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Preliminary first-quarter estimates from the Cancer Control Supplement to the 1987 NHIS are provided in some tables (unpublished data, National Cancer Institute).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, sociodemographic 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]Percentages 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) cigarettes[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:

1–2. 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:
1–2. 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 1977/1978 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