

The Growing Epidemic

A Survey of Smoking Habits and Attitudes toward Smoking among Students in Grades 7 through 12 in Toledo and Lucas County (Ohio) Public Schools—1964 and 1971

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The increased smoking among boys and particularly girls, in a recent 7-year period, is of epidemic proportions. In combating this trend, the precepts and examples of key adults, especially parents, teachers, and physicians, are stressed, as well as the important role of the children's peers.

Introduction

The Northwestern Ohio Action on Smoking and Health (NO ASH) was funded by the Northwestern Ohio Regional Medical Program in November, 1969. Besides stimulating more vigorous and innovative antismoking programs throughout the region, working in cooperation with interagency committees in the counties,¹ this project had as

Dr. Kelson, at the time of the first survey, was Chairman, Inter-Agency Committee on Smoking and Health of Toledo and Lucas County, and at the time of the second survey, Project Director, Northwestern Ohio Action on Smoking and Health. He is presently Chairman, Ohio Advisory Board on Smoking and Health, and is Medical Director, Toledo Health and Retiree Center, Toledo, Ohio 43624. Mr. Pullella is Public Health Specialist, Northwestern Ohio Regional Medical Program. Dr. Otterland, formerly Epidemiologist, Northwestern Ohio Regional Medical Program, is now Professor of Epidemiology, Meharry Medical College, Nashville, Tennessee. A third, similar survey is being conducted in 1975.

one of its goals to repeat for comparison a 1964 survey of the smoking habits and attitudes toward smoking of Toledo and Lucas County (Ohio) children. This study had been performed by the Inter-Agency Committee on Smoking and Health of Toledo and Lucas County (Ohio). Data for the second survey were collected in the spring of 1971 by means of questionnaires distributed to and answered by students in the same grades and school districts as in 1964. Identical forms were used in 1971 as in 1964, with one exception. In 1971 a question on the students' opinions concerning the influence of radio and TV programs on their smoking habits was added (Appendix A).

This paper reports the results of our analysis of data from 1964 and 1971.

Method of Data Collection and Analysis

Questionnaires were distributed to Toledo and Lucas County public junior high and high schools. All students

TABLE 1—Smoking Habits of Students in Grades 7 through 12 in Public Schools in Toledo and Lucas County 1964 and 1971*

Response and Year	No. in Grade											
	7		8		9		10		11		12	
	B	G	B	G	B	G	B	G	B	G	B	G
Never smoked												
1964	107	164	75	114	53	116	53	103	49	61	36	56
1971	94	150	96	96	51	94	46	63	36	44	23	39
Tried to see what it was like, do not smoke												
1964	106	72	96	84	119	76	86	66	72	67	50	54
1971	129	126	111	117	92	92	68	87	50	72	45	48
Used to smoke 1 day a week but quit												
1964	19	7	20	9	21	6	19	5	13	10	8	6
1971	29	25	46	25	29	24	19	16	16	25	12	9
Smokes about 1 day a week												
1964	10	3	14	13	17	19	10	7	13	9	11	12
1971	39	17	22	40	22	41	15	25	16	15	8	15
Smokes every day less than ½ pack a day												
1964	9	6	7	8	19	4	31	9	28	17	20	19
1971	20	15	34	17	29	43	29	25	25	38	24	25
Smokes ½ pack or more every day												
1964	5	1	10	2	12	4	21	7	15	12	25	6
1971	13	7	8	9	16	15	35	14	35	22	35	16
Size of sample												
1964	256	253	222	230	241	225	220	197	190	176	150	153
1971	324	340	317	304	239	309	212	230	178	216	147	152

* This table accounts for 1,234 females and 1,279 males in 1964, and 1,551 females and 1,417 males in 1971, which is a 10 per cent sample of the total population interviewed. B, boys; G, girls.

present the day of the survey were asked to answer them in their classrooms on time specifically set aside for this purpose. The completed questionnaires were returned unsigned.* Identical procedures in the same school districts were used in 1964 and 1971.

In 1964, a total of 25,131 students (12,791 boys and 12,340 girls) took part in the survey. In 1971, a total of 29,682 students (14,169 boys and 15,513 girls) participated.

A 10 per cent sample of the completed questionnaires from 1964 and 1971 is analyzed in this report.

A chi-square test was used to compare the ratios and those mentioned here are significant at the 0.05 level.

Results

Consistency of Data

No questionnaires had to be rejected because of inconsistency. The questionnaires were filled out satisfactorily for analysis of smoking habits among the students (Questions A, B, and I), their attitudes toward smoking (Questions D, J, and L), smoking habits of their parents (Question C), and for the students' perceptions of their

* An article indicates that, overall, anonymity made no difference in responses by boys and girls to questions concerning smoking habits and attitudes.²

parents' attitudes toward their (the children's) smoking (Question E).

The answers to Questions F, G, H, and K, concerning reasons for smoking or not smoking and the possibility of giving up smoking, however, gave insufficient data for analysis because of high numbers of no response. This failure to answer very likely occurred because Questions F, G, and H did not provide mutually exclusive alternatives. Two or more of the statements could well have expressed the student's views. Rather than to "check one" as directed, the student did not answer. The problem in Question K, "I could—could not—be persuaded to give up smoking," may have been that the student just did not feel that he or she could reply with any assurance.

Students' Smoking Habits, 1964 and 1971†

In Tables 1, 2, and 3 the smoking habits, in 1964 and 1971, of students in the 10 per cent sample are presented.

† Our study is concerned with the parameters of smoking of *similar* populations some 7 years later, and not, of course, of the *same* population after a lapse of time. Salber et al.³ have reported a survey according to the latter plan, of 560 boys and girls first studied in 1959 (with an average age, in grade 10, of 15.5) and studied again, 5-1/2 years later, in 1965 (average age 21). The incidence of smoking almost doubled: in 1959, 35 per cent of the boys and 28 per cent of the girls were smokers, and in 1965, 63 per cent of the boys and 55 per cent of the girls were smokers.

(Figure 1 gives some of this information in the form of a graph.) Grade by grade (Tables 1 and 2) the number of smokers* increased from 1964 to 1971, among both girls and boys, but to a greater degree among girls. The increase in 1971 is greater among the ninth and eleventh grade girls. In 1964 less than one girl in 10 in grades 7 to 9 smoked; in 1971, more than one in five smoked (Table 3)! For the tenth to twelfth grade girls, the number of smokers was less than one in five in 1964; in 1971 it was about one in three. It is significant that in the 1971 survey, the percentage of girl smokers was greater than that of boys in grades 8 and 9.

In 1964 the defined incidence of smoking among girls was 59.0 per cent of that among boys. In 1971 it had jumped to 85.7 per cent! If this steep increase continues we shall soon find as high an incidence of smoking among girls as among boys.

From Table 1 we learn that in the 1964 study 373 boys and 614 girls had never smoked (29.2 per cent of all the boys and 49.8 per cent of all the girls). The corresponding figures for 1971 were 346 (24.4 per cent) and 486 (31.3 per cent). In 1964, 629 boys (49.1 per cent) and 462 girls (27.4 per cent) reported that they had discontinued smoking. In 1971, the corresponding figures were 646 (45.6 per cent) and 666 (42.9 per cent). It is encouraging that many boys and girls do stop smoking, but the increased numbers of those who continue constitute an epidemic.

Student Smoking: Three Cities, 4 years

Table 4 gives the percentages of smokers among ninth to twelfth grade boys and girls in Portland 1958,⁴ Toledo 1964, Chicago 1967,⁸ and Toledo 1971.

The reader should keep in mind that all of the studies were not based on the same questionnaire and technique of data collection. The table shows, in general, a trend to an increased percentage of smokers in the successive surveys, more marked among the girls, a rising gradient of smokers from lower to higher grades, and a preponderance of boy over girl smokers (with grade 9 of the 1971 Toledo survey an exception).

* In any study of the incidence or other parameters of smoking, the term "smokers" must be defined. In various studies of smoking among children, its meanings have differed considerably. In the Portland survey,⁴ that in Dublin,⁵ and some others, a smoker is one who smokes one or more cigarettes a week—the Dublin study stresses "regularly per week." In a 1959 British study,⁶ this is increased to five or more cigarettes a week. In the Newton, Massachusetts, study,⁷ "A smoker was a student who had smoked at least ten cigarettes in the past and at the time of the questionnaire considered himself to be a smoker, regardless of the amount smoked." In the present paper, a smoker is one who checked the first blank in Question I of the questionnaire: "At the present time I smoke—I do not smoke—" unless scrutiny of the questionnaire, particularly Question A, disclosed any inconsistency. In other words, the designation "smoker" is based on the student's own self-evaluation.

TABLE 2—Smoking Habits of Students in Grades 7 through 12 in Public Schools in Toledo and Lucas County, 1964 and 1971*

	No. (%) in Grade											
	7		8		9		10		11		12	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Nonsmokers												
1964	231 (90.2)	244 (96.4)	190 (85.6)	209 (90.9)	198 (82.2)	200 (88.9)	158 (71.8)	175 (88.8)	135 (71.1)	140 (79.5)	94 (62.7)	117 (76.6)
1971	259 (79.9)	297 (87.4)	253 (79.8)	241 (79.3)	175 (73.2)	222 (71.2)	140 (66.0)	172 (74.8)	108 (60.7)	140 (64.8)	81 (55.1)	95 (62.1)
Smokers												
1964	25 (9.8)	9 (3.6)	32 (14.4)	21 (9.1)	43 (17.8)	25 (11.1)	62 (28.2)	22 (11.2)	55 (28.9)	36 (20.5)	56 (37.3)	36 (23.5)
1971	65 (20.1)	43 (12.6)	64 (20.2)	63 (20.7)	64 (26.8)	89 (28.8)	72 (34.0)	58 (25.2)	70 (39.3)	76 (35.2)	66 (44.9)	57 (37.9)
Totals												
1964	256	253	222	230	241	225	220	197	190	176	150	153
1971	324	340	317	304	239	309	212	230	178	216	147	152

* Percentage of smokers (in parentheses) is compared to the population in that subgroup.

TABLE 3—Smoking Habits of Students in Grades 7 through 12 in Public Schools in Toledo and Lucas County, 1964 and 1971*

	Grades 7–9		Grades 10–12		Total	
	Boys	Girls	Boys	Girls	Boys	Girls
Nonsmokers						
1964	616 (85.7)	648 (91.5)	386 (68.9)	428 (81.4)	1,002 (78.3)	1,076 (87.2)
1971	677 (76.9)	749 (78.6)	315 (58.6)	403 (67.4)	992 (70.0)	1,152 (74.3)
Smokers						
1964	103 (14.3)	60 (8.5)	174 (31.1)	98 (18.6)	277 (21.7)	158 (12.8)
1971	203 (23.1)	204 (21.4)	222 (41.4)	195 (32.6)	425 (30.0)	399 (25.7)
Total						
1964	719	708	560	526	1,279	1,234
1971	880	953	537	598	1,417	1,551

* Percentages are given in parentheses.

**SMOKING HABITS
TOLEDO AND LUCAS COUNTY PUBLIC SCHOOL STUDENTS
Grades 7 thru 12
1964 and 1971**

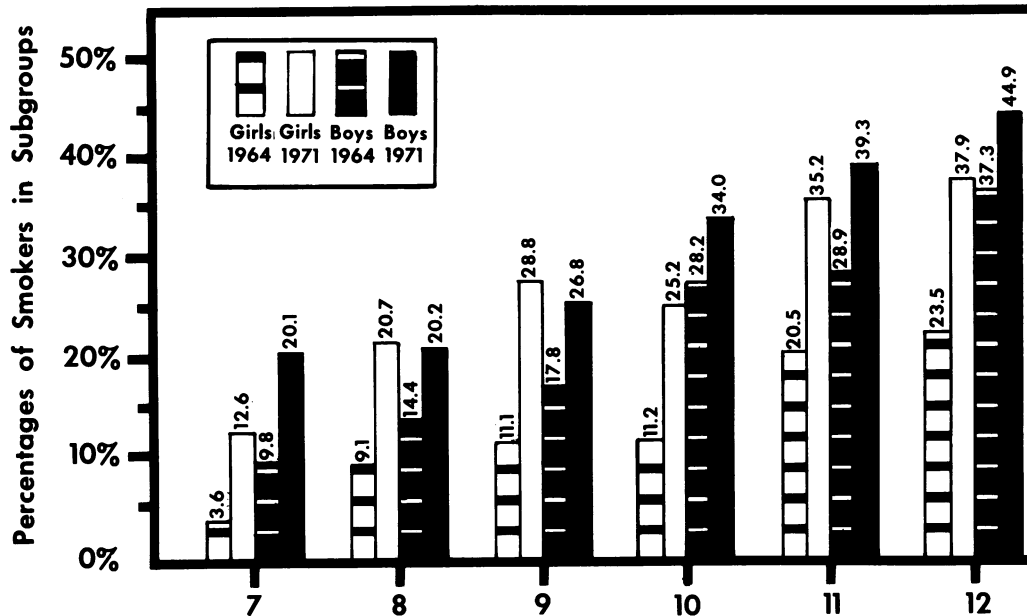


FIGURE 1 Smoking habits of Toledo and Lucas County public school students, grades 7 to 12, 1964 and 1971.

Belief in Health Hazards of Smoking

The reasons why the students smoked were not learned, as we have noted, if indeed the students themselves knew why. Despite their smoking, the preponderance of students, 2,256 of 2,513 (89.8 per cent) in 1964 and 2,705 of 2,968 (91.1 per cent) in 1971 expressed the belief that smoking is harmful to health. Table 5 shows the smoking habits of students who believed that smoking is a health hazard and those who did not.

Relatively more smoking students in 1971 than in 1964 indicated, despite their smoking, a belief that smoking

impairs health. We find more such students in the higher grades.

Smoking Habits of Parents

Table 6 shows the relative distribution of smokers among the fathers and mothers of the Toledo area schoolchildren surveyed in 1964 and 1971.

It is noted that a smaller percentage of both parents were smokers in 1971 than in 1964.

Table 7 presents a more detailed analysis of smoking by parents. An increase in nonsmokers from 1964 to 1971

is seen, both in the category, "Fathers only smoke," and in "Both parents smoke." The percentage rises in "Neither parent smokes." In the category "Mothers only smoke," however, the figure has increased, particularly for the subgroup "Girls."

The smoking habits of the parents of students in grades 7 to 9 and 10 to 12 are correlated with the smoking habits of their children in Table 8. This table also gives the numbers, in 1964 and 1971, of smoking and nonsmoking children and the percentage of nonsmokers in each subgroup. The highest figures for smokers among children are found when both parents smoke, except among girls in grades 10 to 12 in 1964. When neither parent smokes, the percentage of smokers among the children is significantly

TABLE 4—Comparison of Smoking Incidence among Ninth to Twelfth Grade School Children in Portland, 1958; Chicago, 1967; and Toledo, 1964 and 1971

Grade	Portland ⁴ 1958	Toledo 1964	Chicago ⁵ 1967	Toledo 1971
	%			
Boys				
9	18	18	22	27
10	30	28	32	34
11	36	29	40	39
12	40	37	42	45
Girls				
9	6	11	22	29
10	13	11	28	25
11	20	21	31	35
12	31	24	28	38

smaller than if the father or mother or both are smokers, except among girls in grades 7 to 9 in 1964.

How the Children Think Their Parents Stand on Their Smoking or Not Smoking

The children's perception of parents' attitudes toward their smoking or not smoking is correlated in Table 9 with smoking or nonsmoking by children in grades 7 to 9 and grades 10 to 12 for the years 1964 and 1971.

We find relatively higher numbers of children who smoke when both mother and father approve, when the children feel that neither parent cares, and when the parents disagree about the child's smoking. The smallest relative number of smokers is found in the group in which both father and mother do not allow the child to smoke. Slightly more smokers are found when both parents are against their child's smoking, but have not clearly prohibited it. This is true for both 1964 and 1971.

Table 10 shows the parents' attitudes, as stated by their children, toward the children's smoking. Here, smoking and nonsmoking students are not grouped separately. Parents were seen as more tolerant of their children's smoking in 1971 as compared with 1964. This appears from their more frequent approval of smoking in 1971, their less frequent disapproval, and their not revealing to their children their feelings in the matter. The differences are statistically significant. This parental tolerance is more apparent toward the older children and especially toward the boys. "Both mother and father are against child's smoking," however, appears, rather surprisingly, to a

TABLE 5—Smoking Habits and Belief That Smoking is Harmful to Health among Students in Grades 7 to 9 and 10 to 12 in Toledo and Lucas County Public Schools, 1964 and 1971*

	Grades 7-9		Grades 10-12	
	1964	1971	1964	1971
Believed smoking is harmful to health				
Smokers				
Boys	72 (10.9)	164 (20.4)	122 (25.5)	182 (37.7)
Girls	44 (6.8)	169 (19.3)	77 (16.3)	168 (30.9)
Nonsmokers				
Boys	587 (89.1)	639 (79.6)	357 (74.5)	301 (62.3)
Girls	602 (93.2)	706 (80.7)	395 (83.7)	376 (69.1)
Subtotal	1,305	1,678	951	1,027
Did not state smoking harmful to health				
Smokers				
Boys	31 (51.7)	39 (50.6)	52 (64.2)	40 (74.1)
Girls	16 (25.8)	35 (44.9)	21 (38.9)	27 (50.0)
Nonsmokers				
Boys	29 (49.3)	38 (49.4)	29 (35.8)	14 (25.9)
Girls	46 (74.2)	43 (55.1)	33 (61.1)	27 (50.0)
Subtotal	122	155	135	108
Total	1,427	1,833	1,086	1,135

* Percentages are given in parentheses. In 1964 2,256 of 2,513 (89.8 per cent) believed smoking is harmful to health. In 1971 2,705 of 2,968 (91.1 per cent) believed smoking is harmful to health.

TABLE 6—Smoking by Parents*

	1964	1971
	%	
Fathers	66.3	45.6
Mothers	44.6	35.9

* Percentage of smokers among all parents of the same sex in the series.

greater extent, for girls in grades 10 to 12 than in grades 7 to 9, both in 1964 and 1971.

Smoking in Front of Parents

Even as early as the seventh and eighth grades youngsters smoke in front of their parents (Table 11).

The percentage of students who smoke in front of their parents increases by grade. The boys do so earlier than do girls. Girls hide their smoking from their parents to a greater degree all through the school years.

Opinions of the Influence of TV Presentations on the Students' Smoking Habits

Questions concerning the students' opinions as to the influence on them of radio and TV presentations, both promoting and opposing the use of cigarettes, appeared only on the 1971 questionnaire (Appendix A).

In Table 12 we find that 93 boys and 97 girls believed that the net effect of radio and TV programs, spots, and commercials had been to influence them in favor of smoking. These were predominantly seventh to ninth graders. Both smokers (constituting about 60 per cent of those who expressed such an opinion) and nonsmokers gave this answer. All of these nonsmokers previously had smoked and then quit.

Many students, 1,105 of them (512 boys, 593 girls), noted that radio and TV presentations had influenced them *against* smoking. Six hundred eighty (320 boys, 360 girls) of this number were in grades 7 to 9. About 10 per cent of the seventh to ninth graders and 25 per cent of the tenth to twelfth graders who gave this opinion were, however, still smokers. Fifty-six boys and 42 girls in all grades who said they had been influenced against smoking had quit.

A total of 1,673 students believed that TV programs and commercials *had not influenced them* in either direction. For smokers, both boys and girls, in grades 7 to 9 and grades 10 to 12 as well, this was by far the predominant answer.

Other Studies

Smoking among Adults

Many surveys on smoking habits and smokers' and nonsmokers' attitudes toward smoking have been performed over the years. Among them, *Characteristics of*

TABLE 7—Smoking Habits of Parents of Students in Grades 7 to 9 and 10 to 12 in Public Schools in Toledo and Lucas County, 1964 and 1971*

	1964						1971						
	Grades 7-9		Grades 10-12		Total		Grades 7-9		Grades 10-12		Total		
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
Fathers only smoke	211 (29.3)	219 (31.0)	195 (34.8)	192 (36.5)	406 (31.7)	411 (33.3)	256 (29.1)	239 (25.1)	158 (29.4)	181 (30.3)	414 (29.2)	420 (27.1)	
Mothers only smoke	73 (10.2)	74 (10.5)	52 (9.3)	50 (9.5)	125 (9.8)	124 (10.0)	105 (11.9)	115 (12.1)	59 (11.0)	82 (13.7)	164 (11.6)	197 (12.7)	
Both parents smoke	265 (36.9)	254 (35.9)	178 (31.8)	162 (30.8)	443 (34.6)	416 (33.7)	290 (33.0)	335 (35.2)	163 (30.4)	169 (28.3)	453 (32.0)	504 (32.5)	
Neither parent smokes	170 (23.6)	161 (22.7)	135 (24.1)	122 (23.2)	305 (23.8)	283 (22.9)	229 (26.0)	264 (27.7)	157 (29.2)	166 (27.8)	386 (27.2)	430 (27.7)	
Total	719	708	560	526	1,279	1,234	880	953	537	598	1,417	1,554	
													2,968

* Percentages are given in parentheses.

TABLE 8—Smoking Habits of Parents of Students in Grades 7 to 9 and 10 to 12 in Public Schools in Toledo and Lucas County and Smoking Habits of the Children, 1964 and 1971*

	Grades 7—9						Grades 10—12					
	1964			1971			1964			1971		
	Boys	Girls	NS	Boys	Girls	NS	Boys	Girls	NS	Boys	Girls	NS
Fathers only smoke	26 (12.3)	16 (7.3)	209	55 (21.4)	52 (21.8)	187	55 (28.2)	41 (21.4)	151	69 (43.7)	89	62 (34.3)
Mothers only smoke	13 (17.8)	5 (6.8)	69	26 (24.8)	28 (24.3)	87	20 (38.5)	10 (20.0)	40	25 (42.4)	34	31 (37.8)
Both parents smoke	48 (18.1)	27 (10.6)	227	87 (30.0)	92 (27.5)	243	69 (38.8)	31 (19.1)	131	79 (48.5)	84	66 (39.1)
Neither parent smokes	16 (9.4)	12 (7.5)	149	35 (15.3)	32 (12.1)	232	30 (22.2)	16 (13.1)	106	49 (31.2)	108	36 (21.7)
Total	103 (14.3)	60 (8.5)	648	203 (23.1)	204 (21.4)	749	174 (31.1)	98 (18.6)	428	222 (41.3)	315	195 (32.6)

* Percentages in this table (in parentheses) are derived by comparing the number of smokers to the population in that subgroup. S, smokers; NS, nonsmokers.

*Smokers and Nonsmokers in Tecumseh, Michigan*⁹ by Payne et al. is of particular interest since it describes the smoking habits in 1959–1960 of a population in a community adjacent to Northwestern Ohio (Table 13).

Sixty per cent of all men and 34 per cent of all women in Tecumseh were cigarette smokers in 1959–1960. There were more smokers, both among men and women, in the age group 30 to 49 than earlier and later in life. Among teenagers (16 to 19) 41 per cent of the boys and 22 per cent of the girls smoked.

Figures for 5 years later were published by the U.S. Department of Health, Education, and Welfare in its *Chart Book on Smoking, Tobacco and Health*.¹⁰ A 1965 national survey found 51 per cent of men and 34.7 per cent of women to be smokers, and 19 per cent of men and 8 per cent of women ex-smokers (Figure 2).

From the National Conference on Smoking and Health of 1970 we obtain a 4-year comparison of smoking habits in the United States¹¹ (Table 14).

Among both men and women a lower percentage of smokers was found in 1970 than in 1966: 51.9 per cent of men and 33.7 per cent of women smoked in 1966, in 1970 these percentages were 42.0 and 31.0, respectively. In 1971, however, the U.S. Department of Agriculture reported that the per capita cigarette consumption reversed its 4-year downward trend and rose by 2 per cent over 1970 to 202 packs per American age 18 or over.¹²

Smoking among Schoolchildren

Horn and colleagues,⁴ surveying Portland, Oregon, high school students in 1958, found 30 per cent of the boys, ranging from 18 per cent in grade 9 to 40 per cent in grade 12, and 17 per cent of the girls, ranging from 6 per cent in grade 9 to 31 per cent in grade 12, to be smokers (Table 4).

Ten years later, in 1968, the National Clearinghouse for Smoking and Health commissioned a survey conducted by telephone of 4,414 boys and girls from ages 12 through 18 (approximately 315 of each sex at each age).¹³ The percentage of smokers ranged from 1.3 of boys and 0.3 of girls at age 12 to 35.5 of boys and 21.3 of girls at age 18 with an overall percentage of 14.7 of boys and 8.4 of girls.

Repeated 2 years later, with approximately 185 telephone interviews of each sex and age, the survey showed that “teenage smoking increased for both sexes and at every age level.” “Current regular smokers” among boys rose from 14.7 per cent of 1968 to 18.5 per cent, and among girls from 8.4 per cent to 11.9 per cent. For girls ages 15 to 16 the 1968 rate of 9.7 per cent rose to 14.4 per cent in 1970; the increase for boys was small. The greatest absolute increase took place among boys of 17 and 18—from 30.2 per cent in 1968 to 37.3 per cent in 1970.

In 1959, Salber et al.⁷ surveyed 3,449 boys and 3,361 girls in grades 7 to 12 in Newton, Massachusetts. This survey found that 26.7 per cent of all boys, ranging from 6.8 per cent in grade 7 to 45.6 per cent in grade 11, were smokers. Of the girls, 21.2 per cent were smokers: the ranges were from 1.1 per cent in grade 7 to 54.7 per cent in

TABLE 9—The Child's Evaluation of the Parents' Attitudes toward the Child's Smoking (if a Smoker or Not) and the Smoking Habits of the Child*

	Grades 7-9												Grades 10-12											
	1964				1971				1964				1971											
	Boys		Girls		Boys		Girls		Boys		Girls		Boys		Girls									
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS								
Both mother and father approve smoking for the child	9 (33.3)	18 (22.2)	2 (7.1)	7	19 (54.3)	16	22 (59.5)	15	28 (53.8)	24	17 (45.9)	20	57 (67.1)	28	26 (65.0)	14								
Both mother and father are against child's smoking	38 (13.5)	243 (7.1)	17 (7.1)	224	47 (15.1)	265	44 (14.7)	255	53 (25.0)	159	26 (14.1)	159	52 (32.1)	110	40 (19.0)	171								
Both mother and father would not allow child to smoke	11 (5.2)	200 (4.9)	13 (4.9)	255	33 (12.5)	232	37 (12.5)	258	2 (2.4)	83	10 (7.8)	118	15 (24.6)	46	16 (15.5)	87								
Disagreement Between parents	24 (20.3)	94 (16.5)	18 (16.5)	91	55 (47.0)	62	66 (37.3)	111	51 (45.9)	60	28 (25.7)	81	67 (49.5)	68	78 (51.3)	74								
Child feels that neither parent cares	2 (20.2)	8	3 (23.0)	10	11 (50.0)	11	8 (44.4)	10	20 (55.5)	16	8 (42.1)	11	15 (42.9)	20	16 (66.6)	8								
Child feels as if he or she does not know the parents' feelings about smoking	19 (26.4)	53 (10.3)	7 (10.3)	61	38 (29.5)	91	27 (21.3)	100	20 (31.3)	44	9 (18.8)	39	16 (27.1)	43	19 (27.9)	49								

* Percentages in this table (in parentheses) are derived by comparing the number of smokers to the population in that subgroup. S, smokers; NS, nonsmokers.

grade 12. The preponderance of boy over girl smokers diminished in successive grades until the percentage of girl smokers in grade 12 exceeded that of boys (54.7 per cent to 45.5 per cent).

In 1967, the American Cancer Society, Chicago Unit, studied smoking in the Chicago public schools,⁸ with responses from 222,560 students in grades 4 to 12. In grades 9 to 12 it reported a 34 per cent incidence of smoking among the boys and 27 per cent among the girls. There was more smoking among both the boys and girls in Chicago than in Portland and significantly more among the girls (Table 4).

Much lower percentages were found in a 1965 survey by Palmer¹⁴ of 3,112 junior high school students in rural South Dakota and Iowa. Among boys in grades 7, 8, and 9 the percentages of smokers were 6.5, 6.1, and 12.3, respectively, and among girls 0.6, 2.2, and 3.3.

"Rural" appears to be the key to this favorable finding. As the *Chart Book on Smoking, Tobacco, and Health*¹⁰ reported, based on a 1965 survey, "Fewer people who live on farms smoke than those who live in metropolitan areas. The difference is particularly striking among women; only about 16 per cent of the women who live on farms smoke, contrasted with 36 per cent of the women who live in metropolitan areas. Among men, the comparable figures are 45 and 51 per cent." The surveys from the National Clearinghouse¹³ showed that "Girls living in metropolitan areas are more likely to smoke than those in non-metropolitan areas." For boys, "this difference is not statistically significant. . . ."

Perception of Health Dangers of Smoking

What do schoolchildren believe about the hazards to health from cigarette smoking? Of the 8,272 Cincinnati seventh and eighth graders whom Streit¹⁵ studied in 1966, 98 per cent said they knew smoking contributed to lung cancer and chronic lung disease; and 65 per cent believed it contributed to heart disease and hardening of the arteries. Did this knowledge influence them not to smoke? Approximately 75 per cent answered that it did.

In both National Clearinghouse surveys¹³ (1968 and 1970) of teenage smoking, the great majority of schoolchildren agreed that smoking is harmful to health. Answering "Yes," "No," and "Don't know," respectively, were 92.0 per cent, 4.0 per cent, and 4.0 per cent of all boys; 93.1 per cent, 3.7 per cent, and 3.2 per cent of all girls.

A national study of 1,562 teenagers conducted in 1969 for the American Cancer Society by Lieberman Research, Inc.,¹⁶ reported that 65 per cent of smokers and 86 per cent of nonsmokers believed that cigarette smoking is a cause of cancer, and 52 per cent of smokers and 71 per cent of nonsmokers replied that it was "definitely or probably true" that smoking triples the chance of a heart attack.

Since schoolchildren have such a strong belief in the harmful effects of smoking, why is smoking so prevalent? Very likely, because the threats seem so far in the future.

TABLE 10—The Children's Evaluation, 1964 and 1971, of the Parents' Attitude toward the Child's Smoking (if a Smoker or not)

	1964						1971					
	Grades 7-9		Grades 10-12		Total		Grades 7-9		Grades 10-12		Total	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Both mother and father approve smoking for the child	27 (3.8)	9 (1.3)	52 (9.3)	37 (7.0)	79 (6.2)	46 (3.7)	35 (4.0)	37 (3.9)	85 (15.8)	40 (6.7)	120 (8.5)	77 (5.0)
Both mother and father are against child's smoking	281 (39.1)	241 (34.0)	212 (37.9)	185 (35.2)	493 (38.5)	426 (34.5)	312 (35.5)	299 (31.4)	162 (30.2)	211 (35.3)	474 (33.5)	510 (32.9)
Both mother and father would not allow child to smoke	211 (29.3)	268 (37.9)	85 (15.2)	128 (24.3)	296 (23.1)	396 (32.1)	265 (30.1)	295 (31.0)	61 (11.4)	103 (17.6)	326 (23.0)	398 (25.7)
Disagreement between parents	118 (16.4)	109 (15.4)	111 (19.8)	109 (20.7)	229 (17.9)	218 (17.7)	117 (13.5)	177 (18.6)	135 (25.1)	152 (25.4)	252 (17.8)	329 (21.2)
Child feels that neither parent cares	10 (1.4)	13 (1.8)	36 (6.4)	19 (3.6)	46 (3.6)	32 (2.6)	22 (2.5)	18 (1.9)	35 (6.5)	24 (4.0)	57 (4.0)	42 (2.7)
Child feels as if he or she does not know the parents' feelings about smoking	72 (10.0)	68 (9.5)	64 (11.4)	48 (9.1)	136 (10.6)	116 (9.4)	129 (14.7)	127 (13.3)	59 (11.0)	68 (11.4)	188 (13.3)	195 (12.6)
Total	719	708	560	526	1279	1234	880	953	537	598	1417	1551
												2968

TABLE 11—Do Students Smoke in Front of Their Parents?*

Response and Year	No. in Grade												Total
	7		8		9		10		11		12		
	B	G	B	G	B	G	B	G	B	G	B	G	
Smoke in front of parents													
1964	11	2	11	5	22	7	44	15	38	26	54	22	257
1971	20	8	12	9	29	27	47	26	49	34	49	31	341

* B, boys; G, girls.

TABLE 12—Have Radio and TV Programs and Commercials Influenced the Students' Ideas about Smoking? (1971)*

Response	Grade	Boys		Girls	
		S	NS	S	NS
Believe that radio and TV programs and commercials have influenced him or her in favor of smoking	7-9	40	28	39	45
	10-12	18	7	7	6
Believe that radio and TV programs and commercials have influenced him or her against smoking	7-9	33	287	37	323
	10-12	45	147	47	186
Does not believe that radio and TV programs and commercials have influenced him or her either way	7-9	33 (26.4)	362	128 (25.1)	381
	10-12	159 (49.7)	161	141 (40.1)	211

* Percentages in this table (in parentheses) are derived by comparing the number of smokers to the population in that subgroup. S, smokers; NS, nonsmokers.

Children's Smoking Habits as Related to Their Parents'

In 1961 Salber and MacMahon,¹⁷ studying 2,823 high school students, found 51 per cent of the boys and 13 per cent of the girls to be smokers when both parents smoked, and 25 per cent of the boys and 4 per cent of the girls to be smokers when neither parent smoked. When only one parent smoked the percentages fell between those of the other two categories. The incidence of smoking by the child, whether boy or girl, did not appear to be related, when only one parent smoked, to the smoker's being the father or the mother.

In a study of 251 undergraduate men and women and their parents, Wohlford¹⁸ found that the smoking behavior of the sons was directly related to that of their fathers in intact families. "The mother and daughter smoking patterns," however, "remained enigmatic."

Studying 3,112 rural junior high school students in 1965, Palmer¹⁴ found only four instances of boys smoking regularly whose fathers were nonsmokers, and none whose

parents were both nonsmokers. Of boys who smoked, 53.9 per cent reported both parents as smokers; for girls who smoked, the figure was 58.9 per cent.

The survey of Lieberman Research, Inc.,¹⁶ reported parental smoking as a determinant of the children's smoking but following in importance smoking by friends and then older siblings. Parental smoking, it was found, was less significant than rapport with parents in determining whether the child smoked. "A teenager is less apt to smoke if he has good rapport with his parents and they smoke than if his parents don't smoke, but he has bad rapport with them." (Similarly, bad rapport with parents has been stressed as a major determinant in the use of marijuana by teenagers.¹⁹)

Parents' Attitudes toward Children's Smoking

So much for the parents' examples. What of their precepts? There have been a number of studies of the attitudes of parents toward their child's smoking, as well as what the child perceives the parents' attitudes to be. Of the

TABLE 13—Smoking Habits by Age and Sex, Tecumseh, 1959—1960*

Smoking Class	Men at Age										Women at Age									
	16-79	16-19	20-29	30-39	40-49	50-59	60-69	70-79	16-79	16-19	20-29	30-39	40-49	50-59	60-69	70-79				
Numbers																				
Nonsmokers	360	88	77	59	51	33	33	19	1439	156	275	310	217	226	156	99				
Ex-smokers	334	31	48	78	60	52	40	25	293	30	85	71	60	23	15	9				
Cigarette smokers	1426	78	279	463	302	196	75	33	910	52	225	324	197	77	24	11				
Pipe and cigar smokers	268	5	44	73	49	45	29	23	—	—	—	—	—	—	—	—				
Total	2388	202	448	673	462	326	177	100	2642	238	585	705	474	326	195	119				
Percentages																				
Nonsmokers	15	44	17	9	11	10	19	19	54	66	47	44	46	69	80	83				
Ex-smokers	14	15	11	12	13	16	23	25	11	13	15	10	13	7	8	8				
Cigarette smokers	60	39	62	69	65	60	42	33	34	22	38	46	42	24	12	9				
Pipe and cigar smokers	11	2	10	11	11	14	16	23	—	—	—	—	—	—	—	—				
Total	100	100	100	101	100	100	100	100	99	101	100	100	101	100	100	100				

* From Payne et al.⁹

Cincinnati pupils Streit¹⁵ studied, only 15 per cent said that their parents approved of their smoking; 23 per cent said they didn't know what their parents thought.

In 1968, Clausen²⁰ reported from his Oakland, California, study that "almost no parents" approved the teenager's smoking. Fewer than one-fifth did not mind whether their teenage children smoked. Definite objections by parents, he found, were much more frequent to smoking by daughters than by sons.

In his South Dakota and Iowa study, Palmer¹⁴ asked junior high school students to tell whether their parents approved or would approve of their smoking. Of nonsmoking boys 0.5 per cent indicated such approval, 97.0 per cent disapproval; 1.3 per cent of nonsmoking girls indicated approval, 97.1 per cent disapproval. For boys who smoked regularly the corresponding figures were 16.2 per cent and 81.0 per cent; and for girls smoking regularly, 25.8 per cent and 74.1 per cent.

An interesting turnabout: Lieberman Research, Inc.,¹⁶ asked teenagers over the nation how they would feel about their own children smoking. Eighty-six per cent felt that they would disapprove.

Smoking in the Presence of Parents

In a study of New Zealand high school students, Newman et al.²¹ reported in 1970 the percentages of smokers who smoked in the presence of either parent. For boys this ranged from 15.1 per cent in the first year up to 36.5 per cent in the third; for girls, from 20.5 per cent in the first year to 55.9 per cent in the fourth.

Effects of Radio and TV Presentations

What of young people's opinions of the influence of radio and television programs, commercials, and spots about smoking? The Lieberman survey¹⁶ stated, "In the first four weeks, teenagers report seeing or hearing an average of 8.9 anti-cigarette spots, compared with 30.5 pro-cigarette spots. Thus, teenagers are getting exposed to both sides of the issue, but they are seeing or hearing more than three times as many spots supporting the cigarette habit as they see or hear attacking the habit.

"Interestingly, the actual pro-to-anti ratio is probably about six to one, while according to teenagers' recall the ratio is closer to three to one. This suggests that the anti-cigarette spots are getting through to and are penetrating teenagers' minds with greater impact than their sheer frequency would warrant, relative to pro-cigarette spots on the air."

O'Keefe²² reported in 1971 a survey of Florida students and adults. Nearly 70 per cent of the nonsmokers and 52.3 per cent of the smokers thought the antismoking messages were effective. Of the students who smoked, 34 per cent said the messages had led them to smoke less. Similarly, 34 per cent said that they thought more about the ill effects of smoking than before, and 22 per cent said the spots had influenced them to stop smoking temporarily.

Many people had looked forward to the end of

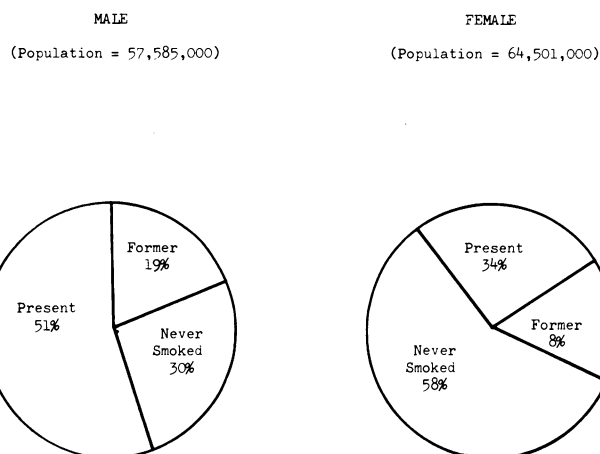


FIGURE 2 Characteristics of present smokers.^{1 0}

cigarette commercials on January 1, 1971, as leading to a decrease in smoking. When cigarette sales rose sharply in 1971, some, including the Department of Agriculture, attributed the rise chiefly to the falling off of antismoking messages that had been required to be broadcast under the Federal Communications Commission's "equal time" regulation. A Justice Department official even suggested that Congress might serve the nation's health better by repealing the ban on cigarette advertising to force equal time for antismoking messages.^{2 3}

Discussion

Smoking by parents, as reported by their children, fell sharply among mothers as well as fathers during the time between our two surveys (1964 and 1971). The decline in smoking among women runs counter to the national trend.^{2 4} We do not know why it occurred in and about Toledo in the face of an upturn over the country.

But the striking and discouraging finding of our surveys is the steep rise in smoking by children, particularly the girls—fast catching up with the boys (and actually overtaking them in grades 8 and 9 in 1971). This prevalence of smoking among the young constitutes an epidemic—a growing epidemic. In 1971 fewer girls belonged to the "never smoked" group than in 1964. Fewer boys discontinued smoking in 1971. Relatively more of the girls did stop after having started, but not enough to prevent an overall increase among them.

We cannot say that our efforts have failed entirely, for without them, very possibly the climb in smoking among schoolchildren would have been even more pronounced. But, as Godber^{2 5} says of the campaign against "smoking diseases" in his native England, "the successes we have achieved . . . are pitifully small."

What can be done? Horn's^{2 6} advice is sound: ". . . one must work to reduce both adult and teenage smoking simultaneously and with equally vigorous efforts, since they strongly influence each other."

Education to the health hazards of smoking is not enough, as our findings, and those of others cited, show. A high percentage of youngsters believe that cigarette smoking can cause lung cancer, emphysema, heart disease, etc.—and still they smoke. Michelson^{2 7} states, "The young person is not deterred from smoking by fears or threats regarding illness or death," but he adds that children are "concerned about the possibility of illness and death of their parents."* How often have we encountered a father who stopped smoking after his child repeatedly cautioned, "Better put it out, Dad. You'll get cancer!"

A new approach is needed. The present trend to start education in earlier years seems highly desirable. The New York State Curriculum Guide^{2 8} recommends that teaching about smoking and health begin in the fourth grade. Along with the emphasis on the hazards to health, there must be, as the Dublin study⁵ stresses, effort "to give students an orientation towards positive health habits so that they realize they have a duty to develop and maintain their potentiality for physical and mental well-being."

The results of innovative educational approaches, such as the campaign of the American Cancer Society based on the work of the Creative Advertising Workshop at the University of Michigan, will bear watching.^{2 9} This rejects common approaches directed at adult, addicted smokers; it rejects, too, scare techniques and preaching. Among other ways, it attempts "to reach teenagers by recognizing their ability to see through phoney approaches and appreciate well-directed satire and sarcasm." It "identifies teenage non-smokers as beautiful people, people in love, happy people doing ordinary things"—an atmosphere in which cigarettes are incongruous. It points out to the teenager "the absurdity of cigarettes and of the smoking habit." It stresses the generation gap: smoking is an old-fashioned practice belonging to the older generation.

Another innovation is the Berkeley Project^{3 0} directed by Richard L. Foster, EdD, which attempts to teach children, especially those in grades 5, 6, and 7, "a belief in their body as a beautiful system. And that no one should abuse that system by smoking, drugs, or anything else damaging."

More important than any organized educational attempts to influence the young, we believe, are redoubled efforts, on a person-to-person basis, of the various groups of key adults most able to change young people's behavior.

* Withdrawal clinics, even if feasible on a large scale, appear to be no answer to children's smoking, in Michelson's experience,^{2 7} in which 35 students signed up for a clinic at a Maryland high school in 1964. Those attending gradually decreased, until only two remained in the last session. Just one child had stopped smoking then, and "probably has resumed." Similarly, Salber et al.³ report withdrawal clinics for teachers as unsuccessful. As in other approaches to smoking control, some may well succeed here where others have failed. Something can be learned from both successes and failures.

Quoting Salber,³¹ "The demonstration of the extent to which the fate of their children lies in adult hands may convince adults to take preventive action they might not be willing to take for their own benefit."

One such group of adults certainly is the parents. Our study indicates how important their examples and precepts are on their children. Their greater permissiveness appears to be a significant factor in the upturn of smoking, as in the related surge of drug abuse and alcohol use.* Rapport of parent with child is a central factor in stemming all three, but this is more easily prescribed than accomplished.

The role of the teacher in influencing children not to start smoking or to give it up can be great, but the poor example of a teacher's being seen—or even known—to smoke can undo all his effectiveness. Such a view is widely expressed. Leedham³² says, "A convinced, dedicated teacher can, in so many ways, build up the favorable image of the non-smoker. But for this task the teacher must be a non-smoker, since by example alone can he or she impart conviction. . . . To the young mind, insincerity can be devastating. . . ." And Hamburg³³ states, "Students who feel that school personnel really care about whether they start to smoke or not are probably less apt to start. A teacher's concern for the well-being of the students, if it is sincere and not a moral judgement, probably has more effect on young people than is appreciated." "Do as I say, not as I do' does not have much educational power. And neither does 'I wish I had never started,' or 'If I had known when I was your age.'"

For this role in influencing students both by persuasion and example, the teacher must be kept informed of the facts of smoking and health. Antismoking groups in the community can help sustain his or her motivation; the parent-teacher groups should have an important place in this effort.

The Lieberman survey¹⁶ reported that "young people might resist beginning the cigarette habit, or could more easily stop it, if figures of authority and influence such as teachers and physicians set better examples and urged them not to smoke." Physicians have set an excellent example, having given up smoking in great numbers. As the well known poster attests, "100,000 Doctors Have Quit Smoking." But all too often physicians do not speak out emphatically to their patients. "The trouble with doctors," it has been said, "is that they don't preach what they practice!" Of the nonsmokers among teenagers surveyed by Lieberman Associates, Inc.,¹⁶ 72 per cent said physicians were the one group that could persuade them not to start smoking; of the smokers, 42 per cent said that advice from a physician would influence them to stop.

General practitioners, internists—in fact, all physicians—can contribute greatly to the antismoking effort. This is especially true for obstetricians and pediatricians. Obstetricians have a key role in ministering to two lives since when mothers smoke there is strong evidence of an

* A reasonable but undocumented theory is that parents these days may ignore their children's cigarette smoking, being so thankful that they are not using marijuana and heroin.

TABLE 14—A 4-Year Comparison of Smoking Habits in the United States*

	Men		Women	
	1966	1970	1966	1970
	%			
% who had ever smoked	75.5	75.3	43.2	45.8
% of these continued smoking	68.7	55.7	78.0	66.4
% of all men or women smoked	51.9	42.0	33.7	31.0
% who smoked 30+ cigarettes/day	29.2	27.0	15.5	14.5

* From Streit.¹¹

increased incidence of spontaneous abortions, stillbirths, and infant deaths in the first month of life.³⁴ Pediatricians play a vital part in influencing the child against taking up the smoking habit and in protecting the respiratory tract of the infant against the now recognized ill effects of smoke from the mother's cigarette—perhaps the most emphatic example of "the rights of the nonsmoker." Pointing out the harm she does to her small child can be a very effective inducement to a woman to stop smoking.

To these three adult groups three others are added—the dentist, nurse, and athletic coach. With growing knowledge of the harm that cigarette smoking does to the teeth and gums, the dentist has a strong stake in antismoking; many dentists have done vigorous and effective work with their patients.

The nurse is in a strategic position to influence people against smoking in the physician's office, in the hospital and clinic, in the school, and in industry, but the success of antismoking pressure on the nurse herself so far has not appeared impressive.

The athletic coach, among the first of antismoking advocates, from his early first hand observations of the deleterious effects of "coffin nails" on athletic performance, can do great good. With the possible exception of health educators, no group is so convinced of the harm cigarettes do as are athletic coaches. Morris and Tichy³⁵ found that 99 per cent of the athletic coaches surveyed in Oregon in 1970 believed smoking harmful to health. In a similar survey³⁶ conducted in the Toledo area in 1969, 99 per cent of the coaches expressed this same belief. (Their practices coincided well with their belief: 80 per cent said they smoked no cigarettes at all. Only 6 per cent reported smoking more than one pack a day.)

To these adult person-to-person persuaders we should add another group, found in a national survey¹⁶ to be first among the determinants of a teenager's smoking. These are the peers, the child's friends and associates. Were it possible to mobilize leaders of the peer group as an antismoking force, they could become as effective for good as they may be for ill.

What can be accomplished when a highly organized antismoking effort, involving forces from the whole community and having federal support, vigorously takes up battle against cigarettes, using measures such as we have noted? Such a community is San Diego, California, and the

TABLE 15—Incidence of Smoking among Students, San Diego, 1967 and 1971

Grade	Boys		Girls	
	1967	1971	1967	1971
	%			
7	16.9	9.5	10.0	12.2
8	17.5	13.5	11	19.2
9	25.2	16.8	18.5	22.0
10	31.8	19.7	20.6	22.8
11	32.7	24.7	31.1	25.4
12	34.7	28.8	29.3	25.3

figures in Table 15 indicate the incidence of smoking among boys and girls in grades 7 through 12 in 1967 and 1971.³⁷ The reduction seen in the boys' smoking is impressive (when Toledo area boys were smoking more), but, except in the eleventh and twelfth grades, smoking among girls had increased.

It is evident that we must redouble our efforts in the best ways we know how against "the greatest preventable cause of illness, disability and premature death in this country."³⁸ Some day, no doubt, there will be better armaments—"safe cigarettes" perhaps; some effective medication; some totally unexpected breakthrough.*

ACKNOWLEDGMENTS

We acknowledge the financial support and staff participation of the Northwestern Ohio Regional Medical Program and of the Inter-Agency Committee on Smoking and Health of Toledo and Lucas County. We thank the Toledo and Lucas County schools and the Toledo and Lucas County Health Departments for their cooperation in making these surveys possible. To the following we express particular gratitude: Mr. James Felkey, Miss Magda Hinojosa, Mr. Richard Honner, Mr. William Jacob, Mr. George Nimmo, Mr. C. H. John Padrutt, Mrs. Charlotte Richards, Martin Welch, MD, and William Wiersma, Jr., EdD.

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* Even now there is one measure of perhaps explosive potential, especially in the less inhibited climate of today's society, against smoking among adults and older children—making known the adverse effects of smoking on sexual functioning, as indicated by Ochsner.³⁹

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APPENDIX A

SMOKING HABITS AND ATTITUDES SURVEY

INTERAGENCY COMMITTEE ON SMOKING AND HEALTH OF TOLEDO AND LUCAS COUNTY

NORTHWESTERN OHIO ACTION ON SMOKING AND HEALTH

School Identification _____

School Grade 6-7-8-9-10-11-12-SP.ED. (Circle one) Age _____ Sex: Male _____ Female _____

A. CHECK ONE STATEMENT (and only one) THAT BEST DESCRIBES YOUR SMOKING HABITS AT PRESENT.

1. () I have NEVER SMOKED.
2. () I have tried smoking but ONLY to see what it is like. I do not smoke at present.
3. () I used to smoke at least one day a week, but I quit.
4. () I do not smoke every day, but I do smoke at least ONE DAY A WEEK.
5. () I smoke cigarettes just about every day, but less than half a pack a day.
6. () I smoke half a pack or more of cigarettes just about every day.

B. AT WHAT AGE DID YOU SMOKE YOUR FIRST CIGARETTE: Age _____ Never Smoked _____

C. DO YOUR PARENTS SMOKE? (Check one)

Father only (1) Mother only (2) Both Parents (3) Neither Parent (4)

D. Check YES or NO on the following questions.

1. Do you approve of boys smoking? yes _____ no _____
2. Do you approve of girls smoking? yes _____ no _____
3. Do you smoke in mixed company? yes _____ no _____
4. Do you smoke in front of your parents? yes _____ no _____

E. HOW DO YOUR PARENTS FEEL ABOUT YOUR SMOKING? (If you don't smoke, how would they feel if you did smoke?) (Check one)

	<u>Mother</u>	<u>Father</u>
1. Approve. All right.	_____	_____
2. They are against it.	_____	_____
3. They would not allow me to smoke.	_____	_____
4. They don't care.	_____	_____
5. I don't know.	_____	_____

F. I DON'T SMOKE BECAUSE: (Check one)

1. () It will harm my health.
2. () I don't want to get the habit.
3. () It doesn't look good.
4. () It's too expensive.
5. () I don't get any enjoyment out of it.
6. () It's a challenge to show others I don't.

G. I SMOKE BECAUSE: (Check one)

1. () I enjoy it.
2. () Smoking relaxes me.
3. () It has become a habit.
4. () I want to be part of the crowd.
5. () It helps me feel grown up.
6. () It helps me defy or disobey Adults.
7. () It helps me show off.

H. OTHER YOUNG PEOPLE SMOKE BECAUSE: (Check one)

1. () They enjoy it.
2. () Smoking relaxes them.
3. () It has become a habit.
4. () They want to be part of the crowd.
5. () It helps them feel grown up.
6. () It helps them defy or disobey Adults.
7. () It helps them show off.

I. AT THE PRESENT TIME: I SMOKE _____ I DO NOT SMOKE _____

J. I DO _____, DO NOT _____ believe that cigarette smoking causes lung cancer, heart disease, and other chest diseases.

APPENDIX A—Continued

- K. I COULD _____ COULD NOT _____ be persuaded to give up smoking.
- L. RADIO AND TV PROGRAMS AND COMMERCIALS HAVE INFLUENCED MY IDEAS ABOUT SMOKING.
Yes _____ No _____
- If answer is yes, check below
- They have influenced me in favor of smoking. _____
- They have influenced me against smoking. _____

A PROJECT OF
THE NORTHWESTERN OHIO REGIONAL MEDICAL PROGRAM

4/19/71

CELL CULTURE CENTER

A remodeled candy factory in Cambridge, Massachusetts, now houses a production facility run by men and women in white laboratory coats.

Instead of producing chocolates, they're growing cells and viruses—millions, even billions of them—in rows of bottles filled with sterile solutions consisting of various salts, water, nutrients, and blood serum.

This precious harvest goes to researchers throughout the northeastern United States who lack facilities to grow the large quantities of cells and viruses they need for studies in basic cell biology.

The Cell Culture Center at the Massachusetts Institute of Technology, established and funded by the National Science Foundation, is one of two such facilities in the United States. (The second, at the University of Alabama, will be in operation in the near future.)

The Center is headed by Dr. P. W. Robbins, professor of biochemistry in the MIT Department of Biology, and Dr. Richard L. Davidson of the Harvard Medical School, and is operated under the direction of Mr. Don Giard. It is located in the Seeley G. Mudd Building at 40 Ames St., a former candy factory, which also houses the Arteriosclerosis Center and the MIT Center for Cancer Research.