

Nonsmoking clubs were established and had their own newspaper. In addition, a booklet of programmed instruction for teachers was developed (42).

Youth-to-Youth Programs

These programs focus on peer influence; typically, high school students carry on antismoking activities with elementary or junior high school students. Although some of these programs reach relatively few elementary pupils (e.g., 22, 49, 53, 72, 85), others are very widespread, reaching 10,000 to 20,000 students (73, 80). One program that includes plans for a systematic follow-up was reported by McAlister, et al. This California program is designed to help young people resist peer group and advertising pressures. At the 3-month follow-up, twice as many in the control group as in the experimental group reported smoking occasionally. The investigators plan to follow the participants for at least 2 years (72). In Broome County, New York, data were gathered from 10,000 fifth- and sixth-graders before the program was begun. Teams of high school students, each responsible for its own format, visited 71 elementary schools, reaching approximately 10,000 students. Favorable comments on the program were received from fifth- and sixth-graders, principals, teenagers, and community groups. No objective data, however, were reported on the effectiveness of the program (73). In a program that began in Philadelphia in 1968—Students Concerned with Public Health—32 low-income students created, produced, and performed puppet shows for fourth-, fifth-, and sixth-grade pupils. When this group graduated in 1971, the program continued with 130 10th-grade students who planned to spend 3 years in the program. During the 1970-71 school year alone, the program reached 20,665 pupils in 28 public and 11 parochial schools. No evaluation data were reported (80).

Programs Involving Physicians

Harlin has suggested that school physicians take time to work with teachers and pupils since physicians know more about the health consequences of smoking (47). In Israel physicians visit interested high schools, lecture on cancer and the hazards of smoking, and distribute colorful antismoking material (12). In Ireland, on the basis of a survey of Dublin school children, recommendations for health education were made to general practitioners who were doctor-educators. Much of the emphasis was on health hazards, including immediate effects (decrease of "prowess at games") and long-term effects (parents are at high risk if they smoke) (86). In Boston, a group of cancer research workers volunteers its services in the public schools. Seven years after the beginning of the program, 20 active members make about 50 talks a year and show films at school assemblies. The results of a question-

naire, filled out by approximately 3,400 seventh- and eighth-grade pupils 4 to 12 weeks after one assembly, indicate that 29 percent of current smokers had quit (94). One of the earliest long-term antismoking programs began in 1959 with high school freshmen in King City, California. Each year for 5 years, six 50-minute periods of instruction by two volunteer physicians were conducted during a 2-week period. Smoking increased every year from 1960 to 1964. It was thought that these teenagers were simply reflecting a nationwide trend of increased smoking among teenagers. Also, the authors felt that efforts would be better directed toward a younger group (9).

Approximately 10,000 secondary and grammar school children in four areas of southeast England were divided into experimental and control groups. Each of the experimental classes received a visit from a team of the Central Council of Health Education who used posters, flannelgraphs, and discussions. The authors concluded that the "scheme had disappointingly little effect on the smoking habits of children" (52).

Several field studies have been conducted with relatively few subjects. Examples are: Sadler's 1969 study of 130 pupils in sixth-grade classes, where, in the experimental condition, physicians visited classes twice within a 4-week period (97); Estrin's 2-week project in 1965 that used experiments, films, posters, and exhibits (35); and the work of Jefferys and Westaway in 1961 with six classes in the third form (average age, 13 years and 9 months), using exhibits, talks, and films (63). In general, little or no differences were found between the experimental and control groups.

Programs with Evaluation Components

The programs described in this section differ from those above in that they have strong evaluation components, with control groups as well as experimental groups.

In most of these programs, a simple comparison is made between experimental schools with antismoking programs and control schools without such programs. A notable exception is Horn's early study (1959) in the Portland schools (55). Schools were assigned to take part in one of five experimental conditions or in a control condition. The five experimental approaches involved mass communication messages emphasizing: (1) the remote effects (health hazards) of smoking, (2) the current meaning of smoking, (3) the two sides of the smoking issue, (4) authoritative stands on the issue, and (5) the assuming of an adult role and trying to dissuade parents from smoking. Evaluation was based on questionnaire responses at the beginning of the school year compared with those at the end of the school year. In the remote effects (or health hazards) group there was a reduction in recruitment rate compared with that of the control group. Recruitment rate was obtained by subtracting the percentage of smokers in the pretest from

the percentage of smokers in the post-test and dividing by the percentage of nonsmokers in the pretest. No other experimental condition showed a significant difference when compared with the control condition (66). This study was replicated as a part of the University of Illinois smoking studies (see below).

The pattern of testing several hypotheses against a control group has not been repeated in most field studies, but several studies have attempted to test a single hypothesis. For example, Botvin, et al. are presently testing a model with 8th-, 9th-, and 10th-graders based on "Life Skills Training" (LST); this includes information on smoking knowledge, self-image, dating skills, and so on. Comparisons between pretest and post-test findings "indicate substantial differences between experimental and control groups." The LST strategy apparently reduced the incidence of new smoking, but the absence of follow-up data leaves the results inconclusive (15).

In 1971 Fodor and Glass tested a sixth-grade curriculum based on the immediate effects of smoking, and found differences in knowledge between experimental and control groups. Few of the sixth-graders were smokers (40).

A health program conducted with approximately 3,000 school children aged 11 to 14 in Westchester County, New York, and New York City involves a medical screening program with feedback. The "Know Your Body" program consists of (1) health screening, (2) return of results, and (3) education. The health program "seeks to capitalize on students' personal knowledge of their own risk factors." Students, teachers, and parents are involved in the program. Results of the effectiveness of the program have not been reported, but plans are indicated for follow-up "over the next several years" (107). Pupils in grades 7 through 9, in 36 randomly selected classes, were administered questionnaires prior to and 6 months after the completion of a smoking education program in half the schools. The content of the course and the methods used are not described, except that "after a comprehensive orientation meeting, teachers were provided throughout the project's course with guidance from consultants and resource persons and computerized documentation sources and planning aids." Changes in knowledge and attitudes, but not in smoking behavior, were greater for the experimental than for the control group (90). A study of the teachers and parents showed significant changes in smoking behavior (91).

The Saskatoon Smoking Study, started in the fall of 1968, is a student-directed program in smoking education in the Saskatoon Rural Health Region of Canada. Eighth-grade opinion leaders in each of the test schools were identified by a sociometric questionnaire, and two from each school were invited to attend a seminar on smoking and health at the University of Saskatchewan. They were charged with the responsibility for taking information back to their schools, particularly

to students in the lower grades. The participants were introduced to educational aids and encouraged to use ingenuity in planning programs. Although it was found that projects varied in scope and complexity, all delegates reported back to their schools. One school completed 12 different projects; the average for all study schools was 5. The program was repeated the following year. Questionnaire data were gathered from 7th- and 8th-grade students in 22 study schools and 12 control schools immediately before the seminar and again in the 5th month after the seminar. The questionnaire measured the students' (1) awareness of the threat of cigarette smoking, (2) perception of its importance, and (3) perception of its personal relevance. It also sought information on smoking behavior and a number of demographic variables. During the first year of the study, the proportion of students in the highest awareness and importance categories increased significantly in both seventh- and eighth-grade classes, in both study and control groups. There was no significant change in the proportion of students in the highest relevance category in either study or control schools. Both eighth-grade boys and eighth-grade girls in the study schools showed a significant decrease in the proportion of current smokers; in the control schools there was no significant change in smoking behavior. By the fall of 1969, one year after the first administration of the questionnaires, the proportion of current smokers increased sharply; the increase was greater in the study group than in the control group. When these pupils were tested for the third time in March 1970, the proportion of boys' smoking increased in the control group but decreased in the study group. Among girls, there was a slight (nonsignificant) decrease in the control group and a slight (nonsignificant) increase in the study group. The changes in eighth-grade students in the second year were similar to those of eighth-grade students in the first year of the study (64, 71, 87, 88, 89).

In 1968 in Portland, Oregon, some aspect of the cigarette smoking problem was introduced in the experimental condition in each grade from kindergarten through twelfth grade. The goal was to incorporate and integrate educational material about the cigarette-smoking problem into the existing school curriculum wherever possible, with the individual teacher deciding what material, if any, to introduce into a given learning unit. The two major hypotheses were: (1) application of the educational program by teachers as they see fit will affect knowledge, attitudes, and smoking behavior; and (2) certain attitudes, beliefs, and knowledge, relevant to cigarette smoking and possessed by school children, are predictive of later actual smoking behavior. Baseline data have been reported; unfortunately, the follow-up was not completed (43).

An educational program in Maine beginning in the fall of 1961, with high school students in 26 experimental schools and 26 control schools, used all five of Horn's communication messages in one program. The

program consisted of five educational exposures spaced throughout the school year, including an audiovisual component, a discussion, and a pamphlet or piece of literature the pupil could take home and read. Questionnaires were administered in the fall of 1961, the spring of 1962, and the fall of 1962. Attitude changes were apparent by the end of the school year, but changes in smoking behavior were not seen until the beginning of the next year, when the original ninth-grade group contained significantly fewer smokers in the experimental than in the control group (11, 69).

The smoking habits of Winnipeg students, grades 5 through 12, were surveyed before (fall 1960) and after (spring 1963) a 3-year program on the hazards of smoking, directed to 8,300 out of 48,000 students. Two high schools were selected for the trial program; all elementary and junior high schools that normally sent students to these high schools were included. It was decided that the program in the elementary schools should be casual and informal and that it should focus on the teachers and parents. The main direct approach was in the junior high schools, with the program continued in high school. The nature of the programs in these schools was left up to the principals and teachers in the schools in the program. Resource materials were provided, student participation and discussion groups were encouraged, and conferences were held between health professionals, students, and teachers. Attempts were made to interest parents, community club organizers, and some sports coaches, but all except one of these attempts met with failure. In one of the two high schools, the program was enthusiastically received and student participation was very active, compared with the other high school. This difference was reflected in the results. There was a slight decrease in the proportion of smokers in this high school at the end of 3 years, while there were increases in smoking in the other experimental high school and in the control group of all other high schools in Winnipeg (78, 79).

In Baltimore, two comparable male senior high schools with approximately 3,000 students each were selected as control and experimental schools in an antismoking study. Questionnaires were administered in September 1963 and again in May 1964. Students in the experimental school had 26 exposures in the antismoking project over a period of 7 months, primarily concentrated on smoking and lung cancer. Activities included school assemblies, posters, letters from the commissioner of health sent to students' homes, articles in the school newspaper, distribution of leaflets, and a large exhibit. The follow-up questionnaire was supplemented by interviews with 95 students in the experimental school. It was found that the proportion of smokers increased in the 10th grade and decreased in the 11th and 12th grades in both schools. For all three grades combined, there was no change in either school. Of four attitudes measured, a significant change was found in one—"Smoking is dangerous to health." There was an

increase in the percentage agreeing with this statement in the experimental group and a small decrease in the control group (77).

Descriptions of Selected Programs

Three programs deserve special attention: The San Diego program, because it is part of an 8-year comprehensive community program; the University of Illinois Antismoking Education Study, because of the experimental nature of its components; and the School Health Curriculum Project, because of its innovative nature and rate of its proliferation.

San Diego Program (3, 30, 31, 32, 98, 99)

Background

In February 1966, the National Clearinghouse for Smoking and Health established the San Diego Community Laboratory to develop a comprehensive smoking control program. The San Diego County Council on Smoking and Health, with 18 member agencies, provided the organizational basis for the school and community programs. The Council established four program commissions encompassing health professions, mass media, schools and colleges, and community programs. The membership of the commission responsible for school programs—Educational Programs for Youth Commission—included classroom teachers at all grade levels, administrators, school nurses, voluntary and official agency members, and representatives from youth-serving agencies outside school. The commissions worked together in a comprehensive community effort to attack the smoking problem.

Program Content

During the 8 years of the program, from 1966 to 1974, a wide variety of programs was undertaken, and resource materials were developed to support them. The focus was primarily on working through classroom teachers. Among the first activities were a teacher workshop and development of a curriculum guide in smoking education for grades 1 through 12. Throughout the program, teacher workshops and inservice education programs were held. Source material for teachers (and others) included: (1) "What's New," a publication mailed five times a year to teachers, nurses, librarians, and youth leaders which reports on the newest teaching methods as well as on material available in the area of smoking education; (2) a list of available materials; (3) "Up in Smoke," a workbook in Spanish and English for primary grade children; (4) a kit of reference and source material; (5) a science teacher kit; (6) "Smoking Sam" and "Nicoteena" dolls that smoke cigarettes, with a device that allows tar and nicotine to be deposited visibly on filter paper; (7) bumper stickers; (8) a checklist of key facts

related to smoking and health; (9) a smoking and health vocabulary; (10) a guide for follow-up activities; and (11) a special health unit for junior high school girls, "Health and Appearance Program for a Prettier You," which covers such topics as diet, grooming, use of alcohol, skin and hair care, and the like, as well as smoking.

Despite an emphasis on working through teachers, the tremendous number of requests for "experts" to work directly with children in the classroom resulted in the hiring of a full-time staff member. The emphasis was on the classroom visit as a demonstration for the teacher's future use. Typically, the visit, in grades five through nine, included a demonstration of "Smoking Sam." To keep this visit from being merely a one-shot effort, a guide was developed for the teacher to use in preparing the class for the visit and continuing the teaching after the visit. During the first 3 years of the program, 884 such school visits were conducted.

A youth-to-youth program involved high school Key Club members who talked with fifth- and sixth-graders in schools that served as "feeder" schools to their high schools. (Key Club is sponsored by the Kiwanis Club.) In a 3-year period, 1971 to 1974, a total of 728 students, trained to conduct peer-training programs, conducted 1,010 such programs and talked with a total of 35,445 students.

Other activities included working with science fairs, workshops, youth-serving conferences, and the like.

Evaluation

In January 1967, a baseline survey was conducted with a random sample of 25 percent of all students in grades 7 through 12. A second survey was conducted in January 1971. During this period, a decrease in the proportion of smokers among boys was found at every grade level, a finding not consistent with experience nationwide, in which boys' smoking increased slightly (44). Although increases were seen among girls in grades 7 through 10 (see Table 1), the results were not considered discouraging because increases in girls' smoking were observed nationwide during this period (44). A decrease in the proportion of students who predicted they would be smokers in later life was considered encouraging.

University of Illinois Antismoking Education Study

The University of Illinois study comprised several related studies using varied approaches to the problem of smoking prevention. The initial survey, in October 1966, included 23,724 public and parochial school pupils in grades 7 through 12 in the Rockford-Winnebago County area of northern Illinois. Follow-up surveys were carried out in May 1967 and October 1968. Data were obtained on measures of smoking knowledge, attitudes, and behavior, adapted from instruments used by

TABLE 1.—Percentage who smoke either “...just about every day” or “...once in a while, but not every day”

	Grade					
	7	8	9	10	11	12
Boys						
1967	16.9	17.5	25.2	31.8	32.4	34.7
1971	10.2	14.0	17.4	19.7	24.7	28.8
Girls						
1967	10.0	11.0	18.5	20.6	31.1	29.3
1971	12.7	19.2	22.4	22.8	25.4	25.3

SOURCE: San Diego County Council on Smoking and Health (98).

Horn, et al. in the 1958 Portland study (see above). The classroom experiments are described briefly below.

1. The Horn study was replicated, using the same five mass communication messages previously cited. Groups were matched according to the proportion of smokers, then were randomly assigned to either the control group or to one of the experimental groups using the five different message themes. The five messages were presented in the form of pamphlets, fliers, and posters. Three distributions were made between February and April 1967 with a 3-week interval between each distribution. The survey was repeated in May 1967 to assess the relative effects of the different message themes on attitudes and smoking behavior.

Three criterion measures were used: (a) net recruitment rate, which was obtained by subtracting the percentage of smokers in the pretest from the percentage of smokers in the post-test and dividing by the percentage of nonsmokers in the pretest; (b) changes in the proportion of smokers; and (c) changes in scores on the attitude scale.

The effect of the five message themes on smoking behavior was assessed by comparing the changes in proportion of smokers in each of the experimental groups with each other and with the change in the proportion of smokers in the control group from pretest to post-test. Only the group that received the contemporary message theme was different from the control group on this criterion. Among the experimental groups, the significant differences in change in proportion of smoking were as follows: the contemporary approach was more effective than the remote approach or the approach in which both sides of the cigarette smoking question were presented; the authoritarian theme was more effective than either the remote or both-sided approach; and the adult-role-taking theme was more effective than either the remote or both-sided approach. In the Portland study, the remote message was found to be most effective (25, 26, 27, 55).

2. A student-centered approach was tested with 8th- and 11th-grade pupils in 12 junior and 5 senior high schools in the rural areas of

Winnebago County. This included 18 classrooms at each level. Four experimental groups and one control group, randomly assigned, at both the 8th- and 11th-grade levels were established. The four experimental conditions were (a) student-centered, remote message, (b) student-centered, contemporary message, (c) mass communication, remote message, and (d) mass communication, contemporary message. The mass communication approach was carried out in the same way as it was in the replication of the Horn study described above. (Pamphlets, fliers, and posters were distributed three times at 3-week intervals.) The student-centered method employed a symposium consisting of four students for each class who were nominated by school administrators, counselors, and English and speech teachers. Three symposia were presented in each class, with a 3-week interval separating each meeting.

The differences in rates of increase, between pretest and post-test, in the proportion of smokers in each group were used as the criterion for measuring effect on smoking behavior. No significant differences were found between the groups with respect to smoking practices.

At the eighth-grade level, significant differences in attitude change were found, with the student-centered approach proving more effective. No significant differences were found between the experimental groups at the 11th grade level (25, 74).

3. An experiment designed to test the role of materials in changing attitudes and beliefs was conducted with seventh-grade pupils. Important elements of this study involved the use of student-selected materials and the sequencing of these materials according to the steps in the health-behavior change model. Experimental and control groups were pretested and post-tested over a 5-week period. Results showed that students exposed to the materials achieved significantly more favorable changes toward nonsmoking attitudes and beliefs (25).

4. A final study, based on findings of the first 2 years, was designed to test the effects of a teacher preparation and classroom approach or method on students' attitudes, beliefs, and knowledge about smoking. Teacher preparation compared the effect of a regular classroom teacher with that of a teacher who had been trained in nonsmoking education. The classroom approaches or methods were: (a) the individual approach, depending upon the student's own study and interpretation of curriculum materials; (b) the peer-led approach, emphasizing classroom discussions led by class members; and (c) the teacher-led approach, combining individual study with class discussions and the teacher's direction. The same curriculum materials were used in all three approaches.

The subjects of the study were 575 seventh-grade students in four junior high schools. The criterion was changes in the students' attitude-belief scores and knowledge scores.

The results on the attitude-belief criterion show that significantly higher scores were achieved (a) in the regular classroom rather than with the specially trained teacher, (b) by students in the individual group rather than in the peer-led group, and (c) by more girls than boys.

On the knowledge test, students in the individual study and teacher-led approaches had higher scores than did students taught by the peer-led approach.

Attitude-belief scores for all approaches combined showed approximately 130 percent increase in mean score. The increase in mean knowledge score was approximately 15 percent (60).

In addition to the classroom experiments, a number of other studies were carried out, including development and studies of the instruments, prospective studies of changes in smoking behavior, and a participant-observation study in one school (25, 65, 82, 83, 93). These, however, are not properly within the purview of this chapter.

School Health Curriculum Project (19)

Background

In an effort to meet the need for a school health program that would prove both exciting and stimulating to pupils, a health curriculum model and a teacher-training model were initially developed in the San Ramon Unified School District in California and later transferred to the Berkeley Unified School District in California. The first curricula to be introduced into the schools consisted of three units. Each unit was organized around a body system: lungs and respiratory system for the fifth grade, heart and circulatory system for the sixth grade, and brain and nervous system for the seventh grade. A fourth-grade unit on the digestive system, a third-grade unit on the eye and vision, and a second-grade unit on the ear and hearing were developed later.

Curriculum Model

Each unit runs from 8 to 10 weeks during the school year and covers (1) the physiology of the body system being studied; (2) how the body system can be affected by man's abuse of the environment; (3) how it is possible to abuse the body by individual actions such as smoking cigarettes, taking drugs, and overindulging in certain foods and alcohol; and (4) how to take care of the body for maximum health. A wide variety of classroom techniques and resources is used, including tapes, filmstrips, and models, and also animal hearts, lungs, brains, etc. All units are specifically correlated with other subjects in the curriculum, such as art, music, mathematics, social studies, and basic language skills.

Teacher Training Model

A 2-week training session for each unit is held before the program is introduced into a school system. Each school sends a team which includes two classroom teachers, their principal, and one or two general support staff members such as school nurses, health educators, or curriculum specialists. It is their responsibility to disseminate the training model within their local school systems.

Evaluation

The rapid growth of the project attests to the acceptance with which it has been met. In addition, several systematic studies have been conducted, the more comprehensive of which are described below.

One evaluation study, which took into account the seven school districts in which the project was initially introduced in 1969, was begun in 1973, when those who had the first unit (lung) in the fifth grade had reached the ninth grade. They were followed up the next year, when they were in 10th grade, and, at the same time, 9th- and 11th-grade students served as additional control groups. Two of the school districts were unable to participate because of extremely high mobility out of their areas, making it impossible to locate many of the students. The experimental group consisted of those pupils who had been exposed to one or more of the units. Controls had never participated in any one of the units. The data collection instruments used were (1) Health Knowledge Test, (2) Health Behavior Inventory, (3) Teenage Self Test (14), (4) School Related Behavior Inventory, and (5) Smoking Behavior Classification. All except the Teenage Self Test were constructed specifically for this study. The findings were as follows: (1) Health Knowledge Test scores obtained 2 to 5 years later do relate to the kind and number of curriculum units students were exposed to—the greater the curriculum exposure, the higher the scores on the Health Knowledge Test. (2) A significant relationship was found between curriculum exposure and Health Behavior Inventory scores for the 9th grade, but not for the 10th. (3) There was no relationship between exposure to the curriculum and scores on the Teenage Self Test. (4) Smoking behavior was found to be significantly related to exposure to the curriculum for 9th-graders, with fewer smokers in the experimental than in the control groups, but this did not hold true for the 10th-graders. (5) The School Behavior Inventory failed to differentiate on the basis of whether or not a student had been enrolled in the curriculum (76).

An evaluation of the fifth-grade unit was conducted with approximately 280 students in three selected school districts (23). Control groups were selected by school district coordinators. Instruments used were (1) a knowledge test which had been previously developed for this unit of study, (2) the University of Illinois smoking attitude items (25),

(3) items "based on the Teenage Self Test," and (4) items eliciting demographic information. Data were collected prior to the beginning of instruction and immediately following the instructional program. The findings were: (1) the curriculum project positively influences health knowledge and attitudes, and (2) significant correlations were found between students' health knowledge and attitudes toward cigarette smoking and the smoking behavior of their parents, their older siblings, and their peers. Very few smokers were found among the fifth-grade pupils (23).

A study conducted in 1974-1975 in the Wichita Public Schools evaluated three curriculum units (lung, heart, brain) through a pretest and post-test control group design. A stratified random sample of the project schools was selected for evaluation purposes and was based on two variables: socioeconomic level of the school, and type of class in which the health unit was taught (i.e., self-contained or combination, etc.). Control schools were selected to match the project schools on relevant variables. Data were available for 512 project pupils and 206 control pupils. Each of three knowledge tests (lung, heart, brain) was used in the appropriate unit. These tests were developed by the School Health Curriculum Project regional office at Champaign, Illinois. The Teenage Self Test was used as the attitude measure. Scores on the Lung Unit Knowledge Test improved significantly from pretest to post-test for both the project pupils and control pupils. There was no significant difference between pretest scores of the project and control groups, nor between their post-test scores. On the Heart Unit Knowledge Test, the control group achieved a higher mean score on the pretest than the project group, but the project group improved significantly from pretest to post-test while the control group decreased significantly. On the Brain Unit Knowledge Test, the project and control groups started out with essentially the same mean score; the project group improved significantly but the control group made significantly lower scores on the post-test than on the pretest. The Heart and Brain Unit Tests, then, were shown to have a substantial impact on knowledge; this was not shown for the Lung Unit Test. Only in the Brain Unit group was a significant difference found on the Attitude Test. It is difficult to understand how a total score was calculated on the Teenage Self Test, which is made up of eight relatively independent factors designed to obtain eight scores. Since a total score might well be meaningless, it is not surprising that no differences were found (75). Another aspect of the Wichita evaluation was the analysis of scores of pupils of "first generation teachers," that is, those who attended the National Training Workshop, and pupils of "second generation teachers," those trained locally by first generation teachers. For both the Heart and Lung Units, mean post-test knowledge scores were higher for the pupils of first generation teachers than for those of second generation teachers. This difference

may well disappear, of course, as the second generation teachers gain more experience with the project. Responses to both student and parent questionnaires showed generally favorable attitudes toward the project (106).

An evaluation of the Heart Unit in lower socioeconomic classes of sixth-grade black students was carried out in two elementary schools in an East coast village and one inner-city school in the Midwest. A total of 144 students participated in the study. In the East coast sample, two experimental classes—one which completed the pretest and one which did not—and a control class were used. The two experimental classes were taught by sixth-grade teachers trained in the School Health Curriculum Project. In the Midwest school, the one experimental class was taught by the researcher, who is a health education specialist. The high incidence of hypertension among blacks motivated the study of the Heart Unit in black schools. Instruments used were the Health Knowledge Test (Heart Unit) developed by Cook at the University of Illinois, the Teenage Self Test, and the reading comprehension and vocabulary sections of the Iowa Test of Basic Skills. On the knowledge test, significant differences between post-test means, adjusted by analysis of covariance on the basis of pretest scores, and between the experimental and control groups were observed. No difference between post-test mean scores of the two experimental East groups was seen, indicating that the use of a pretest had no observable effect. Adjusted post-test means on the attitude measure were significantly higher for experimental than for control groups.¹ No difference between control and experimental groups was found on the reading comprehension test, but a significant difference was observed between post-test means on the vocabulary test. (Reading comprehension and vocabulary tests were not administered to the East coast classes.) No differences between the Midwest class, taught by the researcher, and the East coast classes, taught by the classroom teacher, were found on either knowledge or attitude measures (92).

During the 1975-1976 school year, 635 5th-grade students representing 33 intact groups from 12 Albuquerque public schools participated in an evaluation of the Lung Unit. Emphasis was placed on perceptions and attitudes rather than on knowledge. Measures of the following variables were included: locus of control, perceived vulnerability, semantic differential for health concepts, semantic differential for self-esteem, and two scores from the Teenage Self Test combined. The population included 24 intact groups in the experimental condition, 5

¹In this study, the total score on the Teenage Self Test was obtained as follows: "The attitude section response categories were assigned scores ranging from one to five. A score of five for a response category indicated a very favorable health attitude toward the statement and a score of one indicated a very negative attitude toward the item in question... The highest obtainable score was 200." Since, in the development of the Teenage Self Test the items were not constructed to test either "favorable" or "negative" attitudes toward smoking, it is not known what criterion was used to assign scores to each of the statements.

groups in a control condition with a pretest and post-test, and 4 groups in a post-test-only control condition. No differences were found between the two control groups' scores on any of the measures; they were combined into one control group for further analysis. The only significant differences between post-test means of the experimental and control groups were on the semantic differential for health concepts and the health effects and rationalization scores combined on the Teenage Self Test. The differences were in the desired direction for the experimental group. Secondary analyses examined the differences between subgroups of the treatment group. Sex differences were found on the perceived vulnerability measure (girls higher than boys) and on the Self Test measure (boys higher than girls). Anglos scored higher on perceived vulnerability than Spanish Americans; Spanish Americans scored higher on the Self Test. Those reading below grade level scored higher on locus of control and Teenage Self Test measures than those reading at or above grade level. (A low score on the Teenage Self Test measure indicated attitudes in favor of not smoking.) In general, changes in the treatment group were favorable in the direction of the objectives of the program (10).

The prevalence of smoking behavior is negligible at the grade levels covered by the project, so it cannot be used as a criterion measure on immediate follow-up.

Nonschool Programs

Voluntary Health Agencies

The three major voluntary agencies concerned with cigarette smoking have recognized a responsibility to discourage young people from smoking, but they have approached the problem in different ways.

The American Cancer Society conducted 172,628 programs for young people aged 10 to 18 during fiscal year September 1, 1976 to August 31, 1977. In addition, they conducted 55,740 health education programs which promoted life styles oriented toward nonsmoking. In September 1977, they added a teaching kit aimed at the 5 to 9 age group. Over 25,000 of these units have been distributed, representing 33 percent of the potential schools (68).

The American Heart Association is supporting five local demonstration projects designed to test hypotheses in decision making, health education, and behavior modification of adolescent smoking behavior (13).

The American Lung Association has approached the problem in a completely different way. It has supported, in cooperation with the Bureau of Health Education, the development and field-test evaluation of curriculum models for kindergarten through third grade. The four units were designed to lead into the four units of the School Health Curriculum Project now being used in grades four through seven. The

kindergarten unit, "Happiness is Being Healthy," focuses on individual differences, helping children to discover their own unique qualities. "Super Me," the first-grade unit, helps pupils to understand that each person is very important and unique, yet shares common needs with others. The second-grade curriculum, "Sights and Sounds," is a study of the five senses; children learn how emotion is communicated. In the third-grade unit, "The Body—Its Framework and Movement," children learn about the muscular and skeletal systems. One of the goals throughout is to help children decide to begin or continue health-related behaviors that are likely to contribute to optimal health (6, 100).

This curriculum was written and tested in Seattle, Washington. Further testing was done in El Cajon, California; Fort Myers, Florida; and North Belmore (Long Island), New York. The finished model was completed in June 1977, and the first training workshops were held that summer. By mid-1978, 39 school districts in 14 states were implementing the model.

The field-testing of the model was carried out in five school districts in the United States. Experimental and control groups were tested before and after the unit was taught. The variables investigated were: (1) changes in children's attitudes toward smoking and good health, (2) changes in knowledge about body systems and the effect of smoking on health, (3) social networks of classrooms, (4) teacher attitudes toward teaching, and (5) reported changes in family health practices. Analysis of covariance was used to assess post-test differences, controlling on pretest scores. Findings were: (1) There were significant changes in attitudes of kindergarten and third-grade treatment groups compared with controls. The changes in the first- and second-grade attitudes were in the desired direction but not significantly greater in the treatment groups than in the control groups. (2) Knowledge gains at all four levels were significantly greater in the treatment groups than in the control groups. (3) Social networks in the experimental classrooms became more cohesive, efficient, and effective during the experiment. (4) There was no difference between attitudes of experimental teachers and those of control teachers at the end of the experiment. (5) Parents reported positive changes in children's health habits, and some changes in the habits of other members of the family (7). A plan for a longitudinal study has been developed (8).

Other Efforts

The American Dental Association has developed school programs on oral health for four levels: Level I, Grades Kindergarten through 3; Level II, Grades 4 through 6; Level III, Grades 7 through 9; and Level IV, Grades 10 through 12. All include material on smoking. It is not known how widely this material is used, or what effect it has (5).

The National Interagency Council on Smoking and Health, an organization composed of more than 30 member agencies, funded eight antismoking projects during the 1977-78 school year. Four of the projects were cosponsored by local lung associations. Others were sponsored by the Indiana School of Medicine, the Chicago Heart Association, The Door (a center for adolescents in New York City), and the State University of New York at Buffalo. All programs were student-centered; students were involved in the planning and carrying out of the programs. One program concerns itself with assertiveness training, another with biofeedback machines that allow students to monitor the immediate effects of smoking on their bodies. Three of the projects use youth-to-youth approaches. One program simulated an advertising campaign; in another, "rap" groups and individual counseling were used. At another school, a committee of students was given a \$500 bank account to use in any way it liked to promote a nonsmoking attitude in the school. Results of the evaluation are not yet available (37, 81).

The YMCA has two programs that include antismoking information. The first, "Feelin' Good," is a cardiovascular/fitness program for children, grades kindergarten through nine. Besides being designed for use by YMCA's (Saturday morning gym programs, Indian Guides, leaders' clubs, and so forth), it can be used by schools and churches. It was field-tested on more than 5,000 children and more than 100 teachers and administrators nationwide. Critical comments were furnished by students, teachers, and educational consultants (111).

The other program, "Activetics," is a program for all age groups from high school through senior citizen. "The materials were critiqued by a group of professionals including health educators, exercise physiologists, and valuing educators" (110).

Training programs are available for both "Feelin' Good" and "Activetics."

Summary

For many years a wide variety of antismoking programs have been conducted in schools. These programs have been reported on, reviewed (36, 37, 78, 82, 101, 103, 108), and discussed (41) many times. Undoubtedly, for every school program reported in the literature, there are many underway that have not been reported. Yet, even with this vast proliferation of programs, we still do not know what kinds of educational experiences are effective in keeping young people from moving from merely experimenting with cigarettes to becoming habitual smokers.

Most of the programs are not based on any sound theoretical model, but rather on what people *think* might work—on what seems reasonable to them at the time. For example, it is logical to assume

that young people who know about the harmful effects of cigarettes on health will not take up the habit. Thus, many school programs have used the health threat as one basis for instruction, and many have used it as the only basis. We know that 94 percent of teenagers say that smoking is harmful to health and that 90 percent of teenage smokers are aware of the health threat (44). But it appears people cannot be expected to behave rationally in the face of strong social and psychological pressures to the contrary.

The assumption that young people are more influenced by their peers than by adults has resulted in widespread use of a variety of youth-to-youth programs. Some appear to be more effective than others, but no one knows what particular elements of the program are responsible for the differences. For example, no one has investigated which special qualifications of high school students are most desirable for an effective program. The peer leaders are often selected by the principal (73) on the basis of ability to speak before a group (22), excellent academic record (53), participation in extracurricular activities (53), or ability to perform laboratory experiments (22). Often stress is placed on selecting leaders who are mature, "cool," independent (38), and attractive (38, 72). Whether these are the teenagers most likely to influence younger peers is not known. In fact Newman observed that "hoods," who smoked the most, did not want to emulate the "popular" teenagers. As one girl put it, "I wouldn't want to be rich or nothing like that; they are stuck up—they won't talk to you. I wouldn't want to be like that in a million years" (84). So there is reasonable doubt that those being chosen as peer leaders are actually the most influential.

Another reason for lack of knowledge about what works is that there has been no assessment of the effect of programs on the smoking behavior of children after they become adults. Even data on smoking behavior in the 9th and 10th grades, 3 to 5 years after the program (76), are not sufficient evidence for a comprehensive evaluation.

Changes in health knowledge and changes in attitudes have been measured when pretest scores are compared with post-test scores soon after the program. Are these changes lasting? And if they are, to what extent do they have a significant effect on behavior?

Findings from one study to another have been inconsistent, partly due to lack of comparability of programs, use of varied definitions, and failure to use common evaluation instruments. Even in the School Health Curriculum Project, where classroom procedures are probably similar from one school to another, and where several researchers have used a common instrument (the Teenage Self Test), each changed the scoring procedure in such a way that results were not comparable to each other or to national norms (23, 92, 102, 106).

The greatest gap in knowledge results from paucity of experiments that compare several treatments with one another. Programs that do have an evaluation component usually compare a program in which

something takes place with one where nothing takes place—or, more likely, where nothing is known about what takes place.

Recommendations and Conclusions

Recommendations:

1. Research on program *content* is needed. Should the course content emphasize physiology and the effects of personal choice and of the environment on the body, as in the School Health Curriculum Project (30)? Should lifestyle be the focus, as it is in the American Health Foundation program (15)? Only if the experimental design includes several treatments with different content can we determine what kinds of information are most effective.

2. The most effective *methods* or *approaches* must be determined. What is the best way of getting information to students? Should it come from teachers or other pupils? What other pupils? What learning experiences are most effective? Any experimental design that will answer some of these questions must include several approaches.

3. Which combinations of methods and content work best with various *subgroups* of the student population? At what grade levels are the various techniques effective? With which socioeconomic groups? Studies must be replicated in varied settings and with different kinds of groups.

4. *Evaluation* must include *long-term follow-up*. We do not know if the information and antismoking attitudes of a fifth- or sixth-grader will influence his behavior as a senior in high school.

5. *Standard definitions and common evaluation instruments* are essential if we are to compare experimental programs with one another.

Conclusions:

Much is known about adolescents in general, and about their taking up smoking in particular. This knowledge must be used as a basis for developing sound experimental programs, with theoretical models rooted in established educational and psychological principles. Evaluation literature is rife with descriptions of appropriate procedures. Once goals have been defined in specific, objective, and measureable terms, instruments can be developed to assess the extent to which goals of programs are being met. Whether the purpose of a given instrument is to measure knowledge, attitudes, beliefs, or behavior, it should use sound psychometric procedures. It should, for example, meet criteria for acceptable reliability and validity. Such research should begin immediately. It is hoped that in another 15 years we will not have to say “We still don’t know what works!”

Youth Education: References

- (1) AARFLOT, A. National Association on Smoking and Health in Norway: Scope and activities of a voluntary organization. In: Steinfeld, J., Griffiths, W., Ball, K., Taylor, R.M. (Editors). Proceedings of the Third World Conference on Smoking and Health, New York, June 2-5, 1975. Volume II. Health Consequences, Education, Cessation Activities, and Social Action. U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH) 77-1413, 1977, pp. 943-947.
- (2) ALLEN, A.R., ALLEN, L.M. The case against anti-smoking campaigns in the public schools. *South Dakota Journal of Medicine* 20(4): 41-46, 61, April 1967.
- (3) ALTHAFER, C.A. The San Diego story: An adventure in smoking education. *Bulletin of the National Tuberculosis and Respiratory Disease Association* 36(10): 13-16, November 1970.
- (4) AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION, AND RECREATION. Position statement. Smoking education: The school's responsibility. *Journal of School Health* 41(8): 444-445, October 1971.
- (5) AMERICAN DENTAL ASSOCIATION. Oral health curriculum. Chicago, American Dental Association, 1977, 166 pp. (Materials packet)
- (6) AMERICAN LUNG ASSOCIATION. American Lung Association—Bureau of Health Education's primary grades health curriculum project. U. S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, Bureau of Health Education, Community Program Development Division. New York, American Lung Association. March 1978. 28 pp.
- (7) ANDREWS, R.L. Evaluation report: Seattle school health curriculum project. Field test phase. New York, American Lung Association, May 11, 1977, 19 pp.
- (8) ANDREWS, R.L. Longitudinal evaluation design. Seattle primary health curriculum project. New York, American Lung Association, July 17, 1977, pp. 3-4.
- (9) ANDRUS, L.H., HYDE, D.F., FISCHER, E. Smoking by high school students: Failure of a campaign to persuade adolescents not to smoke. *California Medicine* 101(4): 246-247, October 1964.
- (10) BARNES, S.E. The smoking classroom. *Health Education* 7(2): 37-38, March/April 1976.
- (11) BECKERMAN, S.C. Report of an educational program regarding cigarette smoking among high school students. *Journal of the Maine Medical Association* 54(3): 60-63,74, March 1963.
- (12) BEN-MEIR, D. Fighting smoking habits in a country at war. In: Steinfeld, J., Griffiths, W., Ball, K., Taylor, R.M. (Editors). Proceedings of the Third World Conference on Smoking and Health, New York, June 2-5, 1975. Volume II. Health Consequences, Education, Cessation Activities, and Social Action. U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health. National Cancer Institute, DHEW Publication No. (NIH) 77-1413, 1977, pp. 937-941.
- (13) BENNETT, G. Personal communication. Dallas, American Heart Association, April 1978.
- (14) BOHLAYER, S.K. Pennsylvania—Toward a generation of nonsmokers. *Journal of School Health* 36(10): 515-517, December 1966.
- (15) BOTVIN, G.J., ENG, A., WILLIAMS, C.L. Life skills training: A psychosocial approach to the prevention of cigarette smoking. Paper presented at 106th Annual Meeting of the American Public Health Association and Related Organizations, Los Angeles, California, October 15-19, 1978. Washington, D.C., American Public Health Association, 1978, pp. 143. (Abstract)

- (16) BRINEY, K.L. *Relation of knowledge of effects of cigarette smoking to the practice of smoking among high school seniors.* In: Zagona, S.V. (Editor). *Studies and Issues in Smoking Behavior.* Tucson, University of Arizona Press, 1967, pp. 53-55.
- (17) BROOKS, R.W. *The use of student questions as a partial format for instruction regarding smoking and health.* *Journal of School Health* 40(10): 542-544, December 1970.
- (18) BROWN, R.L. *Where there's smoking there's trouble.* *Journal of School Health* 36(10): 493-497, December 1966.
- (19) BUREAU OF HEALTH EDUCATION. *The school health curriculum project.* U. S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, Bureau of Health Education, HEW Publication No. (CDC) 78-8359, December 1977.
- (20) BYNNER, J.M. *The dilemma facing health educators.* In: Richardson, R.G. (Editor). *The Second World Conference on Smoking and Health: Proceedings of a Conference Organized by the Health Education Council at Imperial College, London, September 20-24, 1971.* London, Pittman Medical, 1971, pp. 81-84.
- (21) CALIFANO, J.A., JR. *School health message.* *Journal of School Health* 47(7): 395-396, September 1977.
- (22) CAMPBELL, L.P. *Modifying attitudes of upper elementary students toward smoking.* *Journal of School Health* 44(2): 97-98, February 1974.
- (23) CARAMANICA, V.P., FEILER, E.G., OLSEN, L.K. *Evaluation of the effects of performance based teacher education on the health knowledge and attitudes of fifth grade students.* *Journal of School Health* 44(8): 449-454, October 1974.
- (24) CRAIL, J.W. *The big count.* *Journal of School Health* 36(10): 517-518, December 1966.
- (25) CRESWELL, J.M., CRESWELL, W.H., JR. *Youth Smoking Behavior Characteristics and Their Educational Implications. A Report of the University of Illinois Anti-Smoking Education Study.* Champaign, University of Illinois, June 30, 1970, 164 pp.
- (26) CRESWELL, W.H., JR., HUFFMAN, W.J., STONE, D.B., MERKI, D.J., NEWMAN, I.M. *University of Illinois anti-smoking education study.* *Illinois Journal of Education.* 60(3): 27-37, March 1969.
- (27) CRESWELL, W.H., JR., STONE, D.B., HUFFMAN, W.J., NEWMAN, I.M. *Antismoking education study at the University of Illinois.* *HSMHA Health Reports* 86(6): 565-576, June 1971.
- (28) DALZELL-WARD, A.J. *The new frontier of preventive medicine.* *Public Health* 90(3): 101-109, March 1976.
- (29) DALZELL-WARD, A. J. *The role of the Health Education Council (The United Kingdom).* In: Steinfeld, J., Griffiths, W., Ball, K., Taylor, R.M. (Editors). *Proceedings of the Third World Conference on Smoking and Health, New York, June 2-5, 1975. Volume II. Health Consequences, Education, Cessation Activities, and Social Action.* U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH) 77-1413, 1977, pp. 911-919.
- (30) DAVIS, R.L. *Making health education relevant and exciting in elementary and junior high school.* *Health Services Reports* 88(2): 99-105, February 1973.
- (31) DAVIS, R.L. *Positive smoking education programs for the school-age child.* In: Steinfeld, J., Griffiths, W., Ball, K., Taylor, R.M. (Editors). *Proceedings of the Third World Conference on Smoking and Health, New York, June 2-5, 1975. Volume II. Health Consequences, Education, Cessation Activities, and Social Action.* U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH) 77-1413, 1977, pp. 237-244.

- (32) DAVIS, R.L. Status of smoking education research. *Journal of School Health* 38(6): 323-332, June 1968.
- (33) DIPPO, J.P. Health class project: Smoking survey. *Journal of School Health* 38(3): 169-176, March 1968.
- (34) DIVISION OF LUNG DISEASES, NATIONAL HEART, LUNG, AND BLOOD INSTITUTE. Respiratory Diseases. Task Force report on prevention, control, and education. U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, DHEW Publication No. (NIH) 78-1248, March 1977, 137 pp.
- (35) ESTRIN, E.R., QUERRY, D.L. A "no smoking" project for ninth and tenth grades. *Journal of School Health* 35: 381-382, October 1965.
- (36) EVANS, R.I. Smoking in children: Developing a social psychological strategy of deterrence. *Preventive Medicine* 5: 122-127, 1976.
- (37) EVANS, R.I., HENDERSON, A.H., HILL, P.C., RAINES, B.E. Current psychological, social, and educational programs in control and prevention of smoking: A critical methodological review. *Atherosclerosis Reviews*. (In press)
- (38) FISHER, L. These students helped design their own smoking education programs. *American Lung Association Bulletin* 63(5): 2-6, June 1977.
- (39) FLECKMAN, B. The tables are turned. *Journal of School Health* 39(4): 239-241, April 1969.
- (40) FODOR, J.T., GLASS, L.H. Curriculum development and implementation of smoking research—A longitudinal study. *Journal of School Health* 41: 199-202, April 1971.
- (41) FODOR, J.T., GLASS, L.H. Education programs influencing youth. In: National Conference on Smoking and Health. A Summary of Proceedings, San Diego, September 9-11, 1970. New York, National Interagency Council on Smoking and Health, 1970, pp. 157-186.
- (42) FRITSCHKE, W.E.P. An antismoking campaign among school children in Germany. In: Richardson, R.G. (Editor). *The Second World Conference on Smoking and Health: Proceedings of a Conference Organized by the Health Education Council at Imperial College, London, September 20-24, 1971*. London, Pittman Medical, 1971, pp. 77-80.
- (43) GRANT, R.L., WEITMAN, M. Cigarette smoking and school children: A longitudinal study. In: Borgatta, E.F., Evans, R.R. (Editors). *Smoking, Health, and Behavior*. Chicago, Aldine Publishing Company, 1968, pp. 189-205.
- (44) GREEN, D.E. Teenage cigarette smoking in the United States—1968, 1970, 1972, and 1974. In: Steinfeld, J., Griffiths, W., Ball, K., Taylor, R.M. (Editors). *Proceedings of the Third World Conference on Smoking and Health, New York, June 2-5, 1975. Volume II. Health Consequences, Education, Cessation Activities, and Social Action*. U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH) 77-1413, 1977, pp. 375-380.
- (45) GRITZ, E. R. Smoking: The prevention of onset. In: Jarvik, M.E., Cullen, J.W., Gritz, E.R., Vogt, T.M., West, L.J. (Editors). *Research on Smoking Behavior*. NIDA Monograph 17. U.S. Department of Health, Education, and Welfare, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, (ADM) 78-581, December 1977, pp. 290-307.
- (46) HAMBURG, M.V. What can schools do? *Bulletin of the New York Academy of Medicine* 44(12): 1526-1535, December 1968.
- (47) HARLIN, V.K. An editorial: The soil is ready, let's sow the seeds. *Journal of School Health* 43(5): 277-278, May 1973.
- (48) HASENFUS, J.L. Cigarettes and health education among young people. *Journal of School Health* 41(7): 372-376, September 1971.
- (49) HENKE, L.J. Student-to-student teaching about tobacco smoking. *School Health Review* 5(1): 17-18, January/February 1973.

- (50) HOCHBAUM, G.M. How can we teach adolescents about smoking, drinking, and drug abuse? *Journal of Health, Physical Education, Recreation* 39(8): 34-38, October 1968.
- (51) HOFFMAN, W. The short life line. *Journal of School Health* 46(1): 48, January 1976.
- (52) HOLLAND, W.W., ELLIOTT, A. Cigarette smoking, respiratory symptoms, and anti-smoking propaganda. An experiment. *Lancet* 1(532): 41-43, January 6, 1968.
- (53) HORINE, L.E. Elementary school anti-smoking project involving high school students. *Journal of School Health* 39(1): 43-45, January 1969.
- (54) HORN, D. The cigarette smoking picture—bright spots and shadows. *Bulletin of the National Tuberculosis and Respiratory Disease Association* 36(10): 7-9, November 1970.
- (55) HORN, D., COURTS, F.A., TAYLOR, R.M., SOLOMON, E.S. Cigarette smoking among high school students. *American Journal of Public Health* 49(11): 1497-1511, November 1959.
- (56) HORNE, T. Smoking and health: The activities of a high school student committee. *Journal of School Health* 33: 451-456, 1963.
- (57) HOROWITZ, M.J. Psychological aspects of education related to smoking. *Journal of School Health* 36(6): 281-288, June 1966.
- (58) HURSTER, M., AMERLING, G., MYERSON, N., PEDRAZA, A. A health fair. *Journal of School Health* 40(10): 539-541, December 1970.
- (59) INTELLECT. Nation fails to arouse teenagers against cigarette risks. *Intellect* 105(2382): 298-299, March 1977.
- (60) IRWIN, R.P., CRESWELL, W.H., JR., STAUFFER, D.J. The effect of the teacher and three different classroom approaches on seventh grade students' knowledge, attitudes, and beliefs about smoking. *Journal of School Health* 40(7): 355-359, September 1970.
- (61) JAMES, W.G. For a healthy tomorrow. *Journal of School Health* 47(3): 180-183, March 1977.
- (62) JAMES, W.G. Smoking and youth education. In: Richardson, R.G. (Editor). *The Second World Conference on Smoking and Health: Proceedings of a Conference Organized by the Health Education Council at Imperial College, London, September 20-24, 1971*. London, Pittman Medical, 1971, pp. 85-89.
- (63) JEFFERYS, M., WESTAWAY, W.R. Catch them before they start. A report on an attempt to influence children's smoking habits. *Health Education Journal* 19: 3-17, 1961.
- (64) JONES, J.A., PIPER, G.W., MATTHEWS, V.L. A student-directed program in smoking education. *Canadian Journal of Public Health* 61(3): 253-256, May/June 1970.
- (65) LAOYE, J.A., CRESWELL, W.H., JR., STONE, D.B. A cohort study of 1,205 secondary school smokers. *Journal of School Health* 42(1): 47-52, January 1972.
- (66) LEVENTHAL, H. Experimental studies of anti-smoking communications. In: Borgatta, E.F., Evans, R.R. (Editors). *Smoking, Health, and Behavior*. Chicago, Aldine Publishing Co., 1968, pp. 95-121.
- (67) LOY, B. Smoking—A representational and experimental model. *School Science Review* 53(185): 497-502, June 1972.
- (68) MABURN, G.J. Personal communication. American Cancer Society, Inc., New York, June 5, 1978.
- (69) MAINE STATE DEPARTMENT OF HEALTH AND WELFARE. The impact of an educational program on teen-age smoking habits. *Journal of the Maine Medical Association* 54: 108-112, May 1963.
- (70) MARTIN, F.M., STANLEY, G.R. Experiments in dissuasion: An assessment of two anti-smoking campaigns. Part I. *Health Bulletin* 23(4): 1-7, October 1965.

- (71) MATTHEWS, V.L. The Saskatoon Smoking Study: Habits and beliefs of children in grades seven and eight about smoking. Saskatoon, University of Saskatchewan, College of Medicine, Department of Social and Preventive Medicine, May 1974, 63 pp.
- (72) MCALISTER, A.L., PERRY, C., MACCOBY, N. Systematic peer leadership to discourage onset of tobacco dependency. A paper presented at the 86th Annual Convention of the American Psychological Association, Toronto, Ontario, Canada. 1978, 22 pp.
- (73) MCRAE, C.F., NELSON, D.M., Youth-to-youth communication on smoking and health. *Journal of School Health* 41: 445-447, October 1971.
- (74) MERKI, D.J. The effects of two educational methods and message themes on rural youth smoking behavior. *Journal of School Health* 38(7): 238-239.
- (75) MILNE, A.M., COLMEN, J.G. Development of a teenagers' self-testing kit (cigarette smoking). Washington, D.C., Education and Public Affairs, July 1973, 100 pp.
- (76) MILNE, A.M., MARSHALL-MIES, J., COLMEN, J.G. A study of impact of the school health curriculum project on knowledge, attitude, and behavior of teenage students. Washington, D.C., Education and Public Affairs, November 8, 1975, 41 pp.
- (77) MONK, M., TAYBACK, M., GORDON, J. Evaluation of an antismoking program among high school students. In: Schulberg, H.C., Sheldon, A., Baker, F. (Editors). *Program Evaluation in the Health Fields*. New York, Behavioral Publications, 1970, pp. 345-359.
- (78) MORISON, J.B. Cigarette smoking: Surveys and a health education program in Winnipeg, Manitoba. *Canadian Journal of Public Health* 55(1): 16-22, January 1964.
- (79) MORISON, J.B., MEDOVY, H., MACDONELL, G.T. Health education and cigarette smoking. A report on a three-year program in the Winnipeg school division, 1960-1963. *Canadian Medical Association Journal* 91(2): 49-56, July 11, 1964.
- (80) MURPHY, B. Pupils and puppets teach about health. *Opportunity* 2(4): 10-15, May 1972.
- (81) NATIONAL INTERAGENCY COUNCIL ON SMOKING AND HEALTH. Teenage cigarette smoking; a national health problem. Washington, Conference of National Interagency Council on Smoking and Health, January 11-12, 1978, 19 pp.
- (82) NEEMAN, R.L., NEEMAN, M. Complexities of smoking education. *Journal of School Health* 45(1): 17-23, January 1975.
- (83) NEWMAN, I.M. Peer pressure hypothesis for adolescent cigarette smoking. *School Health Review* 1(2): 15-18, 1969.
- (84) NEWMAN, I.M. Status configurations and cigarette smoking in a junior high school. *Journal of School Health* 40(1): 28-31, January 1970.
- (85) O'KANE, W.H. Peer group presents value-oriented concepts. *Science Teacher* 37(9): 17-18, December 1970.
- (86) O'ROURKE, A., WILSON-DAVIS, K. Smoking and school children. *Journal of the Royal College of General Practitioners* 20(101): 354-360, December 1970.
- (87) PIPER, G.W., JONES, J.A., MATTHEWS, V.L. The Saskatoon smoking project—The model. *Canadian Journal of Public Health* 61: 503-508, November/December 1970.
- (88) PIPER, G.W., JONES, J.A., MATTHEWS, V.L. The Saskatoon smoking study—Results of the first year. *Canadian Journal of Public Health* 62: 432-441, September/October 1971.
- (89) PIPER, G.W., JONES, J.A., MATTHEWS, V.L. The Saskatoon smoking study: Results of the second year. *Canadian Journal of Public Health* 65: 127-129, March/April 1974.

- (90) RABINOWITZ, H.S., ZIMMERLI, W.H. Effects of a health education program on junior high school students' knowledge, attitudes, and behavior concerning tobacco use. *Journal of School Health* 44(6): 324-330, June 1974.
- (91) RABINOWITZ, H.S., ZIMMERLI, W.H. Teaching-learning mechanisms in consumer health education. *Public Health Reports* 91(3): 211-217, May/June 1976.
- (92) REDICAN, K.J. Analyzing the effects of a special health program on lower socioeconomic sixth grade students. Doctoral dissertation. Champaign-Urbana, University of Illinois. 1976, 139 pp.
- (93) REID, E.L., STONE, D.B. Smoking behavior change among junior high school youth. *Journal of Drug Education* 1(3): 223-234, September 1971.
- (94) REIF, A.E. Public information on smoking: An urgent responsibility for cancer research workers. *Journal of the National Cancer Institute* 57(6): 1207-1210, December 1976.
- (95) REYNOLDS, J.C., JR. The drug education gap. *Clearing House* 50(1): 10-11, September 1976.
- (96) RORKE, G.W. Situational analysis: Profile of women's smoking habits in Canada and the United Kingdom. In: Steinfeld, J., Griffiths, W., Ball, K., Taylor, R.M. (Editors). *Proceedings of the Third World Conference on Smoking and Health*, New York, June 2-5, 1975. Volume II. Health Consequences, Education, Cessation Activities, and Social Action. U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH) 77-1413, 1977, pp. 299-307.
- (97) SADLER, M. A pilot program in health education related to the hazards of cigarette smoking. *Rhode Island Medical Journal* 52(1): 36-38, January 1969.
- (98) SAN DIEGO COUNTY COUNCIL ON SMOKING AND HEALTH. Final Report. U.S. Department of Health, Education, and Welfare, Public Health Service, Regional Medical Program Services, National Clearinghouse for Smoking and Health, April 1972, 224 pp.
- (99) SAN DIEGO COUNTY COUNCIL ON SMOKING AND HEALTH. Final Report. U.S. Department of Health, Education, and Welfare, Center for Disease Control, National Clearinghouse for Smoking and Health, September 30, 1974, 92 pp.
- (100) SCHMIDT, R.W. These kids are excited about their health. *Imagine!* *American Lung Association Bulletin* 62(6): 2-6, July-August 1976.
- (101) SCHWARTZ, J.L., DUBITZKY, M. Research in student smoking habits and smoking control. *Journal of School Health* 37(4): 177-182, April 1967.
- (102) STONE, E.J. The effects of a health education curriculum on locus of control, perceived vulnerability, and health attitudes of fifth grade students. Doctoral dissertation. Albuquerque, The Graduate School of the University of New Mexico, December 1976.
- (103) THOMPSON, E.L. Smoking education programs 1960-1976. *American Journal of Public Health* 68(3): 250-257, March 1978.
- (104) WAKE, F.R. Antismoking—Where do we go? *Canadian Journal of Public Health* 64(5): 493-496, September/October 1973.
- (105) WAKE, F.R., THOMAS, E., BERGIN, J. Nurses, smoking, and school children. *Canadian Nurse*: 19-22, July 1973.
- (106) WICHITA PUBLIC SCHOOLS UNIFIED SCHOOL DISTRICT 259, RESEARCH AND EVALUATION SERVICES DIVISION. A Report of the School Health Education Curriculum Project, Wichita Model 1974-1975. Wichita, Kansas, Wichita Public Schools, July 1975, 17 pp.
- (107) WILLIAMS, C.L., ARNOLD, C.B., WYNDER, E.L. Primary prevention of chronic disease beginning in childhood. The "know your body" program: Design of study. *Preventive Medicine* 6: 344-357, 1977.

- (108) WILLIAMS, T.M. Summary and implications of review of literature related to adolescent smoking. U.S. Department of Health, Education, and Welfare, Health Services and Mental Health Administration, Center for Disease Control, National Clearinghouse for Smoking and Health, September 1971, 59 pp.
- (109) YACENDA, J.A. Smoking behavior and young people. The need for new directions. *Clinical Pediatrics* 12(1): 13A, 17A, January 1973.
- (110) YMCA. *Activetics*. National Council of YMCAs, New York, 2 pp.
- (111) YMCA. *Feelin' Good*. National Council of YMCAs, New York, 4 pp.