

# Cigarette Smoking Among Public School Children in Rhode Island

*Study Highlights the Factors Which Encourage the Smoking Habit Among Teenagers*

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Few public health problems have received more attention in recent years than lung cancer.<sup>1</sup> Since the link between lung cancer and cigarette smoking is now indisputable,<sup>2,3</sup> lung cancer is largely a preventable disease. Nevertheless, the mortality rate from this disease has risen dramatically since 1950, while mortality from other cancers has remained stable or declined.<sup>4</sup>

Fortunately, the proportion of the adult population who are cigarette smokers has also declined.<sup>5</sup> Millions of adult smokers have quit, and each year a smaller proportion is beginning to smoke.<sup>6</sup>

While teenage boys and young men are following the adult trend of decreasing prevalence, teenage girls and young women are not.<sup>7</sup> The proportion of smokers among the latter increased from two to five per cent between 1965 and 1975. This translates into more than a million additional teenage and young women each year who expose themselves and their children to the various adverse affects of cigarette smoking.

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In January 1978, Joseph Califano, then DHEW Secretary, outlined a series of initiatives designed to reduce the effects of cigarette smoking. Among other things he said, "the only sure way to stop smoking is not to start. We will, therefore, concentrate many of our efforts on prevention among young people of school age . . .".<sup>8</sup>

## Study Design and Methods

The purpose of this paper is to report the extent of the smoking problem among public school children in Rhode Island. The focus is upon the proportion of current cigarette smokers by grade and sex.

The data were gathered in conjunction with the School-Based Smoking Project of the Rhode Island Department of Health's Cancer Control Program (RICCP). This model project, developed and conducted through the joint efforts of the Interagency Council on Smoking and the American Cancer Society (Rhode Island Division), is attempting to "reduce by ten per cent per year the proportion of students smoking cigarettes in three target school systems."<sup>9</sup> The three "target" districts were selected, in part, because they represent urban, suburban, and rural communities in Rhode Island and because of a prevailing atmosphere in each area which was conducive to the development of a model program.

Three comparison districts were designated to provide a basis for interpreting the significance of change in smoking prevalence over time. To accomplish this, the urban district was merely split into two parts — one (treatment) consisting of schools in which RICCP activities would be vigorously applied, and the other (comparison) of

89746343

schools in which such activities would not be applied. Separate suburban and rural comparison districts were chosen. Since the purpose of this report is to describe the extent of cigarette smoking, all school districts will be examined without treatment or comparison distinctions.

The study design provided for the administration of a brief, anonymous questionnaire to a sample of sixth, eighth, tenth, and twelfth graders in each of the school districts. The questionnaires were administered by members of the research team between December 1978 and April 1979. An effort was made to minimize the biases introduced by the variation in data collection methodology; however, the sampling frame was not rigorous, and a random sample may not have been achieved. In all, 2651 public school children were surveyed, accounting for 1.8 per cent of all Rhode Island public school enrollees and 7 per cent of those enrolled in sampled districts (all grades).<sup>10</sup>

#### Smoking Behavior of Rhode Island Public School Students

**Smoking prevalence.** Fourteen per cent of male respondents in the four grades currently smoke cigarettes compared to 21 per cent of the females. (Table 1). Conversely, over 38 per cent of males reported having "never smoked", whereas only 32

Table 1. Per cent of Current, Regular Cigarette Smokers Among Public School Children in Five Rhode Island School Districts by Grade and Sex (1975) (N = 2586)

SEX	GRADE				TOTAL
	6	8	10	12	
Male	3.5	11.4	18.7	24.3	13.9
Female	1.9	23.9	24.3	33.3	21.0
Both Sexes	2.7	18.1	21.6	28.9	17.6

per cent of females gave this answer. The proportion of cigarette smokers increases significantly with grade level from 2.7 per cent among sixth graders to 28.9 per cent among twelfth graders. With the exception of the sixth grade, females consistently smoke in significantly greater proportions than males of the same grade level.

The smoking behavior of all respondents is roughly equivalent when controlled for grade (or age) and sex. Therefore, the analysis will proceed without distinguishing between urban, suburban, or rural districts.

**Comparison with United States data.** A national survey in 1974 found that 15.3 per cent of females (age 12-18) were current, regular cigarette smokers.<sup>11</sup> This represented a substantial increase in

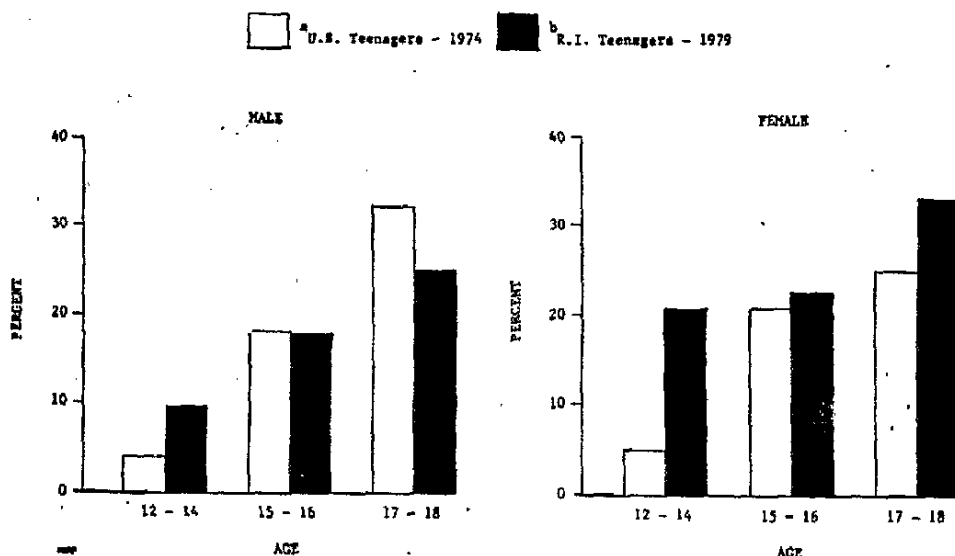


Figure 1 - Percent of teenagers who are current cigarette smokers in United States (1974) and Rhode Island (1979) by age and sex.

<sup>a</sup> Teenage Smoking, USDHEW Publication No. (NIH) 76-931.

<sup>b</sup> School Smoking Survey, Rhode Island Cancer Control Program Evaluation Team, 1979.

89746344

the proportion of female teenagers who smoked compared to a 1969 survey. The proportion of teenage male smokers hovered around 15 per cent over the same period.

Comparison of data from the RICCP School Smoking Survey and the 1974 national survey by age and sex demonstrates that Rhode Island teenage females are smoking in substantially greater proportions than their national counterparts (Fig. 1). This is especially true between the ages of 12 and 14 where 21 per cent of local female respondents are current cigarette smokers compared to 5 per cent of national respondents. Male Rhode Island respondents (age 12-14) smoke in greater proportions than similarly aged US respondents, but by ages 17-18, local males fall below the national rates.

Adults in Rhode Island were, as recently as 1975, also smoking in greater proportions (39 per cent) than were those in the nation as a whole (34 per cent).<sup>3</sup> However there are signs that the prevalence of cigarette smoking among Rhode Island adults is on the decline.

These comparisons underscore the observations made elsewhere that while the proportion of all adults and teenage males who smoke is declining, cigarette smoking among young women and teenage females is on the increase.<sup>7,11</sup> Since the risk of lung cancer due to smoking has been shown to be equivalent among males and females<sup>12,3</sup> — not to mention other cardiovascular and pregnancy-related diseases for which risk may be assessed<sup>13</sup> — cigarette smoking continues to pose a serious public health problem for the schools and the community at large.

*Number of years since smoking began.* Of the 2608 respondents for whom smoking behavior data were complete (45 cases had missing data), 456 (17.5 per cent) reported that they were current cigarette smokers. These respondents were asked how long ago they had started smoking regularly.

Females start smoking earlier than males. Three-quarters of the eighth grade girls who smoke started one year ago or more compared to less than two-thirds of boys in that grade. By grade 10, 91 per cent of the girls started smoking a year ago or more, whereas in grade 12 only 85 per cent of the boys had been smoking that long. This suggests that, among girls, the passage to grade 9 has an important impact on smoking initiation, while among boys grade 11 has more effect. Since boys and girls are still maturing during these times, there may be a connection (probably social rather than biological) between pubescence and smoking initiation which bears further investigation.

*Amount smoked.* Respondents reported smoking from one to over five hundred cigarettes *per week* (mean = 60, median = 40). This transposes into a range of less than one cigarette to more than three packs per day — although only 60 smokers (11 per cent) claimed to smoke one pack or more per day. Whereas a larger proportion of males (25 per cent) than females (12 per cent) smoke ten or more cigarettes per day in the eighth grade, the two are nearly equivalent in the tenth grade (32 per cent and 35 per cent) and twelfth grade (55 per cent and 51 per cent), respectively.

These data, when re-categorized by age rather than grade, contrast markedly with the 1974 national survey of teenage smoking (Table 2).

Table 2. Per cent of Smokers Who Smoke Ten or More Cigarettes Per Day, US\* and RI\* Teenage Smokers, By Age and Sex.

		MALES			FEMALES		
		AGE			AGE		
		12-14	15-16	17-18	12-14	15-16	17-18
10 Or More Cigarettes Per Day	U.S.	52.6	69.0	80.1	26.1	59.7	72.7
	R.I.	17.9	36.0	54.9	11.7	35.2	51.5

\*Teenage Smoking, USDHEW, 1974.

\*RICCP School Smoking Survey, Evaluation Team, 1979.

Substantially fewer Rhode Island teenagers smoke ten or more cigarettes per day compared to their national counterparts. This is equally true for females, signifying that, while a larger proportion of Rhode Island teenage females are exposed to cigarette smoking than obtains nationally, they are apparently receiving a smaller dose. This observation may signal an opportunity to conduct successful cessation programs, since smoking dosage tends to increase with habituation and those least habituated are the easiest to reform.

#### Correlates of Smoking Behavior

Several characteristics of individuals and their social environment have been shown in nationwide surveys to be significantly related to cigarette smoking.<sup>1,5,6</sup> Among teenagers, the more significant of these include: socioeconomic status, scholastic achievement, world experience, and the smoking behavior of associates (family and friends).<sup>7,11</sup> Data from this survey were analyzed to determine if any of these variables are related to the proportion of Rhode Island school children who smoke.

*Ethnic identification.* Respondents were asked if they thought of themselves as belonging to any one

89746345

of five ethnic groups (Blacks, French, Oriental, Portuguese, or Spanish American) which have been designated "target" minorities by RICCP.<sup>9</sup> Thirty-two per cent (N = 860) of the respondents answered affirmatively.

Overall, minority group respondents were no more likely to be cigarette smokers (17.8 per cent) than other respondents (17.3 per cent). When the respondents were categorized by sex, a significantly greater proportion of male minority group respondents smoked (17.1 per cent) than non-minority group respondents (12.4 per cent). There were no significant differences among females.

*Parents' education.* Almost 20 per cent of the respondents did not know the extent of their parents' education. Those who answered were significantly more likely to be current smokers if both parents were high school graduates or less (22.6 per cent) than if at least one parent had some college education (15.9 per cent). When controlled for sex of respondent, the relationship between parents' education and smoking among school children persisted for both females (28.3 per cent and 18.1 per cent) and males (16.6 per cent and 13.5 per cent) — although the tendency among males was not as strong.

*Family smoking patterns.* Whether or not other family members smoke significantly affects smoking behavior among the students surveyed regardless of sex. Fifty-three per cent of all students reported that their father smokes, 45 per cent that their mother smokes, 26 per cent that both smoke, and 31 per cent that neither smokes. Respondents, overall, were one-and-a-half times more likely to smoke if either parent smoked (21.2 per cent) than if neither smoked (14.2 per cent). The effect was equally strong for males (24.9 per cent and 17.6 per cent) and females (17.2 per cent and 10.8 per cent).

Similarly, 1179 respondents (44 per cent) reported having no older brothers and sisters. Of those that had older siblings, 40 per cent said that none of them smoke, while 60 per cent said that at least one of them smokes. Respondents having older siblings who smoke were themselves more than three times more likely to smoke (29.0 per cent) than those having no older siblings who smoke (8.2 per cent). Results are significant for both males and females, although the relationship is strongest among males.

*Smoking behavior among closest friends.* Subjects were asked how many of their four closest friends (male and female) smoke cigarettes. Thirty per cent reported having no close friends who smoke while the remainder had at least one friend that

does. The effects of reported smoking among friends upon the respondent's own smoking behavior are noteworthy. *Subjects are from twenty-three to nearly thirty times more likely to say that they smoke if they have friends who smoke (26.7 per cent) than if they do not (1.0 per cent).* This relationship persists for both males and females, although it is slightly stronger for females. It is, of course, impossible to determine from the data whether association with a group of friends who smoke causes smoking or whether smokers merely tend to associate with other smokers. Probably both are true. For the purpose of this article it is important only to observe that teenage smokers are immersed in a smoking environment which adds to the symbolic content of their behavior and makes change on an individual level more difficult.

*Job experience other than at home.* Three-fourths of all respondents (N = 1961) reported that they have had a job for pay other than at home. This represents 80 per cent of male and 70 per cent of female respondents.

Significant differences obtained when the proportion of smokers among those reporting an outside job experience and those reporting no such experience are compared. Twenty per cent of those who had worked outside the home are cigarette smokers compared to less than ten percent of those who had not worked outside the home. The same doubling of the proportion of smokers applies to males and females when analyzed separately.

*Grades in school.* When asked about their grades in school, nearly half of the students reported that they earned mostly As and Bs. Only 11 per cent admitted that Cs and below were their usual grades. As a result, respondents were separated into groups including those reporting As and Bs only (47.5 per cent) and those reporting all other grades (52.5 per cent).

The proportions of smokers in the two groups were compared. Of those earning the highest grades, 11 per cent were regular cigarette smokers, compared to 23 per cent of those earning lower grades. The difference between the two groups is significant and persists when controlled for sex of the respondents.

### Summary and Conclusions

This report focuses on the proportion of current, regular cigarette smokers among public school students in five Rhode Island school districts. An anonymous questionnaire was completed by 2651 subjects in the sixth, eighth, tenth, and twelfth grades. Fourteen per cent of male students and 21

per cent of female students responding currently smoke cigarettes. Female respondents smoke significantly more than male respondents in the same grade.

Female school children in Rhode Island also are smoking in greater proportions (21 per cent) than their national counterparts (15 per cent), but both female and male Rhode Island school children are smoking less heavily. Local teenage females who smoke also begin earlier than local males who smoke.

Sex of respondent, family smoking pattern, smoking among friends, job experience outside the home, and grades in school were all significantly related to cigarette smoking prevalence. Significantly more target minority group males smoke cigarettes (17 per cent) than do other males (12.4 per cent) and fewer respondents whose parents went beyond high school (15.9 per cent) smoke cigarettes than those whose parents did not smoke (22.6 per cent). The latter relationship was significant for females but not for males.

The data on cigarette smoking among public school children in Rhode Island reflect the national situation. Although substantially larger proportions of local respondents (both male and female) report that they are regular cigarette smokers than were found nationally, the effects of grade (or age), family smoking patterns, and other correlates of teenage smoking behavior are consistent. The magnitude of these relationships, however, is compelling. The presence of a smoking parent can increase by 50 per cent the likelihood that a child will smoke. An older sibling who smokes will triple or quadruple that likelihood. Children who have friends who smoke are themselves *many times* more likely to smoke than children having no friends who smoke.

These observations confirm the belief that regular cigarette smoking (or at least the initiation of smoking) among school children is not merely an individual psychological phenomenon. It is markedly affected by the related behavior of associates and by other achievements, opportunities, and life experiences. Consequently, smoking

among public school children cannot be reduced simply by educating the individual. We must address the same combination of personal and environmental forces which encourages the initiation of smoking, supports the new smoker during the early period of respiratory discomfort, and maintains his behavior until physical and psychological dependence takes over. The RICCP School-Based Smoking Prevention Project focuses on the knowledge, attitudes, and behavior of teachers, school officials, family members, and other students in addition to the individual. Such approaches possess greater potential for having a significant impact upon the relationships documented in this report, than do those directed solely at the individual.

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