal in all states and the District of Columbia (*1*), the prevalence of cigarette smoking among adolescents has continued to increase (*2*), and most minors are able to purchase tobacco products (*3*). Reducing sales to minors is believed to be an effective measure for reducing the prevalence of tobacco use (*4*). To determine recent patterns of minors' access to tobacco products from retail outlets and vending machines, data were analyzed from the 1989 and 1993 Teenage Attitudes and Practices surveys (TAPS I and TAPS II). This report summarizes the results of that analysis, which indicate that most minors who use tobacco purchase their own tobacco and that small stores are the sources of most purchases.

Samples for both TAPS I and II were drawn from households that participated in the National Health Interview Survey (NHIS), a continuing nationwide household survey that collects information from a representative sample of the U.S. civilian, noninstitutionalized population aged ≥18 years. Both TAPS I and II collected information on adolescents' knowledge, attitudes, and practices regarding tobacco use. TAPS I data were collected by telephone interviews; TAPS II data were collected by telephone and personal interviews and included both a new probability sample and a follow-up of respondents from TAPS I. Data for persons aged 12–17 years in each survey were analyzed (n=7773 for TAPS I; n=6165 for TAPS II) and weighted to provide national estimates. SUDAAN was used to calculate standard errors for determining 95% confidence intervals (CIs) and to perform multivariate logistic regression analyses of TAPS II data; simultaneous adjustments were made for age, sex, race/ethnicity, and region of the country. Differences between TAPS I and TAPS II for selected estimates were assessed by using the Generalized Estimating Equations software (*5*). Adjustments were made for subject correlation and age.

Adolescents in both TAPS I and II who were current smokers were asked about purchase practices, and all respondents were asked about perceived ease of purchase (*6*). In TAPS II, adolescents who usually bought, ever bought, or ever tried to buy their own cigarettes were asked, "Have you ever been asked to show proof of age when buying/trying to buy cigarettes?" With the exception of questions regarding purchase from vending machines, similar questions were asked of TAPS II adolescents regarding the purchase of smokeless tobacco (SLT) products. Data were analyzed by race/ethnicity because, after controlling for sociodemographic differences, the prevalence of cigarette smoking is higher among minors in some racial/ethnic groups (*3*).

The overall percentage of smokers aged 12–17 years who usually bought their own cigarettes was higher in 1993 than in 1989 (Table 1). In 1993, minors residing in the Northeast (adjusted odds ratio [AOR]=2.2; 95% CI=1.2–3.8) and South (AOR=1.8; 95% CI=1.1–3.0) were more likely than minors residing in the West to report they usually bought their own cigarettes.* In addition to the 61.9% of U.S. smokers aged

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* Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

12–17 years who usually bought their own cigarettes in 1993, 15.5% reported they ever (but not usually) had bought cigarettes, and 2.3% reported they ever had tried unsuccessfully to buy their own cigarettes.

Among minors aged 12–17 years who usually bought their own cigarettes, 14.6% in 1989 and 12.7% in 1993 often or sometimes bought their cigarettes from vending machines; 49.6% in 1989 and 36.8% in 1993 often or sometimes bought from large stores; and 84.6% in 1989 and 88.5% in 1993 often or sometimes bought from small stores (Table 2). In 1993, minors aged 12–15 years were more likely than those aged 16–17 years (AOR=2.1; 95% CI=1.1–4.3) to often or sometimes use vending machines; those aged 12–15 years were less likely than those aged 16–17 years to often or sometimes buy their cigarettes from small stores (AOR=0.5; 95% CI=0.4–0.7).

TABLE 1. Percentage of smokers* aged 12–17 years[†] who usually bought their own cigarettes in 1989 and 1993, by selected characteristics — United States, Teenage Attitudes and Practices Surveys I and II, 1989[§] and 1993[§]

Characteristic	1989			1993			% Point change 1989 to 1993
	No.	(%)	(95% CI[¶])	No.	(%)	(95% CI)	
Age (yrs)							
12–15	439	(45.4)	(± 4.9%)	264	(52.4)	(± 6.3%)	+ 7.0
16–17	559	(66.6)	(± 4.1%)	446	(69.1)	(± 4.3%)	+ 2.5
Sex							
Male	521	(59.6)	(± 4.5%)	367	(63.6)	(± 4.8%)	+ 4.0
Female	477	(55.3)	(± 4.8%)	343	(60.5)	(± 5.7%)	+ 5.2
Race**							
White	914	(58.7)	(± 3.3%)	639	(62.1)	(± 4.0%)	+ 3.4
Black	64	(43.3)	(±11.5%)	52	(64.1)	(±14.3%)	+20.8
Ethnicity[††]							
Hispanic	68	(41.3)	(±12.8%)	56	(59.1)	(±13.8%)	+17.8
Non-Hispanic	924	(59.0)	(± 3.3%)	654	(62.4)	(± 3.9%)	+ 3.4
Region[§§]							
Northeast	218	(58.8)	(± 6.8%)	146	(68.4)	(± 8.4%)	+ 9.6
Midwest	275	(55.0)	(± 5.5%)	225	(61.6)	(± 6.2%)	+ 6.6
South	305	(61.5)	(± 5.9%)	201	(66.2)	(± 6.2%)	+ 4.7
West	200	(53.6)	(± 7.6%)	138	(50.9)	(± 9.4%)	− 2.7
Total	998	(57.5)	(± 3.2%)	710	(61.9)	(± 3.9%)	+ 4.4[¶¶]

*Youths who reported smoking at least one cigarette during the 30 days preceding the survey.
[†]As of November 1, 1989, or March 15, 1993.
[§]Prevalence estimates were calculated from weighted data.
[¶]Confidence interval.
**Excludes 39 persons of other, multiple, and unknown races because numbers were too small to calculate precise estimates.
[††]Excludes six persons with unknown Hispanic origin.
[§§]Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
[¶¶]The log odds ratio for the change in the overall prevalence of "bought own cigarettes" from 1989 to 1993 estimated using the Generalized Estimating Equations software is 0.21 (odds ratio=1.2). This log odds ratio was significantly different than zero at the 0.05 level. The logistic model used to calculate the above included age as a covariate.

In 1993, 55.3% (95% CI=51.0%–59.6%) of minors aged 12–17 years reported ever having been asked to show proof of age when buying or trying to buy cigarettes. Blacks (AOR=0.4; 95% CI=0.2–0.9) were less likely than whites to ever have been asked for proof of age, and Hispanics (AOR=0.3; 95% CI=0.1–0.6) were less likely than non-Hispanics to ever have been asked for proof of age.[†] Minors residing in the Northeast (AOR=0.4; 95% CI=0.2–0.7) or in the Midwest (AOR=0.4; 95% CI=0.2–0.8) were less likely than minors residing in the West to ever have been asked for proof of age.

In 1993, among minors aged 12–17 years who never had smoked a cigarette, 44.6% (95% CI=42.8%–46.3%) believed it would be easy for them to buy cigarettes, including 34.4% (95% CI=32.4%–36.3%) of minors aged 12–15 years and 76.4% (95% CI=73.8%–79.0%) of minors aged 16–17 years. In 1993, 51.7% (95% CI=43.9%–59.5%) of minors aged 12–17 years who had used SLT on one or more of the 30 days preceding the survey usually purchased their own SLT; 18.3% of SLT users in 1993 ever (but not

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[†]Numbers for other racial/ethnic groups were too small to calculate precise estimates.

TABLE 2. Percentage of smokers* aged 12–17 years[†] who usually bought their own cigarettes and who often/sometimes purchased cigarettes from a vending machine, large store, or small store, by selected characteristics — United States, Teenage Attitudes and Practices Survey, 1989[§] and 1993[§]

Characteristic	Vending machine			Large store			Small store		
	1989	1993	% Point change 1989 to 1993	1989	1993	% Point change 1989 to 1993	1989	1993	% Point change 1989 to 1993
Age (yrs)									
12–15	20	18	– 2.0	41	36	– 4.9	79	83	+3.5
16–17	12	10	– 2.3	54	37	–17.2	87	92	+4.7
Sex									
Male	18	12	– 5.8	51	36	–15.0	82	90	+8.3
Female	11	13	+ 2.3	49	38	–10.9	88	88	–0.5
Region[¶]									
Northeast	15	18	+ 3.3	50	30	–20.1	84	88	+3.8
Midwest	20	8	–12.2	51	33	–17.5	89	88	–0.8
South	12	15	+ 2.3	50	44	– 6.2	85	90	+5.6
West	11	9	– 1.8	47	37	–10.3	80	88	+8.8
Total	15	13	– 1.9	50	37	–12.8	85	89	+3.9**

*Youths who reported smoking at least one cigarette during the 30 days preceding the survey.
[†]As of November 1, 1989, or March 15, 1993.
[§]Prevalence estimates were calculated from weighted data.
[¶]Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
**The log odds ratio (LOR) for the change in the overall prevalence from 1989 to 1993 using the Generalized Estimating Equations software was calculated for those who usually bought their own cigarettes and who often/sometimes purchased cigarettes from a vending machine (LOR=0.17; odds ratio [OR]=1.18), large store (LOR=0.51; OR=1.67), or small store (LOR=0.34; OR=1.40). The LORs were significantly different than zero at the 0.01 level for large stores and at the 0.05 level for small stores. The logistic model used to calculate the above included age as a covariate.

usually) had bought their own SLT, and 3.1% ever had tried unsuccessfully to buy SLT. Among minors aged 12–17 years who usually bought their own SLT, 82.1% (95% CI=74.2%–90.0%) often or sometimes bought from small stores, and 40.5% (95% CI=33.3%–47.9%) often or sometimes bought from large stores. In 1993, 43.2% (95% CI=34.4%–52.0%) of minors aged 12–17 years reported ever having been asked to show proof of age when buying or trying to buy SLT. Among males aged 12–17 years who had never used SLT in 1993, 39.0% (95% CI=36.7%–41.4%) believed it would be easy for them to buy SLT, including 28.1% (95% CI=25.6%–30.7%) of minors aged 12–15 years and 70.7% (95% CI=67.0%–74.5%) of minors aged 16–17 years.

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings in this report are consistent with previous documentation of the ease with which minors can purchase tobacco products over the counter and from vending machines and of the more frequent use of vending machines by younger adolescents (*3*). In surveys of tobacco outlets using unannounced over-the-counter purchase attempts by minors, purchase rates were usually highest in small stores and gas stations (*3*). In addition, previous studies using self-reported surveys of minors' tobacco use indicate that these locations are the most common source of purchased cigarettes by minors (*3,6*).

Differences in access among racial/ethnic groups may be influenced by differences in socioeconomic status and by racial and cultural phenomena. The substantial race/ethnicity-specific differences for some of the variables in this analysis indicate the need to examine factors including attitudes of vendors, enforcement practices, and community norms.

Vendors' requiring proof of age is an important method of preventing tobacco sales to minors (*3,4*; CDC, unpublished data, 1994). Widespread adherence to laws requiring age verification should assist substantially in preventing tobacco sales to minors. However, in 1993, approximately half of minors who ever had attempted to purchase their own tobacco products reported they never had been asked to show proof of age.

The findings in this report are subject to at least two limitations. First, TAPS II may be associated with nonresponse bias; for example, TAPS I respondents who were followed up in TAPS II were less likely to be smokers in 1989 than were those who could not be reinterviewed, possibly contributing to the lower smoking prevalence estimates in TAPS II when compared with other national surveys (CDC, unpublished data, 1993). Second, because the information was collected during telephone and personal interviews, young persons may have been reluctant to disclose tobacco-related behavior when a parent was in the household during the interview (*3*).

Although all states have enacted youth access laws, enforcement of these laws varies and needs to be strengthened. In 1994, enforcement activities were maintained only in 24 (44%) states and territories (*7*). Federal regulations now require states to develop a strategy and a time frame for achieving an inspection failure rate of ≤20% (*8*).

The establishment and enforcement of laws that prohibit sales to minors are consistent with and reinforce existing social norms (*4*). One of the national health objectives for the year 2000 is to enforce laws to reduce the sales rate observed during compliance checks to 20% (objective 3.13) (*9*). In the United States, approximately 70% of purchase attempts made by minors are successful (*3*).

In August 1995, the Food and Drug Administration proposed regulations that could reduce for minors both access to and the appeal of nicotine-containing cigarettes and SLT products (*10*). The regulations would 1) require retailers to verify the age of persons who want to purchase cigarettes or SLT products; 2) eliminate "impersonal" methods of sale and distribution that do not readily allow age verifications (e.g., mail orders, self-service displays, free samples, and vending machines), 3) limit advertising to which minors may be exposed to a text-only format; 4) ban outdoor advertising of tobacco products within 1000 feet of schools and playgrounds; 5) prohibit the sale or distribution of brand-identifiable nontobacco items and services; and 6) prohibit the sponsorship of events in the brand name. FDA is reviewing public comments on the proposed regulations.

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Minors' Access to Smokeless Tobacco — Florida, 1994

Laws enacted by the legislature in Florida to restrict access of minors to tobacco (Florida Revised Statutes 859.06–859.061) went into effect October 1, 1992, and May 20, 1994; these laws prohibit the sale of tobacco products to persons aged <18 years and require the posting of a warning sign indicating that such sales to minors are illegal. Merchants convicted for such violations can be fined up to $500 and imprisoned up to 60 days. Florida and Vermont are the only states that enforce access laws restricting the sale of tobacco to minors statewide (1). Although minors' access to cigarettes is well documented, the extent to which minors have access to smokeless tobacco (SLT) has not been well characterized. To assess the effectiveness of the Florida laws in preventing minors from gaining over-the-counter access to SLT and in ensuring that tobacco vendors comply with the sign statute, in November 1994, the Department of Exercise Science/Wellness Education of Florida Atlantic University conducted a study of minors' attempts to access SLT in Palm Beach County (1990 population: 863,518). The findings in this report indicate that, despite the enactment of laws prohibiting the sale of tobacco products to persons aged <18 years, some minors still were successful at purchasing SLT.

The 1994–95 Florida Business Directory was used to identify four categories of retail outlets in Palm Beach County: convenience stores, grocery stores, pharmacies, and gasoline stations (n=722). A map of the county was divided into 12 equally sized areas; within each of these areas, 11 sample retail sites were randomly selected to produce a total sample of 132 retail sites. Of the 132 sites, 44 were excluded from the assessment because they had closed, had moved, no longer sold tobacco products, or were considered by the adult team member at the time of the purchase attempt to be in unsafe areas. The remaining 88 stores represented 12% of the 722 retail sites in the county, and comprised 25 (17%) of 149 pharmacies, 10 (8%) of 125 grocery stores, 39 (16%) of 246 gas stations, and 14 (7%) of 202 convenience stores. Four teams of volunteers, each comprising one minor (from among four minors aged 11–17 years) and one adult, were used for the assessment; three of the minors were female, aged 11, 14, and 17 years, and one was a 14-year-old male. One purchase attempt was made at each of the 88 stores.

Purchase attempts followed a standard procedure: the adult member of the team entered the store first to note the presence of any clearly displayed signs stating that tobacco products would not be sold to minors. The adult then observed while the minor entered the retail site, selected a SLT (i.e., snuff or loose-leaf or fine-cut chewing tobacco) and attempted to purchase the product. If a sale was recorded on the cash register or the vendor placed the SLT on the counter for purchase by the minor, the attempt was considered successful; the minor would then state that he or she had insufficient money for purchase and would immediately leave the store. The attempt also was considered successful if the vendor asked the minor's age but was prepared to sell the SLT.* If the minor was denied purchase outright or was asked for age verification and denied purchase, the attempt was considered unsuccessful. The adult member recorded reasons for refusal as stated by the vendor at the time of attempted purchase; when no refusal reason was provided to the minor, the adult team member

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*During one successful purchase attempt, the adult/minor team determined that the vendor was prepared to sell based on the vendor's tone of voice during the attempted transaction and the vendor's movement of the SLT toward the minor at the sales counter.

waited until the minor had departed and then asked the vendor about the reason for refusal. Significance testing was performed using Pearson chi-square tests.

Overall, attempts by minors to purchase SLT were successful in 31 (35%) of the 88 retail sites. The likelihood of a successful attempt was greater for the 17-year-old female (24 [77%] of 31 attempts) (p<0.01). The likelihood of a successful attempt was similar for each of the four categories of stores: attempts were successful at 15 (39%) of the 39 gas stations; five (36%) of the 14 convenience stores; eight (32%) of the 25 pharmacies; and three (30%) of the 10 grocery stores. Of the 65 stores for which data were available, warning signs provided by the Florida Department of Business and Professional Regulation were posted in 27 (42%); purchase attempts were more successful in stores without signs than in those with signs (20 [57%] of 35 versus seven [23%] of 30, respectively [p<0.01]).

Reasons specified by the vendors for the 57 unsuccessful attempts were that the minors looked too young (34 [60%] attempts), that the sale of tobacco products to minors was illegal (11 [19%] attempts), and that the store had a policy prohibiting sales to minors (eight [14%] attempts); in four (7%) attempts, either no product was offered when a minor requested it or no refusal explanation was offered.

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Editorial Note: The assessment in Palm Beach County indicates that, despite the enactment of state laws prohibiting the sale of tobacco to persons aged <18 years, 35% of minors were successful in making attempts to purchase SLT. Previous assessments in Kansas and Texas documented successful attempt rates by minors of 15% and 59%, respectively (2,3). The differences in successful attempt rates in the three assessments may reflect, in part, variations related to the ages of the minors making the purchase attempts. For example, in Palm Beach County, the 17-year-old female was more likely to be successful than those minors aged <14 years, possibly because some vendors may have presumed that the SLT was not for her use (S. Bridges, Florida Atlantic University, personal communication, 1995).

As a result of the assessment in Palm Beach County, measures to reduce the sale and use of tobacco products among minors in the county will be implemented and will include educating the public and the business community about this problem, and encouraging businesses that sell SLT to comply with the state laws prohibiting the sale of tobacco to minors and to post warning signs about those laws. In addition, other strategies policy makers and school and public health officials can use to prevent the use of tobacco by minors include 1) the designation of state agencies to be primarily responsible for investigation and enforcement of sales to minors, 2) increasing the severity of penalties for repeat illegal sales, 3) levying separate fines for failure to post warning signs stating the legal age of purchase, 4) requiring retailers to ask all purchasers of tobacco products to show proof of age, 5) restricting tobacco-product advertising targeted toward minors, 6) ensuring that health education curricula in grades kindergarten through 12 include a tobacco-education component; and 7) banning the use of vending machines (3,4).

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MMWR 1995;44(44):839–41

Assessment of the Impact of a 100% Smoke-Free Ordinance
on Restaurant Sales — West Lake Hills, Texas, 1992–1994

Exposure to environmental tobacco smoke (ETS), which is associated with adverse health effects among nonsmokers (*1*), is a health hazard of particular concern for patrons and employees in restaurants (*2*). To protect nonsmokers, many local governments have enacted ordinances requiring restaurants to be smoke-free. However, the potential economic impact of these laws on restaurants is an important concern for restaurant owners. On June 1, 1993, the city of West Lake Hills (a suburb of Austin), Texas (1995 population: 3000), implemented an ordinance requiring a 100% smoke-free environment in all commercial establishments to which the public has access, including all restaurants and restaurants with bar areas. This report summarizes an assessment of sales in restaurants during June 1993–December 1994 compared with January 1992–May 1993.

Restaurants in West Lake Hills had a variety of menus and food-pricing scales. Restaurant sales data for West Lake Hills were obtained from the Texas State Comptroller's office. Aggregate monthly sales data* from January 1992 through December 1994 were obtained for the eight restaurants in West Lake Hills that had indoor dining areas and were in operation during all of 1992 and until the ordinance went into effect in June 1993 (one of these restaurants closed in April 1994 because its lease expired). These sales data included the 17-month period preceding implementation of the ordinance (January 1992–May 1993) and the 19-month period following implementation (June 1993–December 1994). Restaurants that opened during the assessment period were not included in the analysis because the purpose of the study was to assess the impact of the ordinance on a consistent panel of restaurants (five restaurants opened during September 1992–July 1994).

Data were analyzed using a linear regression model (*3*) that examined the relation between total restaurant sales and the presence of a smoke-free ordinance and that incorporated seasonal variations in sales and temporal economic trends. For each factor examined (i.e., time [year and month], quarter of the year, and presence of the implemented ordinance), a corresponding regression coefficient was calculated to measure the effect of that factor on total restaurant sales. A positive regression coefficient suggests that the factor was associated with increased total restaurant sales, and a negative value suggests that the factor was associated with decreased total restaurant sales. To test for multicollinearity, variance inflation factors were computed for each independent variable in the model. The Durbin-Watson statistic was computed (*4*) to test for first-order autocorrelation (correlation of the residuals [error terms] for adjacent observations over time).

Total monthly sales for the restaurants during 1992–1994 varied by season. Sales peaked during the second quarter of each year.

In the initial regression model, the variance inflation factors for the ordinance variable and the year variable were above four, indicating multicollinear involvement between these variables. To address the multicollinearity, the time variable was removed: although reanalysis did not change the regression coefficient for the ordinance variable, the standard error was substantially decreased. The variance inflation factors for this final model indicated that multicollinearity was no longer present, and

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* To protect confidentiality, individual restaurant sales data are not released by the Comptroller's office .

the Durbin-Watson statistic indicated that significant first-order autocorrelation was not present (Table 1).

The regression coefficient for the second quarter of the year was positive, suggesting that restaurant sales were greater in the second quarter of each year than in the first quarter (Table 1). The regression coefficient for the ordinance variable was positive, suggesting that the total sales of the restaurants did not decrease after implementation of the ordinance.

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Editorial Note: The findings in this report are consistent with assessments using similar methods in other locations that have reported that the implementation of smoke-free ordinances has not been associated with adverse economic effects on restaurants (*3,5,6*).

Previous reports of decreases in restaurant sales following the enactment of clean indoor air ordinances have been based on anecdotal information (*7–10*), on studies that used restaurant owners' self-reports of the impact on their business instead of validated sales data (*7,8*), and on studies that used tax data to measure restaurant sales but collected data for only one or two quarters following implementation of ordinances (*9,10*). In comparison, the assessment in West Lake Hills was based on sales data that were validated by tax revenue reported by the State Comptroller's office, included data for periods of time sufficient for statistical analysis, and employed multiple linear regression techniques to account for temporal trends and seasonal variations in sales.

The findings in this assessment are subject to at least three limitations. First, because of limitations in data, an ordinary least squares regression model—which assumes no autocorrelation—was used in place of a more specific time series model; however, the Durbin-Watson statistic indicated that significant autocorrelation was not present. Second, the model only explained 33% of the variation in total restaurant sales; future studies may benefit from the inclusion of other variables that can affect

TABLE 1. Results of multiple linear regression analysis of the effects of a 100% smoke-free ordinance implemented June 1, 1993, on sales in eight restaurants — West Lake Hills, Texas, 1992–1994

Variable	Regression coefficient	(SE*)	Variance inflation factor[†]
Second quarter[§]	21,085	(8806)	1.5
Third quarter[§]	–4,199	(9040)	1.6
Fourth quarter[§]	757	(9040)	1.6
Ordinance	23,539	(6493)	1.1

Adjusted R^2 for model: 0.33
Durbin-Watson statistic[¶]: 2.64

*Standard error.
[†]Values above 2 suggest that multicollinearity may be a problem in the model.
[§]Indicates the effect of the variable on monthly restaurant sales (in dollars). The first quarter is the reference for the quarterly sales coefficients.
[¶]In a model with four independent variables and 36 observations, a Durbin-Watson statistic below 1.24 indicates significant positive autocorrelation and a value above 2.76 indicates significant negative autocorrelation.

restaurant sales. Third, because the assessment focused on a consistent panel of restaurants and excluded restaurants that opened during the assessment period, the findings cannot be generalized to all restaurants in West Lake Hills.

The economic impact of smoke-free ordinances is an important consideration for policymakers concerned about the ETS exposure of nonsmokers; assessment of the potential economic impact of these laws should be based on the most objective, scientific evidence available. The findings from the assessment in West Lake Hills has provided policymakers in that community with a scientific appraisal of the impact of public health measures to reduce exposure to tobacco smoke. In addition, the assessment in West Lake Hills provides a model for other local and state public agencies to consider when evaluating tobacco-control programs.

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Attitudes Toward Smoking Policies in Eight States — United States, 1993

Legislation regulating smoking has at least two functions: to protect nonsmokers from the adverse health effects of environmental tobacco smoke and to prevent young persons from smoking (1). To characterize public attitudes toward such legislation, the National Cancer Institute (NCI) and the American Cancer Society used the Behavioral Risk Factor Surveillance System (BRFSS) to survey persons in eight states* during July–August 1993 as part of the American Stop Smoking Intervention Study for Cancer Prevention (2). This report summarizes the survey findings.

BRFSS provides state-specific estimates of the prevalence of selected risk behaviors to be used for planning, implementing, and evaluating public health programs. Each month, state health departments use survey sampling and random-digit–dialing techniques (3) to conduct telephone interviews with adults aged ≥18 years. During July–August 1993, a total of 20 questions were added to BRFSS in the eight states to assess support for policies related to cigarette smoking (4). To estimate the state population prevalences (5), data were weighted to the age-, race-, and sex-specific population counts from the most current census (or intercensal estimate) in each state and for the respondent's probability of selection. SUDAAN (6) was used to calculate the 95% confidence intervals for the prevalence estimates. For this study, sample sizes ranged from 252 to 431 per state; state-specific response rates for completed interviews ranged from 63.6% to 93.3%. Current smokers were defined as persons who had smoked at least 100 cigarettes and who reported being a smoker at the time of the interview.

Environmental Tobacco Smoke

Respondents were given a list of public locations and asked whether, for each setting, smoking should be allowed in all areas (do not restrict), allowed in some areas (restrict), or not allowed at all (ban). Public opinion about whether to restrict or ban smoking varied across settings (Table 1): support was greater for banning smoking in fast-food restaurants (range: 42.5%–63.0%) and at indoor sporting events (55.4%–66.9%) than in sit-down restaurants (39.5%–50.6%) and indoor malls (33.4%–56.5%). Overall, smokers were less likely than nonsmokers to support banning smoking in the different locations.

Preventing Teenagers from Smoking

Respondents were given a list of five strategies that might prevent teenagers from smoking and asked whether they believed the strategies were not at all effective, somewhat effective, or very effective. Each of the strategies was believed to be effective (i.e., somewhat or very) by most respondents (Table 2): in particular, 65.3%–77.8% of respondents believed that banning all smoking inside and outside school property would be an effective strategy. Most respondents (79.1%–89.6%) favored a ban on smoking inside school buildings that applies to students, visitors, and teachers; 66.2%–85.1% of respondents favored a ban on the use of any tobacco product (including cigarettes, cigars, pipes, and chewing tobacco) at school-sponsored events (e.g., football games and field trips).

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*Louisiana, Missouri, New Jersey, Ohio, Oklahoma, South Carolina, Texas, and Washington.

TABLE 1. Percentage of persons* who favored restricting or banning† smoking in selected locations — eight states, United States, 1993

State	Sample size	Fast-food restaurant				Sit-down restaurant				Indoor malls				Indoor sporting events			
		Restrict		Ban		Restrict		Ban		Restrict		Ban		Restrict		Ban	
		%	(95% CI§)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Louisiana	275	47.9	(±6.3)	46.8	(±6.2)	49.1	(±6.3)	44.3	(±6.4)	47.2	(±6.3)	44.0	(±6.1)	34.3	(±5.3)	58.2	(±5.4)
Missouri	254	46.4	(±7.0)	49.0	(±6.9)	55.5	(±6.9)	39.5	(±6.8)	52.0	(±7.5)	39.4	(±7.2)	35.6	(±6.8)	57.8	(±6.6)
New Jersey	261	41.0	(±6.8)	51.0	(±7.0)	49.0	(±7.0)	44.8	(±7.0)	34.1	(±6.3)	46.9	(±7.1)	29.7	(±6.1)	56.4	(±6.9)
Ohio	258	46.8	(±6.9)	50.2	(±6.9)	55.1	(±6.9)	41.2	(±6.8)	56.2	(±6.8)	33.4	(±6.5)	33.6	(±6.4)	55.4	(±6.8)
Oklahoma	252	52.6	(±6.9)	42.5	(±7.0)	54.3	(±6.8)	42.3	(±6.8)	57.5	(±6.8)	35.5	(±7.1)	35.2	(±7.5)	60.8	(±7.7)
South Carolina	371	36.8	(±5.5)	56.8	(±5.6)	46.0	(±5.9)	50.0	(±5.8)	48.4	(±6.2)	45.6	(±6.3)	25.1	(±5.1)	66.9	(±5.2)
Texas	405	41.4	(±5.4)	50.5	(±6.0)	50.0	(±6.2)	45.8	(±5.8)	46.9	(±6.1)	45.3	(±6.0)	34.1	(±5.6)	57.0	(±6.3)
Washington	431	33.1	(±4.9)	63.0	(±5.0)	45.4	(±5.1)	50.6	(±5.1)	39.0	(±5.0)	56.5	(±5.1)	29.1	(±4.6)	66.8	(±4.8)

* Aged ≥18 years.
† Response categories included: allowed in all areas (do not restrict), allowed in some areas (restrict), not allowed at all (ban), don't know, and refused to answer.
§ Confidence interval.

TABLE 2. Percentage of persons* who believed that selected strategies would be somewhat or very effective† in keeping teenagers from smoking cigarettes — eight states, United States, 1993

State	Sample size	Ban smoking on school property		Ban all cigarette advertising		Strongly enforce laws		Ban all vending machines		Increase price of cigarettes	
		%	(95% CI§)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Louisiana	275	75.8	(±5.2)	71.9	(±6.1)	85.5	(±4.3)	76.0	(±5.6)	67.0	(±6.4)
Missouri	254	65.3	(±6.2)	54.3	(±7.0)	77.6	(±5.7)	69.3	(±6.2)	62.0	(±6.5)
New Jersey	261	76.4	(±6.2)	70.2	(±6.4)	77.1	(±5.8)	75.6	(±5.7)	62.5	(±6.6)
Ohio	258	72.1	(±6.2)	58.0	(±6.8)	78.8	(±5.9)	75.7	(±5.8)	59.0	(±6.8)
Oklahoma	252	77.8	(±6.2)	70.2	(±6.1)	80.9	(±5.4)	79.3	(±5.5)	55.4	(±6.7)
South Carolina	371	75.8	(±5.1)	60.6	(±5.4)	78.8	(±4.9)	72.9	(±5.4)	58.3	(±5.6)
Texas	405	73.6	(±4.8)	64.9	(±5.9)	77.4	(±4.9)	73.3	(±5.5)	63.0	(±5.8)
Washington	431	72.0	(±4.6)	71.0	(±4.8)	84.3	(±3.7)	78.7	(±4.4)	67.7	(±4.8)

* Aged ≥18 years.
† Response categories included: not at all effective, somewhat effective, very effective, don't know, and refused to answer.
§ Confidence interval.

Banning all cigarette advertising was considered to be an effective strategy in reducing smoking among teenagers by 54.3%–71.9% of respondents (Table 2). In addition, 49.8%–66.5% of respondents believed that tobacco advertising influences persons to buy tobacco products. The proportion of respondents who supported a ban on advertising tobacco products at sports stadiums and arenas ranged from 67.7% to 78.2%, and the proportion who supported a ban on advertising tobacco products on billboards ranged from 62.6% to 77.2%.

High proportions of respondents believed in the effectiveness of selected measures to limit teenager's access to tobacco products, including stronger enforcement of laws prohibiting the sale of cigarettes to minors (77.1% to 85.5%), banning all cigarette vending machines (69.3% to 79.3%), and increasing the price of a pack of cigarettes (55.4% to 67.7%) (Table 2). Most respondents (54.1% to 68.8%) favored increasing the tax on a pack of cigarettes $1 per pack; however, many (47.9% to 66.1%) believed that such an increase would be unfair to cigarette smokers. Belief in the effectiveness of teenage access restrictions was high among both smokers (41.8% to 79.3%) and non-smokers (60.2% to 88.4%).

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Editorial Note: The findings in this report are consistent with previous studies that have documented public support for regulating tobacco use in public places (2). For example, in 1987, 72% of adults in seven Minnesota communities favored prohibiting smoking in public buildings (7). In 1989, findings from a survey conducted for the NCI Community Intervention Trial for Smoking Cessation (COMMIT) (8) indicated that among persons in 10 communities, 62%–100% supported restricting or banning smoking in selected locations. Most favored restricting smoking in five locations (bars, restaurants, bowling alleys, private worksites, and government buildings) and banning it in three other locations (indoor sports arenas, hospitals, and doctors' offices).

These findings also confirm increasing support for banning smoking in restaurants (9). For example, 16.2% to 32.3% of respondents in the COMMIT study (8) favored banning smoking in restaurants, compared with 39.5% to 63.0% of BRFSS respondents. In addition, the BRFSS findings distinguish between fast-food and sit-down restaurants. Support for banning smoking in fast-food restaurants was stronger than support for banning smoking in sit-down restaurants, possibly because of the perception that fast-food restaurants tend to cater to and be frequented by children and adolescents (2).

Previous studies (2) have documented high levels of support for measures to prevent teenagers from smoking (7,10). The BRFSS findings indicate widespread belief in the effectiveness of such measures and suggest broad support for banning the use of any tobacco product at school-sponsored events. Finally, the BRFSS findings indicate support for recommendations issued by the Institute of Medicine (2), which include the need to 1) adopt and enforce tobacco-free policies in all public locations, especially those that cater to and are frequented by children and youths; 2) adopt tobacco-free policies that apply to persons attending events sponsored by

organizations involved with youths; 3) restrict the advertising and promotion of tobacco products; and 4) increase the excise tax on cigarettes.

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Minors' Access to Cigarette Vending Machines — Texas

The sale of tobacco products to persons aged <18 years has been prohibited by law in Texas since September 1989*. This law requires cigarette vending machine owners to post signs on their machines stating the illegality of tobacco product sales to persons aged <18 years and that merchants convicted for selling tobacco products to underaged persons be fined a maximum of $500. In August 1991, Arlington, Texas, enacted legislation requiring installation of electronic locking devices on all cigarette vending machines. These devices render the vending machine inoperable until the store owner electronically unlocks the machine on customer request. To assess minors' access to cigarettes through vending machines, in October 1993 the Texas Department of Health conducted a study in Arlington and five neighboring communities. This report summarizes the study findings.

In September 1993, the health department obtained a list of business establishments with cigarette vending machines owned by the largest cigarette vending company in the Arlington area. A total of 116 establishments were identified in the study area; 59 (51%) machines were in establishments considered easily accessible to minors (i.e., restaurants, gas stations, motel lobbies, food stores, and recreational facilities). Data were collected for 42 of the 59 sites.

Four investigative teams consisted of one adult paired with one minor (aged 15–17 years). One purchase attempt was made at each of the 42 establishments. During each purchase attempt, the adult entered the establishment first and asked for street directions. The adult then observed while the minor entered and attempted to purchase cigarettes from the vending machine. Minors were instructed to answer, if asked, that the cigarettes were for themselves.

While attempting to purchase cigarettes from vending machines, no minors were challenged by business owners. Of the 42 attempts, 41 were successful. Of the 41 sites where purchase attempts were successful, 24 (59%) were located within ½ mile of a school. Most (35 [83%] of 42) purchase attempts occurred in restaurants; however, cigarettes were bought at every type of establishment where purchases were attempted. Warning signs prohibiting cigarettes sales to minors were posted on vending machines in 32 (76%) establishments.

Of the 16 vending machines located in business establishments in the city of Arlington, one was equipped with an electronic locking device. The single unsuccessful purchase attempt occurred at this electronically locked machine.

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Editorial Note: The findings in this report indicate that, despite laws prohibiting cigarette sales to persons aged <18 years, minors readily purchased cigarettes from vending machines in Arlington and five neighboring communities. Although the only failed purchase attempt in this study resulted from a vending machine equipped with a remote-controlled locking device, compliance with legislation requiring these devices has been minimal (1). The finding that only one of 16 vending machines in

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*Texas Health and Safety Code, Title 2, Sections 161.081–161.082.

Arlington was equipped with the device is similar to findings of studies about locking device usage in other areas (*1*).

The findings in this report are subject to at least two limitations. First, data in this report were obtained for only one vending machine company in the Arlington area because the Texas Department of the Treasury does not require vending machine companies to specify the locations of their machines. Second, because of time constraints during the study, data were not collected for 17 establishments considered easily accessible to minors; however, sites included in the analysis probably do not differ from sites that were not included.

Approximately 82% of adult smokers report that they first tried a cigarette by age 18 years, and 53% were daily smokers by that age (*2*). The initiation rate for smoking increases rapidly after age 11 years (*3*); in Texas, a 1989 survey of 4400 high school students found that 55% of 12-year-olds had already tried cigarette smoking (*4*). Because vending machine sales are not monitored actively by adults, cigarette vending machines can be an important source for younger adolescents (i.e., aged 12–15 years), who are more likely than older adolescents (i.e., aged 16–18 years) to be refused an over-the-counter cigarette sale (*5*). Studies indicate that younger adolescent smokers are more likely to buy cigarettes from vending machines than older adolescent smokers (*6,7*).

Unregulated cigarette vending machines may facilitate initiation of smoking among younger adolescents; therefore, more effective regulation of these sales may be an important preventive measure. Prevention of adolescent smoking may be enhanced by the recently enacted Synar Amendment to the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) Reorganization Act.[†] The Synar Amendment requires that states demonstrate effective prohibition of the sale of tobacco products (including cigarettes from vending machines) to persons aged <18 years as a condition of receiving full ADAMHA block grants. As a result of this study, the Arlington City Council enacted legislation prohibiting cigarette vending machines in all business establishments that admit persons aged <18 years.

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[†] Public Law 102-321, §1926.

Changes in the Cigarette Brand Preferences
of Adolescent Smokers — United States, 1989–1993

Approximately three million U.S. adolescents are smokers, and they smoke nearly one billion packs of cigarettes each year (*1*). The average age at which smokers try their first cigarette is 14½ years, and approximately 70% of smokers become regular smokers by age 18 years (*2*). Evaluating the changes in the brand preferences of young smokers can help identify factors that influence adolescents' brand choice and may suggest smoking-prevention strategies (*3,4*). This report examines changes in the brand preferences of teenaged smokers from 1989 to 1993 using data from CDC's 1993 Teenage Attitudes and Practices Survey (TAPS-II) and comparing them with data from the 1989 TAPS.

For TAPS, data on knowledge, attitudes, and practices regarding tobacco use were collected from a national household sample of adolescents (aged 12–18 years) by telephone interviews. For TAPS-II, interviews were conducted during February–May 1993. Of the 9135 respondents to the 1989 TAPS, 7960 (87.1%) participated in TAPS-II (respondents were aged 15–22 years when TAPS-II was conducted).* In addition, 4992 (89.3%) persons from a new probability sample (n=5590 persons aged 10–15 years) participated in TAPS-II. Data for the 12–18-year-olds in each survey were analyzed (n=9135 for TAPS; n=7311 for TAPS-II). Because numbers for other racial groups were too small for meaningful analysis, data are presented for black, white, and Hispanic adolescents only. Data were weighted to provide national estimates, and confidence intervals (CIs) were calculated by using the standard errors estimated by SUDAAN (*5*). Adolescent current smokers[†] were asked if they usually bought their own cigarettes, and if so, which brand they usually bought.

Of the 1031 current smokers aged 12–18 years interviewed in 1993, 724 (70%) reported that they usually bought their own cigarettes; the brand they usually bought was ascertained for 702 (97%). Marlboro, Camel, and Newport were the most frequently purchased brands for 86% of the adolescents (Table 1). Marlboro was the most commonly purchased brand for both male (59% [95% CI=±6.0%]) and female (61% [95% CI=±5.8%]) adolescents; the second most commonly purchased brand among males was Camel (16% [95% CI=±5.0%]) and among females was Newport (15% [95% CI=±3.9%]). Marlboro was the most commonly purchased brand among white (64% [95% CI=±4.3%]) and Hispanic (45% [95% CI=±14.9%]) adolescents; black adolescents most frequently purchased Newport (70% [95% CI=±14.1%]). Younger smokers (aged 12–15 years) were more likely than older smokers (aged 16–18 years) to buy Newport and less likely to buy Marlboro; purchasing frequency for Camel cigarettes was similar among all adolescents.

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*TAPS respondents who completed the survey by mail questionnaire were not eligible for the TAPS-II survey. TAPS-II included household interviews of persons who did not respond by telephone.

[†]Adolescents who reported smoking cigarettes on 1 or more of the 30 days preceding the survey.

Among adolescents nationwide, Marlboro was the most commonly purchased brand (Table 1). However, by region§, Camel was most commonly purchased in the West (27% [95% CI=±10.8%]), and Newport, in the Northeast (30% [95% CI=±8.8%]).

From 1989 to 1993, substantial changes in brand preference occurred among adolescents (Table 2). The percentage of adolescents purchasing Marlboro cigarettes decreased 8.7 percentage points (13% decrease), the percentage of adolescents purchasing Camel cigarettes increased 5.2 percentage points (64% increase), and the percentage purchasing Newport cigarettes increased 4.5 percentage points (55% increase). These changes did not completely correlate with changes in overall cigarette market share during 1989–1993. During this period, the overall market share for Camel and Newport remained nearly unchanged, but the overall market share for Marlboro decreased by 2.8 percentage points (11% decrease).

For Marlboro cigarettes, the decreases in brand preference were greatest among white adolescents, younger smokers, and adolescents residing in the Northeast, Midwest, and West (Table 1) (*6*). Increases in brand preference for Camel cigarettes were greatest among white adolescents and adolescents residing in the Midwest and West, and increases for Newport cigarettes were greatest among younger smokers and adolescents residing in the Northeast.

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Editorial Note: Because cigarette sales to adolescents constitute a small percentage of the total market, overall market share can only be used to estimate the brand preferences of adults. TAPS and TAPS-II indicate that brand preference is more tightly concentrated among adolescents than among adults. In both surveys, at least 85% of adolescent current smokers purchased one of three brands (i.e., Marlboro, Camel, or Newport); however, the three most commonly purchased brands among all smokers accounted for only 35% of the overall market share in 1993.

The three most commonly purchased brands among adolescent smokers were the three most heavily advertised brands in 1993 (*7*), suggesting that cigarette advertising influences adolescents' brand preference. In 1993, Marlboro, Camel, and Newport ranked first, second, and third (*7*), respectively, in advertising expenditures. However, Camel and Newport ranked seventh and fifth, respectively, in overall market share (*8*).

Similarly, the increases in adolescents' brand preference for Camel cigarettes and the decrease in preference for Marlboro cigarettes from 1989 to 1993 are not explained by changes in overall market share for these brands. These changes reflect variability in brand-specific advertising expenditures: from 1989 to 1993, Marlboro advertising decreased from $102 million to $75 million (*7,9*), while Camel advertising increased from $27 million to $43 million (*7,9*). In contrast, the increased preference for Newport cigarettes does not reflect the decrease in Newport advertising expenditures from $49 million to $35 million from 1989 to 1993 (*7,9*). The regional differences

§The four regions were Northeast (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont), Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia), and West (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming).

TABLE 1. Percentage* distribution of cigarette brands usually bought by current smokers† aged 12–18 years who reported usually buying their own cigarettes, by demographic characteristic — United States, Teenage Attitudes and Practices Survey-II, 1993, and overall cigarette brand market shares,§ 1993

Characteristic	No.	Percentage																
		Marlboro		Camel		Newport		Winston		Kool		Salem		Virginia Slims		Benson & Hedges		Other brands	
		%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Sex																			
Male	370	59.2	(± 6.0)	16.1	(± 5.0)	10.7	(± 3.2)	1.6	(±1.5)	2.3	(± 2.0)	0.4	(±0.5)	0		0.6	(±0.8)	9.1	(±3.3)
Female	332	60.7	(± 5.8)	10.3	(æ 3.0)	14.7	(æ 3.9)	0.7	(±1.0)	0		1.7	(±1.4)	2.0	(±1.9)	0		9.9	(±3.9)
Race**																			
White	646	63.5	(± 4.3)	14.4	(± 3.1)	8.7	(± 2.4)	1.2	(±1.0)	0.5	(± 0.8)	1.0	(±0.8)	1.0	(±1.0)	0.2	(±0.4)	9.4	(±2.8)
Black	45	8.5	(± 8.5)	0		70.4	(±14.1)	0		11.9	(±10.9)	1.4	(±2.7)	0.5	(±1.0)	1.7	(±3.3)	5.5	(±6.0)
Ethnicity††																			
Hispanic	50	45.4	(±14.9)	10.1	(± 7.7)	34.0	(±15.1)	6.0	(±8.1)	4.5	(± 8.6)	0		0		0		0	
Non-Hispanic	647	60.9	(± 4.3)	13.6	(± 3.1)	11.0	(± 2.5)	0.8	(±0.7)	0.9	(± 0.8)	1.1	(±0.8)	1.1	(±1.0)	0.3	(±0.4)	10.4	(±2.9)
Age (yrs)																			
12–15	140	49.5	(± 9.2)	13.0	(± 7.1)	19.4	(± 6.9)	2.8	(±3.1)	3.7	(± 3.8)	0.4	(±0.7)	0.1	(±0.3)	0		11.1	(±5.3)
16–18	562	63.1	(± 4.4)	13.4	(± 3.0)	10.6	(± 2.6)	0.7	(±0.7)	0.4	(± 0.6)	1.2	(±0.9)	1.2	(±1.2)	0.4	(±0.5)	9.0	(±2.9)
Region§§																			
Northeast	146	54.1	(±10.7)	5.1	(± 3.6)	30.1	(± 8.8)	0.6	(±1.2)	0		0.6	(±1.3)	1.8	(±2.5)	0		7.6	(±6.5)
Midwest	223	61.6	(± 6.7)	15.0	(± 4.6)	11.6	(± 4.8)	0.9	(±1.3)	1.2	(± 1.6)	2.4	(±1.9)	0.8	(±1.1)	0.4	(±0.7)	6.1	(±4.1)
South	217	67.1	(± 6.5)	9.5	(± 3.9)	8.0	(± 3.1)	0.9	(±1.3)	1.5	(± 1.8)	0.6	(±1.2)	1.0	(±2.0)	0.5	(±1.1)	10.7	(±4.4)
West	116	50.3	(±10.6)	27.1	(±10.8)	3.2	(± 3.1)	2.6	(±3.6)	2.0	(± 3.8)	0		0.2	(±0.4)	0		14.7	(±7.4)
Total	702	60.0	(± 4.2)	13.3	(± 2.9)	12.7	(± 2.7)	1.2	(±0.9)	1.2	(± 1.0)	1.0	(±0.7)	1.0	(±0.9)	0.3	(±0.4)	9.5	(±2.6)
Overall market share, 1993§		23.5		3.9		4.8		6.7		3.0		3.9		2.3		2.5		49.4	

*Percentages and confidence intervals are based on weighted data.
† Adolescents who reported smoking cigarettes on 1 or more of the 30 days preceding the survey.
§ Source: reference 8; based on total estimated brand-specific cigarette sales in the United States.
¶ Confidence interval.
**Excludes the category "other" (n=11); numbers for these racial groups were too small for meaningful analysis.
††Excludes five persons for whom ethnicity was unknown.
§§ Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

in brand preference of adolescents and changes in those preferences during 1989–1993 suggest that analysis of the relation between regional advertising expenditures and brand preferences may help to clarify the role of cigarette advertising in influencing adolescents' brand preference.

The findings that black adolescents most commonly purchased mentholated brands (i.e., Newport and Kool) and that Hispanic adolescents most commonly purchased Marlboro are consistent with a previous report (6). Racial/ethnic differences in brand preferences of adolescents may be influenced by differences in socioeconomic status and by social and cultural phenomena that require further explanation.

The findings of TAPS-II are subject to at least two limitations. First, the potential exists for nonresponse bias in the follow-up of TAPS respondents. For example, smoking prevalence estimates derived from TAPS-II are lower than those based on other national surveys; TAPS respondents who were successfully followed up in TAPS-II were less likely to be smokers in 1989 than those who could not be reinterviewed (Office on Smoking and Health, unpublished data, 1994). Second, the small number of black and Hispanic adolescents in TAPS-II lessens the reliability of the brand preference estimates for these subgroups.

Because cigarette advertising may influence brand choice of adolescents (an important component of smoking behavior), legislation may be needed to restrict cigarette advertising to which young persons are likely to be exposed (10). In addition, antitobacco advertising may be an effective public health strategy to prevent smoking initiation and encourage smoking cessation among adolescents. Understanding the influence of advertising on adolescent smoking behavior may assist in

TABLE 2. Change in self-reported cigarette brand preference among adolescents aged 12–18 years* and change in overall cigarette brand market share[†] from 1989 to 1993 — United States, Teenage Attitudes and Practices Survey (TAPS), 1989 and 1993

Brand	Adolescent brand preference, 1989	Rank	Adolescent brand preference, 1993	Rank	Change in adolescent brand preference, 1989 to 1993
Marlboro	68.7	1	60.0	1	–8.7
Camel	8.1	3	13.3	2	+5.2
Newport	8.2	2	12.7	3	+4.5
Winston	3.2	4	1.2	4	–2.0
Kool	1.0	7	1.2	4	+0.2
Salem	1.5	5	1.0	6	–0.5
Benson & Hedges	1.4	6	0.3	7	–1.1

Brand	Overall market share, 1989	Rank[§]	Overall market share, 1993	Rank[§]	Change in overall market share, 1989 to 1993
Marlboro	26.3	1	23.5	1	–2.8
Camel	3.9	6	3.9	7	0
Newport	4.7	5	4.8	5	+0.1
Winston	9.1	2	6.7	2	–2.4
Kool	5.9	4	3.0	9	–2.9

*Data were weighted to provide national estimates. Unweighted sample size for 1989 was 865 and for 1993 was 702.

[†]From reference 8. Based on total estimated brand-specific cigarette sales in the United States.

[§]Rank for brands listed is based on the Maxwell Consumer Report (8). Only brands for which data on adolescent brand preference were available in 1989 and 1993 are listed in the table. Missing ranks are for generic brands.

clarifying the potential role of antismoking advertisements. At least two states (California and Massachusetts) have allocated resources derived from state excise cigarette tax for paid antismoking advertising campaigns aimed at young persons.

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Minors' Access to Tobacco — Missouri, 1992, and Texas, 1993

Approximately 75% of adults who have regularly smoked cigarettes tried their first cigarette before their 18th birthday, and about half became regular smokers by age 18 years (*1*). Despite the importance of reducing smoking among adolescents, the prevalence of smoking among high school seniors has not decreased substantially from 1981 through 1991 (*2*). National health objectives for the year 2000 have targeted substantial reductions in smoking among persons aged <20 years (*3*), and reducing access to cigarettes through laws or statutes (*4*) is an important strategy in reaching this goal. This report describes the results of efforts in two states—Missouri and Texas—to characterize access of minors to cigarettes and other tobacco products.

Missouri

On August 28, 1992, a Missouri law (Missouri Revised Statute 407.925–407.932) went into effect prohibiting the sale of tobacco products to minors. From August 24 through August 27, before implementation of the law, the Missouri Coalition on Smoking and Health, the St. Louis University School of Public Health, and the Missouri Department of Health assessed how minors could purchase cigarettes over the counter (i.e., other than through vending machines).

The *1992–1993 Missouri Business Directory* was used to identify businesses that sold cigarettes—including convenience and grocery stores, pharmacies, and gasoline stations (stores that sold cigarettes only through vending machines were excluded)—in five central Missouri towns (1990 population range: 5600–21,000). In these communities, there were no ordinances prohibiting the sale of tobacco products to minors. Advance notification was given to the city attorney's office in each town.

Teams consisting of two minors (from among seven minors aged 13–14 years) and one adult were used for the assessment. Only one purchase attempt was made at each of 89 stores. During each purchase attempt, the adult entered the store first and noted whether there was any clearly displayed sign stating that cigarettes would not be sold to minors. The adult then observed while one of the minors entered the store and attempted to purchase cigarettes. A purchase attempt was considered successful if the vendor recorded the sale on the cash register and unsuccessful if the vendor refused to sell cigarettes for any reason. If the vendor recorded the sale, the minor stated that he or she did not have enough money and left the store. In 16 stores where the vendor refused to sell to the minor, the adult team member waited until the minor had left and then asked the vendor his or her reasons for refusing.

Of the 89 attempts, 41 (46.1%) were successful (Table 1). Girls were more successful than boys (55.6% versus 36.4%, respectively [p=0.1]). Convenience and grocery stores were less likely to sell cigarettes to minors, although the number of other businesses (e.g., gasoline stations and pharmacies) included in the study was small. The likelihood of success was not significantly different for stores with and without warning signs (36.3% versus 47.4%, respectively [p=0.7]), nor for stores that sold cigarettes from behind the counter only compared with stores with self-service displays (60.5% versus 40.7%, respectively [p=0.2]).

Reasons vendors gave for not selling cigarettes to the minors included belief in the existence of a federal law, a state law, or "some type of law"; a store policy prohibiting sales to minors; and the opinion that some of the minors "just looked too young."

Texas

The sale of tobacco products to persons aged <18 years has been prohibited by law in Texas since September 1989 (Texas Health and Safety Code, Title 2, Sections 161.081–161.082). This law requires cigarette sales outlets to post signs stating the illegality of tobacco product sales to persons aged <18 years and that merchants convicted for such violations can be fined a maximum of $200. In January 1993, the Texas Department of Health conducted a study in the Austin metropolitan area (1990 population: 781,572) to assess 1) minors' access to tobacco products (including smokeless tobacco) not sold in vending machines and 2) tobacco vendors' compliance with the sign ordinance.

The health department obtained a list of licensed tobacco vendors (excluding stores that sold cigarettes through vending machines only) from the Texas Department of the Treasury for the city of Austin and four nearby rural communities. Teams consisted of one to three minors (from among 16 minors aged 14–15 years and one aged 17 years) and one adult. Surveys were conducted in the same manner as those in Missouri.

Of 94 attempts to purchase cigarettes, 59 (62.8%) were successful; girls and boys were almost equally likely to succeed (63.2% versus 61.5%, respectively [p=0.9]) (Table 1). The type of store where the purchase attempt occurred was not associated with the minors' ability to purchase cigarettes. Warning signs required by state law were posted in 28 (29.8%) stores; attempts were equally successful in stores with and without signs (64.3% versus 62.5%, respectively [p=0.9]). Vendors asked minors their age in 15 (18.5%) of 81 attempts, asked to see age identification in 19 (22.8%) of 87 attempts, and asked who the tobacco was for in one (1.3%) of 79 attempts; in all of these queried attempts, the minors failed to purchase cigarettes.

Of the 71 attempts to buy smokeless tobacco products, 42 (59.2%) were successful. The likelihood of successful purchase attempts was similar for stores with and without warning signs (53.8% versus 63.0%, respectively [p=0.7]).

TABLE 1. Number of attempts and number and percentage of successful attempts by minors* to purchase cigarettes — Missouri, 1992, and Texas, 1993

Category	Missouri				Texas			
	No. attempts	Successful attempts			No. attempts	Successful attempts		
		No.	(%)	(95% CI†)		No.	(%)	(95% CI)
Sex of buyer								
Male	44	16	(36.4)	(±14.2)	26	16	(61.5)	(±18.7)
Female	45	25	(55.6)	(±14.5)	68	43	(63.2)	(±11.5)
Type of store								
Convenience§	49	20	(40.8)	(±13.8)	59	37	(62.7)	(±12.3)
Grocery	24	11	(45.8)	(±20.0)	11	8	(72.7)	(±26.4)
Other¶	16	10	(62.5)	(±23.8)	24	14	(58.3)	(±19.7)
Warning sign**								
Yes	11	4	(36.3)	(±28.5)	28	18	(64.3)	(±17.7)
No	78	37	(47.4)	(±11.1)	64	40	(62.5)	(±11.9)
Total	89	41	(46.1)	(±10.4)	94	59	(62.8)	(± 9.8)

*Persons aged <18 years.
†Confidence interval.
§Includes stores that also sold gasoline.
¶Includes full-service gasoline stations, pharmacies, restaurants, and liquor stores.
**Information on warning signs missing for two stores in Texas, one at which there was a successful purchase attempt.

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Editorial Note: The findings in Missouri and Texas are consistent with previous reports: cigarettes could be readily purchased by minors (*5,6*), and the presence of warning signs did not affect minors' success in purchasing cigarettes (*7*). Differences in the findings in the two states may reflect variations in the ages of minors, as well as the media coverage of the law in Missouri following passage in the state legislature.

In 1988, up to $221 million (3% of tobacco industry profits) resulted from cigarette sales to youth, an activity illegal in most states (*8*). While most states have laws in place that restrict minors' access to tobacco, these laws are rarely enforced (*9*). Prevention of youth smoking may be enhanced by the recently enacted Synar Amendment to the Alcohol, Drug Abuse, and Mental Health Administration Reorganization Act*. The Synar Amendment requires that all states enact and enforce a law prohibiting the sale or distribution of tobacco products to minors (persons aged <18 years) as a condition of receiving full Substance Abuse and Mental Health Services Administration block grant funds.

To reduce the use of tobacco products among minors, public policymakers (e.g., legislators, public health officials, and school officials) should consider the following strategies: 1) initiate efforts such as those in Missouri and Texas to monitor minors' ability to purchase tobacco products; 2) require individual tobacco-sales outlets to obtain licenses that may be revoked if tobacco products are sold to minors and require the levying of an established civil fine; 3) impose separate fines for failure to post warning signs stating the legal age of purchase; 4) require retailers to ask all purchasers of tobacco products to show proof of age; 5) increase excise taxes on tobacco products because higher prices can reduce consumption by minors; 6) restrict tobacco-product advertising targeted toward minors; and 7) ensure that health-education curricula in all primary, middle, and secondary schools include discussion of addiction, the short- and long-term risks of tobacco use, refusal skills, social factors influencing use, and the social consequences of use (*3–5,10*).

In Missouri, findings from the survey described in this report and a follow-up survey in August 1993 will be used to assess the impact of the new law and to strengthen efforts to reduce minors' access to tobacco products. In Texas, these findings will be used to support legislation for stronger enforcement of laws and penalties to restrict minors' access to tobacco products.

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*Public Law 102-31.

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Accessibility of Cigarettes to Youths Aged 12–17 Years — United States, 1989

Rates of tobacco-related diseases are higher for persons who initiate smoking at younger ages than for those who begin at older ages (1). Restricted access to tobacco products may delay or prevent the decision by adolescents to initiate tobacco use (1,2). This report summarizes findings from the Teenage Attitudes and Practices Survey (TAPS) regarding minors' access to cigarettes during 1989.

TAPS obtained data from a national household sample of adolescents aged 12–18 years regarding knowledge, attitudes, and practices associated with tobacco use (3). Data were collected using computer-assisted telephone interviewing (CATI) during September–December 1989 and, for those who could not be reached by telephone, through a mailed questionnaire. Only CATI respondents were asked about their access to cigarettes. The data for this report were obtained from 9135 CATI respondents and weighted to provide national estimates. Confidence intervals (CIs) were calculated using the Software for Survey Data Analysis (SUDAAN) (4).

Because most states have established a minimum age of 18 years for the purchase of cigarettes (5), only the 7773 respondents aged ≤17 years were included in this study. Respondents who were current smokers (i.e., those who had smoked cigarettes on one or more of the 30 days preceding the survey) were asked, "Do you usually buy your own cigarettes?" Those who answered "yes" were asked the frequency (i.e., often, sometimes, rarely, or never) with which they bought cigarettes from a vending machine, large store (e.g., supermarket), or small store (e.g., convenience store or gas station). If the response to the question "Have you ever smoked a cigarette?" was "no," respondents were asked, "Do you think it would be easy or hard for you to get cigarettes if you wanted some?"

Among the estimated 2.6 million current U.S. smokers aged 12–17 years in 1989, approximately 1.5 million (57.5%) usually bought their own cigarettes (Table 1). Smokers aged 16–17 years were more likely to have bought their own cigarettes (66.6%) than were smokers aged 12–15 years (45.3%). Those who had smoked during the week preceding the survey were also more likely to have bought their own cigarettes

(72.7%) than were those who had smoked sometime that month but not as recently as that week (27.1%).

Among youths aged 12–17 years who usually bought their own cigarettes, an estimated 1.3 million (84.5%) often or sometimes purchased their cigarettes from a small store, approximately 730,000 (49.5%) purchased cigarettes often or sometimes from a large store, and about 210,000 (14.5%) purchased cigarettes often or sometimes from a vending machine (Table 2). Of the estimated 13.9 million youths aged 12–17 years who had not smoked a cigarette, an estimated 8.7 million (62.4%), including 52.7% aged 12–15 years and 88.3% aged 16–17 years, believed it would be easy for them to obtain cigarettes.

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TABLE 1. Number and percentage of smokers* aged 12–17 years[†] who usually bought their own cigarettes, by selected characteristics — United States, Teenage Attitudes and Practices Survey, 1989[§]

Characteristic	No.	(%)	(95% CI*)
Age (yrs)			
12–15	439	(45.3)	(± 4.9)
16–17	559	(66.6)	(± 4.1)
Sex			
Male	521	(59.6)	(± 4.5)
Female	477	(55.3)	(± 4.8)
Race**			
White	914	(58.7)	(± 3.3)
Black	64	(43.5)	(±11.5)
Hispanic origin[††]			
Hispanic	68	(41.6)	(±12.8)
Non-Hispanic	924	(58.9)	(± 3.3)
Region			
Northeast	218	(58.6)	(± 6.8)
Midwest	275	(55.0)	(± 5.5)
South	305	(61.4)	(± 5.9)
West	200	(53.6)	(± 7.6)
Frequency of smoking			
During preceding week	668	(72.7)	(± 3.5)
Not during preceding week	328	(27.1)	(± 5.8)
Total	**998**	**(57.5)**	**(± 3.2)**

*Youths who reported smoking a cigarette during the 30 days preceding the survey.
[†]As of November 1, 1989.
[§]Estimates based on weighted data.
*Confidence interval.
**Excludes other races.
[††]Excludes unknown Hispanic origin.

Editorial Note: After substantial declines in the 1970s, the prevalence of cigarette smoking among U.S. high school seniors has been stable since 1981 (*1*; L.D. Johnston, J.G. Bachman, P.M. O'Malley, University of Michigan, unpublished data, 1991). The findings in this report are consistent with results of local investigations documenting the widespread direct purchase of cigarettes by teenagers (*6,7*). Despite laws in 48 states and the District of Columbia prohibiting the sale of tobacco products to minors (CDC, unpublished data, June 1992), underaged youth have been successful in 70%–100% of attempts to purchase tobacco (*7*). Small stores and gas stations are the major source of cigarettes for underaged buyers; vending machines play a lesser role probably because of higher purchase prices and easy access to over-the-counter sales.

Educational interventions directed at vendors to decrease retail tobacco sales to minors have resulted in slight and temporary reductions (*6,7*). The greatest decrease in tobacco sales to underaged buyers has been documented in communities that have active surveillance of retailers and substantial penalties for noncompliance (*7,8*). In locations where tobacco sales to underaged persons have been curtailed, the prevalence of smoking by teenagers has decreased, particularly among the youngest age groups (*8*). Active and vigorous enforcement of minors' access laws in these communities has augmented health education and awareness programs aimed at students and parents (*8*).

In response to a 1990 report indicating limited effective enforcement of existing state laws prohibiting tobacco sales to minors (*9*), the Secretary of Health and Human

TABLE 2. Number and percentage of smokers* aged 12–17 years[†] who usually bought their own cigarettes and who often/sometimes purchased cigarettes from a vending machine, large store, or small store, by selected characteristics — United States, Teenage Attitudes and Practices Survey, 1989[§]

Characteristic	No.	Vending machine		Large store		Small store	
		%	(95% CI[*])	%	(95% CI)	%	(95% CI)
Age (yrs)							
12–15	196	19.9	(±5.6)	41.2	(± 7.5)	79.3	(±5.9)
16–17	369	11.8	(±3.3)	53.7	(± 5.6)	87.2	(±3.5)
Sex							
Male	305	17.8	(±4.4)	50.4	(± 5.7)	81.6	(±4.6)
Female	260	10.8	(±3.7)	48.4	(± 6.6)	87.9	(±3.7)
Region							
Northeast	127	15.0	(±7.4)	50.1	(± 9.6)	83.6	(±6.1)
Midwest	150	19.9	(±5.3)	50.7	(± 9.5)	88.9	(±5.1)
South	183	12.5	(±4.9)	49.6	(± 7.3)	84.7	(±5.2)
West	105	10.6	(±6.0)	46.8	(± 9.9)	79.7	(±8.3)
Frequency of smoking							
During preceding week	481	14.9	(±3.3)	52.6	(± 4.7)	85.4	(±3.2)
Not during preceding week	84	12.6	(±6.7)	32.6	(±10.8)	79.7	(±8.5)
Total	**565**	**14.5**	**(±2.9)**	**49.5**	**(± 4.4)**	**84.5**	**(±3.0)**

*Youths who reported smoking a cigarette during the 30 days preceding the survey.
[†]As of November 1, 1989.
[§]Estimates based on weighted data.
[*]Confidence interval.

Services (HHS) proposed to all states a "Model Sale of Tobacco Products to Minors Control Act" containing six major provisions. The proposed legislation includes 1) instituting 19 years as the minimum age for legal tobacco sales; 2) creating a tobacco sales licensing system similar to that used for alcoholic beverages; 3) establishing a graduated schedule of penalties for illegal sales, with separate penalties for failure to post a sign regarding legal age of purchase; 4) placing primary responsibility for enforcement with a designated state agency, with participation and input from local law enforcement and public health officials; 5) using civil penalties and local courts to assess fines; and 6) banning vending machines (10). The HHS proposal also contains provisions to minimize the economic and administrative burdens on retail outlets.

One of the national health objectives for the year 2000 sets a nationwide goal to enact and enforce state laws prohibiting the sale and distribution of tobacco products to youth aged less than 19 years (objective 3.13) (*2*). This national health objective and the findings from TAPS underscore the need for state and local public health agencies to consider mechanisms such as the model tobacco control act to deter minors from initiating and sustaining tobacco use. A commitment to active surveillance and enforcement of tobacco retail restrictions is essential to reduce the prevalence of smoking among teenagers and its detrimental impact on the health of teenagers and adults.

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Discomfort from Environmental Tobacco Smoke
Among Employees at Worksites
with Minimal Smoking Restrictions — United States, 1988

Exposure to environmental tobacco smoke (ETS) is a potential occupational carcinogen according to guidelines of the Occupational Safety and Health Administration (OSHA) carcinogen policy (1). Exposure to ETS in the workplace may represent a substantial contribution to lifetime ETS exposure (2). For many persons, ETS irritates the conjunctiva of the eyes (accompanied by reddening, itching, and increased lacrimation) and the mucous membranes of the nose, throat, and lower respiratory tract (accompanied by itching, coughing, and sore throat) (3). As part of the 1988 National Health Interview Survey-Occupational Health Supplement (NHIS-OHS), CDC measured the degree of discomfort caused by ETS in the workplace. The NHIS-OHS collected information on cigarette smoking, workplace smoking restrictions, and perceived discomfort caused by ETS at the workplace. This report summarizes survey findings and describes efforts to reduce ETS at the workplace.

The 1988 NHIS-OHS was a cross-sectional household interview survey of approximately 44,000 adults (aged ≥18 years) representative of the U.S. civilian, noninstitutionalized population. The data were adjusted for nonresponse and weighted to provide national estimates. Ninety-five percent confidence intervals were calculated using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (4). The survey asked the following question of employed respondents (i.e., persons who reported they had a job during a 2-week period immediately before being interviewed): "Is smoking allowed in your place of work other than in designated areas?" Respondents who reported that smoking was allowed in designated (if any) and other areas were asked: "Do you find that cigarette smoke in the workplace causes you no discomfort, some discomfort, moderate discomfort, or great discomfort?"

Based on the survey findings, among 114.1 million employed adults in 1988 (who reported that their workplace was not in their home), 40.3% worked in locations where smoking was allowed in designated (if any) and other areas. Among 79.2 million employed nonsmokers (former and never smokers*) (who reported their workplace was not in their home), 28.5 million (36.5%) worked at places that permitted smoking in designated (if any) and other areas. Of these, 12.4 million (43.5%) reported some or moderate discomfort and 4.5 million (15.7%) reported great discomfort[†] from ETS at the workplace (Table 1). Of 16.7 million current smokers[§], 2.5 million (15.0%) reported at least some degree of discomfort from ETS at the workplace.

Among nonsmokers, workplace ETS exposure was more likely to be reported as a cause of discomfort by never smokers (63.6%) than by former smokers (51.4%) and by women (69.0%) than by men (53.9%) (Table 1). Nonsmokers in younger age categories were more likely than older nonsmokers to report discomfort from ETS. Prevalence of any discomfort was generally similar by race and ethnicity. The likelihood of any discomfort from ETS increased directly by level of education, from 44.1% among

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*Former smokers reported they had smoked at least 100 cigarettes during their lifetime and did not smoke at the time of the survey interviews. Never smokers reported they had smoked fewer than 100 cigarettes during their lifetime.

[†]Percentages and population estimates exclude the 155 (1.5%) of the 10,565 respondents who did not respond to the question on degree of discomfort.

[§]Current smokers reported they had smoked at least 100 cigarettes during their lifetime and they smoked at the time of the survey interviews.

TABLE 1. Percent distributions of nonsmokers (former and never smokers*) regarding discomfort caused by environmental tobacco smoke at workplaces that permit smoking in both designated (if any) and other areas, by smoking status, sex, age group, race, Hispanic origin, education, and occupational category — United States, 1988

Category	No discomfort (N[†] = 11.6)		Some/Moderate discomfort (N = 12 4)		Great discomfort (N = 4.5)		Total reporting any discomfort (N = 16.9)	
	%	(95% CI[§])	%	(95% CI)	%	(95% CI)	%	(95% CI)
Smoking status								
Former smoker	48.6	(46 2–50.9)	38.3	(36.2–40.4)	13.1	(11.6–14.7)	51.4	(49.1–53.8)
Never smoker	36.4	(34.7–38.0)	46.5	(44 7–48.3)	17.2	(15.9–18.4)	63.6	(62.0–65.3)
Sex								
Male	46.1	(44.3–47.9)	40.7	(39.0–42.4)	13.2	(12.0–14.4)	53.9	(52.1–55.7)
Female	31.0	(29.0–33.0)	48.7	(46.5–50.9)	20.3	(18.6–22.0)	69.0	(67.0–71.0)
Age (yrs)								
18–24	40.1	(36.3–43.8)	45.8	(41.9–49.7)	14.1	(11.4–16.8)	59.9	(56.2–63.7)
25–44	35.2	(33.3–37.1)	47.2	(45.4–49.1)	17.6	(16.2–19.0)	64.8	(62.9–66.7)
45–64	49.3	(46.6–51.9)	36.6	(34.1–39.2)	14.1	(12.2–16.0)	50.7	(48.1–53.4)
·65	58.4	(52.0–64.9)	32.6	(26.5–38.7)	9.0	(5.3–12.6)	41.6	(35.1–48.0)
Race								
White	40.6	(39.1–42.2)	44.1	(42.6–45.7)	15.2	(14.2–16.3)	59.4	(57.8–60.9)
Black	44.3	(40.1–48.5)	36.0	(32.0–40.0)	19.8	(16.1–23.4)	55.7	(51.5–59.9)
Other	31.6	(23.3–39.9)	51.6	(43.0–60.1)	16.8	(10.2–23 4)	68.4	(60.1–76.7)
Hispanic origin								
Hispanic	38.9	(33.9–44.0)	41.4	(36.4–46.4)	19.7	(15.6–23.8)	61.1	(56.0–66.1)
Non-Hispanic	41.0	(39.5–42.4)	43.7	(42.2–45.2)	15.4	(14.3–16.4)	59.1	(57.6–60.5)
Education (yrs)								
- 12	56.0	(52.2–59.6)	31.9	(28.4–35.3)	12.2	(9.8–14.6)	44.1	(40.4–47.8)
12	43.6	(41.6–45.6)	41.4	(39.3–43.5)	15.0	(13.5–16.5)	56.4	(54.4–58.4)
13–15	36.4	(33.6–39.2)	45.4	(42.6–48.2)	18.2	(15.9–20.5)	63.6	(60.8–66.4)
≥16	30.4	(27.6–33.2)	53.1	(50.1–56.0)	16.5	(14.5–18.6)	69.6	(66.8–72.4)
Occupational category*								
White collar**	34.9	(33.1–36.7)	48.1	(46.2–50.0)	17.0	(15.7–18.4)	65.1	(63.3–66.9)
Service[††]	37.5	(33.8–41.2)	45.7	(41.9–49.6)	16.8	(14.1–19.5)	62.5	(58.8–66.2)
Agricultural/ Fishing[§§]	56.0	(48.5–63.5)	31.5	(24.1–38.8)	12.5	(7.0–18.0)	44.0	(36.5–51.5)
Blue collar**	50.0	(47.6–52.4)	36.6	(34.3–39.0)	13.3	(11.6–15.0)	50.0	(47.6–52.4)
Total	40.8	(39.3–42.2)	43.5	(42.1–45.0)	15.7	(14.7–16.7)	59.2	(57.8–60.7)

*Former smokers reported they had smoked at least 100 cigarettes during their lifetime and did not smoke at the time of the survey interviews. Never smokers reported they had smoked fewer than 100 cigarettes during their lifetime. Includes only former and never smokers who reported their workplace was not in their home. Excludes unknown responses to the degree of discomfort question (n = 78). Sample size = 6515.
[†]Population size in millions.
[§]Confidence interval.
*Excludes unknown occupations.
**Includes executive, administrative, and managerial occupations; professional specialty occupations (e.g., engineers; architects; mathematical and computer scientists; health diagnosing, assessment, and treatment occupations; teachers; writers; artists; and athletes); technicians; and sales, clerical, and administrative support occupations.
[††]Includes private household occupations; protective service occupations; and food, health, cleaning, building, and personal service occupations.
[§§]Includes farm, agricultural, forestry, and fishing occupations.
**Includes precision, craft, and repair occupations; machine operators; assemblers; inspectors; fabricators; transportation and material-moving occupations; handlers; equipment cleaners; helpers; and laborers.

nonsmokers with fewer than 12 years of education to 69.6% among college graduates. Reported discomfort was more prevalent among nonsmoking white-collar workers (65.1%) and persons in service occupations (62.5%) than among nonsmoking blue-collar workers (50.0%) and persons in agricultural/fishing occupations (44.0%).

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics; Surveillance Br, Div of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC.

Editorial Note: In 1986, 85% of never smokers and 74% of former smokers in the United States reported that the smoke from another person's cigarette was annoying to them (*5*). The degree of reported discomfort from ETS among the approximately 28.5 million U.S. nonsmokers during 1988—who have either little or no protection from ETS at the workplace—may reflect the perceived harmfulness of exposure to another person's tobacco smoke (*6*), actual ETS exposure, and persons' individual sensitivity to ETS.

The NHIS-OHS findings are consistent with previous reports that employees who had either limited or no restrictions against smoking in their worksites indicated they were at least somewhat exposed to ETS at work (*5*). In addition, in worksites without highly restrictive smoking policies, most workers may be exposed to ETS because the separation of smokers and nonsmokers within the same air space may reduce—but not eliminate—the exposure of nonsmokers (*3,5*).

Two important considerations influence interpretation of the findings in this report. First, because this survey included only employees for whom smoking was permitted in the workplace in both designated (if any) and other areas, the results probably underestimate the number of U.S. nonsmokers in 1988 who experienced discomfort from ETS at the workplace (i.e., employees who experienced discomfort from ETS despite more restrictive worksite smoking policies (*5*) were not included in this survey). Second, these findings are based on self-reported data and perceptions of discomfort have not been validated, even though self-reported workplace exposures of nonsmokers has been validated biochemically (*7*).

In June 1991, CDC's National Institute for Occupational Safety and Health (NIOSH) recommended that employers assess conditions that may result in worker exposure to ETS and take steps to reduce exposures to the lowest feasible concentration (*1*) either by prohibiting smoking in the workplace or designating separate areas for smoking, with separate ventilation. NIOSH also recommended that employers 1) distribute information about the harmful effects of smoking and the benefits of quitting; 2) offer smoking-cessation classes to all workers; and 3) establish incentives to encourage workers to stop smoking (*1*). Two national health objectives for the year 2000 include efforts to prohibit or severely restrict smoking at work. The first is to increase to at least 75% the proportion of worksites that have a formal smoking policy that prohibits or severely restricts smoking at the workplace (objective 3.11). The second is to enact in the 50 states comprehensive laws on clean indoor air that prohibit or strictly limit smoking in the workplace and enclosed public places (e.g., health-care facilities, schools, and public transportation) (objective 3.12) (*8*).

The Environmental Protection Agency is reviewing the health effects of ETS exposure (*9*), and OSHA is considering regulatory options regarding indoor environmental quality (*10*). Enacting and adhering to workplace policies and regulations regarding

worksite exposure to ETS can reduce employee discomfort and the exposure to carcinogens and other toxic substances from ETS.

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Comparison of the Cigarette Brand Preferences of Adult and Teenaged Smokers — United States, 1989, and 10 U.S. Communities, 1988 and 1990

Tobacco use is the single most preventable cause of death in the United States (*1*). Approximately three fourths of adult regular smokers tried their first cigarette before the age of 18 years (National Institute on Drug Abuse (NIDA), 1988 NIDA Household Survey, unpublished data); about half had become regular smokers before their 18th birthday (*2*). Knowing what brands young smokers prefer may suggest what encourages them to smoke and may suggest smoking-prevention or smoking-cessation strategies (*3–5*). To determine brand preferences of smokers, data were reviewed from CDC's National Center for Health Statistics' 1989 Teenage Attitudes and Practices Survey (TAPS) and the National Cancer Institute surveys of adults in 1988 and 9th-grade students in 1990 in 10 U.S. communities* participating in the Community Intervention Trial for Smoking Cessation (COMMIT) evaluation (*6*). This report examines the findings of these surveys on the cigarette brand preferences of adult and teenaged smokers.

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*Four of the 10 communities surveyed are located in the Northeast (Fitchburg/Leominster, Massachusetts; Paterson, New Jersey; and Utica and Yonkers, New York); three in the West (Vallejo, California; Medford/Ashland, Oregon; and Bellingham, Washington); and one each in the South (Raleigh, North Carolina), Southwest (Santa Fe, New Mexico), and Midwest (Cedar Rapids, Iowa).

TAPS

For the TAPS survey, data on knowledge, attitudes, and practices regarding tobacco use were collected from a national household sample of adolescents aged 12–18 years (7) by a computer-assisted telephone interviewing (CATI) system; those who could not be reached by telephone were mailed a questionnaire. During September–December 1989, the CATI interviews were conducted; because only persons reached by telephone were asked what brand they usually purchased, the data for this report were obtained from 9135 CATI respondents (79% of 11,609 adolescents with known telephone numbers and 76% of 12,097 adolescents in the total sample). These data were weighted to provide national estimates. Confidence intervals (CIs) were calculated by using the standard errors estimated by the Software for Survey Data Analysis (SUDAAN) (8). Adolescent current smokers[†] were asked if they usually bought their own cigarettes and, if so, which brand they usually bought.

Of the 1396 current smokers, 865 (62%) reported that they usually bought their own cigarettes. Smokers aged 16–18 years were more likely to buy their own cigarettes (71% [95% CI=±2.9%]) than were smokers aged 12–15 years (45% [95% CI=±4.9%]). Marlboro was the most commonly purchased brand for both male (69%) and female (68%) adolescents (Table 1). Camel was preferred more often by males (11%) than by females (5%). Although Marlboro was the most popular brand among white (71%) and Hispanic (61%) adolescents, black adolescents preferred the mentholated brands of Newport (61%), Kool (11%), and Salem (10%). Among 9th-grade students, Marlboro (75% [95% CI=±8.2%]), Newport (10% [95% CI=±5.3%]), and Camel (6% [95% CI=±4.3%]) were the most commonly purchased brands.

In all regions,[§] Marlboro was the most popular brand (Table 1). Newport was second in the Northeast (16%), and Camel was second in the West (18%). Among white adolescents, Newport was more popular in the Northeast (14% [95% CI=±5.0%]) and the Midwest (7% [95% CI=±3.5%]) than in the South (1% [95% CI=±1.2%]) and the West (1% [95% CI=±1.3%]).

COMMIT

For the COMMIT study, data on the adult preferences for cigarette brands were obtained from telephone surveys conducted during January–April 1988 of random samples of 15,415 adult current smokers[¶] aged 25–64 years in the 10 communities. The survey was conducted in two stages: 1) an adult household member reported the smoking status of all adults in that household and 2) all smokers in the household who were aged 25–64 years were interviewed. The overall response rate for the 10 communities was 75%; the first-stage response rate was 82% (range: 76%–86%) and the second-stage response rate was 92% (range: 85%–94%). Current brand use was

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[†]Adolescents who reported smoking cigarettes on 1 or more of the 30 days preceding the survey.

[§]The four regions were Northeast (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont), Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia), and West (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming).

[¶]Adults who answered "yes" to the question "Have you smoked at least 100 cigarettes in your entire life?" and then answered "yes" to the question "Do you smoke cigarettes now?"

TABLE 1. Percentage of self-reported cigarette brands usually bought by current smokers* aged 12–18 years who usually bought their own cigarettes, by cigarette brand† — Teenage Attitudes and Practices Survey, 1989, and cigarette market shares,† 1989

Category	No.	Marlboro	Newport	Camel	Winston	Salem	Benson & Hedges	Kool	Merit	Vantage	Other
		Percentage (95% confidence interval)									
Overall§	865	68.7 (± 3.4)	8.2 (± 1.8)	8.1 (± 2.1)	3.2 (± 1.2)	1.5 (± 0.8)	1.4 (± 1.2)	1.0 (± 0.6)	0.5 (± 0.5)	0.1 (± 0.2)	7.3 (± 1.9)
Sex											
Male	477	68.9 (± 4.5)	7.3 (± 2.4)	10.9 (± 3.4)	3.6 (± 1.8)	0.5 (± 0.6)	0.2 (± 0.4)	1.9 (± 1.1)	0.7 (± 0.7)	0.2 (± 0.4)	6.0 (± 2.3)
Female	388	68.4 (± 5.2)	9.4 (± 2.9)	4.6 (± 1.9)	2.6 (± 1.7)	2.9 (± 1.7)	2.9 (± 2.5)	0	0.3 (± 0.5)	0	8.9 (± 3.0)
Race¶											
White	807	71.4 (± 3.4)	5.6 (± 1.6)	8.4 (± 2.2)	3.4 (± 1.3)	1.0 (± 0.7)	1.3 (± 1.2)	0.6 (± 0.5)	0.5 (± 0.5)	0.1 (± 0.2)	7.6 (± 2.0)
Black	41	8.7 (± 9.7)	61.3 (± 15.7)	3.1 (± 6.2)	0	9.7 (± 7.2)	3.3 (± 6.4)	10.9 (± 9.1)	0	0	2.9 (± 5.8)
Ethnicity**											
Hispanic	46	60.9 (± 15.0)	12.8 (± 9.5)	7.6 (± 8.6)	0	2.8 (± 5.4)	3.7 (± 4.9)	5.8 (± 6.1)	0	0	6.5 (± 7.6)
Non-Hispanic	817	69.1 (± 3.5)	8.0 (± 1.9)	8.1 (± 2.1)	3.3 (± 1.3)	1.5 (± 0.8)	1.3 (± 1.2)	0.8 (± 0.6)	0.5 (± 0.5)	0.1 (± 0.2)	7.3 (± 1.9)
Age (yrs)											
12–15	195	74.8 (± 6.3)	6.1 (± 3.7)	8.7 (± 3.9)	2.5 (± 2.1)	0.9 (± 1.3)	0.4 (± 0.8)	1.1 (± 1.5)	0	0	5.4 (± 3.2)
16–18	670	67.0 (± 3.9)	8.8 (± 2.0)	7.9 (± 2.4)	3.3 (± 1.5)	1.7	1.6 (± 1.5)	1.0 (± 0.7)	0.6 (± 0.6)	0.1 (± 0.3)	7.8 (± 2.2)
Region											
Northeast	184	68.4 (± 7.7)	16.2 (± 5.2)	4.1 (± 3.1)	0	2.3 (± 2.3)	0	0	0.6 (± 1.2)	0.5 (± 1.0)	7.9 (± 4.0)
Midwest	247	70.2 (± 6.2)	10.0 (± 3.9)	7.3 (± 4.8)	3.4 (± 2.5)	2.2 (± 2.0)	0	1.1 (± 1.3)	0.5 (± 1.0)	0	5.3 (± 3.1)
South	281	67.2 (± 5.8)	5.0 (± 2.3)	6.1 (± 2.8)	6.2 (± 2.9)	1.1 (± 0.8)	2.9 (± 2.9)	2.1 (± 1.5)	0.4 (± 0.7)	0	9.1 (± 3.6)
West	153	69.6 (± 8.1)	2.0 (± 2.2)	18.1 (± 6.3)	0.7 (± 1.3)	0.6 (± 1.1)	2.3 (± 2.2)	0	0.6 (± 1.1)	0	6.2 (± 4.0)
Overall market share,† 1989		26.3	4.7	3.9	9.1	6.2	3.9	5.9	3.8	2.5	33.7

*Persons who reported smoking on 1 or more of the 30 days preceding the survey. Sample size 1396.
†Source: Reference 9
§Data were weighted to provide national estimates.
¶Excludes the racial category "other" (n 17).
**Ethnicity for two persons was unknown.

measured by response to the question, "What brand of cigarettes do you usually smoke now?"

During October–December 1990, data on preferences for cigarette brands among teenaged smokers aged 13–16 years were obtained from school-based surveys of students from a random sample of 9th-grade classrooms in each of the 10 communities. The survey included both public and private schools and yielded representative samples of approximately 400 9th-grade students per community. Forty-six (96%) of the 48 eligible schools (i.e., schools with ≥50 students in 9th grade) participated, and 4129 (86%, range: 76%–91%) of the 4783 eligible students completed the survey. Data in this report were limited to 9th-grade students who reported they were current cigarette smokers** and usually bought their own cigarettes. Current brand use was measured by responses to the question, "What brand do you usually buy?"

In all but one community, Marlboro was the preferred brand for at least 20% of adult smokers (Table 2); in Raleigh, North Carolina, the brand most popular among adults was Salem. Winston was preferred by more than 10% in six of the 10 communities. Except for these three preferences, cigarette brand use among adult smokers varied considerably within and across communities; most brands were mentioned by less than 10% of smokers. In communities where the preference for Camels was high among adults (Santa Fe, Medford/Ashland, and Bellingham), use of Camels was highest among younger adults (i.e., aged 25–34 years). Overall, the cigarette brand preferences of adult smokers were consistent with known national market share patterns[tt] (9).

Among 9th-grade smokers across all 10 communities, three cigarette brands—Marlboro, Camel, and Newport—were consistently preferred (84%–100%) (Table 3). Among the 424 teenaged smokers who usually purchased their own cigarettes, 180 (43%) purchased Marlboro, 126 (30%) purchased Camel, and 85 (20%) purchased Newport. In nine of the 10 communities, one third or more of all 9th-grade smokers preferred Marlboro cigarettes. The preference for Camel and Newport cigarette brands varied considerably among communities. In five communities (Santa Fe, Medford/Ashland, Bellingham, Raleigh, and Cedar Rapids) Marlboro and Camel were the most frequently mentioned cigarette brands. In four other communities (Paterson, Utica, Yonkers, and Vallejo), Newport and Marlboro were the dominant cigarette brands. Camel cigarettes were most popular among teenaged smokers in western and midwestern communities. Newport cigarettes were most popular among teenaged smokers from communities in the Northeast. Newport was the most popular brand among black 9th-grade students and third most popular among white 9th-grade students.

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**Adolescents who reported smoking cigarettes on 1 or more of the 30 days preceding the survey.

[tt]Percentage of all cigarettes sold in the United States, by brand. Market share data are collected quarterly by a tobacco industry analyst (9).

TABLE 2. Percentage of cigarette brand use self-reported by adult current smokers*, by cigarette brand — 10 U.S. communities, 1988†

Community	No.	Percentage (95% confidence interval)										
		Marlboro	Winston	Salem	Kool	Newport	Benson & Hedges	Camel	Merit	Virginia Slims	Doral	All other brands
Vallejo, Calif.	1,536	24.3 (±2.1)	7.7 (±1.3)	10.0 (±1.5)	8.5 (±1.4)	4.6 (±1.0)	9.6 (±1.5)	4.1 (±1.0)	3.5 (±0.9)	4.7 (±1.1)	0.7 (±0.4)	22.4 (±3.9)
Cedar Rapids, Iowa	1,234	23.1 (±2.4)	9.2 (±1.6)	6.4 (±1.4)	5.1 (±1.2)	0.3 (±0.3)	2.6 (±0.9)	5.0 (±1.2)	9.1 (±1.6)	3.3 (±1.0)	2.7 (±0.9)	33.2 (±5.4)
Fitchburg/ Leominster, Mass.	1,185	24.1 (±2.4)	13.8 (±2.0)	6.8 (±1.4)	5.1 (±1.3)	8.1 (±1.6)	3.0 (±1.0)	2.6 (±0.9)	5.6 (±1.3)	3.5 (±1.0)	0.3 (±0.3)	27.1 (±4.9)
Paterson, N.J.	1,854	24.5 (±2.0)	13.8 (±1.6)	9.7 (±1.3)	6.5 (±1.1)	16.0 (±1.7)	3.5 (±0.8)	1.3 (±0.5)	1.7 (±0.6)	3.2 (±0.8)	0.1 (±0.1)	19.5 (±3.3)
Sante Fe, N.M.	2,307	28.6 (±1.8)	11.0 (±1.3)	9.5 (±1.2)	3.3 (±0.7)	0.5 (±0.3)	7.2 (±1.1)	11.2 (±1.3)	4.2 (±0.8)	2.8 (±0.7)	1.0 (±0.4)	20.8 (±3.3)
Yonkers, N.Y.	1,494	24.0 (±2.2)	6.2 (±1.2)	9.6 (±1.5)	6.4 (±1.2)	10.4 (±1.5)	4.1 (±1.0)	1.4 (±0.6)	4.1 (±1.0)	3.3 (±0.9)	0	30.5 (±4.6)
Utica, N.Y.	1,347	21.1 (±2.2)	11.7 (±1.7)	9.9 (±1.6)	4.6 (±1.1)	6.8 (±1.3)	3.4 (±1.0)	3.6 (±1.0)	5.2 (±1.2)	1.6 (±.7)	2.3 (±0.8)	29.7 (±4.8)
Raleigh, N.C.	1,546	13.1 (±1.7)	12.8 (±1.7)	13.8 (±1.7)	4.4 (±1.0)	8.0 (±1.4)	4.3 (±1.0)	2.5 (±0.8)	6.9 (±1.3)	5.2 (±1.1)	1.4 (±0.6)	27.6 (±4.6)
Medford/ Ashland, Ore.	1,373	27.5 (±2.4)	9.2 (±1.5)	4.1 (±1.1)	2.5 (±0.8)	0.3 (±0.3)	4.8 (±1.1)	12.5 (±1.8)	5.0 (±1.1)	3.7 (±1.0)	0.9 (±0.5)	29.6 (±4.8)
Bellingham, Wash.	1,539	23.3 (±2.1)	10.5 (±1.5)	6.6 (±1.2)	3.1 (±0.9)	0.2 (±0.2)	4.6 (±1.0)	14.6 (±1.8)	6.6 (±1.2)	2.7 (±0.8)	0.8 (±0.4)	26.9 (±4.5)
Overall	15,415	23.6 (±0.7)	10.6 (±0.5)	8.8 (±0.4)	4.9 (±0.3)	5.6 (±0.4)	4.9 (±0.3)	6.1 (±0.4)	5.0 (±0.3)	3.4 (±0.3)	1.0 (±0.2)	26.1 (±0.7)

*Persons aged 25–64 years who answered "yes" to the question "Have you smoked at least 100 cigarettes in your entire life?" and then answered "yes" to the question "Do you smoke cigarettes now?"

†Unweighted data.

TABLE 3. Percentage of cigarette brand use self-reported by 9th-grade students who smoked and usually bought their own cigarettes*, by cigarette brand — 10 U.S. communities, 1990[†]

Community	No.	Marlboro	Winston	Salem	Kool	Newport	Benson & Hedges	Camel	Virginia Slims	All other brands
						Percentage (95% confidence interval)				
Vallejo, Calif.	18	50.0 (±23.1)	0	0	5.6 (±10.7)	33.3 (±21.8)	0	5.6 (±10.7)	0	5.6 (±10.7)
Cedar Rapids, Iowa	27	70.4 (±17.2)	3.7 (±7.1)	0	0	0	0	25.9 (±16.5)	0	0
Fitchburg/ Leominster, Mass.	37	64.9 (±15.4)	2.7 (±5.2)	0	0	21.6 (±13.3)	0	10.8 (±10.0)	0	0
Paterson, N.J.	30	36.7 (±17.3)	3.3 (±6.4)	0	0	60.0 (±17.5)	0	0	0	0
Sante Fe, N.M.	71	25.4 (±10.1)	0	1.4 (±2.7)	0	0	0	69.0 (±10.8)	0	4.2 (±4.7)
Yonkers, N.Y.	47	40.4 (±14.0)	2.1 (±4.1)	0	0	44.7 (±14.2)	0	0	0	12.7 (±9.5)
Utica, N.Y.	56	37.5 (±12.7)	3.6 (±4.9)	1.8 (±3.5)	1.8 (±3.5)	53.6 (±13.1)	0	1.8 (±3.5)	0	0
Raleigh, N.C.	49	44.9 (±13.9)	10.2 (±8.5)	0	0	4.1 (±5.6)	2.0 (±3.9)	34.7 (±13.3)	4.1 (±5.6)	0
Medford/ Ashland, Ore.	33	42.4 (±16.9)	0	0	0	0	0	57.6 (±16.9)	0	0
Bellingham, Wash.	56	41.1 (±12.9)	5.4 (±5.9)	0	0	0	0	50.0 (±13.1)	0	3.6 (±4.9)
Overall	424	42.5 (±4.7)	3.3 (±1.7)	0.5 (±0.7)	0.5 (±0.7)	20.0 (±3.8)	0.2 (±0.4)	29.7 (±4.3)	0.5 (±0.7)	2.8 (±1.5)

*Students aged 13–16 years who reported they smoked one or more cigarettes during the 30 days preceding the survey.
[†]Unweighted data.

Editorial Note: In both the TAPS and COMMIT surveys, at least 84% of the adolescent current smokers who usually bought their own cigarettes purchased one of three brands—Marlboro, Newport, or Camel. Brand preference is much more tightly concentrated among adolescent smokers than among adult smokers in the 1988 COMMIT baseline survey of adults and in the 1986 Adult Use of Tobacco Survey (AUTS) (*3*) as well as in the overall market (*9*). Marlboro, Camel, and Newport were among the most heavily advertised cigarette brands in the United States during 1990 (*10*); therefore, these data suggest that tobacco advertising may influence teenagers in their choice of brands.

In both surveys, Marlboro was the predominant brand used by adolescents. Teenaged smokers may be attracted to the brand's image of strength and independence promoted in the long-running "Marlboro man" advertising campaign.

The regional preferences for Camel and Newport brands among teenaged smokers (regardless of race) were consistent in both surveys. A recent report from California showed a high rate of Camel use among adolescent current smokers in that state (*4*). These findings may reflect regional differences in exposure to cigarette brand advertising and promotion.

The preference of black adolescent and adult smokers for Newport is also consistent across surveys and may reflect the increased occurrence of mentholated cigarette advertisements targeted to blacks (*11*). Further research is needed to determine whether preference preceded or followed such targeted advertising.

The COMMIT data for adolescents indicate a slightly different pattern of brand preference than do the TAPS data. The higher preference for Camel among the COMMIT respondents compared with the TAPS respondents may reflect the difference in age composition (adolescents aged 13–16 years compared with 12–18 years) and sample frames (the 10 U.S. communities compared with the overall U.S. population). The difference may, however, reflect a growing effect of the "Old Joe" advertising campaign. Recent evidence suggests that the advertising campaign for Camel that began in 1988 and features a dromedary cartoon character appeals more to children than to adults (*5*). In 1986, Camel ranked seventh among the youngest age group (17–24 years) of smokers responding to the AUTS (*3*); in 1989, 1 year after the advertising campaign began, the brand ranked third among teenagers surveyed in TAPS. Other studies, conducted after TAPS, report even higher rates of Camel preference among adolescents (*4,5*), consistent with the COMMIT survey results. Cigarette brands that appeal to children and teenagers also use promotions such as displays at sports and youth-oriented events and distribution of promotional items (e.g., T-shirts, posters, and caps) that may appeal more to children and teenagers than to adults (*12*). One of the national health objectives for the year 2000 is to eliminate or severely restrict all forms of tobacco product advertising and promotion to which persons aged ≤18 years are likely to be exposed (objective 3.15) (*13*).

The forces that influence smoking initiation are complex and may include advertising, peer influence, and habits of family members (*1,4,5*). The exposure of youth to tobacco advertising can be reduced by 1) prohibiting the use of imagery in advertisements by allowing only words and a picture of the product itself (i.e., "tombstone" advertising); 2) prohibiting tobacco sponsorship of sporting and other events that have a substantial youth audience; 3) prohibiting tobacco advertising in publications that have a substantial teenaged readership; 4) prohibiting tobacco billboards

located near schools and other areas where youths congregate (e.g., parks and shopping malls); 5) prohibiting paid tobacco placements in movies and videos; and 6) prohibiting tobacco advertising on promotional items (*12,13*). In addition, school tobacco-prevention programs can play a key role in reducing smoking initiation and should include information about the media's influence on smoking (*13*).

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Cigarette Smoking Bans
in County Jails — Wisconsin, 1991

In the United States, an increasing number of prisons and jails are adopting restrictions on cigarette smoking (*1,2*); these restrictions could affect approximately 10 million inmates (*3*). Although the importance of smoking restrictions in the workplace and some public places (e.g., health-care facilities, schools, and public transportation) has been well described (*4*), information about smoking restrictions in jails is limited. This report summarizes preliminary findings from a survey of sheriffs in Wisconsin to assess the development of policies and to characterize smoking restrictions among county jails in the state.

During November 1991, the Wisconsin Department of Health and Social Services and CDC conducted a statewide survey of all 72 county jails by mailing a questionnaire to the sheriffs responsible for the jails. The questionnaire asked about the current

smoking policy in the jail, plans to change current policy, and the number of admissions to the jail during 1990. Of the 72 sheriffs, 64 (89%) participated in the survey.

During 1990, there were approximately 150,000 admissions* to county jails in Wisconsin; the average number of admissions per jail was 2405 (range: 60–22,164; median: 900). Information on the length of stay of persons incarcerated and their smoking habits was available for two jails. For the first jail, during November–December 1991, the average length of stay for the 1824 inmates was 18 days (range: 1–495; median: 2); 545 (30%) inmates stayed longer than 1 week; and 686 (71%) inmates surveyed smoked cigarettes. For the second jail, during November–December 1991, the average length of stay for the 1052 inmates was 29 days (range: 1–439; median: 6); 508 (48%) inmates stayed longer than 1 week; and 271 (93%) inmates surveyed smoked cigarettes.

Of the 64 jails, 21 (33%) had policies that banned smoking for inmates; 15 (23%) had smoking-restriction policies; and 28 (44%) had no policies to restrict smoking (Table 1). During 1992, sheriffs at 32 (50%) jails plan to ban or continue their ban on smoking; sheriffs at 16 (25%) jails plan to implement policies or continue policies to restrict smoking; and sheriffs at 16 (25%) jails have no plans to implement smoking restrictions or bans. During 1992, sheriffs at two of the 21 jails where smoking is banned plan to rescind the ban.

Of the 43 jails where inmates were allowed to smoke (15 with and 28 without restrictions), 13 plan to ban smoking in 1992. Implementation of these bans will prevent nearly 88,000 (60%) inmates statewide from being exposed to tobacco smoke.

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Editorial Note: In the United States, restrictions on smoking in public places are increasing in number and comprehensiveness (*5*). Although the primary goal of such restrictions is to protect persons who do not smoke from the unhealthy consequences of involuntary exposure to environmental tobacco smoke, they may also help to reduce smoking prevalence by changing attitudes and behaviors of current and potential smokers (*5*).

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*A person may have been admitted more than once.

TABLE 1. Number of jails and inmates affected by smoking policies — Wisconsin, 1991 and planned for 1992

Type of policy	1991				Planned for 1992			
	Jails		Inmates		Jails		Inmates*	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Ban on smoking	21	(33)	65,753	(44)	32	(50)	87,861	(59)
Smoking restrictions	15	(23)	42,779	(29)	16	(25)	45,465	(31)
No smoking restrictions	28	(44)	39,789	(27)	16	(25)	14,995	(10)
Total	64	(100)	148,321	(100)	64	(100)	148,321	(100)

*Estimated numbers.

In Wisconsin and other locations, county jail administrators have initiated bans on cigarette smoking because 1) cigarettes are a safety hazard (i.e., cigarettes and materials used to light them may cause fires); 2) cigarettes may be used to smuggle other illicit drugs into jail; 3) awareness has increased about the negative health effects of active and passive smoking; and 4) some jail administrators are increasingly concerned about the legal rights of nonsmoking inmates to a smoke-free environment (*6,7*).

This survey has at least two limitations. First, no information was collected regarding the implementation of the smoking policies (e.g., time of introduction, problems in implementation, and enforcement). Second, only limited information was available on the length of stay of persons incarcerated and their smoking habits.

In the United States, more than one third of persons who are incarcerated are kept in custody in local jails, and the average length of stay in county jails varies (*8*). Although most nicotine withdrawal symptoms decrease dramatically during the first week of abstinence (*9*) (substantially less than the average length of stay for a sentenced county jail inmate [*8*]), it is unknown whether forced abstinence from nicotine encourages smokers to quit. However, if smokers who overcome the most severe nicotine withdrawal symptoms would consider quitting smoking, smoking-cessation counseling programs for these inmates before their release may offer an opportunity to reach otherwise inaccessible segments of the population. In Wisconsin, efforts have been initiated to assess the effects of different jail smoking policies on the desire of inmate smokers to quit smoking after they are released.

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Public Attitudes Regarding Limits on Public Smoking
and Regulation of Tobacco Sales and Advertising —
10 U.S. Communities, 1989

The national health objectives for the year 2000 emphasize the need for policies and laws that restrict smoking in public places, restrict minors' access to tobacco products, and restrict minors' exposure to tobacco product advertising and promotion (*1*). To characterize public attitudes regarding policy issues related to the prevention and control of tobacco use, the National Cancer Institute surveyed communities participating in the Community Intervention Trial for Smoking Cessation (COMMIT) (*2*). This report describes the results of a baseline COMMIT survey in 10 U.S. communities.*

Data were obtained from a telephone survey conducted from January through April 1989 of stratified random samples of persons aged 25–64 years who were identified in the 1988 COMMIT baseline survey (*3*). Approximately 113 heavy smokers (≥25 cigarettes per day), 120 light/moderate smokers (1–24 cigarettes per day), 112 smokers who had recently quit (≤5 years), and 172 persons who had not smoked in >5 years or who had never smoked were identified in each of the 10 participating communities during the 1988 baseline survey. Of the 5172 persons identified, 3654 (71%) persons participated in the 1989 survey. The data for each community were weighted to reflect variations in smoking status and response rate differences among communities so that overall weighted estimates were derived for each community.

In all 10 communities, respondents supported limiting smoking in a wide range of locations (Table 1). Although nonsmokers were more likely than smokers to support limiting smoking in various locations, 82%–100% of smokers supported limiting smoking in restaurants, private worksites, government buildings, indoor sports arenas, hospitals, and doctors' offices. In each community, most of the survey population favored efforts to restrict minors' access to cigarettes (Table 2). In six communities, 50%–56% agreed that tobacco companies should not be allowed to sponsor sporting and cultural events, and in nine communities, 55%–73% agreed that all tobacco advertising should be eliminated. Communities varied considerably in their attitudes toward banning the sale of cigarette products (Table 3).

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Editorial Note: The findings in this report indicate a high level of concordance among these 10 geographically diverse communities for support of regulatory efforts to limit public exposure to environmental tobacco smoke. In addition, these findings are consistent with those in other reports (*4,5*). As of 1989, approximately 50% of large businesses had promulgated smoking restriction policies for their employees (*4*). Through March 1991, 46 states[†] had enacted laws restricting smoking in public places (CDC, unpublished data).

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*Four of the 10 communities surveyed are located in the Northeast (Fitchburg/Leominster, Massachusetts; Paterson, New Jersey; Utica, New York; Yonkers, New York); three in the West (Vallejo, California; Medford/Ashland, Oregon; Bellingham, Washington); and one each in the South (Raleigh, North Carolina), Southwest (Santa Fe, New Mexico), and Midwest (Cedar Rapids, Iowa).
[†]Including the District of Columbia.

TABLE 1. Percentage of persons (aged 25–64 years) surveyed who favored restricting or banning smoking in specific locations* — 10 U.S. communities, 1989

Community	No.†	Bars		Restaurants		Bowling alleys		Private worksites		Government buildings		Indoor sports arenas		Hospitals		Doctors' offices	
		Restrict %	Ban %	Restrict %	Ban %	Restrict %	Ban %	Restrict %	Ban %	Restrict %	Ban %	Restrict %	Ban %	Restrict %	Ban %	Restrict %	Ban %
Vallejo, Calif.	359	57.8	9.7	76.1	22.0	66.9	15.4	79.2	14.3	73.7	22.5	37.8	57.9	43.1	56.6	19.7	79.2
Cedar Rapids, Iowa	402	57.0	6.1	78.4	19.1	65.2	11.7	81.1	11.6	74.1	21.7	38.3	59.5	52.2	47.0	24.1	75.0
Fitchburg/ Leominster, Mass.	375	64.7	7.7	79.2	18.5	69.2	16.2	82.9	11.4	79.0	18.8	41.6	54.4	47.3	52.0	21.3	77.6
Paterson, N.J.	298	46.4	15.3	69.0	28.6	50.4	27.8	65.6	28.6	56.9	39.5	30.9	63.8	26.4	73.6	13.5	86.0
Santa Fe, N.M.	356	57.1	12.0	66.8	32.3	69.8	14.6	80.3	14.1	75.3	22.8	34.5	63.9	38.4	61.6	15.7	83.0
Yonkers, N.Y.	356	58.9	10.8	79.7	16.2	67.1	14.8	77.2	14.9	75.3	19.7	43.3	52.1	49.7	50.1	28.9	70.2
Utica, N.Y.	376	58.0	11.1	74.3	23.0	59.8	13.4	79.0	11.0	78.1	16.7	40.7	56.3	39.5	59.8	25.2	72.7
Raleigh, N.C.	384	63.5	9.5	74.7	23.2	65.2	15.7	77.2	14.4	81.4	13.8	38.2	55.1	50.2	48.1	22.9	75.1
Medford/Ashland, Ore.	371	56.3	9.6	72.5	25.8	71.2	16.9	81.5	9.5	70.2	28.0	34.7	63.6	43.4	56.3	20.5	79.3
Bellingham, Wash.	377	65.1	9.2	70.7	28.7	67.9	19.9	79.9	15.2	64.6	35.0	34.0	65.6	36.6	63.0	13.7	86.3
All (range)§		61.7–74.3		95.9–99.4		73.2–88.1		90.0–95.1		94.8–99.6		93.3–99.6		98.3–100.0		97.9–100.0	

*95% Confidence intervals do not exceed ±9% for any given point estimate.
†Number of completed interviews.
§Restricted and banned percentages combined.

TABLE 2. Percentage of persons (aged 25–64 years) surveyed who favored regulating minors' access to tobacco products* — 10 U.S. communities, 1989

Community	Percentage in agreement with the following statements:			
	Tobacco products should be as strictly controlled as alcohol products	Merchants who sell tobacco to minors should be fined	Cigarette vending machines should be eliminated in places where teens gather	Smoking should be banned on school grounds
Vallejo, Calif.	74.2	91.3	88.5	67.2
Cedar Rapids, Iowa	67.6	87.5	83.1	62.2
Fitchburg/Leominster, Mass.	74.4	86.9	83.9	61.9
Paterson, N.J.	75.4	92.6	86.0	76.9
Santa Fe, N.M.	68.3	76.6	83.2	68.2
Yonkers, N.Y.	70.0	91.5	79.4	62.0
Utica, N.Y.	73.2	90.8	86.2	63.9
Raleigh, N.C.	53.5	82.4	76.3	55.4
Medford/Ashland, Ore.	69.2	86.4	89.1	62.2
Bellingham, Wash.	73.0	89.9	88.1	70.6
All (range)	53.5–75.4	76.6–92.6	76.3–89.1	55.4–76.9

*95% Confidence intervals do not exceed ±9% for any given point estimate.

TABLE 3. Percentage of persons (aged 25–64 years) surveyed who favored regulating advertising, promotion, and sale of tobacco products* — 10 U.S. communities, 1989

Community	Percentage in agreement with the following statements:		
	Tobacco companies should not be allowed to sponsor sporting and cultural events	All tobacco advertising should be eliminated	A law should be passed against the sale of all cigarettes
Vallejo, Calif.	52.1	61.4	30.5
Cedar Rapids, Iowa	42.9	54.5	18.5
Fitchburg/Leominster, Mass.	50.4	62.0	31.2
Paterson, N.J	56.0	67.6	49.3
Santa Fe, N.M.	46.4	61.1	24.4
Yonkers, N.Y.	52.1	62.7	31.2
Utica, N.Y.	55.0	57.8	30.3
Raleigh, N.C.	31.2	46.5	17.0
Medford/Ashland, Ore.	45.5	58.4	19.9
Bellingham, Wash.	52.0	73.0	22.6
All (range)	31.2–56.0	46.5–73.0	17.0–49.3

*95% Confidence intervals do not exceed ±9% for any given point estimate.

Respondents in each of the 10 communities in this survey strongly supported the enactment and enforcement of laws restricting the sale of tobacco to minors. Although legislation in 45 states[†] restricting the sale of cigarettes to minors has been in place since 1989 (*6*), enforcement and compliance have been limited (*7*). In 1989, the U.S. Inspector General reported only 32 documented violations of sales laws (*7*); however, in the United States an estimated 1 billion packs of cigarettes are sold annually to persons <18 years of age (*8*).

In 1987 and 1988, surveys on the banning of tobacco advertising indicated that 49%–55% of respondents believed tobacco advertising should not be permitted (*4*). In many communities, tobacco advertising has been banned in public transit systems.

To target the need for smoking control and prevention, the national health objectives for the year 2000 include: 1) increasing to at least 75% the proportion of worksites with a formal smoking policy that prohibits or severely restricts smoking in the workplace; 2) enacting in all 50 states comprehensive laws on clean indoor air that prohibit or strictly limit smoking in the workplace and enclosed public places; 3) enacting and enforcing laws that prohibit the sale and distribution of tobacco products to persons <19 years of age, particularly where age verification is difficult or impossible (such as through vending machines); 4) establishing tobacco-free environments in all elementary, middle, and secondary schools; and 5) eliminating or severely restricting all forms of tobacco product advertising and promotion to which minors are likely to be exposed (*1*).

[†]Including the District of Columbia.

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Establishment of Smoke-Free Offices Worldwide — U.S. Peace Corps

The Peace Corps (PC) of the United States is a government-sponsored international development agency with more than 6000 volunteers in approximately 70 developing countries. Since July 1988, PC headquarters in the District of Columbia has been a smoke-free workplace. From February through March 1991, all overseas PC full-time staff members were surveyed regarding cigarette smoking and attitudes toward a proposed smoke-free policy (complete ban) for PC offices worldwide. In addition, the directors of all overseas offices were surveyed regarding existing restrictions on smoking in the workplace. This report summarizes results of the survey.

During the survey, the PC employed more than 860 full-time staff members (approximately 75% were host-country nationals) in 58 overseas offices that provide field support to PC volunteers. Of these, 644 (75%) full-time staff members from 52 (90%) offices responded to the survey on employee attitudes. Approximately 21%, 21%, and 58% of staff members were current, former, or never smokers, respectively. Overall, 80% of staff members supported a smoke-free policy in the workplace, including 67% of current smokers, 89% of former smokers, and 82% of never smokers. Eighty-seven percent agreed that smoking should be banned in areas where nonsmokers must work. In each office, at least 50% of staff members supported a smoke-free workplace, including 86% of U.S. staff members and 79% of host-country national staff members.

Of the 51 offices that provided information about existing workplace smoking policies, 35 (69%) restricted smoking in the workplace. Most policies prohibited smoking in common areas, such as conference rooms, but allowed smoking in individual offices. Twelve (24%) offices had smoke-free policies. During 1990, 30% of PC office directors had received complaints from staff members regarding exposure to cigarette smoke in the workplace.

Because of the adverse health effects of involuntary exposure to cigarette smoke and the strong support for a smoke-free workplace policy among PC staff members, all overseas PC offices will be smoke-free effective September 1, 1991.

Reported by: PD Coverdell, JK Olsen, Office of the Director, TH van der Vlugt, Office of Medical Svcs, Peace Corps, Washington, DC. International Health Program Office; Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The PC will be the first federal agency to provide a smoke-free environment for its employees worldwide. In 1986, the General Services Administration published guidelines for federal agencies to follow in establishing their own smoking regulations to protect nonsmoking workers from involuntary exposure to environmental tobacco smoke at federal worksites (1). These guidelines specified that smoking be minimized in areas with nonsmokers and that agency heads consider the opinions of employees in determining smoking policy. Other federal agencies with overseas facilities that have restricted (but not banned) smoking in the workplace include the Department of Defense (2) and the Department of State (Office of Medical Services, unpublished data).

For developing countries, information is limited regarding the prevalence of restrictions and the attitudes of workers about restrictions on smoking in the workplace (3). However, in both industrialized and developing countries, the trend is increasing

toward regulation of smoking in public places and workplaces (4). In the PC survey, the high rate of support for a smoke-free workplace policy among host-country national staff members may not be representative of attitudes in the general populations; this level of support is likely to reflect higher levels of education among those staff members, as well as the influence of U.S. staff members.

The World Health Organization estimates that, during the 1990s, approximately 3 million persons will die each year as a direct result of smoking-related illnesses, and about one third of these deaths will occur in developing countries (5). These estimates underscore the need to prevent cigarette smoking and involuntary exposure to cigarette smoke in both industrialized and developing countries.

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Cigarette Sales to Minors — Colorado, 1989

In July 1987, the Colorado legislature enacted a law* that prohibits the sale of tobacco to minors (persons <18 years of age) and prohibits minors from purchasing tobacco. In August 1989, The Coalition for a Tobacco-Free Colorado, a consortium of privately and publicly funded health organizations, assessed the effectiveness of the law in preventing minors from purchasing cigarettes in Colorado. This report summarizes the findings from that assessment.

Eleven teams of volunteers, each consisting of a minor (mean age: 14.9 years; range: 9–17 years) and an adult, attempted to purchase cigarettes (but did not actually purchase cigarettes) at randomly selected tobacco sales outlets in suburban Denver and outlying communities. Adult members of the team were chosen from a network of coalition volunteers; minors were recruited by the adults (e.g., from their own families or from families of friends). Although each team was initially assigned 20 sites, including up to four vending machine sites, the final sample included 121 sites (range: 4–22 per team). The survey design was modeled on a 1988 study in Santa Clara County, California; in that study, the minors actually purchased the cigarettes (1). Because no cigarettes were purchased in the Colorado study, law enforcement officials were not notified of the study.

At each retail site, the team member who was a minor entered the store alone and asked the vendor for a pack of cigarettes. If the minor was asked for age verification and denied purchase, the attempt was classified as unsuccessful. If a sale was

*State of Colorado law CRS 18-13-121 entitled "Concerning Unlawful Distribution of Cigarettes and Tobacco Products."

recorded on the cash register or a pack of cigarettes was placed on the counter, the attempt was considered successful (a purchase was not made, however; instead, the minor stated that he/she did not have enough money and left the store). The attempt was also considered successful if the vendor asked the minor his/her age but was prepared to sell the cigarettes regardless of the minor's age.

At each vending machine site, the minor entered the vending area alone and attempted to locate the vending machine sign that is required by state law to warn against cigarette sales to minors. If the minor was able to simulate a purchase (i.e., by inserting four pennies, pressing a selection button, pretending to pick up a pack of cigarettes, and leaving the site), the attempt was considered successful. If the proprietor asked for the minor's age or identification, the attempt was considered unsuccessful.

Of 121 purchase attempts, 97 involved contact with a vendor and 24 involved vending machines. Overall, 64% of attempts were successful, including 55% of the vendor contacts and 100% of the vending machine attempts. The success rate was similar for older (>14 years of age) and younger (≤14 years of age) minors (26/47 [55%]) compared with 27/50 [54%], respectively). Although girls were more successful than boys (60% compared with 48%), this difference was not statistically significant (p >0.05, chi-square test). Attempts were more successful in pharmacies (8/10 [80%]) and gas stations (11/16 [69%]) than in food stores (10/21 [48%]) and convenience stores (18/39 [46%]); attempts at nonfood outlets were more likely to be successful than attempts at food outlets (68% compared with 46%; p <0.05). Purchase attempts were more successful in rural towns than in suburban Denver stores (64% compared with 41%; p <0.05). For 17 (71%) of the vending machines, the required warning signs were not posted.

Reported by: L Ravesloot, Front Range Community College, Westminster; WF Young, MA, DA Walkington, Div of Prevention Programs, Colorado Dept of Health. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: In the United States, approximately 80%–90% of smokers begin smoking before age 21 (*2*), and an estimated 3000 teenagers initiate smoking each day (*3*). Based on national estimates and Colorado population data, approximately 80 minors in Colorado must initiate smoking each day to sustain 1986 cigarette sales levels (i.e., to offset the number of smokers lost to cessation or death) (*4*).

In general, most smoking-prevention activities in Colorado and other states have been aimed at reducing demand for tobacco among young persons through educational programs. Activities that restrict the supply of tobacco to minors have been hampered because laws that support such activities often do not have substantive provisions for enforcement (*5*).

Findings from this survey indicated that merchant policies requiring sales clerks to establish customer proof of age to purchase cigarettes have not been implemented universally in Colorado. Moreover, sales clerks did not appear to discriminate in their sales practices between very young adolescents and those closer to legal age. Minors' access to cigarettes may have been less successful at food outlets than at nonfood outlets because most food outlets in Colorado sell beer, and sales clerks at these outlets are accustomed to asking for proof of age. Minors may have been able to purchase cigarettes more readily in outlying communities because the age restriction

may not have been as well-publicized in those areas as in the Denver metropolitan area. Many vendors in Colorado may not be familiar with this law and its specific provisions; some may believe that its enforcement is unlikely or that the profits from cigarette sales to minors outweigh possible financial penalties for violating the law.

Options available to state and local jurisdictions that could more effectively restrict access to tobacco by minors include 1) developing a retail tobacco sales licensure system in which licensure fees are used to support enforcement efforts, 2) educating vendors about tobacco sales to minors and about the vendors' responsibility to up-hold the law prohibiting such sales, and 3) enacting state laws and local ordinances that prohibit the sale of tobacco through vending machines (6).

Colorado will use the results from this study to help develop support for an enforcement program to reduce sales of cigarettes to minors, assist tobacco retail groups in increasing their use of warning signs, and help educate tobacco merchants about the need to prevent the illegal purchase of cigarettes by minors.

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Evaluation of an Employee Smoking Policy — Pueblo, Colorado, 1989–90

In December 1988, the Colorado Department of Health and CDC were asked to help evaluate a planned worksite policy banning employee smoking for the Colorado State Hospital, a psychiatric hospital in Pueblo, Colorado. Purposes of the evaluation were to 1) determine whether implementation of the policy reduced the exposure of hospital employees to environmental tobacco smoke (ETS) in the workplace; 2) assess the acceptance of the policy among employees; and 3) assess the effect of the policy on the smoking behavior of employees who smoked. This report presents findings from employee surveys at three time periods: before, and at 3 and 12 months after policy implementation.

Before February 1, 1989 (the day the policy was implemented), employees were allowed to smoke in designated areas within the hospital. After February 1, smoking by employees was prohibited indoors; hospitalized patients were permitted to continue smoking in designated areas on patient-care wards.

Self-administered questionnaires were distributed to all 1400 hospital employees in January (before the policy change) and May 1989 and in February 1990. The questionnaire asked employees to provide information about their exposure to ETS at

work. Other questions elicited attitudes and opinions about the new hospital smoking policy.

The questionnaires were analyzed as cross-sectional samples of the hospital work force. A cohort analysis was done of 73 smokers who voluntarily identified themselves on the questionnaire and responded to the two follow-up surveys; this analysis permitted assessment of individual behavioral changes. All analyses were stratified by smoking status.

"Ever smokers" were defined as persons who had smoked ≥100 cigarettes in their lifetimes, including both current smokers (who continued to smoke at the time of the surveys) and former smokers who did not smoke. "Never smokers" were defined as persons who had smoked <100 cigarettes in their lifetimes. Smokers were asked how many cigarettes they smoked during work hours and in a 24-hour day.

In January 1989, 1032 (74%) employees responded to the questionnaire; in May 1989, 762 (54%) employees responded, and in February 1990, 745 (53%) employees responded to the follow-up survey. Age, sex, and ethnicity of respondents to each survey were similar to the demographic distribution of the entire hospital workforce (Colorado State Personnel Office, unpublished data).

In January 1989, before the employee smoking ban took effect, 41.5% of employees reported working in a smoke-free work area. In May, 3 months after the ban, 72.1% reported their work area was smoke-free (p <0.01, chi-square test); in February 1990, 80.5% reported their work area was smoke-free. The percentage of employees reporting smoke-free worksites did not vary by smoking status.

From January 1989 to February 1990, overall employee support for the smoking ban increased from 59% to 68%, respectively (p <0.01, controlled for smoking status, Mantel-Haenszel chi-square test); the greatest change occurred among former smokers. Support for the ban was greatest among never smokers and least among current smokers (Table 1).

The reported prevalence of current smoking varied little during the evaluation. In January 1989, 29% of respondents were current smokers, compared with 24% in May and 25% in February 1990. Among the cohort of 73 smokers, the average daily number of cigarettes smoked at work declined from 7.7 in January 1989 to 4.2 in February 1990; during the same period, however, the number of cigarettes smoked after work increased from 8.6 to 10.3. The net average change in cigarettes smoked in a 24-hour day declined by 1.8 cigarettes, from 16.3 to 14.5.

Reported by: GS Mayo, Colorado State Hospital, Pueblo; JA Pritzl, Colorado Dept of Admin istration; WF Young, RE Hoffman, MD, State Epidemiologist, Colorado Dept of Health. Program

TABLE 1. Opinions expressed by employees about worksite smoking ban before and 3 months and 12 months after implementation of the ban, by cigarette smoking status — Colorado State Hospital, 1989–90

Smoking status	January 1989				May 1989				February 1990			
	Total		Support policy		Total		Support policy		Total		Support policy	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Current*	300	(29)	60	(20)	184	(24)	39	(21)	187	(25)	45	(24)
Former†	334	(32)	234	(70)	260	(34)	211	(81)	237	(32)	194	(82)
Never§	398	(39)	317	(80)	318	(42)	272	(86)	321	(43)	269	(84)
Total	1032	(100)	611	(59)	762	(100)	522	(69)	745	(100)	508	(68)

*Smoked ≥100 cigarettes and continued to smoke at the time of the surveys.
†Smoked ≥100 cigarettes in their lifetimes but did not smoke at the time of the surveys.
§Smoked <100 cigarettes in their lifetimes.

Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion; Div of Field Svcs, Epidemiology Program Office, CDC.

Editorial Note: Smoke-free worksite policies decrease the exposure of nonsmokers to ETS (*1*). The American Medical Association, the American Hospital Association, and other groups have advocated smoke-free hospitals (*2,3*). However, psychiatric hospitals present special challenges to administrators attempting to prevent the exposure of employees and patients to ETS through the creation of smoke-free hospital environments. The prevalence of smoking among psychiatric patients appears to be substantially higher than among the general population (*4*), and the concept of the smoke-free psychiatric facility has not yet been widely accepted by hospital administrators and staff (*5*). For these reasons, policies that restrict smoking in psychiatric facilities have been difficult to enact. However, smoke-free policies for psychiatric hospitals should benefit patients served by these facilities in ways other than reducing risk for smoking-related disease. For example, patients who are smokers may require higher doses of therapeutic drugs than do patients who are nonsmokers (*6*), and some psychiatric patients may be at increased risk for fatal and nonfatal injuries from fire caused by cigarettes (*7*).

This evaluation indicates that employee acceptance of smoking restrictions can be sustained in a psychiatric facility, even after being in place 12 months. These findings are similar to those reported in other worksites (*8*). Because inpatients were permitted to smoke indoors, approximately 20% of employees reported exposures to ETS at the worksite after policy implementation. Additional studies of smoke-free policies that benefit both patients and staff are under way at this facility.

Through a combination of employee education and cooperation of all management levels, worksite policies can be implemented with minimal conflict and enforcement difficulty (*9*).

In Colorado, only modest short-term changes in smoking behavior (e.g., fewer cigarettes smoked at work) occurred among current smokers, but these were partially offset by an increase in smoking after working hours. Long-term changes in the smoking practices of employees may produce health and economic benefits for smoking and nonsmoking employees, as well as for employers.

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Cigarette Brand Use Among Adult Smokers — United States, 1986

Information about the use of cigarette brands is important to the development of smoking-prevention and smoking-cessation strategies. This report summarizes data from the 1986 Adult Use of Tobacco Survey (AUTS), which describe the brand of cigarettes smoked as reported by respondents; the data are presented by sex, race, age, and level of educational attainment.

The AUTS, conducted by CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, was designed to assess the knowledge, attitudes, and practices of adults regarding all forms of tobacco use. Data for this telephone survey, conducted primarily during October through December of 1986, were collected from a national probability sample of 13,031 respondents ≥17 years of age and were weighted to represent the civilian, noninstitutionalized, adult U.S. population. According to the AUTS, an estimated 26.5% (approximately 46.8 million) of adults were smoking cigarettes in 1986 (*1,2*).

Data from the 4700 current cigarette smokers in 1986 who responded to the AUTS were used in this analysis. Current brand use was determined by responses to the question, "What brand of cigarettes do you usually smoke now?" (*1*). A series of follow-up questions were used to determine the specific variety of the brand used (e.g., mentholated vs. nonmentholated and "lights" vs. regular). In this report, however, data are presented only by overall brand categories. Market share data* are provided for comparison.

In 1986, the 12 most commonly named brands of cigarettes smoked were used by 74.7% of all current smokers and accounted for 72.6% of the cigarette market (*3*) (Table 1). Marlboro, Winston, Salem, Kool, and Newport—the top five brands smoked—were used by 52.0% of current smokers and accounted for 52.1% of the cigarette market. The percentage of smokers who reported using Marlboro (24.1%) was more than double the percentage who reported using Winston (9.6%), the next most commonly named brand (these findings were also consistent with known market share patterns [*3*]).

Brand use varied by smoker's sex, race, and age. Differences by race in part reflected increased use of mentholated cigarettes by blacks (*4,5*). Fifty-five percent of all black smokers reported using one of three brands that were available only in mentholated form (Newport, Kool, and Salem). Fifty-four percent of smokers 17–24 years of age used Marlboro, more than twice the proportion in older age groups or the entire population (Table 1). The use of Merit and Kent varied directly with increasing level of education; in comparison, the use of Newport and Pall Mall varied inversely with level of education (Table 1).

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Editorial Note: Unlike market share data, the AUTS data allow analysis of brand use by sociodemographic variables or other characteristics. Overall, self-reported brand use from the AUTS is consistent with market share data for 1986 (Table 1) (*3*). Discrepancies between the sales-based and self-reported data may reflect differences in the

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*Percentage of all cigarettes sold in the United States, by brand. Market share data are collected quarterly by a tobacco industry analyst (*3*).

TABLE 1. Self-reported cigarette brand use among current cigarette smokers — Adult Use of Tobacco Survey, 1986; and cigarette market shares — 1986 and 1989

Characteristic	No.	Marlboro	Winston	Salem	Kool	Newport	Benson and Hedges	Camel	Merit	Pall Mall	Vantage	Virginia Slims	Kent	Total
Self-reported use*														
Overall	4700	24.1	9.6	8.2	5.6	4.5	4.3	4.0	3.8	2.9	2.8	2.7	2.2	**74.7**
Sex														
Male	2348	28.2	11.5	6.5	6.0	4.9	2.9	6.5	3.6	3.4	2.8	0.3	1.9	**78.4**
Female	2352	19.4	7.5	10.1	5.1	4.1	5.9	1.3	4.1	2.4	2.9	5.3	2.5	**70.4**
Race†														
White	4125	26.2	9.9	7.4	3.7	2.3	3.8	4.4	4.4	3.1	3.2	2.7	2.4	**73.5**
Black	438	6.0	5.7	15.3	18.8	21.0	8.1	0.8	0.1	2.0	0.4	3.0	0.5	**81.5**
Age (yrs)														
17–24	587	54.4	4.0	3.3	4.6	10.5	4.3	2.7	1.9	0.0	0.6	2.4	0.2	**88.7**
25–44	2434	25.9	9.5	10.0	7.0	5.5	4.1	4.2	5.0	1.0	2.7	3.3	1.4	**79.7**
45–64	1264	8.7	12.7	7.8	4.4	0.5	5.0	4.3	2.7	7.1	4.0	1.9	4.0	**63.0**
≥65	415	6.8	10.4	7.5	2.8	0.0	3.7	4.4	3.1	6.3	4.1	2.0	4.7	**55.8**
Education (yrs)														
<12	954	24.4	11.1	7.9	5.3	5.5	4.0	3.9	1.4	3.8	3.1	2.0	1.0	**73.4**
12	1961	24.6	9.6	8.3	6.3	4.8	3.0	4.6	3.8	3.0	2.8	3.0	2.4	**76.0**
13–15	1140	24.0	7.2	9.1	5.2	4.0	6.9	3.2	5.3	1.8	2.4	2.8	2.6	**74.5**
≥16	645	21.4	8.8	7.5	4.3	1.4	6.2	3.5	8.4	1.7	2.6	3.4	4.1	**73.5**
Market share														
1986		23.0	11.2	7.8	6.3	3.8	4.4	2.6	4.0	0.6	3.2	2.9	2.8	**72.6**
1989§		26.5	9.2	6.2	6.0	4.7	3.7	2.7	3.8	0.6	2.6	3.1	2.0	**71.1**

*Data weighted to represent the civilian, noninstitutionalized, adult (≥17 years of age) U.S. population.
†Excludes the racial category "other" (n = 137).
§Preliminary data.

number of cigarettes smoked by users of different brands, differences in brand use between current smokers and former smokers who had quit in 1986 before the AUTS, and errors in measurement (e.g., use by a smoker of more than one brand). The similarity in market shares between 1986 and 1989 (Table 1) (*3*) suggests that the self-reported 1986 data on brand use may also represent more recent cigarette use.

Factors that may affect smokers' use of a brand of cigarettes include cost, the "taste" of the cigarette, the perceived harmfulness of the cigarette, and the image of those who smoke a particular brand as projected through its advertising. Assessing sociodemographic differences among smokers by brand use and determining reasons for those differences may help in developing and targeting effective interventions for reducing smoking among specific population subgroups. For example, local surveys have found that the proportion of teenaged smokers who use Marlboro is substantially higher than the brand's market share (*6,7*)—a finding consistent with the AUTS data for persons aged 17–24 years. As a result, a school curriculum designed in California is being used in several states to counter the advertised image of Marlboro smokers as strong, rugged, and independent (*8*). The key component of the curriculum, a British documentary film entitled *Death in the West*, features six real cowboys in the American West who were dying from lung cancer or emphysema. Although 26.2% of white smokers used Marlboro, only 6.0% of black smokers used that brand; therefore, a health education program based on the Marlboro image may have a greater impact among whites than among blacks.

Several brands have been marketed primarily or exclusively to women (*9*); for example, Virginia Slims (used by 5.3% of female smokers) advertising promotes the image of the independent or "liberated" female smoker. However, more than one quarter of female smokers use either Marlboro (19.4%) or Winston (7.5%), which have been depicted primarily as "male brands"; some women may smoke "male brands" because of the implication of gender equality (*10*).

AUTS data show that 76% of blacks but only 23% of whites smoked mentholated brands (*5*). Increased understanding of why blacks use mentholated brands may assist in designing smoking-prevention and smoking-cessation interventions targeted to blacks.

AUTS data (*5*) also indicate that more highly educated smokers were more likely to use brands with a low-tar yield (≤15 mg per cigarette). This finding suggests that this group may be more receptive to the message that the benefits of quitting substantially exceed the benefits of switching from high- to low-tar brands (*11,12*).

By tracking trends in use of brands of cigarettes, the role of cigarette advertising in smoking initiation may be more clearly understood. For example, recent advertising campaigns for Camel cigarettes featuring the "Old Joe" dromedary cartoon character may "reposition" the brand into a younger population (*13*). An increase in the use of Camel cigarettes by young persons, particularly teenagers, would suggest that the Camel advertising campaign is stimulating the recruitment of new smokers. CDC's 1989 Teenage Attitudes and Practices Survey will provide national data on use of brands of cigarettes and smokeless tobacco among persons 12–18 years of age who use such products.

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State Laws Restricting Minors' Access to Tobacco

To reach the goal of a smoke-free society by the year 2000, children and adolescents must be prevented from initiating the use of tobacco. However, recent national surveys on adult tobacco use indicate that 90% of all new smokers now begin smoking before age 21 (*1*). Laws restricting access to tobacco by minors may help delay and ultimately prevent the decision to begin tobacco use during adolescence (*2*). This report summarizes the content and coverage of state laws restricting minors' access to tobacco.

State laws restricting the sale and distribution of tobacco to minors were described in the 1989 Report of the Surgeon General, *Reducing the Health Consequences of Smoking: 25 Years of Progress* (*1*). That review covered laws in existence as of October 1988. Additional data about these laws and about licensure requirements for the sale of tobacco were obtained in a survey of health agencies in all 50 states and the District of Columbia administered in October 1989 by the Association of State and Territorial Health Officials (ASTHO) (*3*).

Forty-four states and the District of Columbia have laws restricting minors' access to tobacco (Table 1). The age for legal purchase of tobacco products is 19 years in three states, 18 years in 36 states, 17 years in four states, and 16 years in one state and the District of Columbia. Of these, 42 states and the District of Columbia also prohibit the free distribution of tobacco products to minors. Seventeen states require signs

TABLE 1. Summary of current state laws restricting minors' access to tobacco products

State*	Minimum age (yrs) for sale or possession	Prohibits sale of tobacco products to minors	Prohibits free distribution of tobacco to minors	Requires signs posted at point of sale	Penalties†	Requires retail cigarette or tobacco license	Enforcement provisions	Prohibits cigarette vending machines accessible to minors
Alabama	19	Yes	Yes	No	a	Yes	No	No
Alaska	19§	Yes	Yes	No	a	Yes	No	Yes
Arizona	18§	Yes	Yes	No	b	No	No	No
Arkansas	18	Yes	Yes	No	a	Yes	No	No
California	18§	Yes	Yes	Yes	a	No	No	No
Colorado	18	Yes	Yes	No	b	No	No	No
Connecticut	18	Yes	Yes	No	b	Yes	No	No
Delaware	17	Yes	Yes	No	a	Yes	No	No
District of Columbia	16	Yes	Yes	No	a	Yes	No†	No
Florida	18	Yes	Yes	Yes	a	No	Yes¶	No
Georgia	17	Yes	Yes	No	b	Yes	No	No
Hawaii	18	Yes	Yes	No	b	No	No	No
Idaho	18§	Yes	Yes	No	a	No	No	Yes
Illinois	18§	Yes	Yes	Yes	a	Yes	No	No
Indiana	18§	Yes	Yes	Yes	b	No	No	Yes
Iowa	18	Yes	Yes	No	a	Yes	No	No
Kansas	18§**	Yes**	Yes	No	a	Yes	No	No
Kentucky	No	No	No	No	No	No	No	No
Louisiana	No	No	Yes	No	No	No	No	No
Maine	18§	Yes	Yes	Yes	b	No	No	Yes
Maryland	18	Yes	Yes	No	a	Yes	No	No
Massachusetts	18	Yes	Yes	Yes	b	Yes††	No	No
Michigan	18§	Yes	Yes	Yes	a	No**	No	No
Minnesota	18§	Yes	Yes§§	No	a	No**	No	Yes
Mississippi	18	Yes**	Yes	No	a	No	No	No
Missouri	No	No	No	No	No	Yes	No	No
Montana	No	No	No	No	No	Yes**	No	No
Nebraska	18§	Yes	Yes	No	a	No**	Yes¶	No

Nevada	18	Yes	Yes	No	b	No	No	No
New Hampshire	18§	Yes	Yes	Yes	b	Yes††	No	No
New Jersey	18	Yes	Yes	Yes	b	Yes††	Yes	No
New Mexico	No	No	No	No	No	No	No	No
New York	18	Yes	No	Yes	a	Yes	No	No
North Carolina	17	Yes	Yes	No	a	Yes	No	No
North Dakota	18§	Yes	Yes	No	a	Yes	No	No
Ohio	18	Yes	Yes	Yes	a	Yes	No	No
Oklahoma	18	Yes**	Yes	No	a	No	Yes****	No
Oregon	18	Yes	Yes	No	a	Yes	No	No
Pennsylvania	18	Yes	Yes	No	a	Yes††	No	No
Rhode Island	18	Yes	Yes	Yes	b	No	No	No
South Carolina	18	Yes	Yes	No	a	No†††	Yes***	No
South Dakota	18§	Yes	Yes	Yes	b	No	No	No
Tennessee	18	Yes	Yes	Yes	a	No	Yes§§§	No
Texas	18	Yes	Yes	No	b	Yes	No	No
Utah	19§	Yes	Yes	Yes	a	No	No	Yes
Vermont	17	Yes	Yes	No	b	No	No	No
Virginia	16§	Yes	No	No	b	Yes	No	No
Washington	18	Yes	Yes	No	a	No	No	No
West Virginia	18§	Yes	Yes	Yes	b	No‡‡	Yes¶	No
Wisconsin	18	Yes	No	No	b	No	No	No
Wyoming	No	No	No	No	No	No	No	No
Total states with laws	**45**	**45**	**43**	**17**	**45**	**24**	**7**	**6**

*For purposes of this report, the District of Columbia is counted as a state.

† a = Both jail and fine; b = fine only.

§Prohibits possession of tobacco by minors.

¶Provisions to encourage minors to divulge source of tobacco.

**Applies only to cigarettes.

††Provides for license revocation.

§§Prohibits *all* free distribution of tobacco.

‡‡Licensing is done at the local level.

***Provides a bounty to informers.

†††Only vending machines need to be licensed.

§§§Provides that a "sting" operation is not entrapment.

posted at the point of sale that warn about the age limit for purchase of tobacco. Laws in 44 states and the District of Columbia specify penalties for selling tobacco to under-aged persons; these penalties include jail sentences (up to a 1-year imprisonment in Minnesota) and/or fines (ranging from $2 in the District of Columbia to $3000 in Minnesota).

Whereas all states license the production or distribution of tobacco, 23 states and the District of Columbia require state licenses for retail vendors of tobacco (South Dakota requires a license for vending machines only, and three states (Minnesota, Nebraska, and Wisconsin) require that local jurisdictions act as the licensing agents). Of these, four states (Massachusetts, New Hampshire, New Jersey, and Rhode Island) have laws requiring administrative revocation of the license for specified violations of minors' access laws (other states have provisions for revoking licenses as part of local criminal or administrative proceedings for violations involving sales to minors). Seven state laws specify enforcement processes. Six states either require that cigarette vending machines be placed in areas inaccessible to minors or ban such machines completely.

Reported by: Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The development of state and local laws restricting minors' access to tobacco products is a potentially effective public health strategy to prevent tobacco use by teenagers (*4*). Adequate enforcement is the critical element in ensuring the effectiveness of these laws. In May 1990, the Office of Inspector General (IG), U.S. Department of Health and Human Services, completed a study of the enforcement of laws restricting the sale of tobacco to minors. The IG interviewed ASTHO-designated state tobacco prevention and control contacts and, in each state with minors' access laws, the state-designated National Crime Information Center contact. These persons reported the recorded violations of minors' access laws.

The IG found minimal enforcement of the laws; only five states could provide data on the citations for violations of the laws. In 1989, only 32 vendor violations were cited, even though an estimated 1 billion cigarette packs are sold each year in the United States to persons <18 years of age (*5*). In most states, local law-enforcement officials are responsible for enforcement of minors' access laws.

Several successful local enforcement/vendor education initiatives were identified by the IG (e.g., Minneapolis, Minnesota; Marquette County, Michigan; King County, Washington; and Solano County, California). Components of successful initiatives to enforce minors' access laws include the participation of government officials and business leaders; local licensing of vendors that includes revocation provisions for violations; establishment of civil penalties; posting of warning signs; restriction of vending machines; and use of "sting" operations (in which an underage person, sponsored by local authorities, purchases tobacco) (*6*).

In response to these findings, the Secretary of Health and Human Services has recommended model legislation for states to control minors' access to tobacco. This legislation 1) creates a licensing system similar to that used to control the sale of alcoholic beverages, 2) sets the minimum age of legal purchase at 19 years, 3) sets forth a graduated schedule of penalties for illegal sales to minors, 4) provides separate penalties for failure to post warning signs about the illegality of sales to minors, 5) places primary responsibility for enforcement with a designated state agency,

6) relies primarily on civil penalties rather than on the court system to punish offend-ers, and 7) bans the use of vending machines to dispense tobacco products (7). The proposed model legislation is intended to make the laws more enforceable and could be enacted at the state and/or local level.

Copies of the IG report and the model legislation proposed by the Secretary are available from CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion; telephone (301) 443-5287.

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Cigarette Advertising — United States, 1988

Cigarette smoking is the most important preventable cause of death in the United States (1), yet cigarettes are one of the most heavily advertised products. Cigarette advertising themes typically associate smoking with high-style living; healthy activities; and economic, social, and professional success (2). Cigarette advertising campaigns are increasingly targeting women, minorities, and blue-collar workers (3,4), groups that account for an increasing percentage of the smoking population (1). This report provides data on cigarette advertising expenditures for 1988, comparison data from earlier years, and rankings of cigarettes among all products and services by advertising expenditures.

Cigarette Advertising Expenditures

Data collected by the U.S. Federal Trade Commission (FTC) from the six major U.S. cigarette manufacturers indicate that in 1988 cigarette advertising and promotional expenditures in the United States reached an all-time high of $3.27 billion—a 26.9% increase over 1987 expenditures of $2.58 billion (5). During the same period, the consumer price index (all items) increased 4.1%. From 1975 to 1988, total cigarette advertising and promotional expenditures increased more than sixfold; when adjusted by the consumer price index to constant 1975 dollars, expenditures increased threefold (Figure 1).

In 1988, cigarette advertising and promotional expenditures related to the sponsorship of sporting events were $84.0 million (2.6% of total cigarette advertising and promotional expenditures) and included sponsorship, newspaper advertising, and other expenditures.

From 1975 to 1988, the proportion of advertising expenditures for cigarettes yielding ≤15 mg of "tar" has consistently exceeded their domestic market share (Figure 2) by an average of 14.1 percentage points. In 1988, 60.7% of advertising and promotional expenditures were for lower-yield cigarettes; these cigarettes accounted for 54.2% of the domestic market in 1988 (*5*; FTC, unpublished data).

FIGURE 1. Cigarette advertising and promotional expenditures, by year — United States, 1975–1988
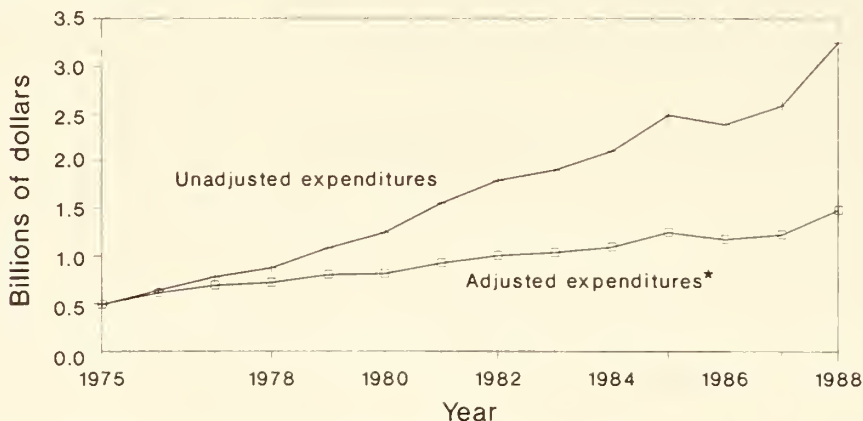
Source: reference *5*; Federal Trade Commission, unpublished data.
*"Adjusted" expenditures are adjusted by the consumer price index (all items) to constant 1975 dollars.

FIGURE 2. Domestic market share and proportion of total advertising and promotional expenditures related to cigarettes yielding ≤15 mg of "tar," by year — United States, 1975–1988
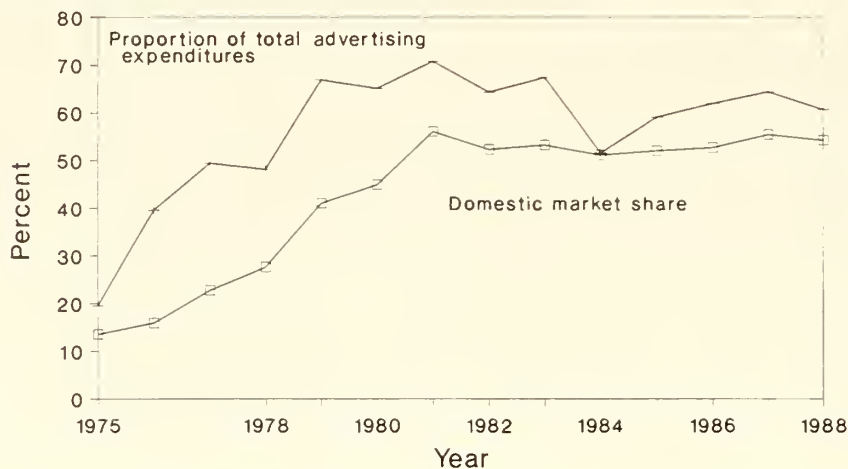
Source: reference *5*; Federal Trade Commission, unpublished data.

The FTC classifies cigarette advertising and promotional expenditures into 14 categories that are consolidated into 10 categories here (Table 1). Five categories are traditional forms of print advertising; the remaining five represent promotional activities. From 1975 to 1988, the proportion of total expenditures for each of the five print advertising categories decreased, while the proportion of total expenditures for each of the promotion categories except free-sample distribution increased. The largest proportional increase occurred in the category "all other"; 88% of the 1988 expenditures in this category were for coupons and "retail value added" promotions (e.g., a "free" pack of cigarettes with the purchase of one or more packs). The proportion of total advertising and promotional expenditures dedicated to promotional activities has increased steadily from 1975 (25.5%) to 1988 (68.0%).

TABLE 1. Cigarette advertising and promotional expenditures* — United States, 1975, 1981, and 1988

	1975		1981		1988	
Expenditure category	Millions of dollars	% of total	Millions of dollars	% of total	Millions of dollars	% of total
Advertising						
Newspapers	104.5	21.3	358.1	23.1	105.8	3.2
Magazines	131.2	26.6	291.2	18.8	355.1	10.8
Outdoor	84.3	17.2	228.1	14.7	319.3	9.7
Transit[†]	10.9	2.2	21.9	1.4	44.4	1.4
Point of sale	35.3	7.2	99.0	6.4	222.3	6.8
Total advertising	**366.2**	**74.5**	**998.3**	**64.5**	**1046.8**	**32.0**
Promotion						
Promotional allowances[§]	72.0	14.7	229.1	14.8	879.7	26.9
Free-sample distribution	24.2	4.9	81.5	5.3	74.5	2.3
Distribution expenses[•]	10.1	2.1	115.1	7.4	190.0	5.8
Public entertainment[**]	8.5	1.7	37.4	2.4	88.1	2.7
All others	10.3	2.1	86.2	5.6	995.8	30.4
Total promotion	**125.1**	**25.5**	**549.4**	**35.5**	**2228.1**	**68.0**
TOTAL	**491.3**	**100.0**	**1547.7**	**100.0**	**3274.9**	**100.0**

Source: U.S. Federal Trade Commission (FTC) (5; FTC, unpublished data).
*Expenditure data have been rounded; percentages were calculated before rounding. Because of rounding, percentages may not total 100%.
[†]Advertising in or on public transportation facilities.
[§]Paid to retailers and any other persons (other than full-time company employees involved in cigarette distribution and sales) to facilitate the sale of cigarettes.
[•]Net costs of distributing noncigarette products either bearing or not bearing cigarette brand names to consumers by sale, redemption of coupons, or otherwise.
[**]Promotion and sponsorship of sporting, musical, and other public entertainment events bearing or otherwise displaying the name of the company or any of its cigarettes.

Rankings Among All Products and Services

Cigarettes remain one of the most heavily advertised products in the print media. In 1988, cigarettes were the most heavily advertised product* in outdoor media, the second most heavily advertised product in magazines (after passenger cars), and the sixth most heavily advertised product in newspapers (Newspaper Advertising Bureau, unpublished data, 1989). When advertising expenditures for these three media are combined, cigarettes were the second most heavily advertised product overall (after passenger cars).

In 1988, cigarette advertising expenditures accounted for 16.9%, 5.7%, and 0.4% of total advertising expenditures (national, retail, and classified advertising) in outdoor media, magazines, and newspapers, respectively (Newspaper Advertising Bureau, unpublished data, 1989). These percentages represent a decline from 1985 (22.3%, 7.1%, and 0.8%, respectively) (3) and are consistent with the shift in emphasis from print advertising to promotional activities.

Reported by: US Federal Trade Commission, Washington, DC. Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The mass media are used to communicate messages designed to promote health and prevent disease and injury. For example, public service announcements and paid advertisements have been used to encourage exercise; immunization; proper dietary habits; screening for cancer, high blood pressure, and high blood cholesterol; use of safety belts and car restraints for infants; avoidance of tobacco, alcohol, and illicit drugs; and avoidance of high-risk sexual practices (6). However, advertising and promotions also have been used to encourage unhealthy activities; cigarette smoking is one such activity.

Cigarette advertising and promotion may increase cigarette consumption by 1) encouraging children and adolescents to experiment with and initiate regular use of cigarettes; 2) deterring current smokers from quitting; 3) prompting former smokers to begin smoking again; and 4) increasing smokers' daily cigarette consumption by serving as an external cue to smoke. Cigarette advertising may also increase consumption through indirect means such as the inhibiting effect of cigarette advertising revenues on media coverage of issues related to smoking and disease (7). Furthermore, the ubiquity of cigarette advertising may contribute to the perception that smoking is less hazardous, more prevalent, and more socially acceptable than it is (1,8).

The proportion of cigarette advertising expenditures for cigarettes yielding ≤15 mg of "tar" has increased since 1975 and has consistently exceeded the domestic market share of these cigarettes (Figure 2). These findings suggest that cigarette manufacturers are seeking to expand the market for these cigarettes (3). Persons who smoke lower-yield cigarettes may believe these products to be less hazardous and thus may be less motivated to quit. According to the 1986 Adult Use of Tobacco Survey, about one fifth of smokers believe that the kind of cigarettes they smoke are less hazardous than others (1). However, any benefits of smoking lower-yield cigarettes are minimal in comparison with the benefits of quitting smoking entirely (9,10).

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*According to the Media Records classification system, national advertising expenditures for products and services are classified into major categories (e.g., alcoholic beverages, automotive products, foods, tobacco, and transportation) and subcategories (e.g., beer, passenger cars, nonalcoholic beverages, cigarettes, and airlines). The rankings here compare cigarettes to all other subcategories.

Promotional activities differ in important ways from traditional advertising. Whereas print advertising may provide information or shape attitudes about a product, certain promotional activities (e.g., free samples and coupons) are designed to result in the trial and/or purchase of the product (*11*). Free samples may encourage initiation of tobacco use among children and adolescents, especially when distributed at youth-oriented events (e.g., concerts) (*12*). Cigarette sponsorship of sporting events allows cigarette brand names to be shown or mentioned on television, even though cigarette commercials are prohibited in the broadcast media, and cigarette sponsorship of televised sporting events is reported to increase cigarette brand recognition among children (*13*). Sponsorship of cultural events may facilitate the targeting of certain ethnic and racial groups.

Numerous policy options for stemming the promotion of tobacco products are being considered within the public health community. Options that have been suggested include: 1) funding a substantial antismoking "counteradvertising" campaign; 2) enforcing an advertising and promotion code that defines permissible imagery in tobacco ads and methods of enforcement; 3) eliminating all imagery (e.g., pictures of persons and objects) in tobacco ads, allowing only words and pictures of the product ("tombstone advertising"); 4) prohibiting tobacco advertising in media that reach a substantial audience of young people; 5) repealing the federal prohibition of state and local regulation of cigarette advertising; 6) eliminating the tax deductibility of tobacco advertising expenditures as a business expense; and 7) banning all tobacco advertising and promotion (*1,8,14,15*). Further discussion of these and other ideas will continue at federal, state, and local levels of government.

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Part Five: Intervention

Great American Smokeout — November 18, 1999

In 1997, approximately one fourth of U.S. adults and one third of U.S. high school students were cigarette smokers *(1,2)*. Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to encourage adults to stop smoking and young persons not to start. In 1998, an estimated 9 million persons participated in the Great American Smokeout community activities by either smoking less or not at all for 24 hours. Of those participants, 10% reported smoking less or not at all for 1–5 days after the event (ACS, unpublished data, 1998). This year, the Great American Smokeout on Thursday, November 18, will encourage smokers to adopt smoke-free, healthier lifestyles that continue into 2000.

The Great American Smokeout will focus on helping adults to quit smoking and on increasing young persons' awareness of the dangers of tobacco use. For the fourth consecutive year, ACS Commit to Quit program will provide adult smokers with information about methods of quitting smoking, including effective pharmacotherapies. ACS volunteers will conduct smoking-cessation and smoking-prevention activities at hospitals, work sites, schools, shopping malls, military installations, and other locations. To facilitate planning and implementation, the *1999 Guide for Great American Smokeout* activities is offered electronically for ACS volunteers and staff.

Additional information is available from ACS, telephone (800) 227-2345; CDC, telephone (800) 232-1311 or (770) 488-5705; or the ACS Great American Smokeout World-Wide Web site, http://www.cancer.org.*

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* References to sites of non-CDC organizations on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of pages found at these sites.

World No-Tobacco Day — May 31, 1999

The theme for this year's World No-Tobacco Day, May 31, is "Leave the Pack Behind." As part of World No-Tobacco Day, smokers are encouraged to quit, and governments, community organizations, schools, and families and friends are encouraged to help smokers quit.

Preventing tobacco use by young persons is critical for long-term reductions in tobacco-related deaths. However, the projected increase in global mortality from tobacco use, from 3 million deaths in 1990 to 10 million in 2025, primarily represents mortality among persons who already smoke *(1)*. Smoking cessation interventions can prevent many of these projected deaths.

The World Health Organization (WHO) recommends that governments, community organizations, and health-care systems and professionals 1) make tobacco-use treatment an important public health priority; 2) offer practical interventions; 3) assess and document tobacco use and provide treatment as part of total health care; 4) fund proven treatments and make them widely available; 5) take responsibility for motivating smokers to quit and remain abstinent; 6) monitor tobacco use, and tax and regulate the sale and marketing of tobacco products; 7) invest in developing new treatments for nicotine dependence; and 8) encourage other professionals to set an example by quitting tobacco use *(2)*.

Additional information about World No-Tobacco Day 1999 is available from WHO's World-Wide Web site, http://www.who.int/toh/worldnotobacco99/teaser.htm* and CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, http://www.cdc.gov/tobacco, telephone (800) 232-1311.

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Illegal Sales of Cigarettes to Minors — Cuidad Juárez, Mexico; El Paso, Texas; and Las Cruces, New Mexico, 1999

In 1996, the United States-Mexico Binational Commission (US-MBC) Health Working Group identified prevention of tobacco use, particularly among adolescents, as a priority and subsequently recommended joint efforts toward reducing illegal sales of cigarettes to minors. A 1997 survey of 561 commercial cigarette outlets in Mexico City found that 79% of retailers sold cigarettes to minors *(1)*. To assess the illegal sale of cigarettes to minors in other regions of Mexico and on both sides of the U.S.–Mexico border, during January–February 1999 the General Directorate of Epidemiology in Mexico, the Chihuahua State Department of Health Services (CDH), the Ciudad Juárez Department of Health (CJDH), the Texas Department of Health (TDH), and the New Mexico Department of Health (NMDH) surveyed cigarette outlets in Ciudad Juárez, Mexico; El Paso, Texas; and Las Cruces, New Mexico. This report summarizes the results of these surveys, which indicate that almost all retailers in the surveyed outlets in Ciudad Juárez sold cigarettes to minors and that sales rates to minors were substantially lower in El Paso and Las Cruces.

Although survey methods were the same in each location, sampling methods varied. In Ciudad Juárez, where no list of cigarette outlets was available, the sample was selected by using a stratified cluster design. Within each of eight geographic areas, 23 clusters were selected, each with an equal probability of selection. All stores within each selected cluster were visited by adults, and the operational cigarette outlets were identified and surveyed. In El Paso, where a list of licensed cigarette outlets was available, a stratified cluster design was used in which the strata were six geographic areas within the city limits and the clusters were postal ZIP code areas. Within each of the six areas, two clusters were selected with a probability of selection proportional to the number of cigarette outlets; within a selected cluster, all outlets were surveyed. In Las Cruces, a list of all operational cigarette outlets was available and all outlets were surveyed. Because the Las Cruces list was a census and not a sample, confidence intervals were not calculated. For both Ciudad Juárez and El Paso, sampling weights were calculated using the inverse probability of selection for each cluster within a stratum. Standard errors and 95% confidence intervals were calculated using SUDAAN *(2)*.

Minors who participated in the surveys were recruited from local schools in Ciudad Juárez and El Paso and from a youth organization in Las Cruces. Adult survey escorts were staff of the local or state health departments and volunteers. Teams comprising one adult and two minors attempted to make one purchase per store using the following protocol *(1,3)*: the adult entered the store before one of the minors and noted whether age-of-sale warning signs were posted. Then the adult observed the transaction between the retailer and minor as the minor attempted to purchase a pack of cigarettes. If asked by the retailer, minors were instructed to state truthfully their age and that they carried no identification. An illegal sale was defined as a transaction in which a retailer sold a pack of cigarettes to a minor. If a sale was completed, the minor left the store with the cigarettes and gave them to the adult.

Illegal sales rates to minors in the teams were higher in Ciudad Juárez (98.1%) than in El Paso (18.0%) or Las Cruces (6.1%) (Table 1). In Ciudad Juárez, sales rates did not vary by age or sex of the minors, sex or estimated age of the retailers, or type of store. In El Paso, sales rates were significantly lower for boys, minors aged 15 or 17 years, and if the retailer asked for identification. Illegal sales did not differ by store type in El Paso. In Las Cruces, sales rates were lower for boys, for minors aged 15 or 16

TABLE 1. Number and percentage of store visits and of retailers who sold cigarettes to minors,* by category and location — Ciudad Juárez, Mexico; El Paso, Texas; and Las Cruces, New Mexico, 1999

| | Ciudad Juárez, Mexico | | | | | El Paso, Texas | | | | | Las Cruces, New Mexico | | | |
| | Store visits | | Retailer sold cigarettes to minors | | | Store visits | | Retailer sold cigarettes to minors | | | Store visits | | Retailer sold cigarettes to minors | |
Category	No.	(%)†	No.	(%)§	(95% CI¶)	No.	(%)†	No.	(%)§	(95% CI)	No.	(%)	No.	(%)**
Minor's age (yrs)														
15	159	(66.1)	151	(95.2)	(±3.7)	94	(26.3)	8	(10.2)	(± 6.8)	38	(38.8)	0	(0.0)
16	81	(33.9)	80	(98.0)	(±3.9)	162	(45.4)	38	(25.9)	(± 6.3)	4	(4.1)	0	(0.0)
17	0	(—)	—	(—)	(—)	101	(28.3)	11	(11.2)	(± 6.5)	56	(57.1)	6	(10.7)
Minor's sex														
Male	141	(58.7)	135	(95.3)	(±4.2)	175	(49.0)	15	(8.8)	(± 4.5)	69	(70.4)	1	(1.4)
Female	99	(41.3)	96	(97.2)	(±3.3)	182	(51.0)	42	(26.1)	(± 6.1)	29	(29.6)	5	(17.2)
Retailer's estimated age (yrs)														
<25	53	(22.1)	51	(97.0)	(±4.3)	131	(36.7)	31	(25.3)	(± 7.1)	43	(43.9)	5	(11.6)
≥25	187	(77.9)	180	(95.9)	(±3.3)	226	(63.3)	26	(13.6)	(± 4.8)	55	(56.1)	1	(1.8)
Retailer's sex														
Male	125	(52.3)	120	(96.3)	(±3.7)	173	(48.6)	27	(17.6)	(± 6.0)	43	(43.9)	4	(9.3)
Female	114	(47.7)	110	(95.9)	(±4.2)	183	(51.4)	30	(18.4)	(± 5.5)	55	(56.1)	2	(3.6)
Unknown	1		1			1		0			0		0	
Retailer asked age														
Yes	8	(3.3)	6	††	††	33	(9.2)	2	(7.1)	(± 9.5)	19	(19.4)	0	(0.0)
No	232	(96.7)	225	(97.2)	(±2.3)	324	(90.8)	55	(19.1)	(± 4.1)	79	(80.6)	6	(7.6)
Retailer asked for identification														
Yes	2	(0.8)	2	††	††	285	(79.8)	8	(3.0)	(± 2.0)	84	(85.7)	1	(1.2)
No	238	(99.2)	229	(96.1)	(±2.8)	72	(20.2)	49	(69.8)	(±10.6)	14	(14.3)	5	(35.7)
Warning signs present														
Yes	3	(1.3)	2	††	††	218	(61.2)	31	(15.2)	(± 4.8)	48	(49.0)	0	(0.0)
No	237	(98.7)	229	(96.4)	(±2.7)	138	(38.8)	25	(21.6)	(± 7.0)	50	(51.0)	6	(12.0)
Unknown	0		0			1		1			0		0	
Total	240	(100.0)	231	(98.1)	(±2.8)	357	(100.0)	57	(18.0)	(± 3.8)	98	(100.0)	6	(6.1)

* Aged <18 years.
† Unweighted percentages.
§ Weighted percentages.
¶ Confidence interval.
** Because percentage of successful purchase attempts represented all cigarette outlets in Las Cruces, 95% CIs are not presented.
†† Numbers were too small to calculate precise estimates.

years, if warning signs were present, and if the retailer appeared to be aged ≥25 years, female, or asked for age or identification.

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Editorial Note: The substantial difference in the percentage of retailers willing to sell tobacco to minors between Ciudad Juárez and the two U.S. border cities may reflect efforts in the United States to enforce minors' access laws and to provide comprehensive retailer education programs. In surveys conducted during 1987–1993, rates of over-the-counter sales to minors ranged from 32% to 87% and sales from vending machines ranged from 82% to 100% *(4)*. However, since those studies were conducted, enforcement of laws against the sale of tobacco to minors has increased in the United States at the local, state, and federal levels *(3,4)*.

Enforcement inspections in the United States use the same methodology as this study, except that retailers who sell tobacco to minors are given warnings or fines or can lose their retail tobacco license for repeated illegal sales. The Synar Amendment, administered by the Substance Abuse and Mental Health Services Administration, requires all states to 1) enact and enforce laws against tobacco sales to minors, 2) conduct annually a representative inspection survey (i.e., Synar surveys) to determine the percentage of retailers in compliance with laws prohibiting sales to minors, and 3) develop a strategy and time frame for achieving a noncompliance rate of ≤20% or risk losing some federal funds (5). In 1998, Synar surveys in Texas and New Mexico found that retailer noncompliance rates were 13.0% and 13.5%, respectively (J. Steele, Texas Commission on Alcohol and Drug Abuse and D. Maestas, New Mexico Behavioral Services Division, personal communication, 1999).

In El Paso, enforcement has been conducted by local officers, and state-funded enforcement has been conducted in communities adjacent to El Paso. Federal level enforcement and retailer education in El Paso were funded directly by the Food and Drug Administration (FDA) *(6)* and indirectly through activities required by the Synar Amendment. In Las Cruces, nine compliance-check surveys conducted during 1996–1998 resulted in warning notices to noncompliant retailers, media publicity, extensive retailer education, and recognition for compliant retailers. Synar Amendment-related enforcement activities have been conducted in New Mexico for several years, and the FDA has distributed retailer education material to tobacco outlets.

In Mexico, the sale of tobacco to minors has been prohibited since 1984. The Mexican Secretariat of Health has developed proposals for strengthening minors' access laws, including requiring identification, prohibiting sale of loose cigarettes and packs with <14 cigarettes, eliminating vending machines in places accessible to minors, and decreasing marketing to youth.

The findings in this report are subject to at least two limitations. First, although this study used standard methods during the store visits, the methods may underestimate the ability of underaged persons to purchase cigarettes because they may use false identification, lie about their age, dress to appear older, persuade retailers to sell them cigarettes, or target retailers known to sell cigarettes to minors *(7)*. Second, because sales rates varied by age and sex of minors in El Paso and Las Cruces, some of the difference in sales rates between these locations can be explained by differences in the percentage of young persons aged 15–17 years who participated in the surveys.

The World Health Organization (WHO) supports a comprehensive approach to tobacco control, including legislative action. However, few countries enact or enforce minors' access laws. To reduce tobacco sales to young persons, WHO recommends that countries 1) establish a minimum age of purchase of ≥18 years; 2) create a tobacco-sales licensing system so retailers can be identified and informed of their legal responsibilities; 3) establish a graduated schedule of civil law penalties for illegal sales, ranging from warnings to license revocation; 4) enlist the assistance of teenagers in the efforts of law enforcement officers to assess retailers' compliance with the prohibition of sales to minors; 5) end tobacco sales in health care, educational, and athletics facilities; and 6) end tobacco sales in vending machines and from self-service displays *(8,9)*. Other strategies include requesting photo identification or other proof-of-age from persons attempting to purchase tobacco products *(3,4,10)*.

The Mexican Secretariat of Health, CDH, and CJDH will use the results of this survey to demonstrate the need for stricter policies prohibiting the sale of tobacco to minors and to intensity enforcement and retailer education. TDH and NMDH plan to publicize the results of the study to show that enforcement and education efforts must continue. In addition to the enforcement of strong minors' access laws and retailer education, a comprehensive approach to preventing young persons from using tobacco should include raising tobacco taxes and reducing the appeal of tobacco to minors through restrictions on advertising and promotion and through counter-advertising and other educational programs *(3,4,6,8)*. The US-MBC will continue to conduct bilateral collaborative tobacco research.

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Ten Great Public Health Achievements — United States, 1900–1999

During the 20th century, the health and life expectancy of persons residing in the United States improved dramatically. Since 1900, the average lifespan of persons in the United States has lengthened by >30 years; 25 years of this gain are attributable to advances in public health *(1)*. To highlight these advances, *MMWR* will profile 10 public health achievements (see box) in a series of reports published through December 1999.

Many notable public health achievements have occurred during the 1900s, and other accomplishments could have been selected for the list. The choices for topics for this list were based on the opportunity for prevention and the impact on death, illness, and disability in the United States and are not ranked by order of importance.

The first report in this series focuses on **vaccination**, which has resulted in the eradication of smallpox; elimination of poliomyelitis in the Americas; and control of measles, rubella, tetanus, diphtheria, *Haemophilus influenzae* type b, and other infectious diseases in the United States and other parts of the world.

Ten Great Public Health Achievements — United States, 1900–1999

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from coronary heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco use as a health hazard

Future reports that will appear in MMWR throughout the remainder of 1999 will focus on nine other achievements:

- Improvements in **motor-vehicle safety** have resulted from engineering efforts to make both vehicles and highways safer and from successful efforts to change personal behavior (e.g., increased use of safety belts, child safety seats, and motorcycle helmets and decreased drinking and driving). These efforts have contributed to large reductions in motor-vehicle-related deaths *(2)*.

- Work-related health problems, such as coal workers' pneumoconiosis (black lung), and silicosis—common at the beginning of the century—have come under better control. Severe injuries and deaths related to mining, manufacturing, construction, and transportation also have decreased; since 1980, **safer workplaces** have resulted in a reduction of approximately 40% in the rate of fatal occupational injuries *(3)*.

- **Control of infectious diseases** has resulted from clean water and improved sanitation. Infections such as typhoid and cholera transmitted by contaminated water, a major cause of illness and death early in the 20th century, have been reduced dramatically by improved sanitation. In addition, the discovery of antimicrobial therapy has been critical to successful public health efforts to control infections such as tuberculosis and sexually transmitted diseases (STDs).

- **Decline in deaths from coronary heart disease and stroke** have resulted from risk-factor modification, such as smoking cessation and blood pressure control coupled with improved access to early detection and better treatment. Since 1972, death rates for coronary heart disease have decreased 51% *(4)*.

- Since 1900, **safer and healthier foods** have resulted from decreases in microbial contamination and increases in nutritional content. Identifying essential micronutrients and establishing food-fortification programs have almost eliminated major nutritional deficiency diseases such as rickets, goiter, and pellagra in the United States.

- **Healthier mothers and babies** have resulted from better hygiene and nutrition, availability of antibiotics, greater access to health care, and technologic advances in maternal and neonatal medicine. Since 1900, infant mortality has decreased 90%, and maternal mortality has decreased 99%.

- Access to **family planning** and contraceptive services has altered social and economic roles of women. Family planning has provided health benefits such as smaller family size and longer interval between the birth of children; increased opportunities for preconceptional counseling and screening; fewer infant, child, and maternal deaths; and the use of barrier contraceptives to prevent pregnancy and transmission of human immunodeficiency virus and other STDs.

- **Fluoridation of drinking water** began in 1945 and in 1999 reaches an estimated 144 million persons in the United States. Fluoridation safely and inexpensively benefits both children and adults by effectively preventing tooth decay, regardless of socioeconomic status or access to care. Fluoridation has played an important role in the reductions in tooth decay (40%–70% in children) and of tooth loss in adults (40%–60%) *(5)*.

- **Recognition of tobacco use as a health hazard** and subsequent public health anti-smoking campaigns have resulted in changes in social norms to prevent initiation of tobacco use, promote cessation of use, and reduce exposure to environmental tobacco smoke. Since the 1964 Surgeon General's report on the health risks of smoking, the prevalence of smoking among adults has decreased, and millions of smoking-related deaths have been prevented *(6)*.

The list of achievements was developed to highlight the contributions of public health and to describe the impact of these contributions on the health and well being of persons in the United States. A final

report in this series will review the national public health system, including local and state health departments and academic institutions whose activities on research, epidemiology, health education, and program implementation have made these achievements possible.

Reported by: CDC.

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Decline in Cigarette Consumption Following Implementation of a Comprehensive Tobacco Prevention and Education Program — Oregon, 1996–1998

In November 1996, residents of Oregon approved a ballot measure increasing the cigarette tax by 30¢ (to 68¢ per pack). The measure stipulated that 10% of the additional tax revenue be allocated to the Oregon Health Division (OHD) to develop and implement a tobacco-use prevention program. In 1997, OHD created Oregon's Tobacco Prevention and Education Program (TPEP), a comprehensive, community-based program modeled on the successful tobacco-use prevention programs in California and Massachusetts *(1,2)*. To assess the effects of the tax increase and TPEP in Oregon, OHD evaluated data on the number of packs of cigarettes taxed before (1993–1996) and after (1997–1998) the ballot initiative and implementation of the program. Oregon's results also were compared with national data. This report summarizes the results of the analysis, which indicate that consumption of cigarettes in Oregon declined substantially after implementation of the excise tax and TPEP and exceeded the national rate of decline.

OHD obtained data on the sale of Oregon cigarette tax stamps from the Oregon Department of Revenue for 1993–1998. OHD also obtained data on the proportion of revenue received at the old and new rates after the tax change (February 1997) to calculate the number of packs sold each month. Per capita consumption was calculated by dividing the number of packs sold by the total population of Oregon each year *(3)*.

National comparison estimates were generated using data from the Tobacco Institute on state tax receipts for wholesale cigarette deliveries. Reliable figures were available through December 1997 *(4)*. Data from Oregon and the other three states (Arizona, California, and Massachusetts) with tobacco-use prevention programs funded through state initiatives were excluded from the comparison estimates. National per capita consumption was calculated by dividing the total number of packs sold by the total population in the remaining 46 states and the District of Columbia *(5)*. Calculations for Oregon for 1996–1998 represent the 1 year before and the 2 years after the tax increase.

From 1993 to 1996, taxable per capita consumption of cigarettes increased 2.2% in Oregon and decreased 0.6% in the 46 remaining states and the District of Columbia. In Oregon, from 1996 to 1998, taxable per capita cigarette consumption declined 11.3% (from 92 packs to 82 packs) (Figure 1). Despite a 2.7% increase in the state's population, 25 million fewer cigarette packs were sold in Oregon in 1998 than in 1996. In the United States during 1996–1997, per capita consumption declined 1.0% (from 93 packs to 92 packs).

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Editorial Note: Two years after the implementation of a ballot measure to increase the excise tax on tobacco and initiate TPEP, per capita consumption has declined 11.3% in Oregon, or the equivalent of 200 cigarettes (10 packs) per capita. Elements of the program include community-based tobacco-use prevention coalitions in every county; a statewide public awareness and education campaign; comprehensive school-based programs; tribal tobacco-use prevention programs; multicultural outreach and education; a quitters' help line providing smoking cessation support; and projects evaluating new approaches to prevent or reduce tobacco use. TPEP has an annual budget of $8.5 million, 93% of which

FIGURE 1. Annual per capita sales of cigarettes — Oregon and United States, 1993–1998
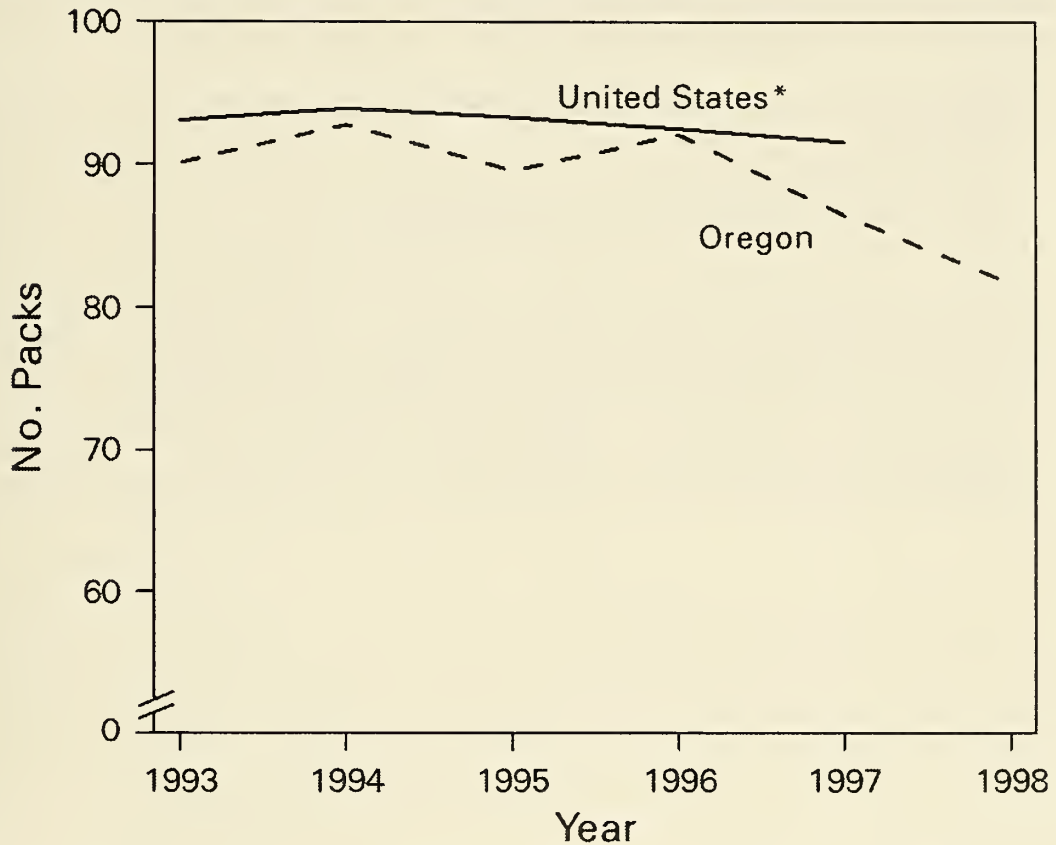
* Excluding Arizona, California, Massachusetts, and Oregon.

is awarded in grants or contracts to external partners (e.g., county health departments, community-based agencies, tribal governments, and private-sector partners implementing the public awareness campaign).

Decreased consumption is probably a result of both the increase in the price of cigarettes and the tobacco-use prevention program. Price elasticity of demand, defined as the percentage change in demand for cigarettes resulting from a 1% change in price, is an estimated –0.4% (6). A 15.8% increase in the price of cigarettes (the amount of the price increase in Oregon, calculated in 1996 dollars) should result in a 6.3% decrease in cigarette consumption. The findings in this report are consistent with reports from other states with tobacco-use prevention programs and indicate that excise taxes in conjunction with prevention programs reduce cigarette consumption more than excise taxes alone (1,7).

Other factors that could account for the decrease in cigarette consumption in Oregon probably did not contribute to the decline. Smuggling or cross-border sales probably are insignificant because a large proportion of Oregon's population resides in Portland, near Washington, where cigarette prices are higher. Increased sales on Indian reservations in the state probably would not contribute to the decline because cigarettes sold on reservations are taxed, and tribes are reimbursed only for tobacco taxes paid by tribal members. Another possibility is that the observed downward trend for Oregon may reflect national declines. Although reliable national data are not available for 1998, it is unlikely that the decrease in Oregon reflects secular trends. During 1990–1997, the annual rate of decline in consumption for all 50 states averaged only 1.4% (8).

Oregon's decrease in cigarette consumption also appears to be resulting in decreases in smoking prevalence. Preliminary data from the Behavioral Risk Factor Surveillance System for 1996–1998 indicate

that prevalence of current smoking among adults in Oregon declined 6.4%, representing 35,000 fewer smokers. The decline in cigarette consumption in Oregon, California, and Massachusetts indicates that an adequately funded, comprehensive tobacco-control program can quickly and substantially reduce tobacco use.

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The Great American Smokeout — November 19, 1998

In 1995, an estimated 47 million U.S. adults smoked cigarettes; in 1997, at least 4.5 million U.S. adolescents were cigarette smokers (*1,2*). Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to promote community-based activities designed to encourage smokers to refrain from smoking cigarettes for at least 24 hours. In 1997, nearly 11.3 million smokers (approximately 24% of smokers) reported participating in the Smokeout, and 19% of participants reported smoking less or not at all 1–5 days after the Smokeout (*3*). This year, the Great American Smokeout on Thursday, November 19, will focus on preventing the use of all tobacco products and encouraging children and adolescents never to start using tobacco.

As part of the Great American Smokeout, ACS volunteers will conduct smoking-prevention and smoking-cessation activities for persons of all ages at shopping malls, worksites, hospitals, military installations, and other locations. Activities will include the ACS *Commit to Quit* program, which helps smokers select a method of quitting that meets their personal needs.

Additional information is available from ACS, telephone (800) 227-2345; CDC, telephone (800) 232-1311 or (770) 488-5705; or the ACS Great American Smokeout World-Wide Web site http://www.cancer.org.

Reported by: American Cancer Society, Atlanta, Georgia. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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MMWR 1998;47(43):921

World No-Tobacco Day — May 31, 1998

Tobacco use is one of the most important determinants of human health trends worldwide (*1*). The annual rate of 3 million deaths attributed to tobacco use will reach approximately 10 million by 2025. Globally, if current trends continue, more than 200 million persons who are currently children and teenagers will die from tobacco-related illnesses (*1*).

In many countries, tobacco use is increasing among young persons, and the age of smoking initiation is declining. Most smokers begin smoking during their teenage years. If young persons do not use tobacco before age 20 years, they are unlikely to initiate use as adults (*2*).

The theme for this year's World No-Tobacco Day, to be held May 31, is "Growing up Without Tobacco." The World Health Organization (WHO) encourages governments, communities, organizations, schools, families, and persons to focus on the increasing epidemic of tobacco-related morbidity and mortality, to take strong actions to prevent nicotine addiction in young persons, to protect nonsmokers from the dangers of environmental tobacco smoke, and to provide effective youth-oriented smoking-cessation programs.

WHO will provide press releases, fact sheets, a poster, and an advisory kit on comprehensive measures to reduce tobacco use. Additional information about World No-Tobacco Day 1998 is available from WHO's World-Wide Web site http://www.who.ch/programmes/psa/toh.htm, from the WHO regional office of the Americas, telephone (202) 861-3200, or from CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, telephone (770) 488-5705; World-Wide Web site http://www.cdc.gov/tobacco.

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MMWR 1998;47(19):385

Missed Opportunities in Preventive Counseling
for Cardiovascular Disease — United States, 1995

Cardiovascular disease (CVD), the leading cause of death in the United States, caused 960,592 deaths in 1995 (*1*) (41.5% of all deaths). Approximately 58 million persons in the United States (20% of the total population) have one or more types of CVD, which include high blood pressure, coronary heart disease, stroke, rheumatic fever or rheumatic heart disease, and other forms of heart disease. Behavioral risk factors for CVD and other chronic diseases include physical inactivity, a diet high in fat, overweight, and smoking. The U.S. Preventive Services Task Force and the American Heart Association recommend that all primary-care providers offer their patients counseling to promote physical activity, a healthy diet, and smoking cessation as part of the preventive health examination (*2,3*). To characterize the provision of counseling by physicians about preventive health behaviors during office visits in 1995, data were analyzed from CDC's National Ambulatory Medical Care Survey (NAMCS). This report summarizes the results of that analysis, which indicates that a high proportion of office visits in 1995 did not include counseling for the prevention of CVD.

The analysis was restricted to the 29,273 office visits by persons aged ≥20 years who sought either a general medical or routine gynecologic examination. Visits excluded were those for examinations for illness or injury, school or employment, prenatal care, birth control consultation, assessment of specific organ systems, and follow-up or progress visits. Physicians participating in NAMCS were asked to complete a standardized survey form about visit diagnoses, patient characteristics, and provision of diagnostic and preventive services during office visits. After weighting for selection probability, nonresponse, and a physician-population weighting ratio adjustment, the 29,273 office visits resulted in a national estimate of 40 million office visits during 1995 (*4*).

During 1995, 29.5% of office visits were with obstetricians or gynecologists, 26.3% with internists, 25.0% with family or general practitioners, 2.4% with cardiologists, and 16.9% with other specialists. Physicians reported offering counseling about physical activity during 19.1% of office visits, diet during 22.8%, and weight reduction during 10.4% (Table 1). Counseling was reported more commonly for persons aged 50–64 years, for men than for women (physical activity [23.0% versus 17.5%, respectively], diet [26.6% versus 21.2%, respectively]), and weight reduction [12.0% versus 9.7%, respectively]), and for non-Hispanic whites and Hispanics (physical activity [19.7% and 19.9%, respectively]) than for non-Hispanic blacks (13.0%). The prevalence of reported counseling was lowest in the South and highest in the Midwest.* Cardiologists and family or general practitioners were more likely than other specialists to provide counseling about physical activity, diet, and weight reduction (Figure 1).

Among all respondents, 64% reported that their office visits included an assessment of smoking status; among current smokers, 41% of office visits included smoking cessation counseling.

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* *Northeast*=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; *Midwest*=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; *South*=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and *West*=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

TABLE 1. Number and percentage of persons who attended general medical/gynecologic visits that included counseling for prevention of cardiovascular disease, by selected characteristics — United States, National Ambulatory Medical Care Survey, 1995

Characteristic	Estimated no. visits*	Subject of counseling					
		Physical activity		Diet		Weight reduction	
		(%)	(95% CI†)	(%)	(95% CI)	(%)	(95% CI)
Age group (yrs)							
20–34	6.9	18.9	(± 6.4%)	20.1	(± 6.6%)	7.9§	(± 4.4%)
35–49	10.3	15.9	(± 4.9%)	17.7	(± 5.1%)	10.5	(± 4.1%)
50–64	9.8	23.8	(± 5.9%)	29.5	(± 6.3%)	15.1	(± 4.9%)
≥65	13.0	18.2	(± 4.6%)	23.2	(± 5.0%)	8.0	(± 3.2%)
Sex							
Men	11.8	23.0	(± 5.3%)	26.6	(± 5.5%)	12.0	(± 4.1%)
Women	28.2	17.5	(± 3.1%)	21.2	(± 3.3%)	9.7	(± 2.4%)
Race/Ethnicity¶							
White, non-Hispanic	34.4	19.7	(± 2.9%)	23.1	(± 3.1%)	10.3	(± 2.2%)
Black, non-Hispanic	3.7	13.0§	(± 7.8%)	21.5	(± 9.2%)	10.9§	(± 7.0%)
Hispanic	1.9	19.9§	(±12.6%)	20.3§	(±12.7%)	11.9§	(±10.2%)
Region**							
Northeast	9.4	20.2	(± 5.6%)	23.2	(± 5.9%)	10.2	(± 4.3%)
Midwest	9.7	22.3	(± 5.8%)	25.7	(± 6.0%)	14.4	(± 4.8%)
South	12.6	14.3	(± 4.2%)	15.7	(± 4.4%)	5.8	(± 2.8%)
West	8.3	21.4	(± 6.1%)	29.7	(± 6.8%)	12.9	(± 5.0%)
Total	40.0	19.1	(± 2.7%)	22.8	(± 2.9%)	10.4	(± 2.1%)

*In millions.
†Confidence interval.
§Estimates should be interpreted with caution because the relative standard error is ≥30%.
¶Numbers for other racial/ethnic groups were too small for meaningful analysis.
**Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; *Midwest*=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; *South*=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and *West*=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Reported by: Cardiovascular Health Br, Div of Adolescent and Community Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Office visits for general medical and routine gynecologic examinations provide an important opportunity for physicians to counsel patients about reducing behaviors associated with CVD. However, the findings in this report indicate that, in 1995, high proportions of patient visits did not include such counseling. Although reported counseling rates were higher for visits to cardiologists than to other specialists, cardiologists accounted for only 2.4% of visits in 1995. The low prevalence of counseling among obstetricians and gynecologists—a group of physicians that accounted for almost one third of office visits in the survey—represents a substantial loss of opportunity. The lower prevalence of counseling among women may be, in part, a result of

FIGURE 1. Percentage of general medical examinations that involved counseling, by physician specialty — United States, National Ambulatory Medical Care Survey, 1995
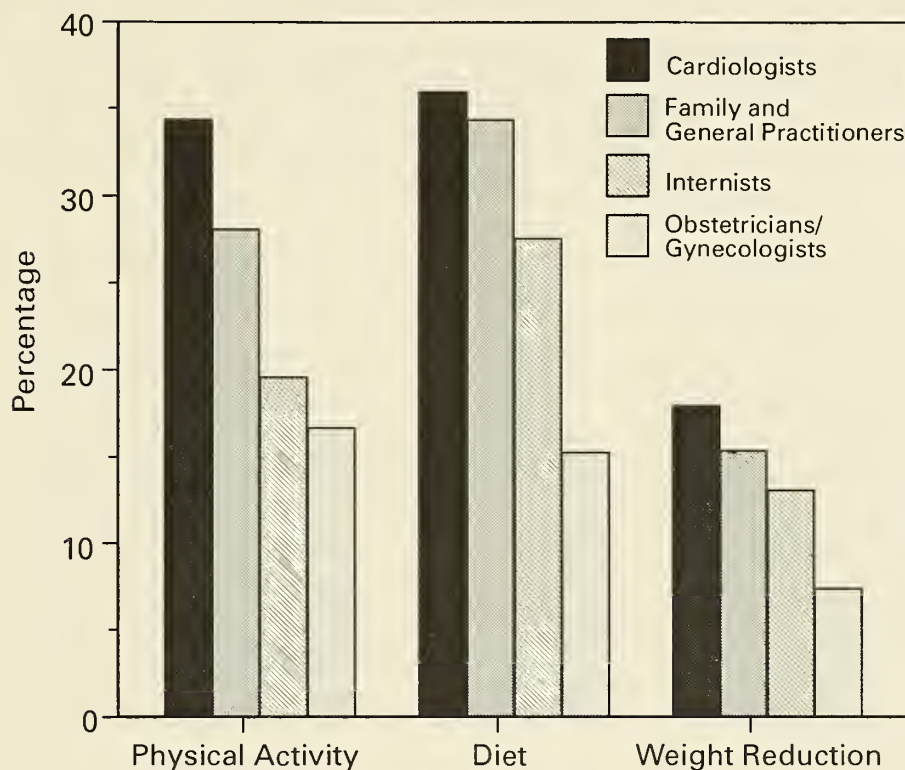
a high proportion of women receiving care from obstetricians and gynecologists; however, when the analysis excluded these specialists, women were still less likely than men to receive preventive counseling. Although physically active persons often cite a physician's advice as a major motivating factor in their decision to be become physically active (5), physician advice is related to physicians attitudes about physical activity: in 1991, 59% of primary-care physicians believed that engaging in regular physical activity was very important for their patients; only 24% reported that they would be able to modify patient behavior (6).

The low proportion of office visits that included counseling about diet probably reflected physician attitudes about dietary advice (5). In 1988, 92% of internal medicine residents reported that a low-fat, low-cholesterol diet can effectively lower cholesterol levels, and 68% reported that they are responsible for providing dietary advice; however, 72% of physicians believed they were inadequately prepared to provide dietary counseling (7). One third of U.S. adults are overweight, and the low prevalence of counseling for weight reduction (10.4%) indicates that most overweight adults are not being counseled about weight reduction (8). Physician counseling

about weight reduction should include advice about weight maintenance for all adults and caloric restriction and increased physical activity for persons who are overweight.

Barriers to physician counseling include time constraints, lack of reimbursement, and lack of professional training (*9*). To promote counseling by all health-care providers, training programs for physicians should increase emphasis on preventive counseling. In addition to medical schools, such training should be provided in residencies, other postgraduate programs, continuing medical education, and by professional organizations. Increasing enrollment in managed-care programs highlights the opportunities for counseling for prevention of CVD and other disease-prevention and health-promotion activities in such programs.

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MMWR 1998;47(05):91–5

Efforts to Quit Smoking Among Persons With a History
of Alcohol Problems — Iowa, Kansas, and Nebraska, 1995–1996

In 1991, approximately 13.8 million adults in the United States met diagnostic criteria for alcohol abuse, alcohol dependence, or both (*1*). In addition, at least 80% of persons in this group were likely to be daily tobacco smokers and, therefore, at increased risk for oral and pharyngeal cancers (*2,3*). In Minnesota, among adult smokers with a history of alcohol abuse during 1972–1983, the number of tobacco-related deaths was higher than the number of alcohol-related deaths (*4*). To assess rates of smoking cessation among adults with a history of alcohol problems, the University of Nebraska Medical Center conducted an intervention study with 1 year of follow-up during 1995–1996 in 12 residential alcohol-treatment centers in Iowa, Kansas, and Nebraska. This report summarizes the findings, which suggest that a substantial proportion of adults recently treated for alcoholism attempted to quit smoking, even though actual quit rates were low.

All participants (n=575) were daily tobacco smokers who voluntarily enrolled in the study while undergoing residential treatment for alcohol abuse. Of these 575 persons, 288 (50%) were receiving care at six alcohol-treatment centers testing a brief smoking-cessation intervention for recovering alcoholics. The intervention consisted of four 10-minute individually tailored counseling discussions about quitting smoking (*3,5*). Nicotine-replacement products were not provided. The remaining 287 participants received alcohol treatment at six other centers but not the additional counseling discussions about quitting smoking.

Characteristics of participants in the centers that provided smoking-cessation counseling and those that provided only usual care were similar in age, sex, race/ethnicity, and drug-abuse history. Overall, 67% of the participants were male, and the overall mean age was 33 years. Approximately 33% of the participants self-identified as racial minorities, including 121 American Indians/Alaskan Natives who were clients at the two centers that served only persons who were American Indian/Alaskan Native. During the 30 days preceding admission for treatment, participants reported drinking a mean of 12 alcoholic drinks per day. The average number of days in residential treatment before discharge to outpatient care was 34. The mean number of cigarettes smoked per day was 20 (range: 1–80 cigarettes).

At 1, 6, and 12 months after discharge from residential treatment, participants completed a mail survey about their recent drug use that included 10 questions about tobacco. The survey asked about attempts to quit smoking since the previous assessment and the number of days of nonsmoking; 1 day was defined as "at least 24 hours." Saliva samples were obtained from and analyzed for cotinine for the 70% of persons who reported they no longer smoked. For a randomly selected subset of 176 (33%) of all respondents, a friend or relative named by the participant at study enrollment was interviewed by telephone to confirm questionnaire data. At least one follow-up survey was completed by most (540 [94%]) participants; the 12-month questionnaire was completed by 448 (78%). In this analysis, a successful quitter was defined as a person who reported at the 12-month follow-up no longer smoking and not having smoked a cigarette for at least the preceding 7 days.

Of the participants who completed the 12-month follow-up, 36 (8%) reported being successful quitters; of these persons, 29 (80%) reported not having smoked a cigarette

for at least the preceding 30 days. Analysis of cotinine scores of successful quitters indicated that most (88%) saliva samples had nondetectable cotinine levels; 12% had been obtained from participants who relapsed to smoking after completing their questionnaire or who had detectable levels below the cut-point, suggesting recent tobacco use. Data from friends and relatives confirmed 165 (94%) of 176 participant drug-use reports. Quit rates for participants from the centers providing the smoking-cessation counseling were similar to those of participants from centers providing usual care (9% compared with 7%, respectively; p>0.05). Sex-specific quit rates were 9% for males and 6% for females (p>0.05). Rates for other subgroups were not meaningful because of small sample sizes.

When quit attempts were analyzed without consideration of tobacco smoking status at the 12-month assessment, the rates were higher. For these analyses, unsuccessful quitters (i.e., persons who had quit smoking but had relapsed back to tobacco smoking by follow-up) were combined with successful quitters. A quit attempt of ≥24 hours was reported by 45% of the study sample; 25% of all participants reported quitting for ≥7 days sometime during the year of follow-up (Table 1). Quit attempt rates for participants from the smoking-cessation and usual-care treatment centers were similar (p>0.05).

Race/ethnicity was the only sociodemographic variable significantly associated with attempts to quit smoking (p<0.05). Based on logistic regression models that adjusted for age, sex, education, and the provision of smoking-cessation counseling, American Indian/Alaskan Native participants were more likely than non-Hispanic white participants to report having quit smoking for ≥24 hours and having quit for ≥7 days (Table 2).

Of the participants who reported having quit smoking for ≥7 days by the 12-month follow-up, 73% reported having relapsed at some time during the preceding year. Relapse rates were similar by race/ethnicity, age, sex, education, and provision of smoking-cessation counseling during alcohol treatment (p>0.05). For example, relapse rates for non-Hispanic whites, American Indians/Alaskan Natives, and participants of other racial/ethnic groups were 75%, 68%, and 75%, respectively.

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Editorial Note: The findings in this report suggest that, although a substantial proportion of clients receiving treatment for alcohol abuse also were willing to attempt smoking cessation, actual quit rates were low. Failure of the tobacco intervention to increase quit rates significantly and high relapse rates among those who reported quitting for ≥7 days probably reflect the brevity of the smoking-cessation intervention, the addictive nature of nicotine, and the concurrent challenges of the other lifestyle changes required for successful recovery from alcohol abuse (*6,7*).

Despite restrictions on the sample population in this trial that limit generalization of the findings, the quit rates in this study are similar to those reported previously for a nationwide sample of persons aged ≥18 years (*8*). In that survey, 42% of daily smokers reported having abstained from cigarettes for at least 1 day during the preceding year, and 86% subsequently resumed smoking (*8*); only 6% of those who were daily smokers 1 year before the interview quit smoking and maintained abstinence for at least 1 month. In this study, the finding that attempts to quit smoking were more common

TABLE 1. Prevalence estimates of recovering alcoholics who reported tobacco smoking quit attempts of ≥24 hours or ≥7 days during 1 year of follow-up after discharge from a residential alcohol-treatment center, by selected characteristics — Iowa, Kansas, and Nebraska, 1995–1996

	% Quitting for ≥24 hours						% Quitting for ≥7 days					
	Received intervention (n=288)		Did not receive intervention (n=287)		Overall (n=575)		Received intervention (n=288)		Did not receive intervention (n=287)		Overall (n=575)	
	%	(95% CI*)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Age group (yrs)												
18-24	55.6	(42.3%–68.9%)	50.9	(37.9%–63.9%)	53.2	(43.9%–62.5%)	35.2	(22.5%–47.9%)	33.3	(15.5%–51.1%)	34.2	(25.4%–43.0%)
25-44	44.0	(37.2%–50.8%)	42.1	(35.3%–48.9%)	43.0	(38.2%–47.8%)	21.3	(15.7%–26.9%)	22.8	(17.0%–28.6%)	22.0	(17.9%–26.0%)
≥45	46.2	(27.1%–65.4%)	50.0	(31.5%–68.5%)	48.1	(34.8%–61.4%)	26.9	(9.8%–43.9%)	32.1	(14.8%–49.4%)	29.6	(17.4%–41.8%)
Sex												
Male	45.0	(38.1%–51.9%)	41.8	(34.7%–48.9%)	43.5	(38.5%–48.4%)	25.0	(18.9%–31.0%)	25.0	(18.6%–35.8%)	25.0	(20.7%–29.3%)
Female	48.9	(38.4%–59.3%).	49.5	(39.8%–59.2%)	49.2	(42.1%–56.3%)	22.7	(13.9%–31.4%)	27.2	(18.6%–35.8%)	25.1	(18.9%–31.2%)
Education (yrs)												
<12	42.4	(29.8%–55.0%)	52.3	(40.1%–64.4%)	47.6	(38.8%–56.4%)	22.0	(11.4%–32.6%)	36.9	(25.2%–48.6%)	29.8	(21.7%–37.9%)
12	43.0	(34.6%–51.3%)	40.7	(32.4%–48.9%)	41.9	(36.0%–47.8%)	20.7	(13.9%–27.5%)	20.0	(13.2%–26.7%)	20.4	(15.6%–25.2%)
>12	53.2	(43.1%–63.3%)	45.3	(34.8%–55.8%)	49.4	(42.1%–56.7%)	30.9	(21.6%–40.2%)	26.7	(17.3%–36.0%)	28.9	(22.2%–35.5%)
Race/Ethnicity†												
White, non-Hispanic	41.1	(34.1%–48.0%)	38.2	(31.3%–45.1%)	39.7	(34.8%–44.6%)	20.3	(14.6%–25.9%)	22.0	(16.1%–27.9%)	21.2	(17.0%–25.2%)
American Indian/ Alaskan Native	65.6	(53.7%–77.5%)	66.7	(54.8%–78.6%)	66.1	(57.7%–74.5%)	42.6	(30.2%–55.0%)	40.0	(27.6%–52.3%)	41.3	(32.5%–50.1%)
Other	40.0	(23.8%–56.2%)	41.7	(25.6%–57.8%)	40.8	(29.3%–52.2%)	14.3	(2.7%–25.9%)	22.2	(8.6%–35.8%)	18.3	(9.3%–27.3%)
Total	46.2	(40.4%–51.9%)	44.6	(38.8%–50.4%)	45.4	(41.3%–49.5%)	24.3	(19.3%–29.2%)	25.8	(20.7%–30.9%)	25.0	(21.5%–28.5%)

* Confidence interval.
† Numbers for other racial/ethnic groups were too small for meaningful analysis.

TABLE 2. Adjusted odds ratios (AORs)* for tobacco smoking quit attempts of ≥24 hours and ≥7 days among recovering alcoholics during 1 year of follow-up after discharge from a residential alcohol-treatment center — Iowa, Kansas, and Nebraska, 1995–1996†

	Quit for ≥24 hours		Quit for ≥7 days	
Characteristic	AOR	(95% CI§)	AOR	(95% CI)
Age group (yrs)				
18–24	1.0	Referent	1.0	Referent
25–44	0.8	(0.5–1.2)	0.6	(0.4–1.0)
≥45	1.0	(0.5–1.9)	0.9	(0.4–1.9)
Sex				
Male	1.0	Referent	1.0	Referent
Female	1.1	(0.7–1.6)	0.8	(0.5–1.3)
Education (yrs)				
<12	1.0	Referent	1.0	Referent
12	0.9	(0.6–1.5)	0.7	(0.4–1.2)
>12	1.4	(0.9–2.3)	1.3	(0.7–2.2)
Race/Ethnicity				
White, non-Hispanic	1.0	Referent	1.0	Referent
American Indian/ Alaskan Native	3.0	(1.9–4.7)	2.7	(1.7–4.3)
Other¶	1.1	(0.7–1.9)	0.9	(0.5–1.8)

*The odds ratios presented for each sociodemographic variable are adjusted for the other sociodemographic variables in the table and for receipt of the smoking cessation intervention.
†n=575.
§Confidence interval.
¶Four respondents indicated Hispanic ethnicity. These persons were included in the "other" category.

among American Indian/Alaskan Native participants than among non-Hispanic whites may reflect the effect of race as a marker for other sociodemographic characteristics previously associated with tobacco and smoking cessation (e.g., income, education, occupation, and community traditions) (9).

In the United States and other countries, recovering alcoholics have not been encouraged to quit smoking as consistently as have smokers in the total population because of concerns that the stress of nicotine withdrawal might provoke a relapse to alcohol abuse (10). However, this position has not been substantiated by rigorous trials or investigation (10). In the study described in this report, recovering alcoholics who were encouraged to quit smoking were less likely to relapse to drinking during the 1-year follow-up period (10). Public health departments can facilitate smoking-cessation efforts among recovering alcoholics by encouraging community chemical-dependency treatment programs to routinely screen for and treat tobacco use. The findings in this report suggest that more intensive interventions, similar to those employed for treatment of alcohol problems, may be needed to markedly increase tobacco smoking-cessation rates among such groups.

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The Great American Smokeout — November 20, 1997

In 1994, an estimated 48 million U.S. adults were current cigarette smokers; in 1996, at least 4 million U.S. adolescents were current cigarette smokers (*1,2*). Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to promote community-based activities that encourage smokers to refrain from smoking cigarettes for at least 24 hours. This year, the Great American Smokeout is Thursday, November 20. This nationwide effort can increase cessation attempts (*3*): for example, the 1996 promotion was associated with helping an estimated 7400 persons quit smoking (*4*). This year's promotion focuses on the prevention of both cigar and cigarette smoking and cautions children and adolescents never to start smoking.

Activities this year will include the ACS *Commit to Quit* program, which helps smokers choose a method of quitting that meets their personal needs. In addition, ACS volunteers will conduct smoking-cessation and smoking-prevention activities for persons of all ages at shopping malls, work sites, hospitals, military installations, and other locations.

Additional information is available from ACS, telephone (800) 227-2345 or (404) 320-3333; CDC, telephone (800) 232-1311 or (770) 488-5705; or the ACS Great American Smokeout website on the World-Wide Web (http://www.cancer.org).

Reported by: American Cancer Society, Atlanta, Georgia. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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MMWR 1997;46(44):1037

Impact of Promotion of the Great American Smokeout
and Availability of Over-the-Counter Nicotine Medications, 1996

The 1996 Great American Smokeout (GASO), sponsored by the American Cancer Society (ACS), was held on November 21 and included a national promotional campaign in collaboration with a distributor of over-the-counter (OTC) nicotine medications. The 1996 GASO was the first to use a national promotion that included paid advertising of the GASO through television, magazines, and newspapers; direct-to- consumer promotions; and educational activities about GASO in retail stores that sell OTC nicotine medications.* To estimate the impact of this promotional partnership between ACS and a distributor of OTC nicotine medications on smoking-cessation activity, the collaborators[†] analyzed data from three sources. This report summarizes the findings, which suggest that the promotional campaign, combined with OTC availability of nicotine medications, encouraged smoking-cessation activity.

The 1996 GASO promotion encouraged quitting in general and did not promote any specific brand of nicotine medications; the focus of the promotion was on quitting on the day of the GASO, November 21. In addition, brand-specific nicotine medication advertising largely did not change during the 1996 promotion. To estimate the number of persons exposed to television promotions of the GASO, A.C. Nielsen's National TV Index Service assessed the number of times viewers in the study sample were exposed to an advertisement (1); such exposures are known as impressions.

To estimate awareness of and participation in the GASO, including efforts to quit smoking on the day of the GASO, ACS commissioned Lieberman Research, Inc., to conduct random-digit–dialed telephone surveys in 1995 and 1996. In 1995, a survey of 5504 adults aged ≥21 years, including 1366 smokers, was conducted from November 17 through November 26. The nationally representative sample comprised ≥100 interviews in each of 48 states; the District of Columbia; Long Island, New York; and the cities of Philadelphia, Pennsylvania, and New York, New York. Data were weighted to produce national estimates. In 1996, a nationwide survey of 983 adults aged ≥21 years was conducted from November 22 through November 26. Smokers were oversampled (n=379), and the data were weighted to produce nationally representative estimates (2). Respondents in the 1995 and 1996 surveys were asked, "On the day of the Great American Smokeout, which of these things did you do: not smoke cigarettes at all; cut down the number of cigarettes you usually smoke; or smoke as much as usual?"

Retail sales of OTC nicotine medications (i.e., Nicorette® nicotine chewing gum, NicoDerm® CQ™ nicotine patches, and Nicotrol® nicotine patches)[§] in 1996 were estimated by A.C. Nielsen's InFact Service, which tallies purchases entered at the cash registers of food, drug, and mass merchandisers by electronic Universal Product Code (UPC) scanner. Data were collected from a nationally representative sample of

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*Standard promotion of the GASO is organized and promoted by ACS volunteers and staff and consists of local activities in malls, businesses, restaurants, hospitals, colleges, and military bases.

[†]SmithKline Beecham Consumer Healthcare; Smoking Research Group, University of Pittsburgh; Pinney Associates; ACS; and CDC.

[§]Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

10,000 outlets located primarily in the top 50 major markets. Purchases from retail outlets without scanner technology were estimated by a sample of those stores. The sample was then weighted to estimate total unit purchases from all outlets. The resulting figures underestimate actual sales (by comparison with factory shipments); therefore, this analysis assumes a 5% underestimation of sales. Projected sales of all three OTC nicotine medications were adjusted to account for underestimation. The baseline period was defined as the 4-week period ending November 2, and the GASO promotion period was the 4-week period ending November 30.

The National TV Index Service reported that the paid advertising specifically for the GASO reached 122.1 million adults aged ≥18 years an average of 2.9 times during the 3 weeks before and the week of the GASO, representing a total of approximately 354 million television impressions nationally. Assuming equal distribution of these impressions among smokers and nonsmokers, an estimated 30.5 million smokers (64% of all U.S. smokers) (*2*) were exposed to GASO promotions.

Responses to the 1995 and 1996 Lieberman surveys were compared to determine whether GASO-related smoking-reduction and smoking-cessation rates changed from 1995 to 1996. During this period, the percentage of respondents who initiated any action during the GASO (either reducing or quitting smoking) increased from 18% in 1995 to 26% in 1996) (Table 1). The percentage who reported quitting remained the same (5% in 1995 versus 6% in 1996); however, the percentage who reported reducing their smoking during the GASO increased significantly, from 13% in 1995 to 20% in 1996. In 1996, reports of smoking behavior were examined at the time of the interview (1–5 days following the GASO): 6% of respondents reported quitting smoking, while 15% reduced their smoking.

Smoking-cessation activity involving the use of nicotine medications was estimated using retail sales of such products as reported by InFact. During the 4-week GASO promotional period, sales of nicotine medications increased by 11% (136,000 units), compared with sales during the baseline period. The proportion of units purchased by new users or by repeat purchasers cannot be determined precisely; however, the smallest package of OTC nicotine medication provides approximately 7 days of therapy; therefore, in this analysis, only the increase in sales during the week ending November 23 was assumed to be due to new purchasers and thus new quit attempts.¶ Compared with weekly average sales during the entire 4-

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¶No evidence suggests the promotion increased repeat purchases.

TABLE 1. Percentage of respondents who participated in the Great American Smokeout, by selected characteristics and year — United States, 1995 and 1996*

Characteristic	1995	1996	Odds ratio	(95% CI†)	Chi square	Df§	p value
Quit smoking	5%	6%	1.2	(0.7–2.0)	0.7	1	<0.41
Reduced smoking	13%	20%	1.7	(1.2–2.3)	11.8	1	<0.001
Any participation¶	18%	26%	1.6	(1.2–2.1)	11.7	1	<0.001

*In 1995, a survey of 5504 adults aged ≥21 years was conducted, and in 1996, a survey of 983 adults aged ≥21 years was conducted. Data for each year were weighted to produce national estmates for the respective year.
†Confidence interval
§Degrees of freedom.
¶Either attempts to reduce or quit smoking.

week baseline period (306,400 units), sales during the week ending November 23 increased 30% (92,600 units), representing a total of 399,000 units. Thus, the enhanced promotional activities and the GASO promotion were associated with an estimated 92,600 attempts at quitting smoking using nicotine medications.

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Editorial Note: Based on nationally representative data for 1965–1994, the prevalence of cigarette smoking in the United States appears to have reached a plateau of approximately 25% (*2,3*). Reducing the initiation of smoking among youth is a priority reflected in the Food and Drug Administration's final tobacco rule, as well as in ongoing public education and awareness efforts such as the GASO. In addition, encouraging cessation is a priority; reducing adult smoking produces substantial short-term and long-term benefits in health improvements and cost savings (*4*). Since 1977, ACS has sponsored the annual GASO to encourage smokers to stop smoking for at least 24 hours. Evaluation of mass media campaigns and previous GASO efforts suggests that public promotions can increase smoking-cessation activity (*5,6*).

The findings in this report suggest that the GASO promotional campaign and OTC availability of nicotine medications encouraged smoking-cessation activity. These findings illustrate the substantial impact of an intensive event-related campaign in promoting smoking-cessation activity. In comparison, data from another source on the use of nicotine medications in 1995 indicated only a 2% monthly increase in nicotine medication prescriptions for November over the annual average; however, there was no promotional campaign nor OTC availability of the products (*7*). OTC availability of the nicotine patch and nicotine gum appears to remove a possible barrier to their use (i.e., obtaining a prescription) and allows more direct promotion of these products and smoking cessation to the general public.

A recent analysis conducted in a setting that simulated OTC availability of three currently available OTC nicotine medications found a continuous (biochemically validated) quit rate of 8% at 12 months using data pooled across studies (*8*). Using the single-week comparison as the most valid indicator of initial quitting attempts (rather than repurchase) and assuming that any product purchased was used for a quit attempt, the increase in nicotine medication use attributable to the 1996 GASO promotion produced an estimated 7400 additional former smokers.

The findings in this report are subject to at least three limitations. First, because no record was maintained of nonrespondents for the Lieberman surveys, response rates could not be calculated. As a result, the level of response bias cannot be determined. Second, the sampling methods of the 1995 and 1996 surveys were different; however, data from both surveys were weighted to produce nationally representative data and, therefore, were considered comparable. Third, the estimate of the impact of the promotional campaign on smoking cessation may not be precise because all purchasers of nicotine medications were assumed to be the user of the product and because retail sales data comprise both new and repeat purchases.

The findings in this report suggest that promoting smoking cessation can increase quit attempts. Smokers interested in quitting smoking should be strongly encouraged

to do so and should optimize their chances for quitting by using effective treatments as outlined by the Agency for Health Care Policy and Research (*9*). Marketing and promotion efforts designed to promote attempts to quit, along with OTC availability of nicotine medications, are a useful part of a national strategy to decrease the prevalence of smoking.

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World No-Tobacco Day — May 31, 1997

World No-Tobacco Day is an annual international event that encourages governments, communities, and other groups to become more aware of the hazards of tobacco use and requests all persons who use tobacco to quit for at least 24 hours. This year's event will be held May 31; the theme is "United for a Tobacco-Free World" (*1*).

Tobacco use is expected to be the greatest risk factor for death and disability in the world by 2020 (*2*). In 1990, approximately 3 million deaths were attributed to tobacco use; by 2025, the annual number of tobacco-related deaths is projected to reach 10 million, with 70% of deaths occurring in developing countries (*1*). Efforts to reduce tobacco use require the participation of all sectors of society and must be comprehensive in scope. This year's event will highlight the complementary roles of policies and programs at the local, national, and international levels in achieving a tobacco-free world.

The World Health Organization (WHO), which is sponsoring this year's event, will provide press releases, fact sheets, a poster, and an advisory kit on comprehensive measures to reduce tobacco use. Additional information is available from WHO on the Internet (http://www.who.ch/programmes/psa/toh.htm), the WHO Regional Office for the Americas (telephone [202] 974-3000), and from CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion (http://www.cdc.gov/tobacco) (telephone [770] 488-5705).

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MMWR 1997;46(20):433

The Great American Smokeout — November 21, 1996

Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to foster community-based activities that encourage smokers to stop smoking for at least 24 hours. This year, the Great American Smokeout is Thursday, November 21. The primary goal of this year's event is to prevent initiation of tobacco use among children and adolescents.

Most smokers began smoking as teenagers (*1*); each day, approximately 6000 young persons try a cigarette and approximately 3000 become daily smokers (Substance Abuse and Mental Health Services Administration, unpublished data, 1994). Among persons who have ever smoked daily, 82% began smoking before age 18 years (*1*). In August 1996, the Executive Branch of the federal government announced the nation's first comprehensive program to prevent children and adolescents from smoking cigarettes or using smokeless tobacco (*2*).

Events this year will include a program to encourage high school-aged children to sign a Great American Smokeout pledge promising to stay smoke-free or to try to quit smoking during the Great American Smokeout. In addition, ACS volunteers will conduct smoking-cessation and -prevention activities for persons of all ages at shopping malls, worksites, hospitals, military installations, and other locations.

Additional information is available from the ACS, telephone (800) 227-2345 or (404) 320-3333; CDC, telephone (800) 232-1311 or (770) 488-5705; or the ACS Great American Smokeout website on the World Wide Web (http://www. cancer.org).

Reported by: American Cancer Society, Atlanta. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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MMWR 45(44):961

World No-Tobacco Day — May 31, 1996

World No-Tobacco Day is an annual international event that encourages governments, communities, and other groups to become more aware of the hazards of tobacco use and requests all persons who use tobacco to quit for at least 24 hours. This year's event will be held May 31, 1996; the theme is "Sports and the Arts Without Tobacco."

The World Health Organization (WHO), in collaboration with the United Nations' Educational, Scientific and Cultural Organization and the International Olympic Committee, is cosponsoring World No-Tobacco Day. This year's initiative extends the growing awareness among arts institutions and sports and other event organizers that their events and activities should not be linked to products that impair health and cause premature death (1).

Additional information about World No-Tobacco Day 1996 is available from the WHO Regional Office for the Americas (telephone [202] 861-3200); from the National Association of African Americans for Positive Imagery (telephone [215] 477-4113); and from CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion (telephone [770] 488-5705).

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Health-Care Provider Advice on Tobacco Use
to Persons Aged 10–22 Years — United States, 1993

Among U.S. adults who have ever smoked daily, 91% tried their first cigarette and 77% became daily smokers before age 20 years (*1*). Among high school seniors who had ever tried smokeless tobacco (SLT), 73% did so by the ninth grade (*1*). Despite the widely publicized risks of tobacco use, in 1993, 61% of high school sophomores believed that the risk from cigarette smoking was "great," and 44% believed the risk from SLT use was "great" (*2*). The low levels of understanding about the harmfulness of tobacco products underscore the need for health-care providers and others to provide adolescents and young adults with information to counter the allure of tobacco use created by marketing efforts. This report summarizes an analysis of data from the 1993 Teenage Attitudes and Practices Survey (TAPS II) regarding the provision of information about tobacco use by health-care providers to persons aged 10–22 years.

Data about knowledge of, attitudes toward, and practices regarding tobacco use among persons aged 10–22 years were collected by TAPS II by telephone interviews and by personal interviews among respondents not available by telephone. The sample for this analysis comprised 7960 respondents who had participated in the 1989 TAPS interview and who subsequently responded to TAPS II (aged 15–22 years at the time of the second interview), and an additional 4992 persons from a new probability sample in 1993 of 5590 persons aged 10–15 years (89.3% response rate). Data were weighted to provide national estimates. Adjusted odds ratios were computed by multiple logistical regression simultaneously adjusting for all other variables, and 95% confidence intervals were calculated using SUDAAN (*3*). Questions included: "Has a doctor, dentist, or nurse ever said anything to you about cigarette smoking?" and "Has a doctor, dentist, or nurse ever said anything to you about using chewing tobacco or snuff?" Correlations with affirmative responses were analyzed in relation to five categories of smoking and SLT use: Never smoked/used (never), tried but never smoked/used on daily basis or during the month preceding the interview (tried), smoked/used daily for at least 1 month but no smoking/use during the month preceding the interview (past daily), smoked/used during the month preceding the interview but never smoked/used daily for at least 1 month (current, never daily), and smoked/used daily for at least 1 month and on ≥1 day during the month preceding the interview (current, ever daily).

One fourth (25%) of respondents reported that a health-care provider had said something to them about cigarette smoking, and 12% said the same about SLT. More females (27%) than males (24%) answered "yes" to the question about cigarettes, and more males (14%) than females (9%) answered "yes" about SLT (Tables 1 and 2). The proportion of respondents who answered "yes" increased significantly with age for cigarette smoking but not for SLT.

Affirmative responses were most strongly correlated with having a history of tobacco use (Tables 1 and 2). Young persons who reported current or previous smoking or SLT use on a daily basis for at least 1 month (current or past daily) were significantly more likely than persons who had never smoked/used to answer "yes." Among current, ever daily users, 50% of smokers and 48% of SLT users answered "yes" compared with 21% of never smokers and 10% of never SLT users.

TABLE 1. Percentage of persons aged 10–22 years* who reported that a health-care provider† ever said anything to them about cigarette smoking, by selected characteristics — United States, Teenage Attitudes and Practices Survey, 1993

Characteristic	%	(95% CI§)	Adjusted odds ratio¶	(95% CI)
Sex				
Male	23.6	(22.5%–24.8%)	1.0	Referent
Female	26.5	(25.3%–27.8%)	1.2	(1.1–1.3)
Age group (yrs)				
10–16	20.7	(19.6%–21.8%)	1.0	Referent
17–19	29.0	(27.4%–30.6%)	1.2	(1.1–1.4)
20–22	33.7	(31.8%–35.7%)	1.4	(1.3–1.6)
Poverty status**				
At/Above poverty level	25.6	(24.6%–26.5%)	1.0	Referent
Below poverty level	22.6	(20.4%–24.8%)	1.1	(0.9–1.3)
Unknown	23.8	(20.6%–27.0%)	1.0	(0.8–1.2)
Health status				
Excellent	24.4	(23.2%–25.6%)	1.0	Referent
Very good/Good	25.6	(24.3%–26.9%)	1.1	(1.0–1.2)
Fair/Poor	29.4	(24.7%–34.1%)	1.3	(1.0–1.7)
**Region†† **				
Northeast	27.6	(25.7%–29.4%)	1.0	Referent
Midwest	24.0	(22.4%–25.7%)	1.1	(1.0–1.3)
South	24.8	(23.2%–26.4%)	0.9	(0.8–1.1)
West	24.6	(22.8%–26.5%)	1.0	(0.9–1.2)
Smoking history§§				
PM–,ED–,ET–	20.9	(19.8%–21.9%)	1.0	Referent
PM–,ED–,ET+	24.0	(22.2%–25.7%)	1.1	(1.0–1.2)
PM–,ED+	41.5	(36.0%–46.9%)	2.2	(1.7–2.8)
PM+,ED–	26.1	(22.6%–29.6%)	1.2	(1.0–1.5)
PM+,ED+	50.2	(47.3%–53.2%)	3.2	(2.8–3.7)
Total	**25.1**	**(24.2%–25.9%)**		

*n=12,871. Persons who had missing data on any variable (n=81) were excluded from this analysis.
†Doctor, dentist, or nurse.
§Confidence interval.
¶Each odds ratio was simultaneously adjusted by multiple logistical regression for all other characteristics and for race/ethnicity.
**Poverty statistics are based on a definition originated by the Social Security Administration in 1964, subsequently modified by federal interagency committees in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.
††Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
§§PM–=Did not smoke during the month preceding the interview; ED–=Never smoked daily for at least 1 month preceding the interview; ET–=Never tried cigarette smoking; ET+=Ever tried cigarette smoking; ED+=Ever smoked daily for at least 1 month preceding the interview; PM+=Smoked on ≥1 day during the month preceding the interview.

TABLE 2. Percentage of persons aged 10–22 years* who reported that a health-care provider† ever said anything to them about using chewing tobacco or snuff, by selected characteristics — United States, Teenage Attitudes and Practices Survey, 1993

Characteristic	%	(95% CI§)	Adjusted odds ratio¶	(95% CI)
Sex				
Male	14.3	(13.4%–15.2%)	1.0	Referent
Female	9.2	(8.4%–10.0%)	0.7	(0.6–0.8)
Age group (yrs)				
10–16	11.3	(10.4%–12.1%)	1.0	Referent
17–19	12.0	(10.9%–13.1%)	0.9	(0.8–1.1)
20–22	13.0	(11.6%–14.5%)	1.0	(0.8–1.2)
Poverty status**				
At/Above poverty level	11.9	(11.2%–12.7%)	1.0	Referent
Below poverty level	10.6	(9.1%–12.2%)	1.0	(0.8–1.3)
Unknown	12.0	(9.5%–14.5%)	0.9	(0.7–1.2)
Health status				
Excellent	11.7	(10.9%–12.6%)	1.0	Referent
Very good/Good	11.9	(10.9%–12.9%)	1.0	(0.9–1.2)
Fair/Poor	11.5	(7.7%–15.2%)	1.0	(0.7–1.6)
Region††				
Northeast	10.0	(8.7%–11.3%)	1.0	Referent
Midwest	11.2	(9.9%–12.5%)	0.9	(0.7–1.1)
South	13.6	(12.3%–14.8%)	1.0	(0.8–1.2)
West	11.0	(9.8%–12.3%)	1.2	(1.0–1.4)
Smokeless tobacco use history§§				
PM–,ED–,ET–	10.4	(9.7%–11.2%)	1.0	Referent
PM–,ED–,ET+	13.2	(11.5%–14.9%)	1.2	(1.0–1.4)
PM–,ED+	27.3	(19.9%–34.6%)	2.7	(1.8–4.1)
PM+,ED–	20.2	(15.1%–25.4%)	1.8	(1.3–2.6)
PM+,ED+	47.9	(41.5%–54.2%)	6.3	(4.7–8.5)
Total	**11.8**	**(11.1%–12.4%)**		

*n=12,843. Persons who had missing data on any variable (n=109) were excluded from this analysis.

†Doctor, dentist, or nurse.

§Confidence interval.

¶Each odds ratio was simultaneously adjusted by multiple logistical regression for all other characteristics and for race/ethnicity.

**Poverty statistics are based on a definition originated by the Social Security Administration in 1964, subsequently modified by federal interagency committess in 1969 and 1980, and prescribed by the Office of Management and Budget as the standard to be used by federal agencies for statistical purposes.

††Northeast=Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest=Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South=Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West=Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

§§PM–=Did not use SLT during the month preceding the interview; ED–=Never used SLT daily for at least 1 month preceding the interview; ET–=Never tried SLT; ET+=Ever tried SLT; ED+=Ever used SLT daily for at least 1 month preceding the interview; PM+=Used SLT on ≥1 day during the month preceding the interview.

Reported by: LS Baker, MPH, Center for the Future of Children, The David and Lucile Packard Foundation, Los Altos, California. GE Morley, The Robert Wood Johnson Foundation, Princeton, New Jersey. DC Barker, MHS, The California Wellness Foundation, Woodland Hills, California. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: One of the national health objectives for the year 2000 is to increase to at least 75% the proportion of primary-care physicians who routinely provide smoking-cessation advice to their patients (objective 3.16) (*4*). In addition, the American Medical Association has recommended that primary-care physicians and other health-care providers ask adolescents annually about their use of tobacco products and patterns of use and provide a cessation plan to adolescents who use tobacco products (*5*). The findings in this report indicate that only approximately half of those persons aged 10–22 years who had ever smoked or used SLT daily and were current cigarette smokers or users of SLT recall ever receiving any communication about the use of cigarettes or SLT from physicians, dentists, or nurses.

The analysis of the TAPS II data is subject to at least two limitations. First, because these self-reported data are based on respondents' recollection of their communication with a health-care provider, they probably underestimate the interactions between patients and their health-care providers. Second, TAPS and TAPS II do not contain information about the number of visits to health-care providers. However, the likelihood that health-care providers will advise against tobacco use is directly related to the number of visits, and the average annual number of physician contacts varies by age, sex, race/ethnicity, and income level (*6*).

The analysis of TAPS is consistent with other reports documenting missed opportunities to provide information before adolescents begin to use tobacco (*1,7,8*). Although use of cigarettes and SLT begins early in adolescence (*1*), the TAPS findings indicate that only 24% of respondents who had tried a cigarette and only 13% of those who had tried SLT recalled hearing about tobacco use from a health-care provider. In addition, health-care providers were more likely to say something about tobacco use to patients who were current or heavy users, a pattern consistent with that for adults (*9*).

· Basic strategies to prevent nicotine addiction in adolescents and young adults include tobacco tax increases, enforcement of laws preventing the access of minors to tobacco, youth-oriented mass media campaigns, and school-based tobacco-use prevention programs (*1*). In addition, the role of health-care providers is critical in preventing patients from initiating tobacco use or quitting if they become addicted to nicotine: patients who are told to quit smoking by their physician are nearly twice as likely to be preparing to quit than were those who had never been so advised (*10*). The National Cancer Institute and the American Medical Association have developed guidelines and national training programs to assist health-care providers in discussing both cigarette and SLT use with young patients (*5,7,8*). In addition, CDC, in conjunction with the American Medical Association, is funding new initiatives to foster development of innovative cessation services for adolescents.

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The Great American Smokeout, November 16, 1995

Since 1977, the American Cancer Society has sponsored the Great American Smokeout to foster community-based activities that encourage cigarette smokers to stop smoking. This year, the Great American Smokeout will be on Thursday, November 16. The primary goal of this year's event is to prevent initiation of tobacco use among adolescents.

From 1965 through 1993, the annual prevalence of cigarette smoking among adults in the United States declined 40% (*1*). However, the prevalence of smoking among adolescents remained steady since the mid-1980s (*2*), and the most recent data suggest it is increasing (*3*).

Events this year will include a week of classroom activities intended to raise awareness among teenagers about the social and physical benefits of never starting to smoke. In addition, American Cancer Society volunteers will conduct activities for smokers and their nonsmoking partners at shopping malls, worksites, hospitals, military installations, and other locations.

Additional information is available from the American Cancer Society, telephone (800) 227-2345 or (404) 320-3333; and from CDC, telephone (800) 232-1311 or (770) 488-5705.

Reported by: American Cancer Society, Atlanta. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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MMWR 1995;44(44):825

World No-Tobacco Day, 1995

The increase in cigarette smoking worldwide since 1950 has been particularly dramatic in developing countries and has been associated with substantial morbidity, mortality, and economic costs (*1,2*). Each year, tobacco use accounts for at least 3 million deaths worldwide (*1–3*). Based on current smoking trends, in 30–40 years, tobacco use is projected to cause 10 million deaths annually, of which 70% will occur among persons in developing countries (*1*). The global health-care costs resulting from tobacco use exceed $200 billion per year—more than twice the current health budgets of all developing countries combined (*4*).

To increase global awareness of tobacco-attributable morbidity, mortality, and economic costs, the theme of the eighth World No-Tobacco Day, to be held May 31, 1995, is "Tobacco Costs More Than You Think." Additional information about World No-Tobacco Day 1995 is available from the Regional Office for the Americas, World Health Organization (telephone [202] 861-3200), or from CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion (telephone [404] 488-5705).

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MMWR 1995;44(19):369

The Great American Smokeout, November 17, 1994

Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to foster community-based activities that encourage cigarette smokers to stop smoking for at least 24 hours. These activities include distributing materials to schools, hospitals, businesses, and other organizations that discourage tobacco use; encouraging restaurants and other businesses to be smoke-free for the day; and promoting media coverage of special events at the national and community level.

During the 1993 Great American Smokeout, an estimated 2.4 million (6%) smokers reported quitting, and 6.0 million (15%) reported reducing the number of cigarettes smoked on that day (*1*). In addition, approximately 1.6 million (4%) smokers quit smoking for 1–10 days after the Smokeout (*1*). Approximately 10.7 million packs of cigarettes were not smoked, resulting in an estimated $18.1 million not spent on cigarettes (*1–3*).

This year, the Great American Smokeout will be on Thursday, November 17. The goal of the Smokeout is to promote and encourage smoking cessation by helping smokers realize that if they can quit for 1 day, they can quit permanently. Information is available from local chapters of the ACS; for telephone numbers of these local chapters, telephone (800) 227-2345 or (404) 329-7576.

Reported by: American Cancer Society, Atlanta. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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MMWR 1994;43(43):785

Role of Media in Tobacco Control —
World No-Tobacco Day, 1994

The mass media have played an important role in efforts to control and prevent tobacco use. To recognize the effectiveness of these efforts, the theme of the seventh World No-Tobacco Day, to be held May 31, 1994, is "The Media and Tobacco: Getting the Health Message Across." Activities will include press releases, videotape presentations, educational symposia, and radio announcements by World Health Organization experts on tobacco control.

The need for collaboration between public health workers and media representatives is particularly urgent in developing countries in which the prevalence of tobacco use is increasing. In these countries, the dissemination of information through the media also can assist in the development of educational and legislative measures to prevent and control tobacco use (*1,2*) and may help reduce the success of aggressive marketing campaigns by transnational tobacco companies. Examples of collaboration between the media and the tobacco-control groups in some countries include successful smoking-cessation and health-education campaigns (e.g., in Estonia, Finland, and New Guinea) and decisions by certain media to refuse cigarette advertising (e.g., in Australia, Canada, and the United States).

Additional information about World No-Tobacco Day 1994 is available from the Office of Information and Public Affairs, Pan American Health Organization (telephone [202] 861-3458) or from CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion (telephone [404] 488-5705).

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MMWR 1994;43(19):341

Examinations for Oral Cancer — United States, 1992

During 1992, oral cancer (i.e., cancers of the oral cavity and pharynx) was diagnosed in approximately 30,000 persons in the United States and caused nearly 8000 deaths (1); approximately 70% of deaths from oral cancer are associated with smoking (2) and other forms of tobacco use (3). Although the 5-year survival rate (53%) for persons with oral cancer remains low, survival varies by stage at diagnosis (4). Detection of oral cancers by oral examination can reduce morbidity and death associated with this problem (5). To characterize examinations for oral cancer among U.S. adults, CDC analyzed data from the 1992 National Health Interview Survey–Cancer Control (NHIS-CC) supplement. This report summarizes findings from that analysis.

The NHIS-CC supplement collected self-reported information from a representative sample (n=12,035) of the U.S. civilian, noninstitutionalized population aged ≥18 years regarding cancer screening and cancer-risk behaviors. The response rate was 87.0%. Participants were asked, "Have you ever had a test for oral cancer," and were provided a description of the examination (i.e., "in which the doctor or dentist pulls on your tongue, sometimes with gauze wrapped around it, and feels under the tongue and inside the cheeks?") and were asked about cigarette smoking and other tobacco use. Persons reporting that they had had an examination were asked the length of time since the most recent one and the reason for and the type of health professional who performed the examination. Data were weighted to adjust for nonresponse and sample design to provide national estimates. Confidence intervals (CIs) were calculated using standard errors generated by SUDAAN (6).

Overall, 14.3% (95% CI=±0.8%) of respondents reported that they had ever been examined for oral cancer. Having ever received an oral cancer examination varied by demographic characteristics, education, and smoking status (Table 1). Blacks were less likely than whites and Hispanics were less likely than non-Hispanics to report an oral cancer examination. The percentage of adults reporting an examination for oral cancer increased with level of education and with age but was lower for persons aged ≥65 years. Current smokers were less likely to report an examination than were former smokers.

Of persons ever examined for oral cancer, 48.7% (95% CI=±3.0%) reported their most recent examination had occurred during the preceding year (Table 1). More than half (54.4%; 95% CI=±3.3%) of respondents who had received oral cancer examinations reported that the most recent one was part of a routine dental examination and more than one third (35.0%; 95% CI=±3.2%) as part of a routine physical examination; small proportions reported that the primary reason was because of a specific oral problem (6.3%; 95% CI=±1.5%) or for other reasons (4.3%; 95% CI=±1.3%).

Among respondents who reported examinations, 67.4% (95% CI=±3.1%) reported that the most recent one had been performed by a dentist, followed by a physician (23.5%; 95% CI=±2.9%), a dental hygienist (6.6%; 95% CI=±1.5%), and another health-care provider (2.5%; 95% CI=±0.8%).

Reported by: Office on Smoking and Health, Div of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion; Div of Oral Health, National Center for Prevention Svcs, CDC.

Editorial Note: More than three fourths of oral cancers occur in sites that can be readily visualized or palpated (e.g., tongue, 20% of oral cancers; lip, 12%; oropharynx or tonsils, 13%; floor of mouth, 11%; and other sites within the oral cavity, 26% [7]) during an oral examination. One of the national health objectives for the year 2000 is to

TABLE 1. Percentage of respondents who reported having had an oral cancer examination ever and during the preceding year, by selected characteristics — United States, National Health Interview Survey–Cancer Control Supplement, 1992

Characteristic	Ever had examination for oral cancer		Had most recent oral cancer examination within preceding year	
	%	(95% CI*)	%	(95% CI)
Sex				
Female	13.9	(±1.0)	50.5	(± 3.8)
Male	14.8	(±1.2)	46.8	(± 4.5)
Age group (yrs)				
18–24	9.0	(±2.0)	37.2	(±10.7)
25–44	14.4	(±1.1)	50.4	(± 4.4)
45–64	17.5	(±1.8)	48.6	(± 5.4)
≥65	13.3	(±1.6)	50.1	(± 7.2)
Race				
White	15.2	(±0.9)	49.8	(± 3.2)
Black	9.0	(±1.8)	29.9	(± 9.0)
Other†	10.7	(±4.2)	§	
Hispanic origin				
Hispanic	9.3	(±1.9)	§	
Non-Hispanic	14.7	(±0.9)	49.5	(± 3.1)
Education (yrs)				
<12	8.5	(±1.3)	39.4	(± 7.6)
12	11.4	(±1.1)	45.0	(± 5.2)
13–15	17.3	(±1.8)	50.4	(± 5.7)
≥16	22.7	(±2.0)	54.2	(± 4.9)
Smoking status				
Current¶	13.0	(±1.5)	46.4	(± 6.0)
Former**	16.7	(±1.6)	47.9	(± 5.4)
Never	13.9	(±1.1)	50.5	(± 4.3)
Smokeless tobacco use status				
Current††	11.2	(±4.1)	§	
Former§§	13.8	(±3.4)	§	
Never	14.5	(±0.9)	48.9	(± 3.1)
Total	14.3	(±0.8)	48.7	(± 3.0)

*Confidence interval.
†Includes American Indians/Alaskan Natives and Asians/Pacific Islanders.
§Number too small for meaningful analysis.
¶Respondents who reported having smoked at least 100 cigarettes and who were currently smoking every day or some days at the time of the interview.
**Respondents who reported having smoked at least 100 cigarettes but were not smoking at the time of the interview.
††Respondents who reported using snuff and/or chewing tobacco at least 20 times and who were using these products at the time of the interview.
§§Respondents who reported using snuff and/or chewing tobacco at least 20 times and who were not using these products at the time of the interview.

increase to at least 40% the proportion of persons aged ≥50 years who have received an oral examination while visiting a primary-care provider during the preceding year (objective 16.14) (*5*).

The findings in this report indicate that a low proportion of persons reported having had an examination for oral cancer, ever or during the preceding year. At least two explanations may account for these findings. First, clinical health-care providers may not conduct oral examinations routinely or when patients' medical histories indicate the need for an examination. In addition, some clinical health-care providers may not have received appropriate training beyond that needed to conduct a simple oral inspection and thus do not examine or palpate for early clinical signs of oral cancer. Second, the prevalence of oral cancer examinations may be underestimated because some persons made primary-care visits for reasons unlikely to prompt an examination for oral cancer and because some patients may not recall receiving an oral cancer examination, despite a prompting question.

Routine examinations by primary-care providers offer opportunities for primary and secondary prevention. The U.S. Preventive Services Task Force has recommended that clinical health-care providers perform oral examinations for cancerous lesions in patients who use tobacco or excessive amounts of alcohol (*8*). Persons who may be at risk for oral cancer should be identified and counseled about risk behaviors (e.g., tobacco use) and encouraged to have regular oral examinations. The findings in this report may be used to target efforts to increase oral examinations in underserved groups and others (e.g., racial/ethnic minorities and persons with <12 years of education) and groups at increased risk for oral cancer (e.g., persons who smoke cigarettes or use other tobacco products).

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Physician and Other Health-Care Professional Counseling of Smokers to Quit — United States, 1991

Physicians and other health-care professionals play a lead role in the prevention of tobacco smoking in the United States (1). In particular, health-care professionals can assist patients to stop smoking by counseling them about quitting (2,3). To monitor progress toward the national health objectives for the year 2000 on tobacco use (4), data from CDC's 1991 National Health Interview Survey–Health Promotion and Disease Prevention (NHIS-HPDP) supplement were used to estimate the prevalence of outpatient physician and other health-care professional counseling of smokers to quit. This report summarizes the results of that survey.

The NHIS-HPDP supplement collected information from a representative sample of the U.S. civilian, noninstitutionalized population aged ≥18 years regarding self-reported information on smoking and receipt of advice to quit. The overall response rate for the 1991 NHIS-HPDP was 87.7% (n=43,732). Participants who reported smoking cigarettes at any time during the preceding 12 months were asked the number of times during that period they had visited a doctor or other health-care professional in an outpatient setting and the number of visits during which they were advised to quit smoking by a doctor or other health-care professional. Doctor visits that occurred during overnight stays in hospitals were not counted. Data were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (5).

In 1991, an estimated 35.8 million (70.2% [95% CI=±1.0%]) of the 51.0 million persons who smoked during the preceding 12 months reported at least one outpatient visit with a physician or other health-care professional during that time. Of these, 11.2 million (31.4% [CI=±1.1%]) had had one visit, 10.7 million (29.9% [CI=±1.1%]) had had two or three visits, and 13.8 million (38.7% [CI=±1.2%]) had had four or more visits.

Overall, 12.8 million (37.2% [CI=±1.3%]) of the persons who had smoked reported having received any advice to quit from a health-care professional during the preceding 12 months. The likelihood of having been counseled to quit was directly related to the number of doctor visits (45.5% [CI=±2.0%] among persons with four or more visits compared with 28.1% [CI=±1.9%] among those with one visit). Rates of receiving counseling were slightly higher for women and persons aged 45–64 years than for men and persons aged <45 years (Table 1). Rates were slightly lower for Hispanics than for white non-Hispanics but otherwise did not vary by race/ethnicity, education, or socioeconomic status.

Among persons who reported that they smoked at the time of the survey, the proportion who had received advice to quit increased with the number of cigarettes smoked per day (33.6% [CI=±2.1%] of those who smoked one to 14 cigarettes per day, 41.4% [CI=±2.1%] of those who smoked 15–24 per day, and 46.3% [CI=±3.0%] of those who smoked ≥25 per day). The likelihood of receiving advice to quit was greatest among persons who smoked ≥25 cigarettes per day and had had four or more visits during the year (55.2% [CI=±4.4%]).

Reported by: Epidemiology Br, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Health Interview Statistics, National Center for Health Statistics, CDC.

Editorial Note: The findings in this report underscore that physicians and other health-care professionals are not yet maximizing their opportunities to counsel their patients who smoke to quit. These findings are consistent with previous reports indicating that patients who make multiple visits to the doctor—among whom the overall prevalence of health problems is increased—and patients who are heavier smokers are more likely to have received advice from their physician to quit (6). The inability of physicians and other health-care professionals to counsel all smokers to quit may reflect an

TABLE 1. Percentage of adult smokers* who reported receiving advice to quit from a physician or other health-care professional during the preceding 12 months, by number of visits, sex, age group, race/ethnicity, educational level, and socioeconomic status — United States, National Health Interview Survey–Health Promotion and Disease Prevention Supplement, 1991†

| Category | No. of health-care professional visits | | | | | | Any visit | |
| | 1 | | 2–3 | | ≥4 | | | |
	%	(95% CI§)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Sex								
Male	27.2	(±2.7)	35.8	(±3.4)	43.9	(±3.4)	35.2	(± 1.8)
Female	29.2	(±2.9)	36.6	(±2.7)	46.4	(±2.5)	38.9	(± 1.6)
Age group (yrs)								
18–24	18.0	(±4.8)	21.3	(±4.8)	42.9	(±6.1)	28.2	(± 3.2)
25–44	27.8	(±2.5)	37.6	(±3.0)	42.2	(±2.9)	35.7	(± 1.7)
45–64	34.8	(±4.1)	40.4	(±4.3)	52.0	(±3.8)	43.8	(± 2.5)
≥65	28.5	(±7.6)	36.7	(±7.5)	44.0	(±4.9)	38.8	(± 3.6)
Race/Ethnicity¶								
White, non-Hispanic	29.4	(±2.3)	36.6	(±2.5)	46.5	(±2.3)	38.2	(± 1.5)
Black, non-Hispanic	23.6	(±4.7)	35.9	(±5.9)	42.4	(±5.4)	34.4	(± 3.2)
Hispanic	24.5	(±8.2)	32.0	(±9.6)	36.2	(±8.8)	30.6	(± 5.1)
Asian/Pacific Islander**	—	—	—	—	—	—	34.4	(±12.1)
American Indian/								
Alaskan Native**	—	—	—	—	—	—	41.4	(±14.3)
Education††								
Less than high school	27.8	(±4.7)	32.6	(±4.4)	47.8	(±3.9)	37.9	(± 2.7)
High school graduate	28.5	(±2.9)	36.2	(±3.4)	46.5	(±3.0)	37.6	(± 1.9)
Some college	29.2	(±4.2)	37.1	(±4.4)	42.4	(±4.2)	36.3	(± 2.5)
College graduate	25.4	(±4.8)	40.9	(±6.1)	41.2	(±5.5)	36.1	(± 3.3)
Socioeconomic status§§								
At or above poverty level	29.0	(±2.2)	36.9	(±2.4)	45.6	(±2.3)	37.5	(± 1.4)
Below poverty level	26.3	(±5.5)	33.5	(±5.9)	45.5	(±4.5)	37.7	(± 3.2)
Unknown	20.4	(±6.1)	31.4	(±7.9)	43.8	(±7.9)	32.5	(± 4.5)
Total	28.1	(±1.9)	36.2	(±2.2)	45.5	(±2.0)	37.2	(± 1.3)

*Persons aged ≥18 years who reported they had smoked during the preceding 12 months.
†Sample size=8778; excludes 369 respondents with an unknown number of doctor visits.
§Confidence interval.
¶Excludes 56 respondents in unknown, multiple, or other racial/ethnic categories.
**Not reported by number of visits because of insufficient sample sizes.
††Excludes 384 respondents with unknown educational status.
§§Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

orientation in the United States toward tertiary rather than primary or secondary prevention (4). Despite these findings, the percentage of smokers who have ever been advised by a physician to quit increased from 26.4% in 1976 to 56.1% in 1991 (7; CDC, unpublished data, 1993). In addition, the prevalence of cigarette smoking among physicians has declined rapidly (8); physicians who do not smoke are more likely than those who do to provide advice to quit (6).

Physician self-reported rates of providing cessation advice to smokers are generally higher than those indicated by the NHIS-HPDP and range from 52% to 97% (4). Potential explanations for the differences in rates reported by smokers and physicians are that patients may be unable to recall cessation advice that they actually received, a discrepancy between what physicians and patients consider to be advice to quit smoking, and methodologic considerations related to the phrasing of questions to physicians and to smokers. Two potential limitations of the analysis in this report are: 1) because the smoking status of respondents at the time of the doctor visit was unknown, some respondents may not have been smoking at that time and thus were not candidates for advice; and 2) because the reason for the visit was not included in this analysis, some visits may have been for emergencies and other conditions for which counseling would not have been appropriate.

The difference in receipt of advice to quit among racial/ethnic groups may be influenced by social and cultural factors. For example, among some Hispanics, language barriers may have played a role in the failure to receive advice to quit.

One national health objective for the year 2000 is to increase to 75% the proportion of primary-care providers who routinely advise smokers to quit smoking (objective 3.16) (4). The NHIS-HPDP results indicated that during 1991 approximately 20 million smokers visited a health-care professional and did not receive advice to quit smoking. This finding suggests that, if every primary-care provider offered brief counseling to all of their smoking patients, an additional 1 million persons could be assisted to stop smoking each year (4). This approach is at least as cost-effective per year-of-life saved as other preventive medical practices (3).

The basic components of a brief counseling session include asking each patient about whether they smoke, advising all smokers to stop, and providing assistance to the patient in stopping (e.g., establishing a quit date and providing self-help materials), and arranging follow-up visits for support (9). Use of office reminders can increase both the provision of cessation advice by providers and the rate of quitting by their patients (4,9). When used as an adjunct to behavioral therapy, nicotine replacement is also helpful (10).

The achievement of long-term health and economic benefits of reducing the overall smoking rate in the United States will require continuing efforts to increase smoking-cessation rates. Physicians and other health-care professionals can maximize their effectiveness in encouraging their smoking patients to quit by taking advantage of every opportunity to provide brief but effective counseling. Self-help and other reference materials for smoking cessation, including information to assist doctors in helping their patients to quit, are available from the National Cancer Institute, telephone (800) 422-6237. Additional materials on smoking cessation are available from CDC, telephone (800) 232-1311.

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The Great American Smokeout, November 18, 1993

Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to foster community-based activities that encourage cigarette smokers to stop smoking for at least 24 hours. These activities include distributing materials to interested schools, hospitals, businesses, and other organizations that discourage tobacco use; encouraging retail businesses not to sell tobacco products and restaurants and other businesses to be smoke-free for the day; and providing media coverage of prominent local citizens who have pledged to stop smoking for the day.

During the Great American Smokeout in 1992, an estimated 3.3 million (7.1%) smokers reported quitting, and 7.5 million (16.4%) reported reducing the number of cigarettes smoked on that day. Furthermore, an estimated 1.5 million (3.3%) smokers reported quitting smoking for 3–5 days after the Smokeout (*1*). Approximately 9.7 million packs of cigarettes were not smoked; thus an estimated $17.8 million were not spent on cigarettes (*1–3*).

This year, the Great American Smokeout will be on Thursday, November 18. The overall goal of the Smokeout is to encourage cessation to show smokers that if they can quit for 24 hours, they can quit permanently. Information is available from local chapters of the ACS; for telephone numbers of these local chapters, telephone (800) 227-2345.

Reported by: American Cancer Society, Atlanta. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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School-Based Tobacco-Use Prevention —
People's Republic of China, May 1989–January 1990

Tobacco consumption has increased markedly in the People's Republic of China
(PRC) since the 1960s (*1,2*). In 1984, when the prevalence of cigarette smoking was
61% among men and 7% among women, approximately 250 million persons in PRC
smoked tobacco products (*1*). In 1988, among junior high school students in PRC, 34%
of boys and 4% of girls reported smoking at least occasionally (*3*). To increase public
knowledge of the health consequences of cigarette smoking, promote healthier atti-
tudes among elementary school students, and motivate fathers who smoke to quit,
the Zhejiang Center for Health Education developed and implemented a school-based
smoking-intervention program in the Jiangan district of Hangzhou from May 1989
through January 1990. This report summarizes an assessment of this program.

The Gongshu district of Hangzhou served as the reference site. The intervention
group comprised 10,395 students in grades 1–7 from 23 primary schools and their
fathers. The reference group comprised 9987 students in grades 1–7 from 21 primary
schools and their fathers. Students' knowledge of the health consequences of tobacco
use and attitudes about smoking were assessed through self-reported questionnaires
administered to both the intervention and reference groups in May 1989 and January
1990. Responses to the questionnaires were graded, and average scores were calcu-
lated for each group.

In the intervention community, a tobacco-use prevention curriculum was incorpo-
rated into the health education programs in schools; the curriculum emphasized the
harmful social and health consequences of tobacco use and the training of students in
refusal skills. Schools were encouraged to implement smoking-control policies to
severely limit or restrict smoking in schools, and teachers were encouraged to be non-
smoking role models. Students whose fathers smoked monitored their fathers'
smoking status by asking them daily whether they had smoked, recording their fa-
thers' responses daily in a chart, and submitting monthly reports of their fathers' daily
smoking status to the schools.

For the baseline assessment, self-reported questionnaires measuring the fathers'
smoking status were sent home with students to be completed by fathers and re-
turned to school. Of the 9953 fathers in the intervention group, 6843 (68.8%) were
current smokers at baseline, compared with 6274 (65.5%) of the 9580 fathers in the
reference group. Cessation materials based on the stages of change theory (*4*) were
developed and distributed to students in the intervention group to take home to their
fathers. A letter, signed by the student, was sent to each father, asking him to quit
smoking. In January 1990, fathers who had stopped smoking for 180 or more days, as
indicated by the students' daily recordings, were visited by health educators to con-
firm their smoking status by direct interview.

Although preintervention scores were similar for the two groups (Table 1), at follow-up, scores of students in the intervention group were significantly higher than both the reference group follow-up scores and the intervention group baseline scores. Scores for the reference group were similar in May 1989 and January 1990.

Based on the daily recordings maintained by the students in the intervention group, in January 1990, 1037 (15.2%) fathers had not smoked cigarettes for 180 or more days. In comparison, based on the interviews of health educators, 800 (11.7%) fathers reported that they maintained cessation for that period. From May 1989 through January 1990, the reported smoking rate for fathers in the intervention group decreased from 68.8% to 60.7% (p<0.05) while the reported rate remained approximately the same among fathers in the reference group. Approximately 90% of the fathers in the intervention group who were smokers in May 1989 were reported to have quit smoking for at least 10 days. The 6-month cessation rate for fathers in the intervention group was 11.7% compared with 0.2% in the reference group (Table 2).

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Editorial Note: Tobacco sales are a primary source of income for PRC (*5*), and transnational tobacco companies have aggressively employed Western-style advertisement and promotion practices (*1,5*) (e.g., billboard advertisement of foreign tobacco and sponsorship of sporting and recreational events by tobacco companies [*1,3*]). Foreign tobacco corporations also have established joint cigarette production factories with Chinese companies and are increasing local cigarette production (*1,5*).

Lung cancer mortality is one of the five leading causes of death and the leading cause of cancer-related death in PRC (*5*). By the year 2025, an estimated 900,000 lung cancer deaths and a total of 2 million smoking-related deaths will occur among Chinese men (*6,7*). In addition, an estimated 200 million children currently living in

TABLE 1. Comparison of students'* preintervention and postintervention scores regarding their knowledge of smoking and health issues — Hangzhou, People's Republic of China, May 1989–January 1990

Category	Intervention group[†]		Reference group[§]	
	No. students	Average score	No. students	Average score
Before intervention (May 1989)	1717	50.0	1027	46.2[¶]
After intervention (January 1990)	1717	89.8[**]	1027	51.1[††§§]

*Randomly selected from the population of students present in May 1989 and January 1990 in each village.
[†]Comprising 10,395 students in grades 1–7 from 23 primary schools and their fathers.
[§]Comprising 9987 students in grades 1–7 from 21 primary schools and their fathers.
[¶]Differences in average scores among students in the intervention and reference groups before intervention are not statistically significant (p>0.05).
**Differences in average scores among students in the intervention group before and after intervention are statistically significant (p<0.05).
[††]Differences in average scores among students in the intervention and reference groups after intervention are statistically significant (p<0.05).
[§§]Differences in average scores among students in the reference group after intervention are not statistically significant (p>0.05).

PRC will become smokers, and 50 million of them will die prematurely from smoking-attributable diseases (*6*). Therefore, widespread implementation of prevention and cessation programs and tobacco-control policies that target adolescents and their families are needed to reduce the present and future health burden of smoking in PRC.

The findings in this report suggest that school-based tobacco-use prevention curricula and policies are effective in increasing knowledge among students in PRC about the health consequences of tobacco use. Furthermore, by including fathers in prevention activities, these programs suggest an additional strategy for motivating adults to quit smoking. These findings are also consistent with the understanding that, in PRC, adolescent smoking behavior is correlated with familial smoking behaviors (*3*) and underscore the importance of involving families and peers in tobacco-use prevention programs.

The first tobacco law in PRC became effective on January 1, 1992, and regulates many aspects of the national tobacco monopoly, including distribution, licensing, sales, importation, and exportation. Numerous health provisions also were mandated, such as reducing tar and nicotine levels, requiring warning labels, and restricting smoking in public places (*5,8*). A national health education effort in PRC will emphasize the health hazards associated with smoking, coordinate research, disseminate materials, and institute a National Stop Smoking Day each year (*5*). With a population of more than one billion persons and limited resources for health promotion, outreach and education remain substantial challenges.

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TABLE 2. Self-reported smoking and quitting status among fathers of students in grades 1–7 — Hangzhou, People's Republic of China, May 1989–January 1990

No. days did not smoke cigarettes	Intervention group*			Reference group†		
	No. current smokers§	Quitters		No. current smokers	Quitters	
		No.¶	(%)**		No.	(%)
10	6843	6191	(90.5)	6274	126	(2.0)
20	6843	4411	(64.5)			
30	6843	3339	(48.8)			
60	6843	2071	(30.3)			
180	6843	800	(11.7)	6274	14	(0.2)

*Comprised 10,395 students in grades 1–7 from 23 primary schools and their fathers (n=9953).
†Comprised 9987 students in grades 1–7 from 21 primary schools and their fathers (n=9580).
§A person who smoked at least one cigarette per day during the 6 months preceding the interview.
¶A person who had not smoked during the 6 months preceding the interview for the number of days indicated.
**The percentage of smokers who quit for at least the number of days indicated.

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Influence of Religious Leaders
on Smoking Cessation in a Rural Population — Thailand, 1991

Despite substantial increases in smoking and intensified marketing of tobacco products in developing countries (1), efforts to prevent tobacco use through community-based approaches have been limited (2,3). In Thailand, an estimated 9 million children will become smokers, and more than 2 million will die prematurely as adults from smoking-related illnesses (1,4). Because of these risks, the Department of Community and Social Medicine, Mae Sot General Hospital (MSGH), and the Field Epidemiology Training Program (FETP) of the Thai Ministry of Public Health recently assessed the impact of community-based smoking-prevention efforts initiated by religious leaders. This report describes this program and summarizes the assessment.

In 1987, a Buddhist abbot in the district of Mae Sot, Tak Province, implemented health-promotion activities by prohibiting smoking and posting warning signs with health messages in the temple area, mandating that all new monks abstain from smoking, and counseling smokers on the health hazards of smoking. Villagers were also requested not to smoke during Buddhist ceremonies anywhere in the village. To evaluate the impact of the monks' smoking-cessation efforts, the MSGH and the FETP conducted household surveys during March 1991 in one village (1990 population: 537) inhabited by monks actively involved in smoking-cessation efforts in their community (intervention village) and, during March and April 1991, in a nearby village (1990 population: 914) where no special smoking-cessation programs had been implemented (reference village). A questionnaire was developed based on World Health Organization guidelines for the conduct of tobacco-smoking surveys among adults (5). All villagers aged ≥15 years were eligible to be interviewed by trained health-care workers. To ensure a high response rate, interviews were conducted in the late afternoon and early evening to reach those who worked during the day, and households were revisited when eligible persons were absent at the time of the initial visit. Respondents were classified by smoking status (current, former, or never smokers) and duration of quit attempts (3).

A total of 372 (94.7%) of 393 eligible persons in the intervention village and 664 (95.7%) of 694 in the reference village participated in the survey. Although not statistically significant, the prevalence of current cigarette smoking was lower in the intervention village (155 [41.7%]) than in the reference village (318 [47.9%]). In the intervention village, 156 (41.9%) persons had never smoked, and 61 (16.4%) were former smokers: in the reference village, 260 (39.2%) had never smoked, and 86 (13.0%) were former smokers.

Of ever smokers in the intervention village, 61 (28.2%) were former smokers compared with 86 (21.3%) (p=0.06) of those in the reference village (Table 1). The proportion of former smokers who previously had quit smoking for >5 years was similar

in both villages (13 [6.0%] in the intervention village and 19 [4.7%] in the reference village [p=0.5]). In comparison, the proportion of persons who had stopped smoking for 1–5 years was significantly greater in the intervention village (19.4% and 11.9%, respectively, [p=0.01]). The proportion of persons who had stopped smoking for ≥1 year (i.e., former smokers who might be less likely to relapse) was significantly greater in the intervention village (25.5%) than that in the reference village (16.6%) (p=0.01) (Table 1).

Both villages were similar when compared for distributions of duration of quitting among current smokers and the prevalence of those who had never considered quitting smoking (Table 1). However, the proportion of ever smokers who had considered quitting but never tried was lower in the intervention village (4.6%) than in the reference village (13.6%) (p=0.001) (Table 1). Therefore, the overall proportion of ever smokers who had tried to quit smoking was significantly higher in the intervention village (79.6%) than in the reference village (72.0%) (p=0.05).

In the intervention village, many (80.3%) of the former smokers cited the encouragement of a monk as an important reason for quitting smoking, compared with 25.6% of the reference village (p<0.001). In the intervention village, this reason was cited among former smokers (80.3%) more often than were suggestions from physicians and other health-care personnel (72.1%) or family members (62.3%).

Reported by: W Swaddiwudhipong, MD, C Chaovakiratipong, P Nguntra, P Khumklam, Mae Sot General Hospital, Bangkok; N Silarug, MD, Div of Epidemiology, Ministry of Public Health, Thailand. Div of Field Epidemiology, Epidemiology Program Office; Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Although the overall prevalence of smoking among adults in Thailand decreased from 30.1% in 1976 to 25.0% in 1988 (4), this risk behavior persists as a major problem in that country. In addition, lung cancer mortality increased from 1.9 per 100,000 in 1977 to 2.6 per 100,000 in 1988. In 1985, health-care costs and lost

TABLE 1. Quitting history of ever smokers in each village — Tak Province, Thailand, 1991

Quitting history	Intervention (N=216)		Reference (N=404)	
	No.	(%)	No.	(%)
Former smokers who had quit for >5 yrs	13	(6.0)	19	(4.7)
Former smokers who had quit for 1–5 yrs	42	(19.4)	48	(11.9)
Former smokers who had abstained for <1 yr	6	(2.8)	19	(4.7)
Current smokers who had last quit for >1 yr in the past	7	(3.2)	16	(4.0)
Current smokers who had last quit for 1–12 months in the past	20	(9.3)	46	(11.4)
Current smokers who had last quit for <1 month in the past	84	(38.9)	143	(35.4)
Current smokers who had never tried to quit but who had ever considered quitting smoking	10	(4.6)	55	(13.6)
Current smokers who had never tried to quit nor considered quitting smoking	34	(15.7)	58	(14.4)

future income due to smoking-attributable illnesses in Thailand were more than $280 million U.S. (4).

In some developing countries, health professionals, educators, and leaders have been effective in decreasing smoking among community members (2,3). The findings of this report suggest that health-education and health-promotion efforts by religious leaders in one community in Thailand may have contributed to a higher proportion of quit attempts and maintenance of abstinence in the intervention village. These efforts also may have increased awareness of the health consequences of smoking in the village. Although religious reasons for quitting or not smoking may not be primary determinants (6,7), this report suggests that religious leaders may play an important role in community-based smoking cessation in developing countries such as Thailand.

Smoking-control efforts in Thailand include 1) the formation of the National Committee for Control of Tobacco Use to administer a national smoking-control program through policy implementation and monitoring; 2) implementation of a total ban on cigarette advertising; 3) use of rotating warning labels on cigarette packages; and 4) health-education and health-promotion efforts to inform the public of the health hazards associated with cigarette smoking (4,8). Involving religious leaders in tobacco-use control, especially in rural areas, can assist in helping smokers break the addiction to nicotine through motivation and support of smokers in their attempts to quit. Such prevention efforts are relatively inexpensive and appropriate for developing countries and other settings in which resources are limited (9).

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Smoking Control Among Health-Care Workers —
World No-Tobacco Day, 1993

In many countries, smoking prevalence among physicians has declined substantially since the 1950s (*1*). Preliminary data indicate that a maximum of 10% of physicians smoke in Australia, Canada, Norway, the United Kingdom, and the United States (*2*); in contrast, at least 40% of physicians in France, Italy, Japan, Spain, and Turkey are smokers (*1*). In the United States, smoking is generally less prevalent among physicians than among other health-care workers (HCWs) (*3*; CDC, unpublished data, 1993). Smoking by HCWs undermines the message to smokers that quitting is important, and HCWs who smoke are less likely to recognize their role as health educators and to counsel smokers about quitting (*4*). Because of their potential for preventing smoking among patients, HCWs may serve as role models by not smoking (*4*). Accordingly, the theme of the sixth World No-Tobacco Day to be held May 31, 1993, is "Health Services: Our Window to a Tobacco-Free World."

Each year, the objectives of World No-Tobacco Day are to encourage governments, communities, and groups worldwide to become aware of the hazards of tobacco use and to encourage all persons who use tobacco to quit for at least 24 hours. World No-Tobacco Day 1993 will emphasize the role health professionals play by not smoking and the need to ban smoking in all health-care facilities to provide smoke-free environments for patients and employees. Activities will include press releases, videotape presentations, and radio announcements by World Health Organization (WHO) experts on tobacco control.

The theme for World No-Tobacco Day 1992, "Tobacco-Free Workplaces: Safer and Healthier," emphasized the right of all persons to breathe smoke-free air (*5*). WHO's Tobacco or Health Program documented a variety of activities associated with World No-Tobacco Day 1992 in many countries, including a nationwide broadcast appealing to all workers to refrain from smoking at the workplace (Togo); a campaign by a Ministry of Health (Chile) to promote the active use of legislative measures against tobacco; a declaration by a government (Nepal) that government and semigovernment offices, public places, public transport, industries, and factories should be tobacco-free areas; prohibition of smoking in hotels and restaurants in one community during World No-Tobacco Day 1992 and quit-smoking competitions in local companies (Norway); and awarding of a WHO medal to a metropolitan government (Tokyo) for declaring a new municipal hall smoke-free (*2*).

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Legislation has been used in at least 60 countries to restrict smoking in health-care facilities (*2,5*). For example, several countries (e.g., Belgium, Brazil, Nigeria, Oman, Singapore, and Thailand) have adopted smoke-free policies in health-care facilities. In addition to legislative approaches, during 1992, the Joint Commission on Accreditation of Healthcare Organizations began requiring accredited hospitals in the United States to disseminate and enforce hospitalwide no-smoking policies (*6*). Smoke-free policies in health-care facilities provide an environment for encouraging smoking cessation by patients, preventing exacerbation of respiratory symptoms among patients, and reducing the risk of fires (*7*). Moreover, approximately 80% of

smokers and 90% of all persons support limiting smoking in hospitals and physicians' offices (*8*).

Smoking-cessation activities by HCWs and the enactment of clean indoor air legislation are key components of tobacco control worldwide (*9*). In the United States, the national health objectives for the year 2000 identify the importance of HCWs counseling patients about smoking cessation and the need for smoke-free policies in health-care facilities (*10*). The goal of one objective (3.16) is to increase to at least 75% the proportion of primary-care and oral HCWs who routinely advise cessation and provide assistance and follow-up for patients who use tobacco. Nonsmoking HCWs are more likely to provide such advice and assistance (*4*). Another objective (3.12) recommends that each state enact comprehensive laws on clean indoor air that prohibit or strictly limit smoking in health-care facilities, other workplaces, and enclosed public places.

Additional information about World No-Tobacco Day 1993 is available from Richard Leclair, Office of Information and Public Affairs, Pan American Health Organization, telephone (202) 861-3457; or CDC's Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, telephone (404) 488-5705.

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The Great American Smokeout — November 19, 1992

Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to foster community-based activities that encourage cigarette and smokeless-tobacco users to stop using tobacco products for at least 24 hours. Local activities for the Great American Smokeout include distributing anti-tobacco-use materials to interested schools, hospitals, businesses, and other organizations; encouraging retail businesses not to sell tobacco products and restaurants and other businesses to be

smoke-free for the day; and providing media coverage of prominent local citizens who have pledged to stop smoking for the day.

During 1991, 83% of adults in the United States knew of the Great American Smokeout, an increase of approximately 2% from 1990 (1). Approximately one third of U.S. smokers participated in this national campaign: 7.1 million (14.2%) smokers reported quitting for the day, and 10.6 million (21.3%) reported reducing the number of cigarettes consumed on that day (1). In addition, approximately 1 million more smokers reported quitting smoking for 1-3 days after the Smokeout in 1991 than did in 1990 (1). Although fewer black and Hispanic smokers knew of the Smokeout, an estimated 25% of those who did know participated, and 14% of black and Hispanic smokers who participated reported that they were not smoking 1–3 days after the Smokeout (1).

This year, the Great American Smokeout will be on Thursday, November 19. This year's objective is for 25% of smokers to give up smoking for the 24-hour period. The goal of the Smokeout is to encourage cessation and, by doing so, to help smokers to realize that if they can quit for 24 hours, they can quit permanently. Information is available from local chapters of the ACS; telephone numbers of these local chapters are available by telephoning (800) 227-2345.

Reported by: American Cancer Society, Atlanta. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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Public Health Focus: Effectiveness of Smoking-Control Strategies — United States

In 1990, approximately 46 million adults in the United States continued to smoke; however, more than 44 million persons were former smokers (1) who had reduced their risk for the leading causes of death in the United States (2). Smoking-cessation methods can be categorized as 1) self-help strategies (e.g., quitting abruptly and completely ["cold turkey"], using quitting manuals, or using nonprescription drugs) or 2) assisted strategies (e.g., smoking-cessation clinics, hypnosis, acupuncture, or nicotine gum or patch with counseling). This report summarizes information regarding the efficacy and cost-effectiveness of smoking-cessation strategies.

Efficacy

Approximately 90% of successful quitters have used a self-help quitting strategy, most by quitting abruptly (3). Those who used an assisted method (8%) were more likely to be women, be aged 45–64 years, have more than a high school education, have made more previous attempts to quit smoking, and have been heavier smokers (3). Twelve-month abstinence rates for persons using self-help methods have ranged from 8% to 25% (4), while cessation rates for persons who used smoking-cessation clinics have ranged from 20% to 40% (5). Fewer smokers use smoking-cessation clinics than use self-help methods; however, clinics are more likely to attract heavy smokers (3).

Mass media campaigns also influence smoking behavior by changing awareness, knowledge, and attitudes of smokers (6). In addition, televised "self-help" clinics have been effective in changing behaviors of smokers, especially when coupled with a social support component (e.g., group discussion) (6). Effective mass media campaigns have been characterized by multiple and repeated messages (e.g., a series of public service announcements), widespread dissemination, and high saturation over a prolonged period.

Physician counseling is an important element in many smoking-cessation strategies. A brief and simple message from physician to patient can be effective in changing smoking behavior (7).

Cost-Effectiveness

Assessment of the American Lung Association's (ALA) self-help smoking-cessation program indicated that, overall, 12-month cessation rates were higher (18%) among groups with a maintenance component (i.e., relapse prevention) than among groups without a maintenance component (12%–15%). The cost per current abstainer at 12 months ranged from $105 to $116 in groups with a maintenance component, compared with $126 to $135 per abstainer in groups without a maintenance component (8).

Smoking-cessation programs designed for the Stanford Five City Project included 1) a smoking-cessation clinic, 2) an incentive-based quit-smoking contest, and 3) a self-help quit-smoking kit (9). The self-help kit was the most cost-effective program, and the smoking-cessation clinic was the least cost-effective. Costs per abstainer for each program ranged from $235 to $399 for the clinic, from $129 to $236 for the contest, and from $22 to $144 for the self-help quit-smoking kit.

Modeling of the cost of brief physician counseling on smoking cessation during a routine office visit per life-year saved was at least as cost-effective as other preventive medical practices (e.g., the treatment of mild to moderate hypertension and cholesterolemia) (10,11). In addition, nicotine gum, when used with physician counseling, enhanced the effectiveness of the intervention; the cost per life-year saved with this intervention ranged from $4113 to $6465 for men and from $6880 to $9473 for women (11).

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The findings described in this report suggest that wider dissemination of self-help materials, such as smoking-cessation booklets, hold the potential for assisting a substantial number of smokers who might not seek help in quitting smoking through more formal methods. In addition, the cost-effectiveness of smoking-cessation programs may be enhanced by targeting specific populations (e.g., smoking-cessation manuals tailored to pregnant women) and developing programs with a follow-up or maintenance component that use a combination of multiple interventions (12).

Physician intervention can be an effective strategy for smoking prevention and cessation. Physicians can counsel persons in high-risk groups, including pregnant women and adolescents whose other behaviors (e.g., alcohol use and poor school performance) indicate they are more likely to use tobacco (7). In 1990, approximately half of current smokers reported that they had ever been advised by their physicians

to quit or reduce their smoking (CDC, unpublished data, 1992). Counseling effectiveness can be increased by direct face-to-face advice and suggestions, setting of a target date for quitting, scheduled reinforcement, provision of self-help materials, referral to community programs, and drug therapy when used as an adjunct to other behavioral interventions. The U.S. Preventive Services Task Force concluded that smoking-cessation counseling should receive the highest priority as a preventive intervention (*7*) and recommended that physicians 1) obtain a complete history of tobacco use for all adolescent and adult patients and 2) offer counseling on a regular basis to all tobacco users.

Effective community-based tobacco-control programs, such as the National Cancer Institute's (NCI) Community Intervention Trial for Smoking Cessation and NCI and the American Cancer Society's American Stop Smoking Intervention Study, stimulate community involvement by identifying major community groups and organizations that can support interventions. Smoking-control activities in communities should encompass health-care providers, worksites, cessation resources and services, and public education.

The proportion of smokers who have quit has been consistently higher for males than for females (although the difference becomes minimal after controlling for other forms of tobacco use), for whites than for blacks, for older smokers than for younger smokers, and for college graduates than for persons with less than a high school education (*3*). Therefore, to reduce overall tobacco use, the U.S. Department of Health and Human Services has targeted several high-risk populations, including women, black adults, and persons with a high school education or less, for smoking-cessation programs (*13*). For example, the national health objectives for the year 2000 includes increasing smoking-cessation efforts for pregnant women so that at least 60% of women who smoke cigarettes at the time they become pregnant quit smoking early and for the duration of their pregnancy (objective 3.7) (*13*).

The achievement of long-term health and economic benefits of reducing the nation's overall smoking rate also requires intensive smoking-prevention efforts. In particular, each year, more than 1 million young persons start to smoke, adding an estimated \$10 billion during their lifetimes to the cost of health care in the United States (*14*). A multicomponent approach to prevent initiation among youths should be coupled with school-based tobacco-use prevention programs and include 1) mass media campaigns to target high-risk groups, 2) increased excise taxes on tobacco products, 3) increasing the minimum age for sale of tobacco products, 4) prohibiting the distribution of tobacco product samples to minors, 5) elimination or severe restriction of tobacco product advertising and promotion to which youth are likely to be exposed, 6) restricting the sale of tobacco products through vending machines, and 7) enforcing tobacco access laws for minors (*13*).

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World No-Tobacco Day, 1992

The theme of the fifth World No-Tobacco Day, May 31, 1992, is "Tobacco-Free Workplaces: Safer and Healthier." Each year, the objectives of World No-Tobacco Day are to encourage governments, communities, and groups worldwide to become aware of the hazards of tobacco use and to encourage all persons who use tobacco to quit for at least 24 hours.

World No-Tobacco Day 1992 will emphasize the right to work in a smoke-free environment and the need to coordinate appropriate actions by governments, employees, and employers. Activities will include press releases, a video on smoke-free workplaces, and radio announcements by World Health Organization (WHO) experts on tobacco control.

The theme for World No-Tobacco Day 1991, "Public Places and Transport: Better Be Tobacco-Free," emphasized the right of all persons to breathe smoke-free air (1). WHO's Tobacco or Health Program documented a variety of activities associated with World No-Tobacco Day, in both developed and developing countries, including a campaign to prohibit smoking on international airline flights (European press conference held by Belgium, France, Italy, Luxembourg, Portugal, Spain, and the United Kingdom); a special documentary film on the theme of the day broadcast on national television (Algeria); distribution of information in public places and airports urging persons not to smoke and reminding them of existing clean indoor air laws (Brazil); and seminars on the health hazards of smoking and an exhibition of antismoking materials (Pakistan, Bangladesh, and Papua New Guinea) (2).

Reported by: Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Since 1985, the number of countries that have enacted laws restricting smoking in public places has increased dramatically (*2*). Preliminary data from WHO indicate that more than half of the countries in the world have laws to control tobacco use in public places: 33% have protection in entertainment establishments, such as theaters and cinemas; health services are protected in 40% of the countries; 33% have laws involving schools, colleges, and other government facilities; and 20% have workplace smoking policies (*3*). In addition, in 30 countries, flights on all or most domestic routes are smoke free, and in more than 70 countries, buses or trains are smoke free or have smoke-free areas (*2*). In the Americas, 19 countries restrict smoking in public places; seven countries ban smoking in the workplace, and 13 ban smoking in health establishments (*4*).

In the United States, the growing evidence linking exposure to environmental tobacco smoke to disease in nonsmokers has led to an increase in clean indoor air legislation at the state and local levels (*5*). As of April 30, 1992, 44 states and the District of Columbia had instituted some form of smoking restriction in public places (CDC, unpublished data, 1992). The proportion of workplaces in the United States reporting smoking policies has also increased dramatically during the past 5 years. In 1992, 85% of employers had workplace smoking policies, compared with 54% in 1987 (*6*). Findings in a recent survey in 10 U.S. communities also indicate a high level of public support, even among smokers, for limiting smoking in a wide range of locations: 82%–100% of smokers and 90%–100% of all respondents supported limiting smoking in restaurants, private worksites, government buildings, indoor sports arenas, hospitals, and doctors' offices (*7*).

In the United States, the national health objectives for the year 2000 specify the need for restrictions on smoking in public places and include establishment of tobacco-free environments. In addition, the objectives include employing tobacco-use prevention in the curricula of all elementary, middle, and secondary schools, preferably as part of quality school health education (objective 3.10); increasing to at least 75% the proportion of worksites with a formal smoking policy that prohibits or severely restricts smoking at the workplace (objective 3.11); and enacting in the 50 states comprehensive laws on clean indoor air that prohibit or strictly limit smoking in the workplace and enclosed public places (including health-care facilities, schools, and public transportation) (objective 3.12) (*8*). The enactment of clean indoor air legislation has been recommended as a key component of tobacco control worldwide (*9*).

Additional information about World No-Tobacco Day is available from Richard Leclair, Office of Information and Public Affairs, Pan American Health Organization; telephone (202) 861-3457; or the Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC; telephone (404) 488-5705.

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The Great American Smokeout — November 21, 1991

Since 1977, the American Cancer Society (ACS) has sponsored the Great American Smokeout to promote communitywide antismoking activities that encourage smokers to refrain from smoking cigarettes for at least 24 hours. Local activities for this national event have included provision of materials to businesses, hospitals, schools, and other organizations that wish to conduct antismoking activities; requests by local ACS offices that stores not sell cigarettes for the day; media coverage of prominent local citizens who have stopped smoking; and participation by restaurants and other public places in a smoke-free day. In 1990, nearly 19 million persons—almost 40% of all smokers in the United States—participated in the Smokeout (1), an increase of 1 million participants from 1989 (2).

During the 1990 Smokeout, approximately 7.4 million (15%) of the nation's smokers refrained from smoking, and 11.5 million (23%) reduced the number of cigarettes smoked. Approximately 4.9 million (10%) smokers were not smoking 1-3 days later. More whites (85%) had heard about the Smokeout than had blacks and Hispanics (65%); however, 25% of black and Hispanic smokers and 14% of white smokers refrained from smoking on the day of the Smokeout. About 14% of black and Hispanic smokers and 9% of white smokers were not smoking 1–3 days later (1).

This year, the Smokeout will be on Thursday, November 21. The goal is to help at least 20% of smokers give up smoking for the 24-hour period. Additional information is available from local offices of the ACS; for telephone numbers of the local offices, telephone (800) 227-2345.

Reported by: L Hurt, American Cancer Society, Atlanta. Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

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World No-Tobacco Day, 1991

World No-Tobacco Day, to be held May 31, 1991, is intended to encourage governments, communities, groups, and persons worldwide to become aware of the hazards of tobacco use. The objective of this event is to convince all persons who use tobacco to quit for at least 24 hours.

The theme for World No-Tobacco Day 1990, "Childhood and Youth Without Tobacco," emphasized the protection of children and young persons from the adverse health effects of tobacco use (*1*). The World Health Organization's (WHO) Tobacco or Health Program, which assessed the impact of that event, documented a broad range of related activities, including media campaigns against tobacco use by children and youth (Indonesia, Kuwait, Mali, and the Philippines); new restrictions on advertisements for tobacco use and new package warnings (Bangladesh, Brazil, and Nigeria); a Public Health Service interagency meeting on youth access to tobacco (United States); national symposia on smoking and health (Indonesia and Taiwan); and speeches by religious leaders regarding the hazards of tobacco use (Somalia) (*2*).

The theme for World No-Tobacco Day 1991, "Public Places and Transport: Better Be Tobacco-Free," emphasizes the right of all persons to breathe smoke-free air. Activities will include press releases, a video presentation on tobacco-free public places and transportation, and radio announcements by WHO experts on tobacco control.

Reported by: H Restrepo, MD, Health Promotion Program, Pan American Health Organization, World Health Organization, Washington, DC. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: During the 1980s, restrictions on smoking in public places became common throughout the world. In at least 30 countries, smoke-free service has been implemented on domestic airline flights; in more than 70 countries, buses or trains are completely smoke-free or have smoke-free areas. Taxis are smoke-free in Norway and Colombia and in New York City. Approximately 40% of countries have restricted smoking in health-care facilities, and 33% have restricted smoking in schools (*2*). These restrictions provide protection against exposure to environmental tobacco smoke (ETS), which in the United States may cause more than 50,000 deaths among nonsmokers annually from lung cancer, heart disease, and other conditions (*3*).

In the United States, additional measures to prevent exposure to ETS are planned or being implemented. As of March 1991, laws restricted smoking in public places in 46 states*, in public-sector workplaces in 38 states*, and in private-sector workplaces in 17 states* (CDC, unpublished data). In addition, more than 450 local ordinances restricted or prohibited smoking in public places (*4*). Because of these restrictions, the proportion of the U.S. population covered by at least minimal clean indoor-air legislation has increased from 8% in 1971 to more than 80% in 1988 (*5*). The national health objectives for the year 2000 target tobacco-free environments in all elementary, middle, and secondary schools; an increase to at least 75% in the proportion of worksites with formal prohibitions or severe restrictions on smoking; and enactment of comprehensive laws in all states that prohibit or strictly limit smoking in the workplace and in enclosed public places, including health-care facilities, schools, and public transportation (*6*).

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*Including the District of Columbia.

In developing countries, additional efforts to establish smoke-free public places and transportation facilities are needed to ensure protection against the adverse health consequences of ETS. Such efforts have been successful in industrialized countries and will help prevent ETS-related diseases if WHO recommendations on decreasing ETS exposure in public places and transportation are implemented.

Additional information about World No-Tobacco Day is available from Richard G. Leclair, Office of Information and Public Affairs, Pan American Health Organization ([202] 861-3439), or the Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC (telephone [301] 443-5287).

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Survey of Smoking-Prevention Education Efforts in Elementary Schools — Washington State, 1989

To achieve the Surgeon General's challenge of a smoke-free society by the year 2000 (*1*), the initiation of smoking must be prevented in school-aged children. In Washington state, recently enacted legislation will restrict smoking in elementary schools by fall 1991.* In addition, the Washington State Smoke-Free Class of 2000 Program[†] (SFC 2000), initiated in September 1988, endeavors to create a smoke-free generation beginning with high school students in the year 2000. This report summarizes a 1989 survey by the Washington Department of Health to assess the implementation of SFC 2000 in first-grade classrooms and to characterize smoking policies in elementary schools.

A principle strategy of SFC 2000 is to provide the state's public elementary schools with teaching materials for preventing smoking. The materials are organized into program packets that include activities (e.g., language and art), posters, certificates of recognition, student's pledge, and discussion questions. By January 5, 1989, 555 (53%) of the state's 1049 elementary schools had been provided the modules for use in kindergarten through sixth grade. In May 1989, questionnaires were mailed to a systematic sample of 345 (33%) of the 1049 schools. Nonrespondents received a follow-up mailing and were contacted by telephone. Forty-one schools were excluded

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*RCW 28A.120.032.
[†]Sponsored by the American Cancer Society, Washington Division, Inc.; the American Heart Association, Washington Affiliate; and the American Lung Association of Washington.

because they did not have a first-grade class. Of the remaining 304 schools, 225 (74%) responded.

The questionnaire asked each school about 1) the school district's policy on smoking and smokeless tobacco use by teachers, staff, and students; 2) teachers' attitudes toward teaching smoking prevention; 3) use of SFC 2000 materials or other smoking-prevention teaching materials; and 4) teachers' opinions about the most helpful teaching materials.

Of the 225 schools, 59 (26%) prohibited faculty and staff from smoking in the buildings and on the grounds, and 27 (12%) prohibited smoking only in the buildings. However, 133 (59%) permitted faculty and staff to smoke in designated areas. Six (3%) schools did not respond to the question. Fifty-two (23%) schools were in districts that permitted high school students to smoke; 146 (65%) were in districts that prohibited student smoking in the buildings and on the school grounds; and 27 (12%) did not respond to the question. Forty-one (18%) had no policy regarding smokeless tobacco use.

In 119 (53%) schools, modules about smoking were presented three or more times during the year. In 121 (54%), a smoking-prevention curriculum was considered important.

One hundred twelve (50%) schools had received and were using SFC 2000 materials in first-grade classes. Sixty-seven (30%) schools had not received these materials but had implemented other approaches to teach first graders about nonsmoking. Thirty-six (16%) did not include a smoking-prevention program in the curriculum, and none of these had received the SFC 2000 materials. For 10 (4%) schools, the status of smoking-prevention efforts could not be determined.

All the elementary schools that had received SFC 2000 materials had incorporated them into their curricula. For the 36 schools that did not include a smoking-prevention module in their first-grade curriculum, the most commonly cited reasons were unavailability of appropriate instructional materials, lack of sufficient classroom time, and inadequate curriculum guidelines.

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Editorial Note: SFC 2000 is the collaborative response of the American Cancer Society (ACS), the American Heart Association (AHA), and the American Lung Association (ALA) to the Surgeon General's challenge to achieve a smoke-free society by the year 2000 (*1*). The four goals of SFC 2000 are to 1) provide the children of the class of 2000 and their parents and teachers with specifically designed antismoking education materials, 2) focus media and community attention on these children as the vanguard of a new "smoke-free" generation, 3) build and strengthen local coalitions of the three agencies, and 4) increase volunteer participation in coalition activities. Since 1988, more than 60,000 first-grade teachers nationwide have received material on SFC 2000 to integrate into their curricula.

In 1987, the National Adolescent Student Health Survey determined that, among eighth- and 10th-grade students, 11.0% of all boys and 8.5% of all girls had smoked a cigarette by the fourth grade (*2*). Because the inclusion of antismoking instruction in school health education curricula reduces initiation of smoking among children and adults (*3*), the need for early intervention within school health curricula is crucial. In

1988, the National School Boards Association (NSBA) reported that 75% of school districts had antismoking educational programs at the elementary school level (*4,5*). Of these schools, 74% received materials from volunteer health organizations (e.g., ACS, ALA, and AHA). NSBA also reported that 24% of school districts prohibited smoking by faculty, staff, and administrators and that 96% of schools with written policies on smoking addressed smoking by faculty, staff, and administrators. The findings in Washington were consistent with these national trends.

The National Cancer Institute advisory panel on smoking and school health recently recommended essential elements for school-based smoking-prevention programs (*6*). These elements include emphasizing the adverse or harmful social and short-term physiologic consequences of tobacco use; training students in refusal skills; involving parents, trained teachers, and peers in smoking-prevention activities; and designing a curriculum that reflects the needs of the community.

To provide local school districts with support for these programs, state health agencies and state superintendents of public instruction should emphasize smoking-prevention education and assist local school districts in obtaining appropriate and useful teaching modules.

Comprehensive teaching materials and supplemental smoking-prevention programs are available from the local ACS, ALA, and AHA offices. Information on the Washington SFC 2000 is available from the Program Director, SFC 2000, ACS, 2120 First Avenue North, P.O. Box 19140, Seattle, WA 98109-1140. Information on the national SFC 2000 is available from the Program Director, SFC 2000, 20 North Wacker, Chicago, IL 60606; telephone (312) 346-4675.

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The Great American Smokeout — November 15, 1990

For each of the last 14 years, the American Cancer Society (ACS) has sponsored the Great American Smokeout to focus attention on tobacco use and encourage smokers to refrain from smoking cigarettes for at least 24 hours. Local activities have included requests by local ACS offices to stores to not sell cigarettes for the day; media coverage of prominent local citizens who have quit smoking; and implementation of a smoke-free day by restaurants and other public places. In 1989, approximately one third of all smokers (nearly 18 million persons) participated in the Smokeout (*1*). Of these, approximately 5.3 million did not smoke at all on the day of the Smokeout, and

an estimated 3.9 million refrained from smoking 1–3 days later. More than 85% of persons surveyed by the Gallup Organization after the Smokeout had heard of the event (*1*).

By 1987, almost half of all living Americans who ever smoked had quit. The proportion of persons who quit for at least 1 day in the 12 months preceding national surveys increased from 27.8% in 1978 to 31.5% in 1987 (*2*).

This year, the Smokeout will be held Thursday, November 15. The goal is to ensure that at least one in every five smokers gives up cigarettes for the 24-hour period. Additional information is available from local offices of the ACS; phone numbers of the local offices are available from the national office (telephone [800] ACS-2345).

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State Coalitions for Prevention and Control of Tobacco Use

In October 1989, the Association of State and Territorial Health Officials (ASTHO) collected information on state* coalitions for prevention and control of tobacco use from all 50 states and the District of Columbia (*1*). State representatives for prevention and control of tobacco use submitted information describing their coalition's membership, history, funding, and activities. This report summarizes the basic characteristics and key activities of these coalitions.

As of December 31, 1989, 47 states had coalitions that addressed prevention and control of tobacco use. Hawaii, Kentucky, Mississippi, and South Carolina did not have state-level coalitions. Of the 47 coalitions, 44 concentrated exclusively on prevention and control of tobacco use; the remaining three also addressed other chronic diseases. In 1963, Colorado established the first state tobacco-related coalition; most (28) states established coalitions after 1984. Twenty coalitions reported receiving funding[†], and 10 of these reported receiving in-kind state support for clerical and administrative needs (Table 1).

All coalitions included a representative from the state public health agency as well as other health professionals (e.g., physicians, nurses, health researchers, and/or hospital administrators). Coalition members represented volunteer, community, policy-relevant, and education groups. In some states, coalitions also included economists (Florida, Michigan, and Vermont), military officials (Alabama, Alaska, and Delaware), representatives from the tobacco industry (Maine), vendor organizations (Indiana and Vermont), youth groups (Maine, Massachusetts, Montana, New York, and Vermont), sports groups (Delaware, Michigan, and Vermont), and veterans groups (Alabama, Minnesota, and Vermont).

The most frequently reported coalition activities were 1) providing public education and information (34 states), 2) lobbying for antitobacco legislation (25 states), 3) educating health-care professionals (21 states), 4) developing and implementing a state plan for tobacco control (18 states), and 5) conducting research and evaluation

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*For purposes of this report, the District of Columbia is counted as a state.
[†]Includes grants, donations, membership fees, and funds from state and other governmental sources.

TABLE 1. Establishment of and annual funding for state* coalitions for prevention and control of tobacco use — United States, December 31, 1989

State	Coalition	Date established	Funding[†] Amount	Funding[†] In kind[§]
Alabama	Yes	1986	$ 22,000	$ 1,000
Alaska	Yes	1988	0	0
Arizona	Yes	1989	0	0
Arkansas	Yes	1989	0	0
California	Yes	1987	1,066,004	0
Colorado	Yes	1963	23,000	18,000
Connecticut	Yes	1982	0	0
Delaware	Yes	1986	¶	¶
District of Columbia	Yes	1965	100	0
Florida	Yes	1985	1,500	0
Georgia	Yes	1988	0	0
Hawaii	No			
Idaho	Yes	1981	0	0
Illinois	Yes	1978	0	0
Indiana	Yes	1986	0	0
Iowa	Yes	1984	0	0
Kansas	Yes	1985	0	0
Kentucky	No			
Louisiana	Yes	1988	0	0
Maine	Yes	1983	5,000	0
Maryland	Yes	1982	15,000	0
Massachusetts	Yes	1980	0	0
Michigan	Yes	1989	¶	¶
Minnesota	Yes	1984	57,550	0
Mississippi	No			
Missouri	Yes	1982	18,000	0
Montana	Yes	1986	70,000	70,000
Nebraska	Yes	1985	5,000	1,000
Nevada	Yes	1987	0	0
New Hampshire	Yes	1983	4,500	4,000
New Jersey	Yes	1985	0	0
New Mexico	Yes	1983	0	0
New York	Yes	1985	0	0
North Carolina	Yes	1988	0	0
North Dakota	Yes	1985	6,713	0
Ohio	Yes	1964	0	0
Oklahoma	Yes	1986	0	0
Oregon	Yes	1989	0	0
Pennsylvania	Yes	1980	0	0
Rhode Island	Yes	1987	0	0
South Carolina	No			
South Dakota	Yes	1984	0	0
Tennessee	Yes	1986	13,700	0
Texas	Yes	1970	0	0
Utah	Yes	1984	0	0
Vermont	Yes	1989	10,000	70,000
Virginia	Yes	1989	0	0
Washington	Yes	1988	3,000	0
West Virginia	Yes	1989	4,000	12,000
Wisconsin	Yes	1980	0	0
Wyoming	Yes	1985	250	100
Total states with coalitions	**47**			

*For purposes of this report, the District of Columbia is counted as a state.
[†]Includes grants, donations, membership fees, and funds from state and other governmental sources.
[§]Estimated dollar value of in-kind support.
[¶]Funding received but dollar value not available.

(12 states) (Table 2). Other reported activities included promoting a Smoke-Free Class of 2000 (cosponsored by the American Lung Association, the American Heart Association, and the American Cancer Society [ACS]) (Illinois, Minnesota, and New Hampshire), advising the state health department (New York and Ohio), and anti-tobacco advertising (Colorado).

Reported by: State specialists for prevention and control of tobacco use. KM Marconi, PhD, Public Health Applications Br, National Cancer Institute; GC Bennett, MPH, Health Education Br, National Heart, Lung, and Blood Institute, National Institutes of Health. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Direct community involvement is essential to achieve a smoke-free society by the year 2000. State coalitions for prevention and control of tobacco use bring together a broad range of persons and organizations to reach a common goal: reducing the prevalence of tobacco use. Coalitions can amplify state resources by involving community groups, volunteer organizations, advocacy groups, educators, and representatives of target populations. Leadership from physicians and other health officials is needed to ensure the success of community coalitions.

State coalitions for prevention and control of tobacco use should set specific, measurable objectives that enhance the strength and credibility of the coalitions' immediate plans, as well as maintain support for long-term public health efforts (*2*). Coalitions should provide direction for the development of state plans for prevention and control of tobacco use, enlist political and constituent support, ensure input from special target groups, and provide technical expertise in advising policymakers. These issues are discussed in more detail in the *Guide to Public Health Practice: State Health Agency Tobacco Prevention and Control Plans* (*3*).

The American Stop Smoking Intervention Study (ASSIST), sponsored by the ACS and the National Cancer Institute (NCI), National Institutes of Health (NIH), will provide additional funding to approximately 15 states or large municipalities to support coalition initiatives for prevention and control of tobacco use (*1*). Agencies working through a national network of state public health professionals to increase public health efforts to prevent and control tobacco use at the state level include ASTHO; CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion; and NCI and the National Heart, Lung, and Blood Institute (NHLBI), NIH (*4*).

Additional information on developing tobacco-related coalitions is available in *With Every Beat of Your Heart*, published by NHLBI (*5*), and *Smoke Fighting: A Smoking Control Movement Building Guide*, published by ACS (*2*).

References
1. CDC. State tobacco-use prevention and control plans. MMWR 1990;39:133–6.
2. American Cancer Society. Smoke fighting: a smoking control movement building guide. Washington, DC: Advocacy Institute, 1987.
3. Association of State and Territorial Health Officials/National Cancer Institute. Guide to public health practice: state health agency tobacco prevention and control plans. McLean, Virginia: Association of State and Territorial Health Officials, 1989.
4. Silver J. Network development. In: Proceedings of the ASTHO Conference on the Public Health Practice of Tobacco Prevention and Control. Rockville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1990.

TABLE 2. Summary of activities of state* coalitions for prevention and control of tobacco use — December 31, 1989

State	Public education and information	Legislation	Professional education	Developing a state plan for tobacco control	Research/ evaluation
Alabama	Yes	Yes	Yes	No	No
Alaska	No	Yes	No	No	No
Arizona	No	No	No	Yes	No
Arkansas	No	Yes	No	No	No
California	No	Yes	No	No	No
Colorado	Yes	No	Yes	Yes	Yes
Connecticut	Yes	Yes	Yes	No	No
Delaware	Yes	Yes	Yes	Yes	No
District of Columbia	Yes	Yes	Yes	No	No
Florida	Yes	Yes	No	Yes	Yes
Georgia	Yes	No	No	No	No
Idaho	Yes	Yes	No	No	No
Illinois	Yes	Yes	Yes	Yes	Yes
Indiana	Yes	No	Yes	No	No
Iowa	Yes	No	No	No	No
Kansas	Yes	No	Yes	No	Yes
Louisiana	Yes	No	Yes	No	No
Maine	Yes	Yes	No	No	No
Maryland	No	Yes	No	No	No
Massachusetts	Yes	Yes	Yes	Yes	No
Michigan	No	Yes	No	Yes	No
Minnesota	No	No	Yes	No	No
Missouri	No	Yes	No	No	No
Montana	Yes	No	Yes	Yes	Yes
Nebraska	Yes	No	No	No	No
Nevada	No	Yes	No	No	No
New Hampshire	Yes	No	Yes	No	No
New Jersey	Yes	No	Yes	No	Yes
New Mexico	Yes	Yes	No	Yes	No
New York	No	No	No	Yes	No
North Carolina	Yes	No	Yes	Yes	No
North Dakota	Yes	No	Yes	Yes	Yes
Ohio	No	No	No	No	No
Oklahoma	Yes	No	No	No	No
Oregon	No	No	No	Yes	Yes
Pennsylvania	Yes	No	No	Yes	No
Rhode Island	Yes	Yes	Yes	No	No
South Dakota	Yes	Yes	No	No	No
Tennessee	Yes	No	No	No	No
Texas	Yes	Yes	Yes	Yes	No
Utah	Yes	Yes	Yes	Yes	No
Vermont	Yes	No	Yes	Yes	Yes
Virginia	Yes	Yes	No	No	Yes
Washington	No	Yes	No	No	Yes
West Virginia	Yes	Yes	Yes	Yes	Yes
Wisconsin	Yes	No	No	No	No
Wyoming	Yes	Yes	No	No	No
Total states with activities	**34**	**25**	**21**	**18**	**12**

*For purposes of this report, the District of Columbia is counted as a state.

5. National Heart, Lung, and Blood Institute. With every beat of your heart. Bethesda, Maryland: US Department of Health and Human Services, Public Health Service, National Institutes of Health, 1989; DHHS publication no. (NIH)89-2641.

World No-Tobacco Day

In 1987, the World Health Assembly of the World Health Organization (WHO) designated the 40th anniversary of WHO, April 7, 1988, as World No-Tobacco Day (*1*). The objective of World No-Tobacco Day was to encourage all persons worldwide who smoke or chew tobacco to quit for at least 24 hours. Extensive press coverage of this event stimulated and identified a range of policy and health education activities linked to the event, the specific theme of which was "Tobacco or Health: Choose Health." Illustrative activities in selected countries included bans on smoking in public places (Ethiopia), suspension of government tobacco sales (Cuba), radio and printed health messages from the government (Lebanon), poster contests (Spain), public cigarette-burning ceremonies (Nepal), and large public information campaigns (China).

The second World No-Tobacco Day, held May 31, 1989, emphasized the theme "Women and Tobacco—The Female Smoker: At Added Risk" (*2*). In preparation for this event, the WHO director-general asked all major United Nations agencies to collaborate by declaring their offices free from tobacco on World No-Tobacco Day. Press advisory kits, video tapes, and radio programs were distributed by WHO. After the event, the WHO's Tobacco or Health (TOH) Program received more than 300 newspaper articles from around the world documenting activities and press coverage related to World No-Tobacco Day. In some countries, these celebrations were led personally by the president (Bangladesh), a former prime minister (Sudan), or ministers of health (Nigeria, Fiji, Oman, and many others) (*1*).

Reported by: H Restrepo, MD, Adult Health Program, Pan American Health Organization, Washington, DC. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: WHO estimates that each year approximately 2.5 million premature deaths occur worldwide as a result of tobacco use (*3*). World No-Tobacco days, like the Great American Smokeout in the United States each November (*4*), focus global attention on tobacco use. In the United States in 1989, approximately one third (almost 18 million persons) of all smokers participated in the Smokeout by decreasing cigarette smoking (25.4%) or quitting for the day (10.5%) (*4*).

On May 31, 1990, WHO will celebrate the third World No-Tobacco Day; the theme for this event will be "Childhood and Youth Without Tobacco" (*2*). Additional information about the event can be obtained from the Adult Health Program, Pan American Health Organization (telephone [202] 861-3261) or CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion (telephone [301] 443-5287).

References
1. Report of the WHO Technical Advisory Group on Tobacco or Health. TOH/TAG/89.11. Geneva: Switzerland: World Health Organization, November 3, 1989.
2. Stroot P. World No-Tobacco days. World Health Organization Tobacco Alert 1990 (January):2.
3. Mahler H. Tobacco or health: choose health. World Health Forum 1988;9:78–83.

4. Lieberman Research Inc. A study of the impact of the 1989 Great American Smokeout: summary, Gallup Organization. New York: American Cancer Society, 1989.

State Tobacco-Use Prevention and Control Plans

In October 1989, the Association of State and Territorial Health Officials (ASTHO) surveyed health agencies in all 50 states and the District of Columbia to assess activities related to control of tobacco use. The survey focused on the extent to which planning efforts met criteria listed in *Guide to Public Health Practice: State Health Agency Tobacco Prevention and Control Plans* (*1*).* Respondents submitted copies of existing plans for tobacco-use prevention and control. This report summarizes the analysis of specific plans to control tobacco use (free-standing plans) or plans that form a discrete section on tobacco-use-control in a more general health-planning document.

Plans were evaluated in terms of the following components: 1) involvement of a tobacco-and-health coalition or advisory group comprising representatives from both the private and public sectors; 2) inclusion of an analysis of state-specific tobacco-use behavior; 3) presentation of detailed objectives and specific strategies for reducing tobacco use in the state; 4) presence of an outline of a specific workplan identifying individuals and organizations responsible for implementing the plan; 5) description of outcome evaluation measures, including tobacco-use surveillance systems; 6) description of process evaluation measures of program/plan activities (e.g., integrity of programs and models); and 7) presence of state funding for reducing tobacco use (Table 1).

As of December 31, 1989, 12 states (Colorado, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, North Dakota, Oregon, Pennsylvania, Utah, Vermont, and Virginia) had published plans for tobacco-use prevention and control (Table 1). Minnesota published the first plan in 1984, and five states (Colorado, Michigan, New Jersey, Vermont, and Virginia) published their plans during 1989. Alabama, Connecticut, Idaho, Illinois, Indiana, and Rhode Island reported that smoking prevention was included in their general plans for health service. Colorado, North Dakota, and Utah have plans as part of the Rocky Mountain Tobacco-Free Challenge, an eight-state effort to reduce the prevalences of tobacco use and chronic diseases associated with tobacco use (*2*).

All the state plans addressed the seven critical components of planning as well as high-risk populations, health care, smoking cessation issues, worksite policies, public education activities, and school and adolescent program strategies. Nine of the 12 states with plans funded activities for tobacco-use prevention and cessation. Workplans to implement listed objectives and process measures were the most frequently omitted critical elements.

Of the nine plans that included state-specific assessment of tobacco-use behavior, six assessed adolescent smoking prevalence, and eight assessed adult smoking prevalence (Table 2). Seven states included an economic analysis, including tax data

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*Copies are available from the National Cancer Institute, 9000 Rockville Pike, Building 31, Room 10A24, Bethesda, MD 20892; or the Technical Information Center, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC, 5600 Fishers Lane, Park Building, Room 1-16, Rockville, MD 20857.

TABLE 1. Analysis of 12 state tobacco plans — Association of State and Territorial Health Officials and CDC survey, 1989

State	Free-standing tobacco-control plan	Year published	Involvement of tobacco coalition	Presence of analytical assessment	Specific objectives included	Specific workplan included	Outcome measure described	Process measure described	State funding for tobacco control
Colorado	Y*	1989	Y	Y	Y	N	Y	N	Y
Massachusetts	Y	1988	Y	Y	Y	N	Y	N	N
Michigan	Y	1989	Y	Y	Y	Y	Y	Y	Y
Minnesota	Y	1984	Y	Y	Y	Y	Y	Y	Y
Nebraska	Y	1985	Y	N	Y	N	Y	N	Y
New Jersey	N	1989	Y	Y	Y	N	N	Y	Y
North Dakota	Y	1986	Y	Y	Y	Y	Y	N	Y
Oregon	N	1988	Y	Y	Y	Y	Y	Y	N
Pennsylvania	Y	1986	Y	Y	Y	N	N	Y	Y
Utah	Y	1988	Y	Y	Y	Y	Y	Y	Y
Vermont	N	1989	Y	N	Y	N	N	Y	Y
Virginia	N	1989	Y	N	Y	N	Y	N	N
Total	8Y,4N		12Y	9Y,3N	12Y	5Y,7N	9Y,3N	7Y,5N	9Y,3N

*Y yes; N no.

or other economic issues. Four states included state legislation and policies in their plans, and three included using state/local resources for tobacco-use prevention and control.

Reported by: KM Marconi, PhD, JW Colborn, MS, National Cancer Institute, National Institutes of Health. Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: Elements essential to the control of tobacco use include comprehensive planning, evaluation, funding, and community support. The ASTHO survey provides baseline information for measuring progress in these areas during the 1990s. This information will be particularly important in 1993, when the National Cancer Institute and the American Cancer Society will sponsor the American Stop Smoking Intervention Study (ASSIST) (*3*). This multistate effort will provide funding, coordination, training, and evaluation for tobacco-use prevention and control in 20 geographic areas (which could include entire states or large metropolitan areas) through 1998.

One indication of the growth in state-based tobacco-use-control activities is the number of states that reported developing plans to address this problem. Ten additional states (Arkansas, Delaware, Maine, Missouri, New Mexico, Ohio, Rhode Island, Texas, West Virginia, and Wisconsin) are expecting to publish plans.

Tobacco use is a public health problem that may be approached at the state level through community involvement. A conference on the Public Health Practice of Tobacco Prevention and Control on March 8 and 9, 1990, in Houston will address these issues. This conference will provide state-based tobacco-control specialists a forum for information exchange and technical assistance on a wide range of tobacco-control activities. These activities will direct the national efforts toward a smoke-free society by the year 2000. Further information on the conference is available from ASTHO at (703) 556-9222 or CDC at (301) 443-1575.

TABLE 2. Analysis of nine state-specific tobacco-use behavior assessment plans — Association of State and Territorial Health Officials and CDC survey, 1989

State	Disease impact estimate*	Adult smoking behavior surveillance	Adolescent smoking behavior surveillance	Economic analysis[†]	Legislation/ policy analysis	State/local resource assessment
Colorado	Y[§]	Y	Y	Y	Y	Y
Massachusetts	Y	Y	Y	Y	Y	Y
Michigan	N	Y	N	N	N	N
Minnesota	Y	Y	Y	Y	Y	Y
New Jersey	Y	N	N	Y	N	N
North Dakota	Y	Y	Y	Y	Y	N
Oregon	Y	Y	N	Y	N	N
Pennsylvania	Y	Y	Y	N	N	N
Utah	Y	Y	Y	Y	N	N
Total	**8Y,1N**	**8Y,1N**	**6Y,3N**	**7Y,2N**	**4Y,5N**	**3Y,6N**

*Smoking-attributable mortality, morbidity, and economic costs.
[†]Including state/local tax data and economic incentives, such as differential insurance rates for smokers and nonsmokers.
[§]Y = yes; N = no.

References
1. Association of State and Territorial Health Officials/National Cancer Institute. Guide to public health practice: state health agency tobacco prevention and control plans. McLean, Virginia: Association of State and Territorial Health Officials, 1989.
2. CDC. State-based chronic disease control: the Rocky Mountain Tobacco-Free Challenge. MMWR 1989;38:749–52.
3. CDC. Trends in lung cancer incidence—United States, 1973–1986. MMWR 1989;38:505–6, 511–3.