CHAPTER 4

TRENDS IN PUBLIC BELIEFS, ATTITUDES, AND OPINIONS ABOUT SMOKING

CONTENTS

Introduction

This Chapter analyzes trends in public beliefs, attitudes, and opinions about smoking. It is divided into three sections. The first describes trends in public beliefs regarding the health effects of smoking, the second describes trends in public attitudes about smokers and smoking, and the third describes trends in public opinion about smoking policies.

At the outset, it is important to define and clarify the important terms used in this Chapter. Terms such as knowledge, awareness, opinions, beliefs, and attitudes have commonsense meanings to the lay person, but more complex meanings to the social scientist. For example, Allport (1935) reviewed many definitions of attitude and constructed his own comprehensive definition: "An attitude is a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related." Entire books have been devoted to the science of defining and measuring public attitudes, opinions, and beliefs (e.g., Oskamp 1977).

For sections two and three of this Chapter, which deal with attitudes and opinions, the commonplace understanding of these terms will suffice. For the first section, however, which covers beliefs about health effects, a more careful approach is warranted. This Section generally follows the construct described by Fishbein (1977), which embraces three levels of belief:

1. Level 1 (awareness): A person may believe that "the Surgeon General has determined that cigarette smoking is dangerous to health."
2. Level 2 (general acceptance): A person may believe that "cigarette smoking is dangerous to health."
3. Level 3 (personalized acceptance): A person may believe that "my cigarette smoking is dangerous to my health."

Most of the survey data presented in the first section address Level 2 beliefs. At times, the term public knowledge is used to refer to public beliefs (Level 2 beliefs at the population level). There are few data regarding Level 1 beliefs; consequently, use of the terms awareness and public awareness is generally avoided. Data pertinent to Level 3 beliefs are available from a few surveys in three forms: (1) questions asking whether smoking "is harmful to your health"; (2) questions asking whether respondents are "concerned" about the effects of smoking on their health; and (3) questions asking whether respondents believe that they are less likely, as likely, or more likely than other people to be adversely affected by smoking. These levels of beliefs are discussed in more depth later in this Chapter.

Data Sources

The information presented in this Chapter is derived from three principal sources:

1. Nationally representative surveys conducted by the U.S. Public Health Service from 1964-87, including the Adult Use of Tobacco Surveys (AUTSs) (1964, 1966, 1970, 1975, 1986) and the National Health Interview Surveys (NHISs) (1985, 1987). The NHIS questions were part of the Health Promotion and Dis-

ease Prevention Supplement in 1985 and the Cancer Control Supplement in 1987. The surveys for 1964-75 used, for the most part, the same methods and questionnaire wording. Different methods and questionnaires were used in subsequent surveys.

2. Nationally representative surveys conducted by private organizations, such as Gallup and Roper, and sponsored by various organizations.
3. National surveys of population *subgroups* or local surveys. These surveys were used, for the most part, only when nationally representative data were unavailable.

Data from these surveys are presented in several tables throughout this Chapter, each of which addresses beliefs or opinions about a particular smoking-related scientific fact or policy. When one of the primary data sources (e.g., the AUTS) is not included in a table, it is because the relevant question was not asked in the survey or survey year or because the data were not available.

Preliminary first-quarter estimates from the Cancer Control Supplement to the 1987 NHIS are provided in some tables (unpublished data, National Cancer Institute). These data are unweighted. When available, year-end weighted data are cited; in all cases, these figures are very similar to the first-quarter estimates.

The surveys used in this Chapter and in Chapter 5 are described in the Appendix to this Chapter. Table 1 provides basic information about the survey methodology. The amounts of information provided for the different surveys vary because certain

TABLE 1.—Methodology of surveys

Survey	Survey firm	Sample size	Age (years)	Response rate (%)	Mode[a]
AUTS 1964	National Analysts	5,794	≥21	76	P
AUTS 1966	National Analysts Opinion Research	5,768		72	P T[b]
AUTS 1970	Chilton	5,200	≥21		P(9%[c]) T(91%)
AUTS 1975	Chilton	12,000			T(96%) P(4%[c])
Roper 1978	Roper	2,511			P
NHIS 1985	Census Bureau	33,630	≥18	90	P
AUTS 1986	Westat	13,031	≥17	74	T
AMA 1986	Kane, Parsons	1,500			T
AMA 1987	Kane, Parsons	1,500			T
MTF[d] 1975–87	University of Michigan		18		Q

[a]P, personal interview; T, telephone interview; Q, self-administered questionnaire.
[b]Nonrespondents to personal interviews.
[c]Nontelephone households.
[d]Monitoring the Future Project, survey of high school seniors.

methodological details were available for some surveys but not for others. Additional information on the methodology of these surveys has been published elsewhere (Massey et al. 1987).

Issues in Comparing Surveys

When assessing trends from different surveys conducted at different times by different organizations, it is important to consider the following caveats. The response to each specific question depends upon multiple factors, including the mode of data collection (e.g., in person versus telephone), the sociodemographic representativeness of the sample, the exact wording of the question (e.g., bold, direct-sounding questions versus conservative-sounding statements), the type of response allowed or requested (e.g., open- versus closed-ended questions), the order of questions within the survey, and the content and nature of the rest of the survey (e.g., a survey specifically addressing smoking versus another of a general topic). Even minor changes in the survey methods or questionnaire wording may lead to markedly discrepant results for a specific question.

Additional precautions exist when interpreting surveys that assess public knowledge. When asked a knowledge question, respondents may attempt to answer it "correctly" in order to please the interviewer. The Health Promotion and Disease Prevention Supplement to the 1985 NHIS sheds light on this question. In this survey (NCHS 1986), respondents were asked whether smoking increases the risk of developing cataracts and gall bladder disease--two conditions not associated with smoking. The extent to which these types of questions (sometimes called "red herrings") are answered in the affirmative (and thus incorrectly) may reflect the respondents' general tendency to respond in the affirmative. More than 85 percent of respondents reported that smoking causes emphysema, chronic bronchitis, and laryngeal, esophageal, and lung cancer; however, 11 percent and 16 percent reported that smoking causes gallstones and cataracts, respectively. The responses indicating a connection between smoking and cataracts or gall bladder disease may represent misinformed beliefs or a bias from attempting to answer knowledge questions "correctly." There are other possible explanations, however. For instance, these responses (as well as other "correct" responses) may represent inferences that respondents have made, in some cases regarding questions they have never thought about. In these cases, some persons may be inclined to infer a connection between a known risk behavior and *any* disease outcome.

In the case of questions about public knowledge (e.g., "Do you think that smoking is or is not a cause of lung cancer?"), the "don't know" response should be included in the denominator when calculating the proportion of the population that believes a particular fact. This process was used for calculating unpublished data presented below.

When two surveys produce unexpected or discrepant results, a close inspection of the methods often explains the findings. Two examples involve surveys of public opinion about smoking policies. In one case, two separate national surveys conducted in 1986 regarding support for a ban on cigarette advertising provided apparently discrepant results (American Medical Association (AMA) 1986). A careful review of the questionnaire wording revealed marked differences in the remarks made just prior to each question. In a survey conducted for AMA, respondents were first informed about

the AMA's support of a policy to ban advertising--67 percent subsequently responded that they were in favor of such a ban. In contrast, in a survey conducted for the American Cancer Society (ACS), the American Heart Association (AHA), and the American Lung Association (ALA), respondents were first informed that "some people feel that as long as cigarettes are legal, cigarette advertising should be permitted. Others feel that cigarette advertising should not be permitted." Thirty-three percent subsequently responded that cigarette companies should not be permitted to advertise in newspapers and magazines.

There are at least three reasons these questions might be expected to evoke different responses. First, the wording prior to each question may have biased the respondents-one to align with the sponsoring agency's policy and the other to consider the legal implications of such a ban. Second, the first survey asked whether cigarette advertising should *be banned* while the second asked whether cigarette advertising should be *permitted.* To the extent that some respondents may have a general inclination to answer in the affirmative, such wording differences could influence the results. Third, the word "ban" may have negative connotations for some respondents. Two national surveys (including one sponsored by AMA) conducted 1 year later, which provided no introductory comments, found that 49 percent of adults (Gallup 1987a) and 55 percent of adults (Harvey and Shubat 1987) were in favor of a ban on tobacco advertising (see Table 31).

A second example involves two surveys conducted in Michigan in 1986 regarding public opinion on smoking in public places (Perlstadt and Holmes 1987). A survey sponsored by the affiliates of ALA and AHA in Michigan revealed that 82 percent of adults favored restrictions on smoking in public places. In contrast, a survey conducted 2 months later and sponsored by the Michigan Tobacco and Candy Distributors and Vendors Association indicated that 82 percent of the public thought the legislature should refrain from further legislation restricting smoking. After assessing the survey methods and questionnaires, the Michigan Department of Public Health concluded that markedly different questionnaire wording and survey methods accounted for the discrepant results.

To assist in the interpretation of the data presented in this Report, data sources are described in Table 1 and in the Appendix to this Chapter, and the exact (or approximate) question wording and response choices are provided as a footnote to each table when available. Response choices, when obvious, are often omitted (e.g., simple yes-no questions). Although the same question wording may be used in different surveys, other factors may have important effects on the responses. The reader should therefore interpret with caution observed differences and trends presented in this Chapter because many of the potential factors that may affect responses are not known.

Trends in Public Beliefs About the Health Effects of Smoking

Overview

The health consequences of smoking are well documented and widely acknowledged in the scientific literature (see Chapter 2 in this Report). In 1964, the Surgeon General's Advisory Committee on Smoking and Health, after an extensive review of the literature, reported that cigarette smoking was causally associated with lung and laryngeal cancer in men, was the most important cause of chronic bronchitis, and was associated with esophageal cancer, bladder cancer, coronary artery disease, emphysema, peptic ulcer, and low-birthweight babies (US PHS 1964).

During the 25-year period since 1964, subsequent reports of the Surgeon General have updated and extended the findings of the Advisory Committee. The purpose of this Section is to determine the extent to which this information has been disseminated to and accepted by the U.S. public. Public knowledge of the health risks of smoking can be considered under three broad categories: whether smoking is harmful to health in general and whether smokers perceive *themselves* to be at risk from smoking, as well as the magnitude of risk from smoking and how this compares to other health risks. Because health concerns and risks among adolescents differ from those of adults, we have addressed surveys of their knowledge under a separate heading.

For each specific known health risk noted, the section below includes: (1) a description of the known medical or scientific facts; that is, a brief summary of the information known about the health risk (see Chapter 2 for a more detailed description of the information about health risks), (2) a report on the trends in the public's knowledge of this fact (if available), and (3) a brief description of the current status of knowledge with respect to smoking status. This Section concludes with a summary of the important gains in knowledge, the gaps that remain, the factors that may promote or interfere with change, and the relationship between these trends and the 1990 Health Objectives for the Nation.

In a few cases, published studies have analyzed public knowledge or beliefs by sociodemographic groupings (NCHS 1988; Folsom et al. 1988; Fox et al. 1987; Shopland and Brown 1987; Dolecek et al. 1986). Because these analyses were available only occasionally, and because some of these studies did not control for smoking status, socoidemographic correlation data are not presented below. Because smoking rates and socioeconomic status are inversely correlated (Chapter 5), differences in public knowledge or beliefs according to smoking status may reflect differences in socioeconomic status.

Is Cigarette Smoking Harmful to Smokers in General?

In 1964, 81 percent of adults strongly or mildly agreed that smoking is harmful to health (Table 2). An identical series of questions asked in the AUTSs from 1964-75 demonstrated an increase in this belief to 90 percent of adults. Public knowledge on this question increased during this period among current smokers (70 to 81 percent), as well as among never smokers (89 to 95 percent).

TABLE 2.--Trends in public knowledge about smoking and health

Survey	Year	Reference	Cigarette smoking is harmful to health (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All non-smokers	All adults
1. AUTS[a]	1964	US DHEW 1969	70	91	89	89	81
2. AUTS[a]	1966	US DHEW 1969	78	89	89	89	85
3. AUTS[a]	1970	US DHEW 1973	79	92	92	92	87
4. AUTS[a]	1975	US DHEW 1976a	81	95	95	95	90

[a]Percentagcs include those who "strongly agree" or "mildly agree."

NOTE: Actual questions:

1. Smoking cigarettes is harmful to health (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree).

2. Cigarette smoking is harmful to health (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree).

3-4. Smoking Cigarettes is harmful to health (strongly agree, mildly agree, no opinion/don't know, mildly disagree, strongly disagree).

TABLE 3.--Trends in public beliefs regarding the relative hazards of different cigarette brands, 1970, 1975, 1986

	Percentage of current smokers		
	1970	1975	1986
Some kinds of cigarettes are probably more hazardous to health than others[a]			
Kind I smoke probably more hazardous than others[a]	(6)	(10)	(8)
Kind I smoke probably less hazardous than others[a]	(25)	(25)	(21)
Kind I smoke probably about the same as others[a]	(14)	(14)	(13)
Don't know	(2)	(2)	(2)
Subtotal	47	51	45
All cigarettes are probably about equally hazardous[a]	43	41	50
Cigarettes are probably not hazardous to health at all	4	5	2
Don't know or not stated if some are hazardous	6	4	3
Total	100	100	100

[a]The word "probably" was not used in the 1986 AUTS. The wording in the three surveys was otherwise similar.
SOURCE: AUTSs 1970, 1975, 1986 (US DHEW 1973, 1976a: US DHHS, in press).

Although smokers and nonsmokers acknowledge the health risks from smoking, certain types of smoking (such as light smoking or smoking low-tar cigarettes) or smoking for a limited period of time may be perceived as less hazardous. In general, there are few data to assess the degree to which these beliefs are held. According to the AUTSs in 1970, 1975, and 1986, 45 to 50 percent of current smokers believed that "some kinds of cigarettes are probably more hazardous than others," 40 to 50 percent believed that "all cigarettes are probably about equally hazardous," and 5 percent or less believed that "cigarettes are probably not hazardous to health at all" (Table 3). More specific data are reviewed below.

Heavy Versus Light Smoking

A large body of evidence has shown that light smoking, that is, 1 to 9 cigarettes per day, is associated with a significantly increased risk of overall morbidity and mortality from lung cancer, chronic obstructive pulmonary disease (COPD), heart disease, and other smoking-related diseases compared with never smoking (US DHEW 1979a; US DHHS 1982, 1983, 1984).

Between 1970 and 1978, national surveys conducted by the Roper Organization addressed beliefs regarding the health risks of heavy versus light smoking (FTC 1981). Respondents were asked how hazardous smoking is and were given three possible responses: any amount, only heavy smoking, and not hazardous. In 1970, 45 percent of respondents considered only heavy smoking to be hazardous (Table 4); by 1978, 31

TABLE 4.—Trends in public knowledge about the health hazards of smoking

Survey	Year	Reference	What amount of smoking is hazardous to health?[a,b] (percentage who responded for each amount)			
			Any amount	Only heavy smoking	Not hazardous	Don't know
1. Roper	1970	Roper 1978	47	45	5	3
2. Roper	1972	Roper 1978	48	42	6	4
3. Roper	1974	Roper 1978	54	39	4	3
4. Roper	1976	Roper 1978	54	38	4	4
5. Roper	1978	Roper 1978	61	31	5	4
6. AUTS	1986	US DHHS, in press	72	20		5 (current smokers)
			81	13		4 (former smokers)
			85	11		4 (never smokers)

[a]Respondents were allowed to choose only one answer. The "not hazardous" response was not available for the AUTS.

[b]Percentages of responses in Roper surveys refer to all respondents; in AUTS 1986, percentages represent current, former, and never smokers, respectively.

NOTE: Actual questions:

1–5. How hazardous is smoking? (any amount, only heavy smoking, not hazardous, don't know)

6. Do you think that only heavy smoking is hazardous or that *any* smoking is hazardous? (only heavy smoking, any smoking, don't know)

percent considered only heavy smoking to be hazardous. Corresponding increases occurred in those responding "any amount."

The 1986 AUTS posed a similar question but did not offer "not hazardous" as a possible response (Table 4). It showed that most respondents, given the two choices of "any amount" or "only heavy smoking," chose the former (85, 81, and 72 percent of never, former, and current smokers, respectively).

When asked, "How many cigarettes a day do you think a person would have to smoke before it would affect their (sic) health?" 49 percent of current smokers and 40 percent of never smokers cited 10 or more (Table 5), thus failing to recognize light smoking as a health risk. Twenty percent of current smokers cited 25 or more cigarettes as the minimum number necessary for adverse health effects (Table 5), which is identical to the proportion of current smokers who indicated, in response to the prior question, that only heavy smoking is hazardous to health (Table 4).

Tar Yield

Studies have shown that smoking filtered lower tar cigarettes reduces the risk of lung cancer compared with smoking unfiltered higher tar cigarettes. However, there is no conclusive evidence that the lower yield cigarettes are associated with reduced risk of overall mortality, cancers other than lung, COPD, or heart disease. Moreover, compensatory smoking behavior in response to lower nicotine intake might actually increase the intake of tobacco smoke toxins in some individuals (US DHHS 1981).

Very few surveys have assessed the perceived harmfulness of low-tar cigarettes versus high-tar cigarettes or never smoking. In the 1980 Roper Survey (FTC 1981), respondents were presented with the following false statement: "It has been proven that smoking low-tar, low-nicotine cigarettes does not significantly increase a person's risk of disease over that of a nonsmoker." Nine percent of smokers said they "know it's true," 27 percent said they "think it's true," and 32 percent said they did not know if it was true or not. The complicated wording of this question and use of the word "proven" make interpretation of these results difficult. Different results may have been obtained using a question such as, "Do you believe that smoking low-tar cigarettes is or is not harmful to health?"

The 1980 Roper survey also asked respondents their beliefs about the following statement: "Even if a woman smokes low tar, low nicotine cigarettes during pregnancy, she still significantly increases her risk of losing the baby before or during birth." Forty-three percent of all respondents and 37 percent of smokers said they "know it's true" or "think it's true" (unpublished data, FTC).

The 1987 NHIS asked respondents if they believed that "People who smoke low tar and nicotine cigarettes are less likely to get cancer than people who smoke high tar and nicotine cigarettes." A total of 30 percent agreed with the statement whereas 50 percent disagreed (year-end data).

Folsom and associates (1988) surveyed 1,252 blacks (aged 35 to 74 years) and 1,870 whites in the metropolitan Minneapolis/St. Paul area during 1985-86. Respondents were presented with the following statement: "If 'tar' and nicotine were removed from cigarettes, there would be no other chemicals in tobacco smoke that cause disease."

TABLE 5.—Public knowledge about the health hazards of smoking in relation to daily cigarette consumption, 1986

	How many cigarettes a day you think a person would have to smoke before it would affect their health?[a] (percentage indicating the following number of cigarettes per day)							
	1	2–4	5–9	10–14	15–24	25–39	≥40	Don't know
Current smokers	14	4	8	12	17	3	17	25
Former smokers	17	6	10	13	19	2	9	22
Never smokers	21	9	10	11	19	1	9	20

[a]The question was open ended. Responses were grouped in the categories 1–9, 10–24, and ≥25 cigarettes per day to conform to the common definitions of light, moderate, and heavy smoking.
SOURCE: AUTS 1986 (US DHHS, in press).

The percentages of those correctly identifying this statement as false were 59 percent of black men, 76 percent of white men, 42 percent of black women, and 60 percent of white women. Those who considered the statement to be true may believe low-tar and -nicotine cigarettes to be less hazardous.

Duration of Smoking

Overall mortality ratios for smokers compared with nonsmokers increase with the duration of smoking. Overall mortality rates among smokers are slightly above the rates of nonsmokers for the first 5 to 15 years of smoking but then increase more rapidly as the years of smoking increase (US DHEW 1979a). Mortality ratios for lung cancer, coronary heart disease (CHD), and COPD increase with decreasing age of initiation (US DHHS 1982, 1983, 1984). An increased risk of morbidity (e.g., as measured by days of hospitalization, bed disability, and work lost) among smokers may occur much earlier than increases in mortality ratios.

The 1964 AUTS asked respondents, "How many cigarettes a day for how many years might make a cigarette smoker more likely to get lung cancer?" Most of those who considered smoking to be a cause of lung cancer believed that smoking would increase the risk of lung cancer only after at least 10 years of smoking (regardless of the number of cigarettes smoked per day) (Table 6).

The 1986 AUTS asked respondents, "How long would a person have to smoke (number) of cigarettes each day before it would affect their (sic) health?" The number of cigarettes used in this question was the number identified by the respondent (in the previous question) as that which "a person would have to smoke before it would affect their (sic) health" (see Table 5). A majority of respondents in all smoking categories believed that smoking 10 or fewer years would affect a person's health. A higher percentage of never smokers (36 percent) than current smokers (23 percent) believed that smoking less than 1 year would affect a person's health. Correspondingly, a slightly higher percentage of current smokers (10 percent) than never smokers (5 percent) believed that health effects would occur only after at least 15 years of smoking (Table *7).*

The wording in these two questions from the 1964 and 1986 AUTSs is substantially different, making any comparison difficult. In particular, the 1986 question may have favored responses indicating a shorter duration of smoking by referring to general effects on health (which could be interpreted as nothing more than a cough) whereas the 1964 question asked about the risk of lung cancer.

Does Cigarette Smoking Cause:

Lung Cancer?

Lung cancer, first correlated with smoking more than 50 years ago, is the single largest contributor to the total cancer death rate (US DHHS 1982). Lung cancer alone accounted for an estimated 139,000 (28 percent) of the estimated 494,000 total cancer deaths in the United States in 1988 (ACS 1988a). It is estimated that cigarette smoking

TABLE 6.—Public beliefs about the health effects of smoking in relation to duration of smoking, 1964

	How many cigarettes a day for how many years might make a cigarette smoker more likely to get lung cancer?[a] (percentage indicating the following number of years[b])					
	≤9	10–19	20–29	≥30	Don't know/ no answer	Smokers not more likely to get lung cancer
Current smokers	10	12	12	11	10	43
Former smokers	17	17	16	14	14	22
Never smokers	17	16	10	13	19	24

[a]Asked only of those who indicated in the previous survey question that smokers are more likely than nonsmokers to develop lung cancer. The denominators for these percentages include all respondents.

[b]Regardless of number of cigarettes per day.

SOURCE: AUTS 1964 (US DHEW 1969).

TABLE 7.--Public beliefs about the health effects of smoking in relation to duration of smoking, 1986

	How long would a person have to smoke (number) cigarette[a] each day before it would affect their health? (percentage indicating the following years of smoking)							
	<1	1-2	3-5	6-10	11-15	>15	Never	Don't know
Current smokers	23	15	10	8	3	10	0.6	30
Former smokers	24	13	13	10	3	9	0.4	29
Never smokers	36	16	10	6	2	5	0.1	25

[a]The number of cigarettes used in this question was the number identified by the respondent (in the previous survey question) as that which "a person would have to smoke before it would affect their health." (See Table 6).

SOURCE: AUTS 1986 (US DHHS, in press).

causes approximately 90 percent of lung cancer deaths in men and 80 percent in women (see Chapter 3).

Surveys have addressed public knowledge about the relationship between smoking and lung cancer since 1954. In 1954, fewer than half of adults (41 percent) thought that smoking is one of the causes of lung cancer (Table 8). Since that time, public knowledge of the association between smoking and lung cancer has increased steadily. By 1964, a majority of adults (66 percent) believed that smoking causes lung cancer; surveys in 1985, 1986, and 1987 showed that this proportion had increased to between 87 and 95 percent.

Heart Disease?

The 1964 Report of the Surgeon General's Advisory Committee identified an association between smoking and CHD, although it did not consider the available data to be sufficient to establish a causal relationship (US PHS 1964). Since that time, evidence from numerous investigations has established cigarette smoking as the most important modifiable risk factor for CHD in the United States (US DHHS 1983). Cigarette smoking increases the risk of death from CHD approximately threefold in persons less than 65 years old and is responsible for 40 to 45 percent of CHD deaths in this age group (Chapter 3).

Public beliefs that smoking is associated with the risk of CHD have steadily increased since 1964, when fewer than half of adults (40 percent) thought that smokers were more likely than nonsmokers to develop heart disease (Table 9). Surveys in 1985, 1986, and 1987 showed that 77 to 90 percent of adults believed that smoking increases the risk of developing heart disease. Each of these recent surveys showed that current smokers were less likely to have this belief than former and never smokers.

In 1986, current smokers were less likely to acknowledge a relationship between smoking and heart disease (71 percent) than were former smokers (84 percent) and never smokers (80 percent).

Chronic Obstructive Pulmonary Disease?

The 1964 Report of the Surgeon General's Advisory Committee identified cigarette smoking as the most important cause of chronic bronchitis (US PHS 1964). Today, cigarette smoking has been identified as the major cause of chronic bronchitis and emphysema in the United States. Eighty to eighty-five percent of deaths from COPD are attributed to cigarette smoking (Chapter 3; also see US DHHS 1984).

Since 1964, the public belief that smoking is associated with an increased risk of COPD has increased. In 1964, half of adults (50 percent) thought that smokers were more likely to get chronic bronchitis and emphysema (Table 10). By 1986, most adults thought that cigarette smokers were more likely than nonsmokers to develop chronic bronchitis (81 percent) and emphysema (89 percent). The preliminary first-quarter 1987 NHIS estimates were similar.

In three surveys that asked identical questions regarding emphysema and chronic bronchitis (NHISs 1985 and 1987, AUTS 1986), there were consistent slightly higher proportions who believed that smoking is associated with emphysema compared with chronic bronchitis.

In 1986, smokers were less likely to acknowledge an association between smoking and chronic bronchitis (73 percent) than were former smokers (84 percent) and never

TABLE 8--Trends in public knowledge about smoking and lung cancer

Survey	Year	Reference	Cigarette smoking causes lung cancer (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. Gallup	1954	Gallup 1981					41
2. Gallup	1957	Gallup 1981					50
3. Gallup	1958	Gallup 1981					44
4. AUTS	1964	US DHEW 1969	53	75	75	75	66
5. AUTS	1966	US DHEW 1969	57	79	70	72	66
6. Gallup	1969	Gallup 1981					71
7. Gallup	1971	Gallup 1981					71
8. Gallup	1977	Gallup 1981					81
9. Gallup	1978	Gallup 1978	72			87	81
10. Gallup	1981	Gallup 1981	69			91	83

TABLE 8.--Continued

Survey	Year	Reference	Cigarette smoking causes lung cancer (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
11. NHIS	1985	NCHS 1986[a]	92	96	96	96	95
12. AUTS	1986	US DHHS, in press	85	94	95	95	92
13. Gallup	1987	ALA 1987	75	90		94	87
14. NHIS[b]	1987		83	92	92		89

[a]And unpublished data.
[b]Preliminary first-quarter data (unpublished). Year-end percentage for all adults is 89 percent.
NOTE: Actual questions:
1-3. Do you think that cigarette smoking is or is not one of the causes of lung cancer? (yes, is a cause; no, is not a cause; no opinion)
4-5. Would you say that cigarette smoking is definitely, probably, probably not, or definitely not a major cause of lung cancer, or that you have no opinion either way?*
6-10. Do you think that cigarette smoking is or is not one of the causes of lung cancer? (yes. is a cause; no, is not a cause; no opinion)
11. Tell me if you think cigarette smoking definitely increases, probably increases, probably does not, or definitely does not increase a person's chances of getting the following problems lung cancer.**
12. Do you think a person who smokes is any more likely to get lung cancer than a person who doesn't smoke? (much more likely. somewhat more likely, no, don't know)†
13. Do you think smoking is a cause of lung cancer? (yes, no, don't know)
14. People have differing beliefs about the relationship between smoking and health. Do you believe cigarette smoking is related . . . to lung cancer?
*Percentages include those who say smoking is "definitely" or "probably" a major cause of lung cancer.
**Percentages include those who believe smoking "definitely" or "probably" increases the risk.
†Percentages include those who believe smokers are "much more likely" or "somewhat more likely" to get lung cancer.

TABLE 9.--Trends in public knowledge about smoking and heart disease

	Survey	Year	Reference	Smoking cigarettes causes heart disease (percentage who agree by smoking status)				
				Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1.	AUTS	1964	US DHEW 1969	32	51	44	46	40
2.	AUTS	1966	US DHEW 1969	33	53	43	47	42
3.	AUTS	1966	US DHEW 1969	46	65	58	60	54
4.	Gallup	1969	Gallup 1981					60
5.	Gallup	1977	Gallup 1981					68
6.	Gallup	1978	Gallup 1978	63			72	68
7.	Gallup	1981	Gallup 1981	59			82	74
8.	NHIS	1985	NCHS 1988	88	93	92	92	90
9.	AUTS	1986	US DHHS, in press	71	84	80	81	78

TABLE 9.--Continued

Survey	Year	Reference	Smoking cigarettes causes heart disease (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
10. NHIS[a]	1987		73	82	77		77

[a]Preliminary first-quarter data (unpublished). Year-end percentage for all adults is 76 percent.

NOTE: Actual questions:

l-2. Do you think the chances of getting coronary heart disease are the same for people who don't smoke cigarettes as they are for people who do smoke cigarettes? Who would be more likely to get it, people who don't smoke cigarettes or people who do smoke cigarettes?

3. Cigarette smokers are more likely to die from heart disease than people who don't smoke cigarettes. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*

4-7. Do you think that cigarette smoking is or is not one of the causes of heart disease?

8. Do you think cigarette smoking definitely increases, probably increases. probably does not, or definitely does not increase a person's chances of getting heart disease?†

9. Do you think a person who smokes is any more likely to get heart disease than a person who doesn't smoke? (much more likely, somewhat more likely, no, don't know)**

10. People have differing beliefs about the relationship between smoking and health. Do you believe cigarette smoking is related to . . . heart disease?

*Percentages include those who "strongly agree" or "mildly agree."

†Percentages include those who believe that smoking "definitely" or "probably" increases the risk.

**Percentages include those who believe smokers are "much more likely" or "somewhat more likely" to get heart disease.

TABLE 10.--Trends in public knowledge about smoking and emphysema or chronic bronchitis

	Survey	Year	Reference	Percentage who agree by smoking status				
				Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
			Smoking is a cause of emphysema/chronic bronchitis					
1.	AUTS	1964	US DHEW 1969	42	60	55	56	50
2.	AUTS	1966	US DHEW 1969	46	60	52	54	51
			Smoking is a cause of emphysema					
3.	NHIS	1985	NCHS 1986[b]	89	94	91	92	91
4.	AUTS	1986	US DHHS, in press	85	92	90	91	89
5.	Gallup	1987	ALA 1987	75	91		90	85
6.	NHIS[a]	1987		79	87	84		84
			Smoking is a cause of chronic bronchitis					
7.	AUTS	1966	US DHEW 1969	50	56	65	56	59
8.	NHIS	1985	NCHS 1986[b]	82	89	88	88	86

TABLE 10.--Continued

Survey	Year	Reference	Percentage who agree by smoking status				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
9. AUTS	1986	US DHHS, in press	73	84	83	84	81
10. NHIS[a]	1987		71	81	79		77

[a]Preliminary first-quarter data (unpublished). Year-end percentages for all adults are 75 percent (chronic bronchitis) and 82 percent (emphysema).
[b]And unpublished data.
NOTE: Actual questions:
l-2. Do you think the chances of getting emphysema and chronic bronchitis are the same for people who don't smoke cigarettes as they are for people who do smoke cigarettes? Who would be more likely to get it, people who don't smoke cigarettes or people who do smoke cigarettes?*
3. Tell me if you think cigarette smoking definitely increases, probably increases, probably does not, or definitely does not increase a person's chances of getting the following problems. . . emphysema.‡
4. Do you think a person who smokes is any more likely to get emphysema than a person who doesn't smoke? (much more likely, somewhat more likely, no, don't know)**
5. Do you think that smoking is a cause of emphysema? (yes, no, don't know)
6. Do you believe cigarette smoking is related to emphysema?
7. Cigarette smoking causes chronic bronchitis. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)†
8. Tell me if you think cigarette smoking definitely increases, probably increases, probably does not, or definitely does not increase a person's chances of getting the following problems . . . chronic bronchitis. ‡
9. Do you think a person who smokes is any more likely to get chronic bronchitis than a person who doesn't smoke? (much more likely, somewhat more likely, no, don't know)**
10. People have differing beliefs about the relationship between smoking and health. Do you believe cigarette smoking is related to . . . chronic bronchitis?
*Percentages are those who believe that smokers are more likely to get emphysema and chronic bronchitis.
†Percentages include those who "strongly agree" or "mildly agree."
**Percentages include those who believe smokers are "much more likely" or "somewhat more likely" to get the disease.
‡Percentages include those who believe that smoking "definitely" or "probably" increases the risk.

smokers (83 percent). Similarly, smokers were less likely to acknowledge an association between smoking and emphysema (85 percent) than were former smokers (92 percent) and never smokers (90 percent). Similar patterns were seen in the earlier surveys.

Other Cancers?

Laryngeal and esophageal cancer: By 1964, smoking was identified as a cause of laryngeal cancer in men; an association between smoking and cancer of the esophagus was also noted, although the data were not considered sufficient to establish a causal relationship at that time (US PHS 1964). An estimated 75 to 90 percent of laryngeal and esophageal cancer deaths are attributed to smoking, and smokers have mortality rates from these diseases that are approximately 8 to 18 times higher than those of never smokers (Chapter 3).

Since 1977, public beliefs that smoking increases the risk of developing cancer of the larynx and esophagus have not changed substantially (Table 11). In 1977, 79 percent of adults reported that smoking is one of the causes of throat cancer. In 1985, 80 percent of adults thought that smoking increases a person's risk of developing esophageal cancer and 88 percent thought that smoking increases the risk of acquiring laryngeal cancer. Use of different wording to describe the cancer site (throat, laryngeal, esophageal, "mouth and throat") makes comparisons among these surveys difficult.

In 1986, current smokers were less likely to acknowledge a relationship between smoking and laryngeal cancer (82 percent) than were former smokers (91 percent) or never smokers (91 percent). Similar patterns were seen in the earlier surveys and in the preliminary 1987 NHIS data (Table 11).

Bladder cancer: The 1964 Report of the Surgeon General's Advisory Committee identified an association between smoking and cancer of the bladder, although the evidence was not considered sufficient to establish a causal relationship (US PHS 1964). Thirty-seven to forty-seven percent of bladder cancer deaths are now attributable to smoking (Chapter 3).

Few data are available on public knowledge about the association between smoking and cancer of the bladder. The 1979 Chilton Survey (Chilton 1980) showed that 25 percent of adult respondents (29 to 31 years of age) believed that "cancer of the bladder (has) been found to be associated with cigarette smoking." In the 1985 NHIS, 36 percent of adults thought that cigarette smoking definitely or probably increases a person's risk of developing bladder cancer. In the 1986 AUTS, 33 percent of adults thought that smokers are more likely than nonsmokers to develop bladder cancer. Current smokers were less likely to acknowledge this relationship (25 percent) than were former smokers (32 percent) and never smokers (38 percent).

What Are the Special Health Risks for Women?

The special health risks for women include effects of smoking on pregnancy outcome, increased risk of cardiovascular disease (CVD) among smokers who use oral contraceptives, and increased risk of cervical cancer in women who smoke (Chapters 2 and 3). Data exist on public beliefs regarding the first two of these three categories of risk.

TABLE 11.--Trends in public knowledge about smoking and cancer of the mouth/throat/larynx/esophagus

Survey	Year	Reference	Smoking causes cancer of the mouth/throat/larynx/esophagus (percentage who agree by smoking status)				
			current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. Gallup	1977	Gallup 1981				79	
2. Gallup	1978	Gallup 1978	73			82	79
3. Gallup	1981	Gallup 1981	69		87	81	
4. NHIS	1985	NCHS 1986[b]	83	90	90	90	88
5. NHIS	1985	NCHS 1986[b]	75	83	82	82	80
6. AUTS	1986	US DHHS, in press	82	91	91	91	88
7. NHIS[a]	1987		73	85	83		80

[a]Preliminary first-quarter data (unpublished). Year-end percentage for all adults is 80 percent.
[b]And unpublished data.

NOTE: Actual questions:

1-3. Do you think that cigarette smoking is or is not one of the causes of cancer of the throat?

4-5. Tell me if you think cigarette smoking definitely increases, probably increases, probably does not, or definitely does not increase a person's chances of getting the following problems cancer of the larynx or voice box (question 4) . . . cancer of the esophagus (question 5).*

6. Do you think a person who smokes is any more likely to get cancer of the larynx or voice box than a person who doesn't smoke?

7. People have differing beliefs about the relationship between smoking and health. Do you believe cigarette smoking is related to cancer of the mouth and throat?

*Percentages include those who believe that smoking "definitely" or "probably" increases the risk.

Effects of Smoking on Pregnancy Outcome

In 1964, knowledge of the health consequences of smoking during pregnancy mostly concerned the increased risk of low-birthweight babies (US PHS 1964). Considerable evidence has accumulated since that time. In the 1980 Surgeon General's Report, smoking was identified as an important cause of premature births, miscarriages, and stillbirths, as well as low-birthweight babies (US DHHS 1980).

From the data available, it appears that the public has become more knowledgeable about the effects of smoking on premature births. In 1966, 34 percent of adults of *all* ages thought that women who smoke during pregnancy are more likely to have premature babies than women who do not smoke (Table 12). Fox and coworkers (1987) published data on beliefs about the risks of smoking during pregnancy among persons 18 to 44 years of age. By 1985, 70 percent of adults aged *18 to 44 years* thought that smoking during pregnancy definitely or probably increases the chances of premature birth.

Only recent data are available on public knowledge of the effects of smoking on spontaneous abortion (miscarriage), stillbirth, and low birthweight (Table 12). In 1985, 80 percent of adults (aged 18 to 44 years) thought that smoking during pregnancy definitely or probably increases the risk of having a low-birthweight baby; 74 percent of adults thought that smoking definitely or probably increases the risk of miscarriage; and 66 percent of adults thought that smoking during pregnancy definitely or probably increases the risk of stillbirth. The 1987 NHIS showed that 89 percent of respondents believed that smoking during pregnancy "may" harm the baby. The 1966, 1985, and 1987 surveys each showed that current smokers were less likely than nonsmokers to believe that smoking increases the risk of adverse pregnancy outcomes. The Federal Trade Commission (FTC) (1981) reviewed data from a 1979 Chilton survey and a 1980 Roper survey on public beliefs concerning the effects of smoking during pregnancy.

Risk of Cardiovascular Disease Among Smokers Who Use Oral Contraceptives

In 1964, the interactive effect of smoking and oral contraceptive use on the risk of CVD had not been established. The 1977/l978 Surgeon General's Report cited recent studies showing that oral contraceptive use potentiates the harmful effects of smoking on the cardiovascular system (US DHEW 1978). Since 1978, the package inserts for oral contraceptives have described this risk for users (see Chapter 7). It is now known that oral contraceptives or cigarettes, when used alone, increase the risk of heart attacks twofold; however, when used in combination, the increased risk is tenfold (US DHHS 1980). Smoking and oral contraceptive use also appear to interact synergistically to greatly increase the risk of subarachnoid hemorrhage (US DHHS 1983).

No trend data are available on the knowledge of health risks from the combined use of cigarettes and oral contraceptives. In 1985, 62 percent of adults aged 18 to 44 years believed that a woman who both takes oral contraceptives and smokes is more likely to have a stroke (Table 12). Nonsmokers were only slightly more likely than smokers to believe this (65 vs. 59 percent). Women were much more likely to believe this than were men (72 vs. 52 percent). In 1980, 64 percent of women believed that a woman who takes birth control pills further increases her risk of getting a heart attack if she also smokes.

TABLE 12.--Trends in public knowledge about the special health risks for women who smoke

Survey	Year	Percentage who agree by smoking status[a]				
		Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
Smoking during pregnancy increases the chances of premature birth						
1. AUTS	1966	25	43	34		
2. NHIS	1985 (all)	64	71	75		70
2. NHIS	1985 (men)					64
2. NHIS	1985 (women)					76
Smoking during pregnancy increases the chances of stillbirth						
3. NHIS	1985 (all)	57	67	72		66
3. NHIS	1985 (men)					63
3. NHIS	1985 (women)					68
Smoking during pregnancy increases the chances of miscarriage						
4. NHIS	1985 (all)	66	75	79		74
4. NHIS	1985 (men)					72
4. NHIS	1985 (women)					75
Smoking during pregnancy increases the chances of having a low-birthweight baby						
5. NHIS	1985 (all)	74	82	83		80
5. NHIS	1985 (men)					74
5. NHIS	1985 (women)					85
A woman taking birth control pills is more likely to have a stroke if she smokes						
6. NHIS	1985 (all)	59	67	64	65	62
6. NHIS	1985 (men)	48	57	54	55	52
6. NHIS	1985 (women)	70	80	72	74	72

TABLE 12.--Continued

Survey	Year	Percentage who agree by smoking status: Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
A woman who takes birth control pills further increases her risk of getting a heart attack if she also smokes						
7. Roper	1980 (women)					64
Smoking by a pregnant woman may harm the baby						
8. NHIS[b]	1987	83	90	93		89

a Data for 1966 include all adults (US DHEW 1969). Data for 1985 are from Fox et al. (1987) and NCHS (1986) and include only those people 18 to 44 years of age. Roper data for 1980 are from the FTC (1981).

[b]Preliminary first-quarter data (unpublished). Year-end percentage for all adults is 89 percent.

NOTE: Actual questions:

1. Women who smoke during pregnancy are more likely to have premature babies than women who do not smoke (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree).*
2. Does cigarette smoking during pregnancy definitely increase, probably increase, probably not or definitely not increase the chances of premature birth?[†]
3. . . . of stillbirth?[†]
4. . . . of miscarriage?[†]
5. . . . of low birthweight of the newborn?[†]
6. If a woman takes birth control pills, is she more likely to have a stroke if she smokes than if she does not smoke?
7. A woman who takes birth control pills further increases her risk of getting a heart attack if she also smokes (know it's true, don't know if it's true, think it's true. think it's not true, know it's not true).[‡]
8. Smoking by a pregnant woman may harm the baby. (strongly agree, agree, disagree, strongly disagree)**

*Percentages include those who "strongly agree" or "mildly agree."

[†]Percentages include those who believe that smoking "definitely" or "probably" increases the risk.

[‡]Percentage includes those who "know it's true" or "think it's true."

**Percentages include those who "strongly agree" or "agree."

Involuntary (Passive) Smoking

In 1964, the health effects of environmental tobacco smoke (ETS) exposure were not established. Today, ETS has been identified as a cause of disease, including lung cancer, in healthy nonsmokers. In addition, compared with the children of nonsmoking parents, children of parents who smoke have an increased frequency of respiratory infections and slightly lower rates of increase in lung function as the lungs mature (US DHHS 1986a).

From the available data, it appears that the public is more likely to believe that there are health risks from ETS exposure. The percentage of adults who thought that smoking is hazardous to nonsmokers' health increased from 46 percent to 58 percent between 1974 and 1978 (Table 13). By 1986 (AUTS), 81 percent of adults thought that tobacco smoke is harmful for nonsmokers who live or work with smokers. Similarly, in 1987 (ACS 1988b), 81 percent thought that people's smoke is harmful to others nearby. The 1986 and 1987 surveys used wording corresponding to Level 2 (general acceptance) beliefs. The 1987 NHIS used wording corresponding to Level 3 (personalized acceptance) beliefs, but nevertheless obtained the same proportion (81 percent) (Table 13).

In the 1986 AUTS, former and never smokers were more likely to consider ETS to be *generally* harmful to health (82 and 87 percent, respectively), compared with current smokers (69 percent). Similar patterns were seen in the 1987 NHIS and 1988 Gallup survey. In the 1986 AUTS, when nonsmokers were asked whether they considered ETS to be harmful to *their* health, 69 percent responded that they thought so (62 percent of former smokers and 74 percent of never smokers).

Is Smoking an Addiction?

In 1964, the Surgeon General's Advisory Committee came to the following conclusion, based on the evidence available at that time: "The tobacco habit should be characterized as an habituation rather than an addiction." The Advisory Committee's Report, however, did note that tobacco use is "reinforced and perpetuated by the pharmacologic actions of nicotine on the central nervous system" (US PHS 1964). The 1979 Surgeon General's Report called smoking "the prototypical substance-abuse dependency" (US DHEW 1979a). The 1988 Surgeon General's Report reaffirmed that conclusion and provided a detailed review of the evidence (US DHHS 1988).

Only limited data are available to assess public knowledge of the addictive nature of tobacco use. In a 1978 survey conducted by the Roper Organization, 50 percent of adults (57 percent of smokers) considered smoking a habit, 29 percent (22 percent of smokers) thought it an addiction, and 17 percent (15 percent of smokers) believed it to be both (Roper 1978).

In a 1986 Gallup poll of 1,046 adults 18 years and older conducted in Canada by household interviews, 76.5 percent of respondents considered "cigarette smoking to be

TABLE 13.--Trends in public knowledge about the health risks of passive smoking

Survey	Year	Reference	Smoking is hazardous to nonsmokers' health (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. Roper	1974	Roper 1978	30			51	46
2. Roper	1976	Roper 1978	38			61	52
3. Roper	1978	Roper 1978	40			69	58
4. AUTS[a]	1986	US DHHS, in press	69	82	87	85	81
5. NHIS[b]	1987		68	85	88		81
6. Gallup	1987	ACS 1988b	64	86	89		81

[a]Percentages presented here are slightly lower than those previously published (CDC 1988) because the latter did not include "don't know" responses in the denominator,

[b]Preliminary first-quarter data (unpublished). Year-end percentage for all adults is 81 percent.

NOTE: Actual questions:

l-3. Is smoking hazardous to nonsmokers' health? (probably is hazardous, probably doesn't have any real effect, don't know)

4. Think now for a moment about a nonsmoker who lives or works with smokers . . . . Do you think that exposure to tobacco smoke is harmful or not harmful to the nonsmoker's health?

5. The smoke from someone else's cigarette is harmful to you. (strongly agree, agree, disagree, strongly disagree)*

6. If people smoke, do you think that it *is* harmful or is *not* harmful to people who are near them? (yes, harmful: no, not harmful; can't say/no opinion)

*Percentages include those who "strongly agree" or "'agree."

like a drug addiction." Of current smokers, 79.6 answered "yes" to the question, "Do you think you are addicted to cigarettes?" (Canadian Gallup 1986)

Interaction Between Smoking and Other Exposures

The 1985 Surgeons General's Report (US DHHS 1985) reviewed evidence regarding the interaction between smoking and a variety of occupational exposures in causing disease. With respect to the interaction between smoking and asbestos, the Report concluded that these two exposures act synergistically to increase the risk of lung cancer. The risk of lung cancer in cigarette-smoking asbestos workers is more than fiftyfold the risk in nonsmokers who have not been exposed to asbestos.

Few data are available on public knowledge of these interactions. The 1980 Roper survey (unpublished data, FTC) asked respondents about their belief concerning the following statement: "If you smoke and have worked with asbestos you are at least 50 times more likely to get lung cancer than if you have done neither." Seventy-four percent of respondents (and 69 percent of smokers) said that they "know it's true" or "think it's true."

Smokeless Tobacco

Smokeless tobacco (ST) use leads to increased risk of oral cancer and nicotine addiction (US DHHS 1986c).

No data are available to assess trends in public knowledge of the health risks of ST use. In the 1986 AUTS, 78 percent of adults thought that the use of chewing tobacco is harmful in any way to a person's health. Similarly, 73 percent thought that the use of snuff is harmful to a person's health. Current smokers were less likely to know about the health effects of using chewing tobacco and snuff (71 and 66 percent, respectively) compared with former smokers (79 and 75 percent, respectively) and never smokers (81 and 76 percent, respectively).

According to the 1987 NHIS (preliminary first-quarter estimates), 82 percent of adults thought that a relationship exists between chewing tobacco use and mouth and throat cancers. Seventy-seven percent thought that snuff use is related to these cancers (unpublished data, National Cancer Institute).

Personal Health Risks for Smokers

There have been few attempts to determine smokers' beliefs regarding their own personal risk. Several Gallup surveys conducted between 1977 and 1987 asked respondents, "Do you think cigarette smoking is or is not harmful to your health?" (Table 14). Data are available for current smokers for the years 1981 and 1985. The proportion of current smokers answering in the affirmative increased from 80 percent in 1981 to 90 percent in 1985. These data, at first glance, suggest that a high percentage of smokers

TABLE 14.--Trends in public beliefs about one's personal risk from smoking

Survey	Year	Reference	Cigarette smoking is harmful to YOUR health (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. Gallup	1977	Gallup 1985					90
2. Gallup	1978	Gallup 1978	83			95	90
3. Gallup	1981	Gallup 1985	80			96	90
4. Gallup	1983	Gallup 1985					92
5. Gallup	1985	Gallup 1985	90	96		96	94
6. Gallup	1987	ALA 1987					94
7. NHIS[a]	1987		55				

[a]Preliminary first-quarter data (unpublished). Year-end percentage is 55 percent.

NOTE: Actual questions:

1-6. Do you think cigarette smoking is or is not harmful to your health?

7. Do you believe your smoking has affected your health in any way?

perceive a personalized risk from smoking. However, nonsmokers were asked to respond to the question, implying that the wording may not be understood by some respondents as referring to truly personalized health risks. Wording such as, "Do you think that *your* cigarette smoking is or is not harmful to your health?" might elicit different responses.

The 1987 NHIS (unpublished data, National Cancer Institute) showed that 55 percent of current smokers answered "yes" to the question, "Do you believe your smoking has affected your health in any way?" The principal reason this percentage is substantially lower than that obtained by the 1985 Gallup survey (90 percent) is probably that the former was likely to be understood as referring to overt symptoms or disease, while the latter was likely to be understood as referring to the risk of harm.

Another approach to measure perceptions of personalized risk has been to ask smokers whether they are "concerned" about the effects of smoking on *their* health. It appears that smokers are more likely today to be concerned that smoking is harmful to their own health. In 1964, 50 percent of current smokers were concerned about the possible effects of smoking on their own health (Table 15); this proportion increased to 75 percent by 1986. However, in 1986, only 18 percent of smokers were *very* concerned about the effects of smoking on their health; 56 percent of smokers were only fairly or slightly concerned; and 24 percent were not at all concerned.

From 1970-86, the percentage of smokers who were very concerned about the possible effects of smoking on their health decreased from 29 to 18 percent, while the percentage who were only slightly concerned increased from 19 to 34 percent. This redistribution within the population of smokers having any concern may have occurred because a much greater proportion of those who were very concerned may have quit smoking during this period; therefore, they would not have been included in subsequent surveys.

A third approach to assess personalized risk, or more correctly, the absence of personalized risk, is to ask smokers if they believe themselves to be at lower risk than other smokers. In 1986, 21 percent of adults thought that the cigarettes they smoked were less hazardous than other cigarettes (Table 3).

Other data pertaining to perceptions of personalized risk from ETS and from smoking among adolescents appear in the sections on Involuntary Smoking (above) and Adolescent Knowledge (below).

How Harmful Is Smoking?

The data presented above reveal that a vast majority of adults agree that smoking is hazardous to health and correctly recognize the conditions that are associated with smoking. However, these data do not address the depth of the public's understanding regarding the absolute risk of smoking, the relative risks of smoking, the population-attributable risk of smoking, and the risk of smoking in comparison with other risks. A more in-depth understanding of the risks of smoking may be much more important in promoting behavioral change than the more superficial beliefs measured by the data presented above. Unfortunately, only limited data are available to address the public's in-depth understanding of the risks of smoking.

TABLE 15--Trends in smokers' concern about the effects of smoking on their own health

Survey	Year	Concern about the possible effects of cigarette smoking on your health (percentage who responded by level of concern)				
		Very concerned	Fairly concerned	Only slightly concerned	Not concerned	Any concern[a]
1. AUTS	1964	13	18	19	50	50
2. AUTS	1966	12	17	18	53	47
3. AUTS	1970	29	22	19	31	69
4. AUTS	1975	25	23	19	32	68
5. AUTS	1986	18	22	34	24	75

[a]Very, fairly, or only slightly concerned.

NOTE: Actual questions:

1-5. Are you in any way concerned about the possible effects of cigarette smoking on your health?

SOURCE: US DHEW (1969, 1973, 1976a); US DHHS, in press.

Absolute Risk

Absolute risks can be described by the proportion of those exposed to a given risk factor who will actually die or develop the particular condition, or by the reduction in life expectancy caused by exposure. As many as one-third of heavy smokers aged 35 years will die before age 85 of diseases caused by their smoking (Mattson, Pollack, Cullen 1987), and 30-year-old smokers will shorten their lives an average of 6 to 8 years if they smoke a pack a day (US DHEW 1979a).

From 1970-78, the proportion of adults who believed that smoking a pack of cigarettes a day made a great deal of difference in longevity increased slightly from 42 to 50 percent (FTC 1981). However, most adults underestimate the impact of smoking on longevity, according to a 1980 Roper survey. In this survey, 30 percent of the population and 41 percent of smokers did not know that a typical 30-year-old smoker shortened his life expectancy *at all* by smoking (FTC 1981). Among those who did know that smoking reduces one's life expectancy, many underestimated the degree to which this is true. On average, nonsmokers underestimated the loss in life expectancy by about 2 years and smokers underestimated it by more than 4 years.

Relative Risk

Relative risk describes the risk of dying or developing disease for a person exposed to a particular risk factor compared with someone not exposed. For example, male smokers are 22 times more likely and female smokers are 12 times more likely to develop lung cancer compared with nonsmokers of the same sex (Chapter 3).

In the 1980 Roper study, respondents were asked if smokers were specifically 10 times more likely to die from lung cancer (the estimated relative risk derived from the data available at that time); 23 percent of the general population and 39 percent of smokers did not believe this statement. Some of this lack of belief may be due to the use of a specific figure. However, using more general terms, 16 percent of adults and 25 percent of smokers did not think that smokers were "many times" more likely than nonsmokers to develop lung cancer (FTC 1981).

Attributable Risk and Smoking-Attributable Mortality

Attributable risk refers to that proportion of a disease that can be "attributed" to (or is caused by) a particular risk factor, such as smoking. For example, smoking accounts for about 80 to 90 percent of lung cancer deaths and 80 to 85 percent of deaths from COPD (Chapter 3).

Much of the information regarding the public's understanding of the magnitude of the risks of smoking comes from the Roper survey conducted in 1980. In this survey, 43 percent of adults and 49 percent of smokers did not know that smoking causes *most* of the cases of lung cancer and 22 percent of adults and 27 percent of smokers did not know that smoking even causes *many* cases of lung cancer (FTC 1981). In the 1987 NHIS (unpublished data, National Cancer Institute), 28 percent (preliminary first-quarter estimate) of smokers and 16 percent (year-end figure) of the general population

disagreed with the statement, “Most deaths from lung cancer are caused by cigarette smoking.”

Attributable risk figures can be used to calculate smoking-attributable mortality. The 1979 Surgeon General’s Report (US DHEW 1979a, p. ii) attributed approximately 350,000 deaths each year to cigarette smoking. In 1985, an estimated 390,000 deaths in the United States were attributable to smoking (Chapter 3). In the 1979 Chilton survey, adults aged 29 to 31 years were asked: “In the United States, two million people die each year. About how many of these deaths are probably related to cigarette smoking?” The responses offered by the interviewer, along with the percentages chosen, were: 10,000 deaths, 22 percent; 50,000, 16 percent; 100,000, 16 percent; 300,000, 17 percent; don’t know, 31 percent (Chilton 1980).

Comparative Risk

The risk of dying from smoking can be compared with the risk of dying from other behavioral risk factors, such as living under stress, eating high-cholesterol foods, or drinking heavily. The public’s perception of these comparative risks was assessed by Roper surveys from 1970-78 (Table 16). In 1970, living under a lot of tension and stress and not getting regular exercise were considered by more adults to make a great deal of difference in longevity than was smoking a pack of cigarettes daily. In contrast, fewer adults considered regularly eating food high in cholesterol, consuming three or four drinks of liquor a day, or being 20 lb overweight to have an effect on longevity. In 1978, only stress was considered by more adults to make a great deal of difference on longevity.

In 1983, Louis Harris and Associates conducted a national telephone survey of 1,254 randomly selected adults for *Prevention* magazine (Harris 1983). Respondents were asked to rank 24 health and safety factors on a l-to-10 (low-to-high) scale of importance. A sample of 103 health experts (medical school chairmen of preventive medicine, public health school deans, government officials, journal editors, and others) was also interviewed and was asked to make the same rankings. All of the public’s mean rankings were in the top half of the scale; thus, none of the factors were seen as trivial in importance. “Not smoking” was ranked near the middle, below “keeping water quality acceptable,” “having smoke detectors in the home,” “taking steps to control stress,” and “getting enough vitamins and minerals” (Figure 1). In contrast, the panel of experts ranked “not smoking” at the top of the list (Figure 2).

The 1986 AUTS asked five questions comparing the perceived risk of cigarette smoking with the perceived risk of drinking alcoholic beverages, smoking marijuana, being exposed to air pollution, driving without a seat belt, and being 20 lb overweight (Table 17). In each of the comparisons, never smokers were more likely to disagree than to agree that cigarette smoking is less harmful than the other risks. Only in the case of marijuana smoking are the percentages of those agreeing and disagreeing similar. On the other hand, current smokers were more likely to agree than to disagree that cigarette smoking is less dangerous than marijuana smoking and air pollution.

Dolecek and coworkers (1986) surveyed 973 adults in Chicago from a sample of family members of students who participated in AHA’s Chicago Heart Health Cur-

TABLE 16.--Trends in public knowledge about the health risks of smoking compared to other risks, 1970-78

Question	It makes a great deal of difference in longevity if a person . . . (percentage who agree by year)				
	1970	1972	1974	1976	1978
lives under a lot of tension and stress	69	72	74	76	74
deosn't get regular exercise	49	38	38	33	34
smokes a pack of cigarettes a day	42	42	44	45	50
regularly eats a lot of food with high cholesterol	31	34	38	39	43
drinks 3 or 4 highballs a day	29	34	35	37	39
is 20 pounds overweight	23	26	25	24	24

SOURCE: Roper (1978).

Q.: In helping people in general to live a long and healthy life, how would you rate the importance of . . .

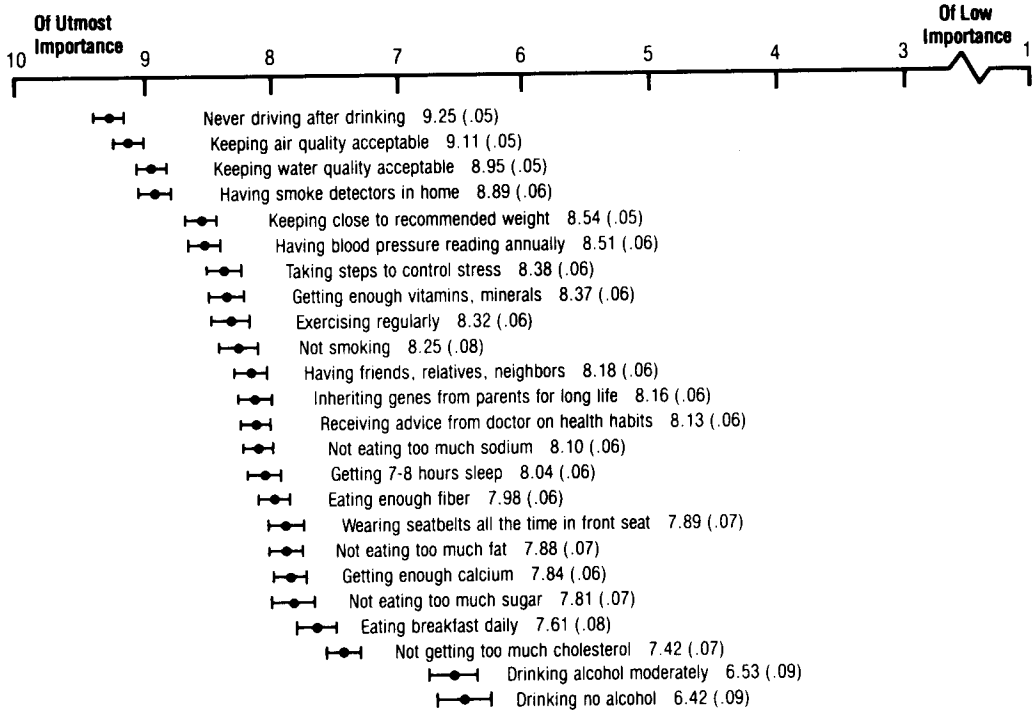

FIGURE 1.—Adult public's rating of 24 health and safety factors

NOTE: Shown above is the mean importance rating for each factor given by 1,254 adults using a 1 to 10 scale. Given in parentheses is the standard error of the mean. The 95-percent confidence interval around each mean is graphically displayed as a band or range consisting of ± two standard error values.

SOURCE: Harris (1983).

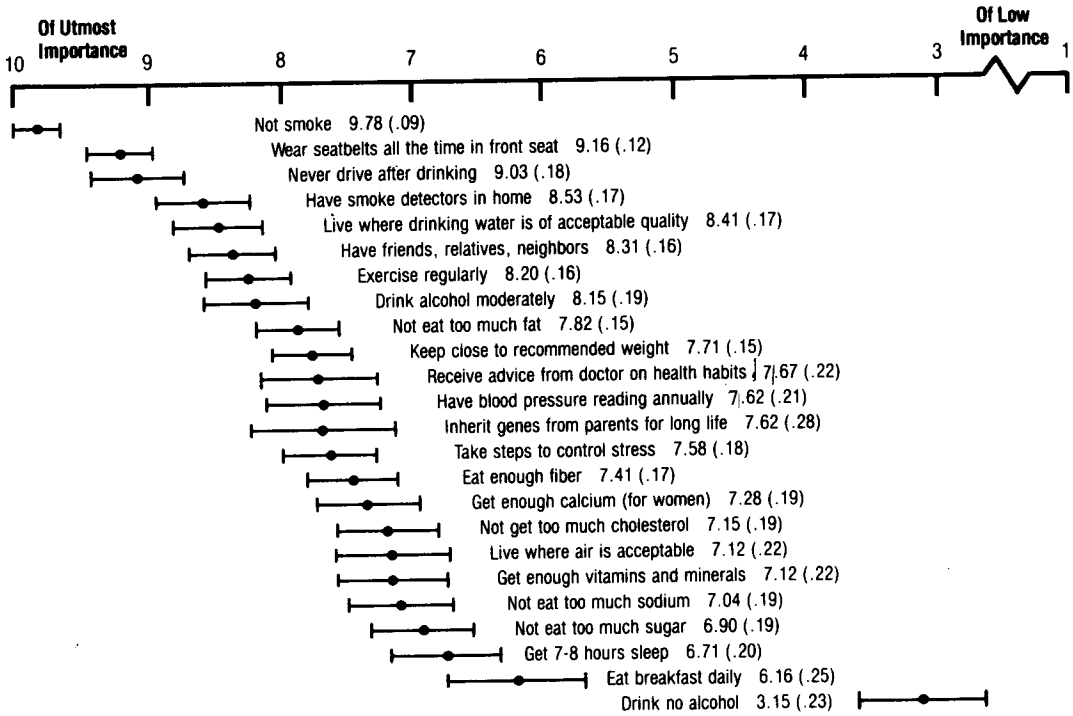

FIGURE 2.—Experts' rating of 24 health and safety factors

NOTE: Shown above is the mean importance rating for each factor given by 103 experts using a 1 to 10 scale. Given in parentheses is the standard error of the mean. An indicator of the variability of individual ratings around each mean is graphically displayed as a band or range consisting of ± two standard error values.

SOURCE: Harris (1983).

TABLE 17.--Public knowledge about the harmfulness of cigarette smoking compared with other risks, 1986

	Percentage who agree			Percentage who disagree		
	Current smokers	Former smokers	Never smokers	Current smokers	Former smokers	Never smokers
Moderate use of cigarettes is less harmful to health than moderate use of alcoholic beverages.	32	21	20	54	63	63
Smoking cigarettes is less harmful to health than smoking marijuana.	48	38	37	33	34	40
Air pollution is a greater health risk than cigarettes.	48	30	28	41	54	57
Smoking cigarettes is less dangerous than driving without a seat belt.	36	25	26	52	58	68
Smoking is less harmful than being 20 pounds overweight.	31	19	18	59	69	71

NOTE: Percentages of those who agree include those who "strongly agree" or "somewhat agree." Percentages of those who disagree include those who "strongly disagree" or "somewhat disagree."
SOURCE: AUTS 1986 (US DHHS, in press).

riculum Program during the 1980-81 school year. Respondents were asked to select the three major risk factors for CVD from a list of nine. The percentage responses for these risk factors were: high blood pressure, 25 percent; overweight, 22 percent; stress/tension/worry, 14 percent; *cigarette smoking*, 13 percent; heredity/family history, 7 percent; eating too much cholesterol (fat), 7 percent; not enough rest/working too hard, 6 percent; not enough exercise, 4 percent; and diabetes, 2 percent.

From 1982-86, Becker and Levine (1987) surveyed 90 adults with no known CHD who were siblings of patients hospitalized for recently documented CHD. Patients and siblings were all less than 60 years old. The siblings were randomized into an assessment group (interviewed within 2 weeks of the index patients' discharge and again 4 months later) and a control group (received only one interview at 4-month followup). Participants were asked in an open-ended question to name factors thought to cause or be associated with CHD. Smoking was identified by 81 percent of the control group (after stress, 91 percent) and was the risk factor most often cited by the assessment group (97 percent).

Folsom and others (1988) conducted two surveys in the metropolitan Minneapolis/St. Paul area during 1985-86. One survey sampled blacks aged 35 to 74 years, while the other sampled a primarily white population. Subjects were asked the open-ended question, "What do you think are the most important causes of cardiovascular diseases (heart attack or stroke)?" The percentage of blacks (total sample size=1,252) who identified smoking as one of the most important causes of CVD was 32 percent; stress/worry (54 percent) and improper diet (45 percent) ranked higher. Among whites (total sample size=1,870), smoking and improper diet were both ranked highest (54 percent).

In a survey conducted in 1987 by the Gallup Organization for ACS, 90 percent of adults reported that smoking cigarettes contributes to a higher risk of cancer. Lower percentages reported that a higher cancer risk is associated with suntan and sunburn (73 percent), alcohol (34 percent), high-fat diet (33 percent), and smoked and nitrite-cured meats (31 percent) (ACS 1988b).

For the studies reviewed above on comparative risk, data stratified by smoking status were available only from the 1986 AUTS.

Knowledge Among Adolescents About the Health Risks of Smoking

Because most regular cigarette smokers begin to smoke before age 21 (Chapter 5), it is important to consider teenagers' knowledge about the health effects of smoking. This knowledge can be addressed in the following categories: (1) general health effects of smoking, (2) personalized risk of smoking-related diseases, (3) risks of smoking compared with other health risks, (4) beliefs about addiction, and (5) health effects of ST use.

General Health Effects

Since 1975, beliefs among adolescents that cigarette smoking is harmful have increased. National data on knowledge of high school seniors about the health risks of smoking are available from the Monitoring the Future Project (sponsored by the Na-

TABLE 18.--Knowledge about the health risks of smoking among high school seniors, 1975-86, Monitoring the Future Project, National Institute on Drug Abuse

Survey year	How much do you think people risk harming themselves (physically or in other ways), if they smoke one or more packs of cigarettes per day? (percentage responding in each category)					
	Don't know	No risk	Slight risk	Moderate risk	Great risk	Any risk [a]
1975	2	3	9	35	51	95
1976	2	2	9	31	56	96
1977	2	2	9	29	58	96
1978	2	2	8	30	59	97
1979	1	2	7	27	63	97
1980	1	1	7	27	64	98
1981	1	1	6	28	63	98
1982	2	2	7	30	61	97
1983	1	2	7	29	61	97
1984	1	2	6	27	64	97
1985	2	2	6	24	67	97
1986	1	1	5	26	66	97

[a]Slight, moderate, or great risk of harm combined.

SOURCE: Bachman, Johnston, O'Malley (1980a,b, 1981, 1984, 1985, 1987): Johnston and Bachman (1980); Johnston, Bachman, O'Malley (1980a,b, 1982, 1984. 1986).

TABLE 19.--Perceived harmfulness of drugs among high school seniors, 1986; Monitoring the Future Project, National Institute on Drug Abuse

How much do you think people risk harming themselves (physically or in other ways), if they... (percentage of people responding)	Great risk
try one or two drinks of an alcoholic beverage (beer, wine, liquor)?	5
try marijuana (pot, grass) once or twice?	15
take one or two drinks nearly every day?	25
smoke marijuana occasionally?	25
try amphetamines (uppers, pep pills, bennies, speed) once or twice?	25
try barbiturates (downers, goofballs, reds, yellows, etc.) once or twice?	25
use smokeless tobacco regularly (chewing tobacco, plug, dipping tobacco, snuff)?	26
try cocaine once or twice?	34
have five or more drinks once or twice each weekend?	39
try LSD once or twice?	42
try heroin (smack, horse) once or twice?	46
take cocaine occasionally	54
smoke one or more packs of cigarettes per day?	66
take amphetamines regularly?	67
take barbiturates regularly?	67
take four or five drinks nearly every day?	67
take heroin occasionally?	68
smoke marijuana regularly?	71
take cocaine regularly?	82
take LSD regularly?	83
take heroin regularly?	87

NOTE: Possible responses included great risk, moderate risk, slight risk, no risk, don't know.
SOURCE: Bachman, Johnston, O'Malley (1987).

tional Institute on Drug Abuse) for every year since 1975. Although nearly all teenagers recognize some risk of harm from smoking, the proportion who think that smoking a pack or more a day causes great risk of harm increased from 51 percent in 1975 to 67 percent by 1985 (Table 18).

A 1975 survey (US DHEW 1975a) of teenagers who smoked revealed that many thought that the dangers of smoking were exaggerated for their age group (52 percent of girls; 54 percent of boys); that there was too much talk about things that were bad for them (43 percent of girls; 48 percent of boys); and that air pollution was just as important a cause of lung cancer as cigarettes (67 percent of girls; 51 percent of boys). In 1986, only 16 percent of high school seniors agreed with the statement, "The harmful

effects of cigarettes have been exaggerated" (see Table 24; Bachman, Johnston, O'Malley 1987) (data stratified by smoking status were not published).

Personalized Risk

In a survey of 895 students in grades 2 through 12 in 134 public schools in Milwaukee, WI, during the 1979-80 academic year, Leventhal, Glynn, and Fleming (1987) assessed the degree to which the students personalized the health risk from smoking. When asked, "Do you think that smoking can injure or hurt the body?" 98 percent answered affirmatively and were able to accurately name one or more body parts that are adversely affected by smoking. A subsample of 622 subjects (smokers and nonsmokers) was asked whether they "would be less likely, about as likely, or more likely to get sick from smoking than other people." Those answering "less likely" accounted for 47 percent of the smokers but only 36 percent of the nonsmokers, 47 percent of those who intended to become adult smokers versus 36 percent of those who did not intend to become adult smokers, and 41 percent of those from smoking families versus 28 percent of those from nonsmoking families. These findings suggest that although children and adolescents recognize smoking as harmful, they may not personalize the risk. This failure to personalize the perception of risk may play a role in the initiation of smoking.

Some teenagers may minimize or deny their personal risk because of a belief that certain smoking patterns are safe. In the 1974 and 1979 Teenage Smoking Surveys conducted by the Department of Health, Education, and Welfare (US DHEW 1976b. 1979b), about one-quarter of teenagers agreed with the statement, "There's nothing wrong with smoking cigarettes if you don't smoke too many." About one-third agreed with the statement, "Cigarette smoking is harmful only if a person inhales."

Comparative Risk

In the 1979 Chilton Survey (Chilton 1980), teenagers were asked which of the following caused the most deaths during the past year: traffic accidents, fires, cigarette smoking, or drug overdose. Traffic accidents were cited by 44 percent of teenagers, followed by drug overdose (21 percent), cigarette smoking (19 percent), and fires (6 percent).

The High School Seniors Survey includes questions about the risks associated with using a variety of licit and illicit drugs at different levels of intake. In 1986, 66 percent of high school seniors thought that smoking one or more packs of cigarettes per day causes great risk of harming oneself. More students saw great risk in the regular use of marijuana, cocaine, LSD, and heroin (Table 19). In contrast, more teenagers saw great risk in regular smoking compared with trying amphetamines, barbiturates, cocaine, or LSD; in trying or using occasionally marijuana or cocaine; or in trying alcohol, having one to two drinks per day, or having five or more drinks one or two times per week.

The *Weekly Reader* magazine includes a survey twice a year in the periodical, which is distributed throughout the country to more than 10 million children in grades 2

through 9. Surveys are filled out in class by students under a teacher's supervision. The topics addressed are rotated so that the same survey is repeated every 4 years. The Spring 1986 survey covered safety and health (Weekly Reader 1986). Of an estimated 400,000 student responses for grades 2 through 6, 128,000 were randomly chosen for analysis. Although the respondents do not represent a randomly selected sample, results pertaining to tobacco are presented here because of the large sample size and the paucity of data available for young children.

The survey included the following question: "Many people say the following things are harmful for kids to do. How harmful do you think each is for kids your age? (very harmful, somewhat harmful, not harmful) . . . overeating, eating junk food, listening to very loud music, smoking, chewing tobacco, staying up late, failing to get enough exercise." Grade-specific results for students in grades 4 through 6 showed that smoking (90 to 95 percent) and chewing tobacco (80 to 90 percent) were much more likely to be perceived as "very harmful" compared with the other choices, all of which were considered to be "very harmful" by less than 40 percent of respondents (except for loud music, among fourth graders--70 percent). However, these results should be interpreted with caution because of the possibility of sampling bias and the leading nature of the question.

Addiction

Of particular concern are teenagers who are unaware of the addictive nature of cigarette smoking, and who, therefore, may be tempted to "experiment" with smoking. In the 1974 and 1979 DHEW Teenage Smoking Surveys (US DHEW 1976b, 1979b), about one-quarter of the teenagers agreed with the statement, "Teenagers who smoke regularly can quit for good any time they like." About 60 percent agreed that "It's okay for teenagers to experiment with cigarettes if they quit before it becomes a habit." In the 1979 survey, teenagers were asked, "What would you say is the possibility that 5 years from now you will be a cigarette smoker?" Fifty percent of the current regular smokers (48 percent of boys and 52 percent of girls) answered "definitely not" or "probably not." These findings suggest that a large proportion of new smokers are unaware of or underestimate the addictive nature of smoking.

In 1975, 56 percent of girls aged 13 to 17 years and 62 percent of young women aged 18 to 35 years thought that smoking was as addictive as illegal drugs (US DHEW 1975a).

In the study by Leventhal, Glynn, and Fleming (1987) of 895 students in grades 2 through 12 in Milwaukee, WI, subjects were asked how hard it is for heavy smokers and for light smokers to quit smoking, and how heavy and light smokers feel when they quit. Answers were used to construct a "knowledge of addiction" scale. The investigators found that young people who smoke or who have smoking family members have lower "knowledge of addiction" scores. The authors speculate that these individuals may be "defending against the thought that either they or a parent has an uncontrollable problem."

Information on teenage beliefs concerning the addictiveness of ST use is discussed below.

In 1985, the Office of the Inspector General, Department of Health and Human Services, surveyed a nonrandom sample of 399 students in 11 junior high or middle schools and 20 high schools in 16 States regarding ST use (US DHHS 1986d). ST users were oversampled based on identification of users and nonusers by school officials. The sample was composed of 290 current ST users (73 percent) and 109 nonusers (27 percent). Eighty percent of junior high school users and 92 percent of high school users acknowledged that dipping snuff and chewing tobacco *can be* harmful to a person's health (Table 20). When asked about the extent of physical harm that may result from ST use, however, about half of users believed that there is no risk or only slight risk from regular use. One-third of junior high school users and only 5 percent of high school users thought that ST use may lead to mouth cancer. There was poor understanding of the effects of ST use on gum and dental conditions. One-quarter of junior high school users believed that regular ST use is not addictive, and more than one-third did not know that snuff contains nicotine. In summary, these findings suggest that users are substantially uninformed about the health effects and addictiveness of smokeless tobacco use. However, the degree to which these results can be generalized nationally is limited by the nonrepresentative nature of the sample.

Data from the Monitoring the Future Project showed that in 1986, a total of 59 percent of high school seniors believed that regular ST use poses a great (26 percent) or moderate (33 percent) risk of harm, compared with 36 percent who believed that ST use poses slight (28 percent) or no (8 percent) risk (Bachman, Johnston, O'Malley 1987).

Constituents of Tobacco Smoke

The estimated number of known compounds in tobacco smoke exceeds 4,000, including some that are pharmacologically active, toxic, mutagenic, carcinogenic, and antigenic (Chapter 2). One of these is carbon monoxide, whose presence in cigarette smoke is cited in one of the four health warnings rotated on cigarette packages and advertisements since 1985 (Chapter 7).

In a 1979 survey conducted by Chilton Research Services for the Federal Trade Commission (FTC 1981), respondents were asked, "Does cigarette smoke contain carbon monoxide?" Fifty-one percent of teenagers (aged 13-18) either did not know (21 percent) or said "no" (29 percent); 45 percent of adults (aged 29-31) either did not know (26 percent) or said "no" (19 percent).

In a 1980 Roper survey (FTC 1981) 53 percent of all respondents and 56 percent of smokers did not know or believe that "Cigarette smoke contains carbon monoxide, which is a dangerous gas."

In the 1986 AUTS, 62 percent of current smokers answered "yes" to the question, "As far as you know, does cigarette smoke contain carbon monoxide?" Thirteen percent said "no," and 25 percent did not know. Former and never smokers were not asked this question.

TABLE 20.--Beliefs about the health effects of smokeless tobacco (ST) use among 399 junior and senior high school students (percentage who agree) in 16 States, 1986

	Users		Nonusers
	Junior high school *(N = 76)*	High school *(N = 214)*	*(N* = 109)
ST use *can be* harmful	80	92	97
Risk from ST use			
None or slight	57	42	32
Moderate to great	43	58	68
Regular ST use may lead to mouth cancer	33	5	5
Gum and mouth problems among users are very rare	64	41	33
ST use increases risk of tooth stains, wear, and loss	24	11	16
Snuff does not contain nicotine	38	20	32
Regular ST use is not addictive	25	15	10
ST use is much more safe than cigarettes	81	81	59

NOTE: ST user defined as follows: has dipped or chewed more than 100 times, currently uses daily or at least 3 days per week, dipping at least three times on days of use. Nonuser defined as follows: has never dipped or chewed, or has only tried it a few times or more than a few times but fewer than 100 times.
SOURCE: US DHHS (1986d).

Health Benefits of Smoking Cessation

The overall mortality ratio of former smokers (compared with never smokers) declines with increasing years of abstinence. According to data reviewed in the 1979 Surgeon General's Report (US DHEW 1979a) from the U.S. Veterans Study and the British Doctors Study, overall mortality rates of former smokers are similar to those of never smokers 15 years after quitting (US DHEW 1979a). With respect to lung cancer mortality, the increased risk diminishes substantially by 5 to 9 years after quitting, but remains above the risk of never smokers for many more years except for those with fewer than 30 years of cigarette smoking (Chapter 2). A reduction in CHD mortality occurs within the first few years after cessation (US DHHS 1983). The risk of COPD mortality decreases eventually after smoking cessation but does not decline to equal that of never smokers, even after 20 years of cessation (US DHHS 1984).

In the 1986 AUTS, respondents were asked how long it takes before former smokers' chances of developing a disease return to normal. Slightly more than half believed that the risks return to normal within 5 years (Table 21). Results were similar when stratified by smoking status.

The 1987 NHIS included questions regarding the health benefits of quitting in terms of specific disease risks. These data were not available for inclusion in this Report.

Discussion

It has been 25 years since the release of the first Surgeon General's Report on smoking and health. During that time, a major public health effort has been made to educate the public regarding the health consequences of smoking (see Chapters 6-8).

Public knowledge of the health risks of smoking has improved as a result of this massive public health education campaign. The belief that smoking is harmful to health has increased since 1964. In 1964, a majority of adults acknowledged the general health risk of smoking and believed that smoking is a major cause of lung cancer, but a minority believed that smoking increases the risk of COPD, heart disease, and premature birth. By the mid-1980s, a substantial majority of adults (including nonsmokers and smokers) recognized the general health risks of smoking and believed that smoking increases the risk of lung cancer, COPD, and heart disease, and prematurity, low birthweight, miscarriage, and stillbirths.

Knowledge of the risks of exposure to ETS has also increased markedly since 1974; in fact, this high level of belief preceded the release of the 1986 Surgeon General's Report on the health consequences of involuntary smoking.

Current Gaps in Public Beliefs About the Health Effects of Smoking

Despite the growing level of public knowledge noted above, a substantial *number* of Americans are still uninformed about or do not believe the health risks of smoking. These gaps in knowledge or beliefs are more evident when one considers the proportion of adults who do not acknowledge certain health risks rather than the proportion who do. For example, among smokers--for whom this information is particularly

TABLE 21.--Public knowledge about the health benefits of smoking cessation in relation to years of abstinence, 1986

	If someone gives up smoking completely, how long do you think it will take before their chances of developing a disease return to normal? (percentage indicating the following number of years)							
	<1	1–2	3–5	6–10	11-15	15	Never	Don't know
Current smokers	17	23	16	8	1	1	7	27
Former smokers	14	23	20	8	1	1	7	26
Never smokers	16	23	16	6	1	1	12	25

SOURCE: AUTS 1986 (US DHHS, in press).

relevant--10 percent in 1985 did *not* believe that smoking is harmful to health. In 1986, 15 percent did *not* think that a person who smokes is more likely than a person who does not smoke to get lung cancer. Similar proportions of smokers did *not* believe that smokers are more likely to get heart disease (29 percent), chronic bronchitis (27 percent), emphysema (15 percent), and laryngeal cancer (18 percent). These percentages correspond to 8 million to 15 million adult smokers in the United States.

Another gap exists in the public's understanding of the special health risks of women who smoke. Compared with 1964, in 1985 smokers were more than twice as likely to recognize smoking as a cause of premature delivery. However, in 1985, 24 percent of all women (smokers and nonsmokers combined) 18 to 44 years of age did not recognize the risk of prematurity; 15 percent did not recognize the risk of low birthweight; 25 percent did not recognize the risk of miscarriage; and 32 percent did not recognize the risk of stillbirth (Table 12; Fox et al. 1987).

The fact that in 1985 10 percent of smokers did not indicate that smoking is harmful to health (Table 2), despite all efforts designed to impart such information (Chapters 6-8), suggests that this group of smokers may resist accepting any information on the health effects of smoking. This finding has important implications for smoking control efforts and for setting public health objectives. It implies that other techniques besides providing information (e.g., policy incentives--see Chapter 7) are necessary to persuade some smokers to quit. It also suggests that it is unrealistic to set a goal above 90 percent of smokers for public knowledge about any health effect of smoking.

Another gap in public knowledge involves teenagers. Youth may understand that smoking is generally harmful to health, but many may not appreciate the addictive nature of smoking or may deny a personal susceptibility (Leventhal, Glynn, Fleming 1987). In addition, data from one study (US DHHS 1986c) suggest that many ST users are not aware of the health effects and addictiveness of the product.

Fishbein (1977) described three different ways in which individuals may be informed of a given piece of information: (1) they may become aware that the information exists; (2) they may accept the information in general; or (3) they may accept the information at a personalized level. These three ways of being informed correspond to three levels of belief mentioned at the beginning of this Chapter: Level 1 (awareness), Level 2 (general acceptance), and Level 3 (personalized acceptance).

Persons may have knowledge or beliefs at one level, but not at another. For example, some smokers may be aware of the Surgeon General's Reports and accept the general fact that smoking is dangerous, but do not believe that they will be harmed by smoking. The data presented in this Report support this concept. Whereas in 1975 approximately 90 percent of smokers believed that smoking is harmful to health (Table 2), in 1986 only 75 percent were concerned about the effects of smoking on their health (Table 15). The recognition of a general risk but disbelief in a personal risk may result from several factors, including a belief that using low-tar cigarettes (see Table 3), smoking fewer cigarettes daily (see Table 5), or having certain genetic factors eliminates the personal risk.

In order to make a fully informed decision, a person should have complete and accurate Level 3 beliefs about the outcomes of each alternative action (Fishbein 1977). The personalization (perception of the personal relevance) of abstract information has

been shown to be an important aspect of behavior change in general (Mahoney 1974) and of health-related behavior change in particular (Ben-Sira 1982; Schinke and Gilchrist 1984).

Factors Interfering With Changes in Knowledge

There is a vast body of literature pertaining to the acquisition of knowledge and the process of learning. Research in this area has identified many factors that enhance or interfere with this acquisition. The brief discussion below does not attempt to provide a comprehensive review of this literature, but rather attempts to identify a few of the more salient factors that may impede the development of accurate beliefs about the health risks of smoking. The importance of beliefs in determining smoking behavior is discussed in Part II of Chapter 5 (sections on Cognition and Decisionmaking).

Informing the public about the health risks of smoking is difficult to accomplish. Risk assessment is a complex discipline, not fully understood by its practitioners, much less the lay public (Slovic 1986). Risk judgments are influenced by the memorability of past events; as a result, any factor that makes a risk memorable--such as a recent disaster or heavy media coverage--seriously distorts the perception of risk. Risks from dramatic and sensational causes of death, such as injuries, homicides, and natural disasters, tend to be greatly overestimated. Risks from undramatic causes, such as bronchitis, emphysema, or cancer, which take one life at a time and which may be more common in nonfatal form, tend to be underestimated (Slovic 1986). News media coverage of health risks has been found to be biased in the same direction, thus contributing to the difficulties of obtaining proper perspective on risks (Slovic 1986).

The fact that perceptions of risk are often inaccurate may indicate the need for warnings and educational programs. Such programs, however, face the obstacle that information based on probability is likely to have less impact on recipients than information based on certainty. For example, the data presented herein indicate that the majority of smokers believe that smoking increases the *chance* of getting lung cancer. However, not all smokers develop lung cancer, and on occasion, a well-publicized case of lung cancer occurs in an individual who never smoked. These “exceptions” may provide smokers with a rationale to continue smoking despite their abstract belief of risk.

In addition to their difficulty with understanding risks, smokers may deny personal risk with respect to health effects of smoking and addiction. Some smokers incorrectly believe that while smoking may be hazardous to others, it is not hazardous to themselves because of the particular type of cigarette they smoke, the amount they smoke, or their family history of disease. Persons who are exposed to a health risk, such as smokers, may attempt to reduce the anxiety generated in the face of that risk by denying the existence or magnitude of the risk, thus making the risk seem so small that it can be safely ignored (Slovic 1986).

Teenagers pose a special challenge for sharing knowledge of the health risks of smoking. As mentioned above and as shown in Table 18, the majority of high school seniors do believe that smoking is generally harmful. However, the fact that the health risks are in the distant future for teenage smokers may make it difficult for them to fully appreciate those risks. In other words, this lag may reduce teenagers’ likelihood to

transform Level 2 beliefs to Level 3 beliefs. This is one reason smoking prevention efforts now tend to emphasize social influence approaches and to deemphasize communication of the long-term health risks of smoking (Chapter 6).

Although empirical evidence is sparse, tobacco industry activities in the form of advertising and promotion, public relations, and lobbying may interfere with public beliefs and personalized acceptance of the health risks of smoking. Because most individuals may not understand *how* smoking causes the diseases with which it is associated, many persons may be vulnerable to information that attempts to cast doubt on such relationships. These industry activities are reviewed in Chapters 6 and 7.

The 1990 Health Objectives for the Nation

In 1980, the U.S. Public Health Service established the 1990 Health Objectives for the Nation (US DHHS 1980). A midcourse review of progress toward meeting these objectives was published in 1986 (US DHHS 1986b). These objectives included five goals for public knowledge of the health consequences of smoking:

> Objective 1: By 1990, the share of the adult population aware that smoking is one of the major risk factors for heart disease should be increased to at least 85 percent.
>
> Objective 2: By 1990, at least 90 percent of the adult population should be aware that smoking is a major cause of lung cancer, as well as multiple other cancers including laryngeal, esophageal, bladder, and other types.
>
> Objective 3: By 1990, at least 85 percent of the adult population should be aware of the special risk of developing and worsening chronic obstructive lung disease, including bronchitis and emphysema, among smokers.
>
> Objective 4: By 1990, at least 85 percent of women should be aware of the special health risks for women who smoke, including the effect on outcomes of pregnancy and the excess risk of CVD with oral contraceptive use.
>
> Objective 5: By 1990, at least 65 percent of 12-year-olds should be able to identify smoking cigarettes with increased risks of serious disease of the heart and lungs.

For the purposes of these objectives, the term aware was not defined and no distinction was made between Level 1, Level 2, and Level 3 beliefs (see above).

Progress toward meeting the first two objectives cannot be assessed reliably because they refer to smoking as "one of the major risk factors" for heart disease and "a major cause" of lung cancer and other cancers. On the other hand, most surveys have assessed public beliefs about whether smoking increases the risk of or "is related to" heart disease or lung cancer (Tables 8 and 9). As mentioned above, such wording changes can markedly affect results of surveys assessing public beliefs.

The third objective appears to have been met in the case of emphysema and nearly met in the case of chronic bronchitis (Table 10). In 1985, the percentages of adults 18 to 44 years of age who acknowledged the various effects of maternal smoking on the fetus were generally 10 to 20 percentage points below the goals listed in the fourth objective, except that 85 percent of women believed that smoking during pregnancy in-

creases the risk of having a low-birthweight baby (Table 12). The percentage who knew of the interactive effects of smoking and oral contraceptive use on CVD was also below the 1990 goal. No data exist to assess progress toward achieving the fifth objective.

Trends in Public Attitudes About Smoking and Smokers

This Section describes trends in public attitudes about smoking in general and about smokers.

Involuntary Smoking as an Annoyance

Since 1964, the population has become increasingly annoyed by exposure to ETS. In 1964, less than half of adults (46 percent) thought that it was annoying to be near a person smoking cigarettes (Table 22). Identical questions asked in surveys conducted in 1964, 1966, 1970, and 1975 reveal an increase in the proportion of adults who were annoyed by being near a person who is smoking (from 20 to 35 percent among smokers and from 64 to 77 percent among nonsmokers). By 1986, 42 percent of smokers and 80 percent of nonsmokers reported that they were annoyed by the smoke from another person's cigarette. The 1987 NHIS (preliminary first-quarter data) obtained results similar to those of the 1986 AUTS.

Nonsmokers' Rights

According to Gallup surveys, the proportion of adults who feel that smokers should refrain from smoking in the presence of nonsmokers increased slightly between 1983 and 1987. In 1983, 69 percent of adults thought that smokers should refrain from smoking in the presence of others (Table 23). By 1987, 77 percent of adults (64 percent of smokers and 86 percent of nonsmokers) thought that smokers should refrain from smoking in front of others.

In the 1987 Gallup survey, respondents were asked where smokers should refrain from smoking when nonsmokers are present. The proportions who believed that smokers should not smoke in the presence of nonsmokers were 62 percent with respect to public places, 34 percent with respect to work, and 19 percent with respect to the home (ALA 1987).

In a 1987 survey conducted for AMA, respondents were asked, "Which do you feel is a more important individual right, the right of smokers to smoke anywhere, or the right of nonsmokers to a smoke-free environment?" Three-quarters of respondents (76 percent) thought that nonsmokers had the right to a smoke-free environment (49 percent of smokers and 86 percent of nonsmokers), compared with 10 percent who thought that smokers had the right to smoke anywhere (25 percent of smokers and 5 percent of nonsmokers) (Harvey and Shubat 1987).

TABLE 22.--Trends in public attitudes about exposure to environmental tobacco smoke

Survey	Year	Reference	It is annoying to be near a person who is smoking cigarettes (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. AUTS	1964	US DHEW 1969	20	49	69	64	46
2. AUTS	1966	US DHEW 1969	26	52	70		48
3. AUTS	1970	US DHEW 1973	34	63	78	73	59
4. AUTS	1975	US DHEW 1976	35	72	79	77	63
5. Roper	1978	Roper 1978	5			60	
6. AUTS	1986	US DHHS, in press	42	73	83	80	69
7. NHIS[a]	1987		34	73	85		67

[a]Preliminary first-quarter data (unpublished).

NOTE: Actual questions:

1-4. It is annoying to be near a person who is smoking cigarettes. (strongly agree, mildly agree, no opinion. mildly disagree, strongly disagree)*

6. Is the smoke from someone else's cigarette very annoying to you, somewhat annoying to you, or not annoying at all?[†]

7. In general, would you say the smoke from other people's cigarettes is very annoying to you. somewhat annoying to you, or not at all annoying?[†]

*Percentages include those who "strongly agree" or "mildly agree."

[†]Percentages include those who state that smoke from someone else's cigarette is "very annoying" or "somewhat annoying."

TABLE 23.--Trends in public attitudes about smoking in the presence of nonsmokers

Survey	Year	Reference	Smokers should refrain from smoking in the presence of nonsmokers (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. Gallup	1983	ALA 1987	55	70		82	69
2. Gallup	1985	ALA 1987	62	78		85	75
3. Gallup	1987	ALA 1987	64	76		86	77
4. NHIS[a]	1987		65	81	89		80

[a]Preliminary first-quarter data (unpublished). Year-end percentage for all adults is 80 percent.

NOTE: Actual questions:

1-3. Should smokers refrain from smoking in the presence of nonsmokers? (strongly agree, agree, disagree. strongly disagree, no opinion)*

4. If people want to smoke, they should not do so in indoor public places where it might disturb others. (strongly agree, agree, disagree, strongly disagree)*

* Percentages include those who “strongly agree” or “agree.”

Actions When Smokers Light Up

Surveys conducted by the Roper Organization in 1974, 1976, and 1978 (Roper 1978) assessed actions of smokers when they are indoors with other people and want a cigarette, and actions of nonsmokers in response. Although these questions technically pertain to smoking behavior, the subject of the next chapter, they are indicators of attitudes toward smoking.

Smokers were asked, "Do you light up a cigarette without really thinking about it, or do you look around and then decide whether it's okay, or do you ask if others would mind, or do you just not smoke?" In 1978, a total of 57 percent either looked around and then decided (27 percent), or asked others (26 percent), or did not smoke (4 percent). Slightly lower total percentages for these three actions were reported in 1976 (55 percent) and 1974 (53 percent). The 1987 NHIS indicated that 21 percent of smokers would light up in a public place, while 26 percent would look around first, 15 percent would ask others, and 31 percent would refrain from smoking.

A total of 58 percent of *nonsmokers* in 1978 said that when someone is smoking indoors, they either ask the smoker to stop smoking (6 percent), indicate disapproval without saying so (10 percent), or try to move away (42 percent). In both 1974 and 1976, the total percentage for these three actions was 53 percent; other possible responses were: "doesn't matter," "enjoy it," "it depends," "and "don't know." According to the 1987 NHIS, fewer than 5 percent of nonsmokers would ask a smoker in public not to smoke (preliminary first-quarter data).

Opinions of Teenagers

According to recent surveys from the Monitoring the Future Project, most high school seniors think that smokers their age are trying to appear mature and sophisticated, and about half of teenagers think that smoking makes them look insecure (Table 24). Only 5 to 10 percent of respondents thought that smokers look cool, calm, in control; rugged, tough, independent; or mature and sophisticated. Most teenagers prefer to date people who do not smoke. Most also consider smoking a dirty habit and think that becoming a smoker reflects poor judgment. In 1986, 45 percent of teenagers strongly disliked being near people who were smoking while 37 percent did not mind being around people who were smoking. There appears to have been little change in these attitudes from 1981-86

In summary, smokers and nonsmokers, adults and teenagers alike, generally believe that smokers should refrain from smoking in the presence of others and that it is annoying to be near a person who is smoking. In addition, teenagers are more likely to associate smoking and smokers with negative attributes than positive ones.

TABLE 24.--Trends in attitudes about smoking and smokers among high school seniors, 1981-86, Monitoring the Future Project, National Institute on Drug Abuse

	In my opinion, when a guy my age is smoking a cigarette, it makes him look . . (percentage who agree)	
	1981	1986
like he's TRYING to appear mature and sophisticated	61	63
insecure	42	44
conforming	25	21
rugged, tough, independent	9	10
cool, calm, in control	6	6
mature, sophisticated	5	5

	In my opinion, when a girl my age is smoking a cigarette, it makes her look . . (percentage who agree)	
	1981	1986
like she's TRYING to appear mature and sophisticated	65	65
insecure	47	50
conforming	27	22
independent and liberated	11	10
mature, sophisticated	7	5
cool, calm, in control	6	5

TABLE 24.--Continued

	Do you agree or disagree . . . (percentage who agree)	
	1981	1986
I prefer to date people who don't smoke	66	71
Smoking is a dirty habit	66	69
I think that becoming a smoker reflects poor judgment	57	59
I strongly dislike being near people who are smoking		45
I personally don't mind being around people who are smoking	38	37
The harmful effects of cigarettes have been exaggerated	16	16
Smokers know how to enjoy life more than nonsmokers	3	2

NOTE: Possible responses included agree, mostly agree, disagree, mostly disagree, neither. Percentages include those who "agree" or "mostly agree."
SOURCE: Johnston, Bachman, O'Malley (1982): Bachman, Johnston, O'Malley (1987).

Trends in Public Opinion About Smoking Policies

Overview

Background

This Section describes trends in public opinion about smoking policies. Public opinion information is helpful to legislators, public health officials, and other policymakers who often wish to know the degree of public support for an issue under consideration. The results presented in this Section are taken primarily from public opinion polls sponsored by a variety of private health organizations (Appendix).

This Section uses the categorization of policies employed in Chapter 7, including the following categories: (1) smoking restrictions, (2) restrictions on the sale and distribution of cigarettes, (3) policies pertaining to information and education, and (4) economic policies. Each section reviews trends in public opinion toward the policy and briefly describes the current status of opinions toward the policy with respect to the smoking status of the respondents.

Limitations of the Surveys in Assessing Public Opinion About Smoking Policies

Assessing trends in public opinion regarding smoking policies is more difficult in some ways than assessing trends in public knowledge regarding the health effects of smoking. For instance, surveys that ask about public opinion often refer to the "current" situation. However, the "current" situation may change from year to year and from survey to survey. For example, in 1964, 52 percent of adults thought that smoking should be allowed in fewer places than it was at that time. By 1975, 70 percent of adults thought that smoking should be allowed in fewer places than it was at that time. However, the "current" situation changed from 1964-75, making the survey results difficult to compare. Because smoking was already allowed in fewer places by 1975, the results of the 1975 survey reveal even greater support for limitations on smoking than indicated by the difference in percentages.

Restrictions on Smoking

General

Between 1964 and 1975, adults increasingly favored restrictions on smoking. In 1964, about half (52 percent) thought that smoking should be allowed in fewer places than it was at that time, compared with 70 percent by 1975 (Table 25). Comparable questions have not been asked to assess more recent trends since 1975. However, in 1986, 50 percent of adults disagreed that there were already enough restrictions on where people can smoke.

TABLE 25.--Trends in public opinion about restrictions on smoking in public places

Survey	Year	Reference	Smoking should be allowed in fewer places than it is now (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. AUTS	1964	US DHEW 1969	34	56	68	65	52
2. AUTS	1966	US DHEW 1969	35	58	67	65	52
3. AUTS	1970	US DHEW 1973	42	61	68	66	57
4. AUTS	1975	US DHEW 1976a	51	77	82	80	70

Survey	Year	Reference	There are already enough restrictions on where people can smoke (percentage who DISAGREE by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
5. AUTS	1986	US DHHS, in press	23	53	63	59	50

NOTE: Actual questions:

1-4. The smoking of cigarettes should be allowed in fewer places than it is now. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*

5. There are already enough restrictions on where people can smoke. (strongly agree, somewhat agree, neutral, somewhat disagree, strongly disagree) †

*Percentages include those who "strongly agree" or "mildly agree."

†Percentages include those who "strongly disagree" or" "somewhat disagree."

Public Places

Table 26 presents data from five surveys conducted since 1978 that asked about opinions regarding restrictions on smoking in public places. Differences in the wording of the questions make comparisons among the surveys difficult. Two surveys solicited opinions about three mutually exclusive options (total ban on smoking, separate sections for smokers and nonsmokers, and no restrictions at all), two surveys asked for an opinion only about a total ban, and the fifth asked for an opinion only about "no smoking" sections.

The 1978 Gallup survey and the 1987 Harris survey both presented three options. The proportion of respondents favoring *either* a total smoking ban or separate sections was 84 percent in both. However, the percentage favoring a total ban increased from 16 to 23 percent. The 1987 and 1988 Gallup surveys showed that the percentages favoring a total ban were 55 and 60 percent, respectively (69 and 75 percent of nonsmokers, respectively); the option of separate sections was not presented in these surveys (Table 26).

Workplace

Questions used to assess opinions regarding smoking restrictions in the workplace have varied from year to year. It is not possible, therefore, to identify a clear trend, but the public has consistently shown support for policies that limit smoking in the workplace.

In 1966, 92 percent of adults thought that an employer had a right to tell employees when or where they can smoke while on the job (US DHEW 1969). In 1975, 78 percent of adults thought that management had the right to *prohibit* smoking in a place of business (US DHEW 1976a). By 1985, 87 percent of adults thought that companies should have a policy on smoking (80 percent of current smokers, 92 percent of nonsmokers). Most adults (79 percent) preferred assigning certain areas for smoking and nonsmoking as opposed to totally banning smoking at work (8 percent) (Gallup 1985).

Airplanes

Since 1978, it appears that more adults favor restricting smoking on airline flights. In a 1978 Gallup survey, 43 percent of adults thought a smoking ban should be imposed on commercial airline flights (Table 27). A 1987 AMA survey reported that 67 percent of adults thought that cigarette smoking should not be allowed on commercial airline flights. A 1987 survey conducted by the American Association for Respiratory Care (AARC) of 33,242 airline passengers in 39 States and 89 airports in the United States yielded similar results (AARC 1987) (Table 27).

According to the 1986 AUTS, 61 percent of respondents (82 percent of never smokers, 69 percent of former smokers, and 14 percent of current smokers) ask to be seated in the no-smoking sections of airplanes, restaurants, and other public places when given a choice (CDC 1988).

TABLE 26.--Trends in public opinion about restrictions on smoking in public places

Survey	Year	Reference	Smoking in public places[a]		
			% favoring total ban	% favoring separate sections	Total % favoring ban or sections
1. Gallup	1978	Gallup 1978	16 (22/8)	68 (67/70)	84 (89/78)
2. Lieberman	1986	Lieberman 1986		94 (95/93)	
3. Harris	1987	Harris 1988	23	61	84
4. Gallup	1987	Gallup 1987a	55 (69/25)		
5. Gallup	1988	Gallup l988b	60 (75/26)		

[a]Percentages in parentheses refer to nonsmokers and current smokers, respectively.

NOTE: Actual questions:

1. In your opinion, which of the policies on this card should be followed with regard to smoking in such places as trains, buses. airplanes, restaurants, and offices? (There should be no restrictions at all on smoking in public places such as these; Special sections for smokers should be set aside in public places such as these; Smoking should not be allowed at all in public places such as these.)
2. Should public places have "no smoking" sections? (yes, no, no opinion)
3. Do you think that laws should prohibit smoking in public places, or should they require separate smoking and nonsmoking sections, or should smoking in public places not be regulated by law?
4-5. Would you favor or oppose a complete ban on smoking in all public places?

TABLE 27.--Trends in public opinion about restrictions on smoking in airplanes

Survey	Year	Reference	Smoking should not be allowed on commercial airline flights (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. Gallup	1978	Gallup 1978	55			23	43
2. AMA	1987	Harvey and Shubat 1987	40			78	67
3. AARC[a]	1987	AARC 1987	30			74	64

[a]Survey of 33,242 airline passengers conducted in 39 States and 89 airports in the United States.

NOTE: Actual questions:

1. Do you think that cigarette smoking on commercial airplanes should or should not be banned completely?*
2. Do you feel that cigarette smoking should or should not be allowed on commercial airline flights?**

*Percentages are those who believe that cigarette smoking should be banned on flights.

**Percentages are those who believe that cigarette smoking should not be allowed on flights.

Restaurants

In four surveys, conducted between 1976 and 1987, approximately 20 percent of respondents favored a total ban on smoking in restaurants (Table 28). In contrast, most adults are in favor of *limiting* smoking in restaurants. A 1976 Roper poll indicated that 57 percent believed smoking should be restricted to certain areas in restaurants, while 22 percent favored a total ban on smoking. In a 1987 Gallup survey conducted for ALA, 74 percent of adults thought that certain areas should be set aside for smoking and 17 percent thought that smoking should be banned completely (ALA 1987; Gallup 1987a).

As mentioned above, 61 percent of respondents to the 1986 AUTS choose no-smoking sections of restaurants and other public places when given a choice (CDC 1988). In a survey conducted by the Gallup Organization for the National Restaurant Association in 1987, adults were asked about various opinions regarding smoking in restaurants: 61 percent overall said that they prefer to sit in a no-smoking section (83 percent of never smokers, 65 percent of former smokers, and 20 percent of current smokers) (Gallup 1987d).

Other Places

A Gallup survey conducted for the ALA in 1983 showed that 54 percent of adults favored setting aside certain areas for smoking in hotels and motels and 12 percent favored a total smoking ban. In a similar survey in 1987, these percentages were 67 percent and 10 percent, respectively, and were slightly higher for nonsmokers than for current smokers (Gallup 1988a).

Restrictions on the Sale and Distribution of Cigarettes

Complete Ban on Sales

The questions used to assess opinion regarding the outright ban of cigarette sales have varied considerably in wording. In 1964, respondents were asked if they agreed that "The selling of cigarettes should *not* be stopped completely." In 1970, respondents were asked if they agreed that "The selling of cigarettes *should* be stopped completely." Despite these differences, the responses consistently indicated little sympathy for this most stringent policy: approximately 30 percent of adults supported a ban in 1964, compared with 20 percent in 1981 (Table 29).

Limiting Sales to Minors

Most adults favor limiting cigarette sales to minors. In 1964, only 9 percent of adults thought that sales of cigarettes to people under a certain age should *not* be against the law. In 1970, 88 percent thought that such sales *should be* against the law (Table 30).

TABLE 28.--Trends in public opinion about restrictions on smoking in restaurants

survey	Year	Reference	Smoking should be banned (or limited) in restaurants[a] (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. Roper	1976	Roper 1978					22 (57)
2. Roper	1978	Roper 1978					23 (73)
3. Gallup	1983	ALA 1987	12 (74)	19 (71)		26 (65)	19 (69)
4. Gallup	1987	ALA 1987	7 (79)	19 (74)		23 (71)	17 (74)

[a]Percentages represent those who favor a total smoking ban. Percentages *in parentheses* represent those who favor setting aside certain areas for smoking.

NOTE: Actual questions:

1-2. Should smoking he permitted only in separate sections or should it be permitted anywhere . . . in eating places?

3-4. What is your opinion regarding smoking in these public places . . . restaurants? (set aside certain areas, totally ban smoking, or no restrictions)

TABLE 29.--Trends in public opinion about banning the sale of cigarettes

Survey	Year	Reference	Percentage who agree by smoking status: Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
		The selling of cigarettes SHOULD BE stopped completely					
1. AUTS	1970	US DHEW 1973	27	36	48	44	38
2. Roper	1970	Roper 1978					15
3. Roper	1972	Roper 1978					13
4. Roper	1974	Roper 1978					12
5. Roper	1976	Roper 1978					12
6. Roper	1978	Roper 1978					16
7. Gallup	1977	Gallup 1981					19
8. Gallup	1978	Gallup 1978	11			23	19
9. Gallup	1981	Gallup 1978	10			26	20
		The selling of cigarettes should NOT be stopped completely					
10. AUTS	1964	US DHEW 1969	83	74	57	61	70
11. Gallup	1978	Gallup 1978					75

NOTE: Actual questions:
1. The selling of cigarettes should be stopped completely. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*
2-6. A law should be passed against the sale of all cigarettes. (agree. disagree, don't know)
7-9. Do you think the sale of cigarettes should or should not be banned completely?
10. The selling of cigarettes should *not* be stopped completely.
11. Cigarette sales should *not* be banned completely.
*Percentages include those who "strongly agree" or "mildly agree."

TABLE 30.--Trends in public opinion about restrictions on the sale or distribution of cigarettes

Survey	Year	Reference	Percentage who agree by smoking status				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
		Sales of cigarettes to people under a certain age should NOT be against the law					
1. AUTS	1964	US DHEW 1969	12	7	7	7	9
		Sales of cigarettes to people under a certain age SHOULD BE against the law					
2. AUTS	1970	US DHEW 1973	87	87	90	89	88
		Cigarette companies should not be permitted to distribute free cigarettes on public streets					
3. Lieberman	1986	Lieberman 1986	48			67	61

NOTE: Actual questions:

1. Sales of cigarettes to people under a certain age should not be against the law. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*
2. Sales of cigarettes to people under a certain age should be against the law. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*
3. Should cigarette companies be permitted to distribute free cigarettes on public streets?†

*Percentages include those who "strongly agree" or "mildly agree."

†Percentages are those who believe cigarette companies should not be permitted to distribute free samples.

Banning Free Samples

In a 1986 survey conducted by Lieberman Research, Inc. (1986) (New York City) for ACS, AHA, and ALA, 61 percent of adults said that the distribution of free cigarette samples should not be permitted (67 percent of nonsmokers, 48 percent of smokers) (Table 30).

Policies Pertaining to Information and Education

Restricting or Prohibiting Tobacco Advertising

Since 1964, several surveys have investigated public opinion regarding a cigarette advertising ban, with marked differences in the wording of questions. Taken together, they do not seem to indicate any trend in public opinion (Table 31). However, separate examinations of surveys using identical questions over time indicate increasing support for an advertising ban. A series of identical questions from the AUTSs from 1964 and 1975 showed an increase in support for a complete ban between 1964 and 1970. In 1964, 36 percent of adults thought that cigarette advertising should be stopped completely. This increased to 61 percent in 1970 and 56 percent in 1975 (Table 31). Support for an advertising ban may have increased by 1970 because Congress had already banned cigarette advertising on television and radio in 1969 (effective on January 2, 1971) (see Chapter 7). Another series of identical questions used in Gallup surveys after the broadcast advertising ban showed an increase in the proportion of the public favoring a cigarette advertising ban, from 36 percent in 1977 to 43 percent in 1981 to 49 percent in 1987 to 55 percent in 1988.

Since 1975, surveys have provided conflicting results regarding public support for a complete ban, most likely as a result of differences in the wording of questions. In the two Gallup surveys conducted in 1977 and 1981, support *for a complete ban on cigarette advertising* increased from 36 to 43 percent (Gallup 1987a). In a 1985 Gallup survey, adults were asked which statement best described the respondent's opinion regarding cigarette advertising: "There should be a total ban on cigarette advertising." "There should be a curb on some types or forms of cigarette advertising." "There should be no ban whatsoever on cigarette advertising in newspapers, magazines, or billboards." The public was divided in their responses: about a third favored each option (32, 36, and 31 percent, respectively) (Gallup 1985).

As mentioned at the beginning of this Chapter, two surveys conducted in 1986 reported different results. One, conducted by AMA, reported that almost two-thirds of adults favored such a ban whereas another, sponsored by ACS, AHA, and ALA, reported that only one-third of Americans supported such a ban for newspapers and magazines (see the earlier discussion of these discrepant results). Four more recent surveys, conducted in 1987 and 1988, revealed that about half of adults favor a complete ban on advertising (Table 31).

TABLE 31.--Trends in public opinion about restricting or banning cigarette advertising

Survey	Year	Reference	Cigarette advertising should NOT be permitted (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. AUTS	1964	US DHEW 1969	23	37	46	44	36
2. AUTS	1970	US DHEW 1973	50	64	68	67	61
3. AUTS	1975	US DHEW l976a	43	59	64	63	56
4. Gallup	1977	Gallup l987a	28			41	36
5. Gallup	1978	Gallup 1978	28			41	36
6. Gallup	1981	Gallup l987a	27			53	43
7. Liebetman	1986	Liebetman 1986	21 (23)			38 (38)	33 (33)
8. AMA	1986	Harvey and Shubat 1986	48			71	64
9. AMA	1987	Harvey and Shubat 1987	42			61	55[a]
10. Gallup	1987	Gallup l987a	30			57	49[a]
11. Gallup	1987	ACS 1988	37	53	59	57	51[a]
12. Gallup	1988	Gallup l988b	34			64	55[a]

[a]The percentages who believe that cigarette advertising *should* be permitted were 36 percent (Harvey and Shubat 1987), 47 percent (Gallup 1987a), 33 percent (ACS 1988). and 40 percent (Gallup 1988b). Remaining respondents indicated no opinion.

NOTE: Actual questions:

l-3. Cigarette advertising should be stopped completely. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*

4-6, 10, 12. Do you think there should or should not be a complete ban on cigarette advertising?

7. Some people feel that, as long as cigarettes are legal, cigarette advertising should be permitted. Others feel that cigarette advertising should not be permitted. Should cigarette companies be permitted to advertise . . . in magazines? . . . in newspapers?†

8. The American Medical Association called for a ban on tobacco advertising. Do you favor or oppose such an advertising ban?

9. Do you favor or oppose a ban on advertising of all tobacco products?

11. Some people feel that cigarette advertising *should* be permitted; others feel that cigarette advertising *should not* be permitted. Do you feel that cigarette advertising *should be* or should *not* be permitted?

*Percentages include those who "strongly agree" or "mildly agree."

†Percentages in parentheses are for newspapers (otherwise for magazines).

Warning Labels for Cigarettes

Recent data are not available on public opinion about warning labels. However, from 1964-70, support for these appeared to increase. In 1964, 28 percent of adults thought that cigarette advertising or commercials should *not* be required to carry a warning statement to the effect that smoking may be harmful to health; in 1970, 88 percent thought that cigarette advertising or commercials *should* be required to carry such a warning statement (Table 32).

Several surveys have assessed opinions regarding the need to strengthen the then existing health warning on packages and/or advertisements (e.g., Roper 1978). Some of these surveys tested specifically worded warnings that had been produced as an alternative to the existing warning. Because these data over time are difficult to compare and were most relevant at the time of the survey, they are not presented here.

Survey data from Lieberman Research, Inc. (1986) pertaining to recall of warning statements are presented in Chapter 7.

Economic Policies

Taxation

Questions regarding taxation of cigarettes are referenced to the taxation level at the time of the interview. This level varies with time, so it is difficult to delineate trends in opinion regarding taxation. Nevertheless, national surveys indicate an increase in public acceptance of increased cigarette taxation (Table 33).

In 1964, 30 percent of adults thought that taxes on cigarettes should be much higher than they were at the time of the interview. Similar questions asked in 1977 and 1981 revealed an increase in this proportion to 39 and 46 percent, respectively (Gallup 1981) (Table 33). In 1987, 79 percent of adults (75 percent of smokers and 80 percent of nonsmokers) favored an increase in the tax on tobacco products if the money from the increase went to medicare (Harvey and Shubat 1987). These recent data are of particular interest in light of the prevailing sentiment opposing increases in taxes in general.

Hiring

A minority of adults feel that employers should be allowed to refuse to hire cigarette smokers. In the 1978 Roper survey, 22 percent of adults thought that an employer has the right to refuse to hire someone who smokes cigarettes. In a 1986 survey (Lieberman Research 1986), 21 percent of adults (27 percent of nonsmokers, 7 percent of current smokers) believed that employers should be allowed to turn down job applicants who smoke.

TABLE 32.--Trends in public opinion concerning cigarette warning labels

Survey	Year	Reference	Percentage who agree by smoking status				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
Cigarette advertising should NOT be required to carry a warning statement							
1. AUTS	1964	US DHEW 1969	38	27	19	21	28
Cigarette packages should NOT be required to carry a warning statement							
2. AUTS	1964	US DHEW 1969	42	27	21	22	30
Cigarette advertising SHOULD BE required to carry a warning statement							
3. AUTS	1970	US DHEW 1973	83	90	91	91	88

NOTE: Actual questions:

1. Cigarette advertising or commercials should *not* be required to carry a warning statement to the effect that smoking may be harmful to health. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*

2. Cigarette manufacturers should *not* be required to put on the outside package a warning label like "Cigarette smoking is dangerous to health." (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*

3. Cigarette advertising or commercials should be required to carry a warning statement to the effect that smoking may be harmful to health.*

*Percentages include those who "strongly agree" or "mildly agree."

TABLE 33.--Trends in public opinion about increasing cigarette taxes

Survey	Year	Reference	Taxes on cigarettes should be increased (percentage who agree by smoking status)				
			Current smokers	Former smokers	Never smokers	All nonsmokers	All adults
1. AUTS	1964	US DHEW 1969	14	33	44	42	30
2. Roper	1970	Roper 1978	20			46	36
3. Roper	1972	Roper 1978	13			44	32
4. Roper	1974	Roper 1978	14			42	31
5. Roper	1976	Roper 1978	12			46	33
6. Gallup	1977	Gallup 1981					39
7. Roper	1978	Roper 1978	16			50	38
8. Gallup	1978	Gallup 1978	45			57	45
9. Gallup	1981	Gallup 1981	23			59	46
10. AMA	1987	Harvey and Shubat 1987	75			80	79

NOTE: Actual questions:

1. Taxes on cigarettes should be much higher than they are now. (strongly agree, mildly agree, no opinion, mildly disagree, strongly disagree)*

2-5, 7. The tax on cigarettes should be sharply increased to reduce their sale. (agree, disagree, don't know)

6, 9. Do you think federal and state taxes on cigarettes should or should not be increased?

8. Do you think the present 8 cents/pack federal tax on cigarettes should or should not be increased?

10. Would you favor or oppose an increase in the tax on tobacco products if the money from the increase went to Medicare?

*Percentages include those who "strongly agree" or "mildly agree."

Conclusions

1. In the 1950s, 40 to 50 percent of adults believed that cigarette smoking is a cause of lung cancer. By 1986, this proportion had increased to 92 percent (including 85 percent of current smokers).
2. Between 1964 and 1986, the proportion of adults who believed that cigarette smoking increases the risk of heart disease rose from 40 to 78 percent. A similar increase occurred among smokers, from 32 to 71 percent.
3. The proportion of adults who believed that cigarette smoking increases the risk of emphysema and chronic bronchitis rose from 50 percent in 1964 to 81 percent (chronic bronchitis) and 89 percent (emphysema) in 1986. These proportions increased among current smokers from 42 percent in 1964 to 73 percent (chronic bronchitis) and 85 percent (emphysema) in 1986.
4. Despite these impressive gains in public knowledge, substantial numbers of smokers are still unaware of or do not accept important health risks of smoking. For example, the proportions of smokers in 1986 who did not believe that smoking increases the risk of developing lung cancer, heart disease, chronic bronchitis, and emphysema were 15 percent, 29 percent, 27 percent, and 15 percent, respectively. These percentages correspond to between 8 and 15 million adult smokers in the United States.
5. In 1985, substantial percentages of women of childbearing age did not believe that smoking during pregnancy increases the risk of stillbirth (32 percent), miscarriage (25 percent), premature birth (24 percent), and having a low-birthweight baby (15 percent). Of women in this age group, 28 percent did not believe that women taking birth control pills have a higher risk of stroke if they smoke.
6. Some smokers today do not recognize their own personal risk from smoking or they minimize it. In 1986, only 18 percent of smokers were "very concerned" about the effects of smoking on their health, and 24 percent were not at all concerned.
7. In 1986, about half of current smokers and 40 percent of never smokers incorrectly believed that a person would have to smoke 10 or more cigarettes per day before it would affect his or her health.
8. A national survey conducted in 1983 by Louis Harris and Associates found that the public underestimates the health risks of smoking compared with many other health risks.
9. Many smokers underestimate the population impact of smoking. In 1987, 28 percent of smokers (and 16 percent of the general population) disagreed with the statement, "Most deaths from lung cancer are caused by cigarette smoking."
10. The proportion of high school seniors who believe that smoking a pack or more of cigarettes per day causes great risk of harm increased from 51 percent in 1975 to 66 percent in 1986.
11. In 1986, about three-quarters of adults believed that using chewing tobacco or snuff is harmful to health.
12. The social acceptability of smoking in public is declining, as measured by the proportion of adults who find it annoying to be near a person smoking cigarettes. This proportion increased from 46 percent in 1964 to 69 percent in 1986.

13. A majority of the public favors policies restricting smoking in public places and worksites, prohibiting the sale of cigarettes to minors, and increasing the cigarette tax to fund the medicare program. Recent surveys indicate that about half the public supports a ban on cigarette advertising.

Appendix

Description of Primary Data Sources for Chapters 4 and 5

Adult Use of Tobacco Survey, 1964

This was the first AUTS sponsored by the U.S. Public Health Service. The survey was conducted by National Analysts, Inc., under contract with the National Clearinghouse for Smoking and Health in the fall of 1964. The data for this survey were collected using area probability sampling techniques and stratifying by the type of population and geographic area. Approximately 5,794 adults 21 years and older were interviewed in person. The response rate was 76 percent. Detailed methods have been published elsewhere (US DHEW 1969).

Adult Use of Tobacco Survey, 1966

This was the second AUTS sponsored by the U.S. Public Health Service. The survey was conducted by two research firms: National Analysts, Inc., and Opinion Research Corporation, under contract with the National Clearinghouse for Smoking and Health in the spring of 1966. The data were collected using area probability sampling techniques and stratifying by the type of population and geographic area. The 1964 AUTS questionnaire was used with minor changes. Approximately 5,768 adults were interviewed. Interviews were primarily in person, although telephone interviews were used for nonrespondents. The response rate was 72 percent. Detailed methods have been published elsewhere (US DHEW 1969).

Adult Use of Tobacco Survey, 1970

This was the third AUTS sponsored by the U.S. Public Health Service. The survey was conducted by Chilton Research Services under contract with the National Clearinghouse for Smoking and Health in the spring of 1970. The data were collected from a probability sample of households in the contiguous United States. Approximately 5,200 individuals were surveyed; 91 percent were interviewed by telephone and 9 percent, from nontelephone households, were interviewed face to face. Of the total number of respondents, 44 percent were male and 56 percent were female; all were at least 21 years old. The methods have been described elsewhere in detail (US DHEW 1973).

Adult Use of Tobacco Survey, 1975

This was the fourth AUTS sponsored by the U.S. Public Health Service. The survey was conducted by Chilton Research Services under contract with the National Clearinghouse for Smoking and Health in 1975. The data were collected from a probability sample of telephone numbers in the contiguous United States, with a separate survey

of nontelephone households. Approximately 12,000 individuals were surveyed. The methods have been described elsewhere in detail (US DHEW 1976a).

Adult Use of Tobacco Survey, 1986

In 1986, 13,031 members of the civilian, noninstitutionalized population of the United States 17 years of age and older were surveyed by telephone on their smoking history, attitudes, and beliefs (CDC 1986).

A 2-stage sampling procedure was used within a computer-assisted telephone interview format. The first stage involved selecting a random sample of telephone exchanges within the United States. The sampling procedure was balanced for the number of telephones within the exchange. Clusters of between 10 and 15 households within each exchange were contacted using random-digit dialing. Households were enumerated and smoking status of members ascertained. Up to 27 callbacks were made to obtain a total of 36,405 households, with a response rate of 85.5 percent.

A further stratified random sampling procedure was used to provide an approximate equal proportion of respondents in each smoking category (current, former, never). The stratification variable was the number of smokers in the household. Up to 10 callbacks were made to interview the selected respondent, with a response rate of 86.9 percent. The overall response rate from the two stages of sampling was 74.3 percent (85.5 percent times 86.9 percent).

Quality control procedures in the survey involved 26 hours of survey-specific training and practice for interviewers and a silent monitoring of 10 percent of all interviews by supervisory staff. Data obtained were weighted to reflect the U.S. population in 2 stages. A base weight was calculated, which was the product of the weighting for cluster (completed screeners within cluster), household (telephone numbers within household), and person (to account for selection based on smoking status). Poststratification weighting was then undertaken for region, education, race, sex, and age.

American Medical Association, 1986, 1987

The data were gathered in telephone interviews with approximately 1,500 adults, conducted during May-June 1986 and January-February 1987. The surveys were conducted by Kane, Parsons and Associates of New York City. The samples were generated by Survey Sampling, Inc. (Westport, Connecticut) using a multistage probability method to provide a random sample of all residential telephones in the United States. Sampling error was an estimated plus or minus 2.5 percentage points at the 95-percent confidence level (Harvey and Shubat 1986, 1987).

Behavioral Risk Factor Surveillance System

Between 1981 and 1983, the U.S. Centers for Disease Control (CDC) collaborated with 29 State health departments (including the District of Columbia) to conduct one-time random-digit-dialed telephone surveys of adults 18 years of age and older. Stand-

ard methods and questionnaires were used to assess the prevalence of personal health practices and behaviors related to the leading causes of death, including cigarette smoking. Beginning in 1984, the surveys evolved into an ongoing surveillance system when States began collecting data throughout the year. For each State, approximately 1,200 (range 600-3,000) interviews are completed each year. The raw data are weighted to the age, race, and sex distribution for each State from the 1980 Census. This weighting accounts for the underrepresentation of men, blacks, and younger persons (18-24 years of age). A detailed review of the survey design and methods of analyzing the data has been published (Remington et al. 1985).

Chilton Survey, 1979

This survey was conducted by Chilton Research Services (Radnor, PA) for the FTC from December 21, 1978 through February 4, 1979. A random-digit-dialing procedure was used to collect interviews from 1,211 teenagers aged 13 to 18 years and from 407 adults aged 29 to 31 years in a national probability sample of telephone households. The 1,618 completed interviews represented 81 percent of the number of usable household telephone numbers (Chilton 1980).

Current Population Surveys

The U.S. Bureau of the Census regularly collects information as part of its Current Population Survey (CPS). Households are selected for survey via a sampling procedure designed to accurately reflect the U.S. population, and information is collected in person during a home visit. In 1955, 1966, 1967, 1968, and 1985, the CPS included a supplement that asked questions on current smoking practices. For 1985, 114,342 individuals, 16 years and older, were surveyed on smoking and smokeless tobacco use. Approximately 55 percent of the sample consisted of self-respondents while the remaining 45 percent were proxy respondents. The 1985 CPS sample was initially selected from the 1980 census files with coverage in all 50 States and the District of Columbia. This sampling methodology allows for State-specific analysis of smoking practices.

The estimation procedure used in this survey involves the inflation of the weighted sample results to independent estimates of the total civilian, noninstitutional population of the United States by age, race, sex, and Hispanic/non-Hispanic categories. These independent estimates are based on statistics on births, deaths, immigration, and emigration, as well as statistics on the strength of the Armed Forces. Based on the use of a special weighting algorithm developed by the Bureau of the Census, the CPS household sample estimates are considered to be representatitve of the United States. However, one potential problem with the CPS is the effect of proxy reports on sample estimates of smoking status. This may result in an underreporting bias.

Gallup Surveys

Gallup surveys are conducted using personal (face-to-face) or telephone interviews.

Personal surveys. The design of the sample for personal surveys is that of a replicated area probability sample down to the block level in the case of urban areas and to segments of townships in the case of rural areas.

After the Nation has been stratified geographically and by size of community according to information derived from the most recent census, more than 350 different sampling locations are selected on a mathematically random basis from within cities, towns, and counties that have in turn been selected on a mathematically random basis.

The interviewers are given no leeway in selecting the areas in which they are to conduct their interviews. Each interviewer is given a map on which a specific starting point is marked, and is instructed to contact households according to a predetermined travel pattern. At each occupied dwelling unit, the interviewer selects respondents by following a systematic procedure. This procedure is repeated until the assigned number of interviews has been completed.

Telephone surveys. The national Gallup telephone samples are based on the area probability sample used for personal surveys. In each of the sampling locations selected (as described above for personal surveys), a set of telephone exchanges that falls within the geographic boundaries of the sampling location is first identified. Listed telephone numbers in these exchanges are selected randomly and used as "seed numbers" for randomly generating telephone numbers. The result of this procedure is a sample of listed and unlisted telephone numbers assigned to households within telephone exchanges serving the sampling locations. The final sample of numbers thus reflects the stratification and selection of sampling locations.

After the survey data have been collected and processed, each respondent is assigned a weight so that the demographic characteristics of the total weighted sample of respondents match the latest estimates of the demographic characteristics of the appropriate adult population available from the U.S. Census Bureau. Telephone surveys are weighted to match the characteristics of the adult population living in households with access to a telephone. The weighting of personal interview data includes a factor to improve the representation of the kinds of people who are less likely to be found at home. The procedures described above are designed to produce samples approximating the adult civilian population (18 and older) living in private households (excluding those in prisons, hospitals, hotels, and religious and educational institutions, and those living on reservations or military bases)--and in the case of telephone surveys, households with access to a telephone (Gallup 1987a).

Lieberman Research Inc., 1986

The study was based on telephone interviews in a nationwide sample of 1,025 persons 18 years of age and older in the contiguous United States (Alaska and Hawaii were not included). A random-digit-dialed sample was used. Interviews were conducted from June 26 through July 10, 1986. The study was jointly sponsored by the American Cancer Society, the American Heart Association, and the American Lung Association; neither interviewers nor respondents were aware of the sponsors.

National Adolescent Student Health Survey, 1987

The National Adolescent Student Health Survey was initiated in 1985 by three national health organizations: the American School Health Association, the Association for the Advancement of Health Education, and the Society for Public Health Education. Funding for the survey was provided by the following agencies of the Public Health Service: the Office of Disease Prevention and Health Promotion (Office of the Assistant Secretary for Health), the Center for Chronic Disease Prevention and Health Promotion (CDC), and National Institute on Drug Abuse (Alcohol, Drug Abuse, and Mental Health Administration).

A two-stage cluster sampling procedure was used to survey 5,859 8th graders and 5,560 10th graders from 112 public and private schools. Twenty-four percent of the original sample of schools did not agree to participate and each was replaced by another randomly selected school from the same geographic area. Parents were informed of the content and purpose of the survey and were provided the opportunity to exclude their children from the survey. Students were informed that participation was voluntary and that all information provided would be strictly confidential. Parental requests for exclusion, student absenteeism, and voluntary nonparticipation reduced the survey response rate to 87.5 percent (88.9 percent for 8th grade and 86.0 percent for 10th grade).

During October to December 1987, trained survey administrators collected data from three randomly selected classes of 8th or 10th grade students at each participating school. Each student responded to one of three survey forms. The 30-day prevalence of cigarette smoking and smokeless tobacco use appeared on all survey forms. The item nonresponse on these questions was 0.2 percent of those who were surveyed.

National Health Interview Surveys

The National Health Interview Survey (NHIS), which is conducted regularly by the National Center for Health Statistics, uses a sampling frame developed by the U.S. Bureau of the Census and is based on a multistaged random probability sampling design. Information is collected in face-to-face household interviews using one adult per household and using proxy reporting for other members of the household. Since 1974, information on smoking has been obtained only by self-report. This has entailed telephone followup to selected household members who were not personally interviewed. Basic smoking information has been collected for several years, including 1965, 1966, 1970, 1974, 1976-80, inclusive, 1983, 1985, and 1987 (data prior to 1974 are based on both self-reports and proxy reporting; all of the more recent surveys were based on self-reports). Sample sizes for smoking data have ranged from 10,000 to 50,000 persons. There has been an overall consistency in the smoking questions asked in the different surveys. Beginning in 1985, an adequate sample of blacks was ensured by the survey design (using the technique of oversampling). The NHIS generally has a response rate of 96 percent (NCHS 1987). However, the extra step in converting proxy response to self-report leads to a decrease in the response rate to approximately 90 percent.

The data presented in this Chapter were taken from the Health Promotion and Disease Prevention Supplement to the 1985 NHIS and the Cancer Control Supplement to the 1987 NHIS.

National Health and Nutrition Examination Survey and Hispanic Health and Nutrition Examination Survey

Since 1960, the National Center for Health Statistics has conducted periodic health surveys that have included physical examinations and laboratory tests. Initially called the National Health Examination Survey (NHES), the name of this survey was changed to the National Health and Nutrition Examination Survey (NHANES) in 1970 when a nutrition component was added. The NHES was conducted in 1960, 1963, and 1966, and the NHANES in 1971, 1976, and 1988.

Although the NHANES as a population survey included all of the Nation's major subpopulations including Hispanics, the sample sizes were insufficient to produce reliable estimates of health status, particularly if the three major Hispanic subgroups--Mexican-Americans, Cuban-Americans, and Puerto Ricans--were considered separately. Therefore, the Hispanic Health and Nutrition Examination Survey (HHANES) was developed by the National Center for Health Statistics. The HHANES was designed to provide sufficient samples of each Hispanic subgroup. The survey not only produces reliable estimates of health status for each subgroup but also permits cross-cultural comparisons within the broader Hispanic cultural context.

The HHANES was a probability-based survey of three distinct subgroups of a major U.S. minority group rather than of a national sample. The sampling methodology used complex, multistaged, stratified, clustered samples of the defined population. When weighted, the sample data represent the targeted population. For HHANES, the targeted population consisted of three groups of civilian, noninstitutionalized persons, aged 6 months to 74 years from three areas of the country that had a sufficient number or proportion of Hispanics to render it economically feasible to screen households and to operate an examination center: (1) Mexican-Americans residing in selected areas of Texas, California, Colorado, New Mexico, and Arizona; (2) Cuban-Americans residing in Dade County, Florida; and (3) Puerto Ricans residing in the New York City area. Data were collected from 1982 through 1984 via in-person household interviews and via examination at a local examination center. Information was collected regarding a number of health issues, including the use of tobacco.

NIDA High School Seniors Surveys on Drug Use

Each year since 1975, the Monitoring the Future project has conducted surveys of representative national samples of high school seniors in the United States (Johnston, O'Malley, Bachman 1987). Monitoring the Future is conducted by the University of Michigan Institute for Social Research and receives its core funding from the National Institute on Drug Abuse.

Each year, a multistage sampling procedure is used to identify approximately 135 public and private schools (the number of private schools has varied from 14 to 22) that

represent an accurate cross-section of high school seniors throughout the coterminous United States. The first stage involves the use of 74 primary sampling units developed by the University of Michigan Survey Research Center for use in its nationwide interview surveys.

The second sampling stage involves choice of a single high school from most geographic areas (more than one is chosen in major metropolitan areas). The probability of selection of any school is proportional to the size of the senior class. When a sampled school is unwilling to participate, a replacement school is selected from the same geographic area. Response rate of schools has been from 66 to 80 percent throughout the survey period.

Up to 400 seniors are surveyed from each school. In schools with more than 400 seniors, a random sampling system convenient for the school (provided it results in an unbiased sample) is used to choose the 400 students to be interviewed. Most schools use the classroom as the basis for this selection. The total number of students interviewed each year has been between 15,700 and 19,000. The student response rate has varied from 77 percent to 84 percent throughout the survey period.

The questionnaire administration in each school is carried out by local Survey Research Center representatives and their assistants following standardized procedures detailed in a project manual. Questionnaires are generally delivered in classrooms during normal class periods, although in some instances larger groups are used. Because of the range of topics, five different questionnaire forms are used in the survey. These are distributed to participants in an ordered sequence to produce identical subsamples. All five forms contain core data on demographics and some drug use (about one-third of the form); all other questions are asked of subsamples of the total respondents. Basic questions on cigarette usage have been included in the core for all years.

Followup surveys by mail are conducted annually using representative subsamples from each of the previously participating classes, that is, the classes of 1976 through 1987. Thus, long-term panel data are collected on individuals, and analyses aimed at separating secular, age, and cohort effects are possible. (See O'Malley, Bachman, Johnston 1988.)

NIDA National Household Surveys on Drug Abuse

NIDA conducted household surveys on drug use in 1979, 1982, and 1985. Data were obtained from a stratified random sample of 8,000 U.S. households; approximately 2,000 in-person interviews were conducted with respondents in the 12- to 17-year-old age group. Questions included whether any cigarettes were smoked within 30 days as well as within the previous year.

Roper Survey, 1978

This survey was conducted for the Tobacco Institute via face-to-face interviewing with 2,511 subjects. Other methodological details are unavailable.

Roper Survey, 1980

The 1980 Roper Survey used face-to-face interviews to test a nationally representative sample of 2,000 adults for knowledge about the health hazards of smoking. The study was commissioned by the FTC and was conducted in November 1980. The total sample was split into two halves, and one set of questions was varied between the two. Thus, the sample size for several of the questions on the health effects of smoking was approximately half the total sample size.

US DHEW Teenage Smoking Surveys

In 1968, 1970, 1972, 1974, and 1979, random samples of teenagers aged 12 to 18 years were surveyed by telephone in December-January (US DHEW 1972, 1976b, 1979b). The first stage of the 3-stage sampling plan involved grouping and selecting telephone exchanges and was designed to eliminate geographic bias. Within the selected exchanges, equal numbers of random-digit-dialed telephone numbers were generated and contacted. Household enumeration was undertaken with an adult respondent and if more than one person aged between 12 and 18 years lived in the house, random selection was used to choose the study participant.

In 1968, the sample size was 4,931, 89 percent of whom were interviewed by telephone. The other 11 percent lived in nontelephone households and were interviewed in their homes. As exclusion of the nontelephone households did not substantially affect prevalence estimates, later surveys did not include household interviewing of nontelephone households. The sample size in 1970 was 2,640; in 1972, it was 2,790; in 1974, it was 2,553; and in 1979, it was 2,639. In 1979, a followup survey was also undertaken of 1,194 (46.8 percent) of the 1974 respondents. Approximately 12,000 households were contacted in 1979, from which 2,639 people aged 12 to 18 years were interviewed. In no survey was there any attempt to validate the smoking status indicated.

References

ALLPORT, G.W. Attitudes. In: Murchison, *C.* (ed.) *A Handbook of Social Psychology*. Worcester, Massachusetts: Clark University Press, 1935.

AMERICAN ASSOCIATION FOR RESPIRATORY CARE. Majority of airline passengers want smoking ban; National health group calls for action. Press release. Dallas: American Association for Respiratory Care, September 1, 1987.

AMERICAN CANCER SOCIETY. Release of the Lieberman Survey. Press release. New York: American Cancer Society. November 10, 1986.

AMERICAN CANCER SOCIETY. *Cancer Facts and Figures--1988.* New York: American Cancer Society, 1988a.

AMERICAN CANCER SOCIETY. *The 1987 Survey of Public Awareness and Use of Cancer Tests.* Sponsored by the American Cancer Society, conducted by the Gallup Organization, analyzed by Lieberman Research, 1988b.

AMERICAN LUNG ASSOCIATION. Americans want smoke-free air at work. Press release. New York: American Lung Association, December 5, 1985.

AMERICAN LUNG ASSOCIATION. Smokers know risks but don't say "no" to cigarettes. Press release. New York: American Lung Association, December 4, 1987.

AMERICAN MEDICAL ASSOCIATION. Americans favor tobacco advertising ban, says AMA survey. Press release. Chicago: American Medical Association, October 29, 1986.

BACHMAN, J.G., JOHNSTON, L.D., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1976.* Ann Arbor, Michigan: University of Michigan, 1980a.

BACHMAN, J.G., JOHNSTON, L.D., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1978.* Ann Arbor, Michigan: University of Michigan, 1980b.

BACHMAN, J.G., JOHNSTON, L.D., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors,* 1980. Ann Arbor, Michigan: University of Michigan, 1981.

BACHMAN, J.G., JOHNSTON, L.D., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1982.* Ann Arbor, Michigan: University of Michigan, 1984.

BACHMAN, J.G., JOHNSTON, L.D., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1984.* Ann Arbor, Michigan: University of Michigan, 1985.

BACHMAN, J.G., JOHNSTON, L.D., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1986.* Ann Arbor, Michigan: University of Michigan, 1987.

BECKER, D.M., LEVINE, D.M. Risk perception, knowledge, and lifestyles in siblings of people with premature coronary disease. *American Journal of Preventive Medicine* 3(1):45-50, 1987.

BEN-SIRA, Z. Health promoting function of mass media and reference groups: Motivating or reinforcing of behavior change. *Social Science and Medicine* 16(7):825-834, 1982.

CANADIAN GALLUP POLL, October 1986.

CENTERS FOR DISEASE CONTROL. Survey to assess the prevalence, attitudes, knowledge, and beliefs about smoking behavior among the adult population. Survey questionnaires. Prepared by Westat for the Office on Smoking and Health, Rockville, Maryland, August 1986.

CENTERS FOR DISEASE CONTROL. Passive smoking: Beliefs, attitudes, and exposures--United States, 1986. *Morbidity and Mortality Weekly Report* 37(15):239-241, April 22, 1988.

CHILTON RESEARCH SERVICES. *A Survey of Adolescent and Adult Attitudes, Values, Behavior, Intentions and Knowledge Related to Cigarette Smoking. Final Report.* Submitted to the Federal Trade Commission, June 25, 1980.

DOLECEK, T.A., SCHOENBERGER, J.A., OMAN, J.K., KREMER, B.K., SUNSERI, A.J., ALBERTI, J.M. Cardiovascular risk factor knowledge and belief in prevention among adults in Chicago. *American Journal of Preventive Medicine* 2(5):262-267, 1986.

FEDERAL TRADE COMMISSION. *Federal Trade Commission Staff Report on the Cigarette Smoking Advertising Investigation*. Federal Trade Commission, May 1981.

FISHBEIN, M. *Consumer Beliefs and Behavior With Respect to Cigarette Smoking: A Critical Analysis of the Public Literature. A Report Prepared for the Staff of the Federal Trade Commission*. Federal Trade Commission, May 1977.

FOLSOM, A.R., SPRAFKA, M., LUEPKER, R.V., JACOBS, D.R. JR. Beliefs among black and white adults about causes and prevention of cardiovascular disease: The Minnesota Heart Study. *American Journal of Preventive Medicine* 4(3):121-127, 1988.

FOX, S.H., BROWN, C., KOONTZ, A.M., KESSEL, S.S. Perceptions of risks of smoking and heavy drinking during pregnancy: 1985 NHIS findings. *Public Health Reports* 102 (1):73-79, January-February 1987.

GALLUP. *Smoking in America. Public Attitudes and Behavior. Gallup Report No. 155.* Princeton, New Jersey: Gallup Organization, June 1978.

GALLUP. *Gallup Smoking Audit. The Gallup Report. Report No. 190.* Princeton, New Jersey: Gallup Organization, July 1981.

GALLUP. Survey of attitudes toward smoking. Conducted for the American Lung Association. Princeton, New Jersey: Gallup Organization, July 1985.

GALLUP. *Majority Backs Ban on Smoking in Public Places. Gallup Report No. 258.* Princeton, New Jersey: Gallup Organization, March 1987a.

GALLUP. Majority backs ban on smoking in public places. Press release. Princeton, New Jersey: Gallup Organization, April 3, 1987b.

GALLUP. Survey of attitudes toward smoking. Conducted for the American Lung Association. Princeton, New Jersey: Gallup Organization, 1987c.

GALLUP. Attitudes toward smoking in restaurants and fast food establishments. Conducted for the National Restaurant Association. Princeton, New Jersey: Gallup Organization, February 1987d.

GALLUP. On-the-go Americans prefer smoke-free air. *American Journal of Public Health* 78(5):563, May 1988a.

GALLUP. Majorities now support ban on public smoking, cigarette ads. Press release. Princeton, New Jersey: Gallup Organization, September 4, 1988b.

HARRIS, L. *Prevention in America: Steps People Take--Or Fail to Take-- for Better Health.* Louis Harris and Associates, 1983.

HARRIS, L. *The Prevention Index, 1988.* Louis Harris and Associates, May 13, 1988.

HARVEY, L., SHUBAT, S. Public opinion on health care issues, *1986.* In: *AMA Surveys of Physician and Public Opinion, 1986.* Chicago: American Medical Association, October 1986.

HARVEY, L., SHUBAT, S. Public opinion on health care issues. In: *AMA Surveys of Physician and Public Opinion on Health Care Issues, 1987.* Chicago: American Medical Association, April 1987.

JOHNSTON, L.D., BACHMAN, J.G. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1975.* Ann Arbor, Michigan: University of Michigan, 1980.

JOHNSTON, L.D., BACHMAN, J.G., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1977.* Ann Arbor, Michigan: University of Michigan, 1980a.

JOHNSTON, L.D., BACHMAN, J.G., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1979.* Ann Arbor, Michigan: University of Michigan, 1980b.

JOHNSTON, L.D., BACHMAN, J.G., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1981.* Ann Arbor, Michigan: University of Michigan, 1982.

JOHNSTON, L.D., BACHMAN, J.G., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1983.* Ann Arbor, Michigan: University of Michigan, 1984.

JOHNSTON, L.D., BACHMAN, J.G., O'MALLEY, P.M. *Monitoring the Future. Questionnaire Responses From the Nation's High School Seniors, 1985.* Ann Arbor, Michigan: University of Michigan, 1986.

JOHNSTON, L.D., O'MALLEY, P.M., BACHMAN, J.G. *National Trends in Drug Use and Related Factors Among High School Students and Young Adults, 1975-1986.* U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse. DHHS Publication No. (ADM) 87-1535, 1987.

LEVENTHAL, H., GLYNN, K., FLEMING, R. Is the smoking decision an 'informed choice'? Effect of smoking risk factors on smoking beliefs. *Journal of the American Medical Association* 257(24):3373-3376, June 26, 1987.

LIEBERMAN RESEARCH. A *Study of Public Attitudes Toward Cigarette Advertising and Promotion Programs--Conducted for American Cancer Society, American Heart Association, American Lung Assocation.* Lieberman Research, October 1986.

MAHONEY, M.J. *Cognition and Behavior Modification.* Cambridge, Massachusetts: Ballinger Publishing, 1974.

MASSEY, M.M., BOYD, E., MATTSON, M., FEINLEIB, M.R. Inventory of surveys on smoking. *Public Health Reports* 102(4):430-438, July-August 1987.

MATTSON, M.E., POLLACK, E.S., CULLEN, J.W. What are the odds that smoking will kill you? *American Journal of Public Health* 77(4):425-431, April 1987.

NATIONAL CENTER FOR HEALTH STATISTICS, THORNBERRY, O.T., WILSON, R.W., GOLDEN, P.M. Health promotion data for the 1990 objectives, estimates from the National Health Interview Survey of Health Promotion and Disease Prevention, United States, 1985. *Advance Data From Vital and Health Statistics,* No. 126. U.S. Department of Health and Human Services, Public Health Service. DHHS Publication No. (PHS) 86-1250, September 19, 1986.

NATIONAL CENTER FOR HEALTH STATISTICS, THORNBERRY, O. An experimental comparison of telephone and personal health interview surveys. *Vital and Health Statistics,* Series 2, No. 106. U.S. Department of Health and Human Services, Public Health Service. DHHS Publication No. (PHS) 87-1380, August 1987.

NATIONAL CENTER FOR HEALTH STATISTICS, SCHOENBORN, C.A. Health promotion and disease prevention: United States, 1985. *Vital and Health Statistics,* Series 10, No. 163. Public Health Service. DHHS Publication No. (PHS) 88-1591, February 1988.

O'MALLEY, P.M., BACHMAN, J.G., JOHNSTON, L.D. Period, age, and cohort effects on substance use among young Americans: A decade of change, 1976-86. *American Journal of Public Health* 78(10):1315-1321, October 1988.

OSKAMP, *S. Attitudes and Opinions.* Englewood Cliffs, New Jersey: Prentice-Hall, 1977.

PERLSTADT, H., HOLMES, R.E. The role of public opinion polling in health legislation. *American Journal of Public Health 77(5):612-614,* May 1987.

REMINGTON, P.L., FORMAN, M.R., GENTRY, E.M., MARKS, J.S., HOGELIN, G.C., TROWBRIDGE, F.L. Current smoking trends in the United States. The 1981-1983 Behavioral Risk Factor Surveys. *Journal of the American Medical Association* 253(20):2975-2978, May 24-31, 1985.

ROPER. *A Study of Public Attitudes Toward Cigarette Smoking and the Tobacco Industry in 1978,* Volume 1. Roper Organization, May 1978.

SCHINKE, S.P., GILCHRIST, L.D. Preventing cigarette smoking with youth. *Journal **of** Primary Prevention* 5(1):48-56, Fall 1984.

SHOPLAND, D.R., BROWN, C. Toward the 1990 objectives for smoking: Measuring the progress with 1985 NHIS data. *Public Heath Reports* 102(1):68-73, January-February 1987.

SLOVIC, P. Informing and educating the public about risk. *Risk Analysis* 6(4), 1986.

STEWART. P.J.. DUNKLEY. G.C. Smoking and health care patterns among pregnant women. *Canadian Medical Association Journal* 133(10):989-994, November 15, 1985.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking for Women. A Report of the Surgeon General.* U.S. Department of Health and Human Services. Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health, 1980.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking. The Changing Cigarette: A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health. Office on Smoking and Health. DHHS Publication No. (PHS) 81-50156, 1981.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking: Cancer. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health. DHHS Publication No. (PHS) 82-50179, 1982.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking: Cardiovascular Disease. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health. DHHS Publication No. (PHS) 84-50204. 1983.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking: Chronic Obstructive Lung Disease. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health. DHHS Publication No. (PHS) 84-50205, 1984.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking: Cancer and Chronic, Lung Disease in the Workplace. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health. DHHS Publication No. (PHS) 85-50207, 1985.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Involuntary Smoking. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service. Centers for Disease Control. DHHS Publication No. (CDC) 87-8398, 1986a.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The 1990 Health Objectives for the Nation: A Midcourse Review.* U.S. Department of Health and Human Services, Public Health Service, Office of Disease Prevention and Health Promotion, November 1986b.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Using Smokeless Tobacco. A Report of the Advisory Committee to the Surgeon General, 1986.* U.S. Department of Health and Human Services, Public Health Service. NIH Publication No. 86-2874, April 1986c.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *Youth Use of Smokeless Tobacco: More Than a Pinch of Trouble.* U.S. Department of Health and Human Services, Office of Inspector General, Office of Analysis and Inspections, January 1986d.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking: Nicotine Addiction. A Report of the Surgeon General,* 1988. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Health Promotion and Education, Office on Smoking and Health. DHHS Publication No. (CDC) 88-8406, 1988.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *Adult Use of Tobacco, 1986.* U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Office on Smoking and Health, in press.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Use of Tobacco. Practices, Attitudes, Knowledge, and Beliefs. United States--Fall 1964 and Spring 1966.* U.S. Department of Health, Education, and Welfare, Public Health Service, Health Services and Mental Health Administration, National Clearinghouse for Smoking and Health, July 1969.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Teenage Smoking. National Patterns of Cigarette Smoking, Ages 12 Through 18, in 1968 and 1970.* U.S. Department of Health, Education, and Welfare, Health Services and Mental Health Administration, National Clearinghouse for Smoking and Health. DHEW Publication No. (HSM) 72-7508, 1972.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Adult Use of Tobacco, 1970.* U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, National Clearinghouse for Smoking and Health, June 1973.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Cigarette Smoking Among Teen-agers and Young Women.* U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health. DHEW Publication No. (NIH) 77-1203, 1975a.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *The Health Consequences of Smoking. 1975.* U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, HEW Publication No. (CDC) 77-8704, 1975b.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Adult Use of Tobacco--1975.* U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, 1976a.

U.S. DEPARTMENTOF HEALTH, EDUCATION, AND WELFARE. *Teenage Smoking: National Patterns of Cigarette Smoking, Ages 12 Through 18, in 1972 and 1974.* U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health. DHEW Publication No. (NIH) 76-931, 1976b.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *The Health Consequences of Smoking, 1977-1978.* U.S. Department of Health, Education, and Welfare, Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health. DHEW Publication No. (PHS) 79-50065, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Smoking and Health. A Report of the Surgeon General.* U.S. Department of Health, Education, and Welfare. Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health. DHEW Publication No. (PHS) 79-50066, 1979a.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Teenage Smoking. Immediate and Long-Term Patterns.* U.S. Department of Health, Education, and Welfare, National Institute of Education, November 1979b.

U.S. PUBLIC HEALTH SERVICE. *Smoking and Health. Report of the Advisory Committee to the Surgeon General of the Public Health Service.* U.S. Department of Health, Education. and Welfare, Public Health Service, Center for Disease Control. PHS Publication No. 1103, 1964.

U.S. PUBLIC HEALTH SERVICE. *The Health Consequences of Smoking. 1969 Supplement to the 1967 Public Health Service Review.* U.S. Department of Health, Education, and Welfare, Public Health Service. PHS Publication No. 1696-2 (Supplement), 1969.

WEEKLY READER. *Weekly Reader National Survey on Safety and Health.* Middletown, Connecticut: Field Publications, 1986.