Overview of Recent Changes in Adolescent Smoking Behavior

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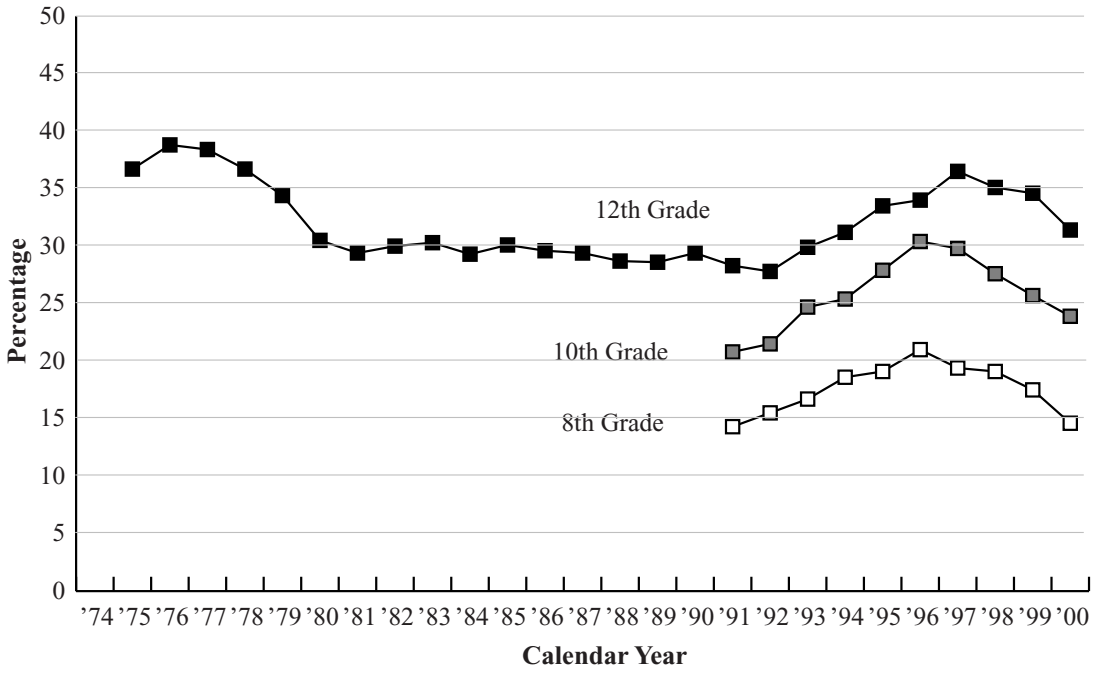
This chapter provides a synopsis and integration of a range of findings put forward by the authors of this monograph. The reader is referred to the relevant chapters for the complete exposition of the findings, their place in the larger literature, and the supporting references.

INTRODUCTION One principal aim of tobacco control programs is the prevention of smoking initiation. Adolescent smoking prevalence peaked during the 1940s for males and during the early1970s for females. Since the 1940s, there has been a substantial decline in smoking prevalence among adolescent males. However, during the 1980s, the decline in prevalence stopped and began to level. The decline from the peak prevalence in the 1970s was less dramatic among female adolescents than male. During the 1990s, both genders experienced an increase in smoking prevalence and smoking rates among males and females are now similar. Recent changes in smoking behavior have been comprehensively documented in a report by the Centers for Disease Control and Prevention (CDC, 2000).

Data from the Monitoring the Future study (see Chapter 2) show a dramatic increase in adolescent smoking prevalence (Figure 1-1) during the 1990s, and similar trends have been observed with the Youth Risk Behavior Survey (YRBS) (see Chapter 3). The National Household Survey on Drug Abuse (NHSDA) showed an increase in the incidence of initiation over the same period (see Chapter 4). This volume examines the increases in smoking prevalence, defines the demographic composition and determinants of smoking, and identifies some of the approaches to dealing with this public health problem.

CHANGES IN ADOLESCENT SMOKING BEHAVIOR OVER TIME The Monitoring the Future study (Chapter 2) has been conducted consistently since 1975 and offers the most complete set of cross-sectional measures of adolescent smoking behavior since that time. Figure 1-1 presents trends in prevalence of any smoking within the last 30 days from 1975 to 2000 for 12th-grade students and from 1991 to 2000 for 8th- and 10th-grade students. The data in Figure 1-1 suggest a peak in 12th-grade smoking prevalence in the mid-1970s, followed by a short period of decline, then by a 10-year period from 1980 to 1990, during which prevalence remained level. Beginning in the 1990s, all three grades showed a nearly simultaneous period of increasing current and daily smoking. The smoking prevalence peaked for 8th- and 10th-grade students in 1996 and for 12th-grade students in 1997. However, all grades have shown declines in prevalence over the last few years. These national trends are confirmed by data from the BRFS and NHSDA surveys (see Chapters 3 and 4).

Figure 1-1
Trends in 30-Day Prevalence of Cigarette Smoking for 8th-, 10th-, and 12th-Graders, 1975-2000

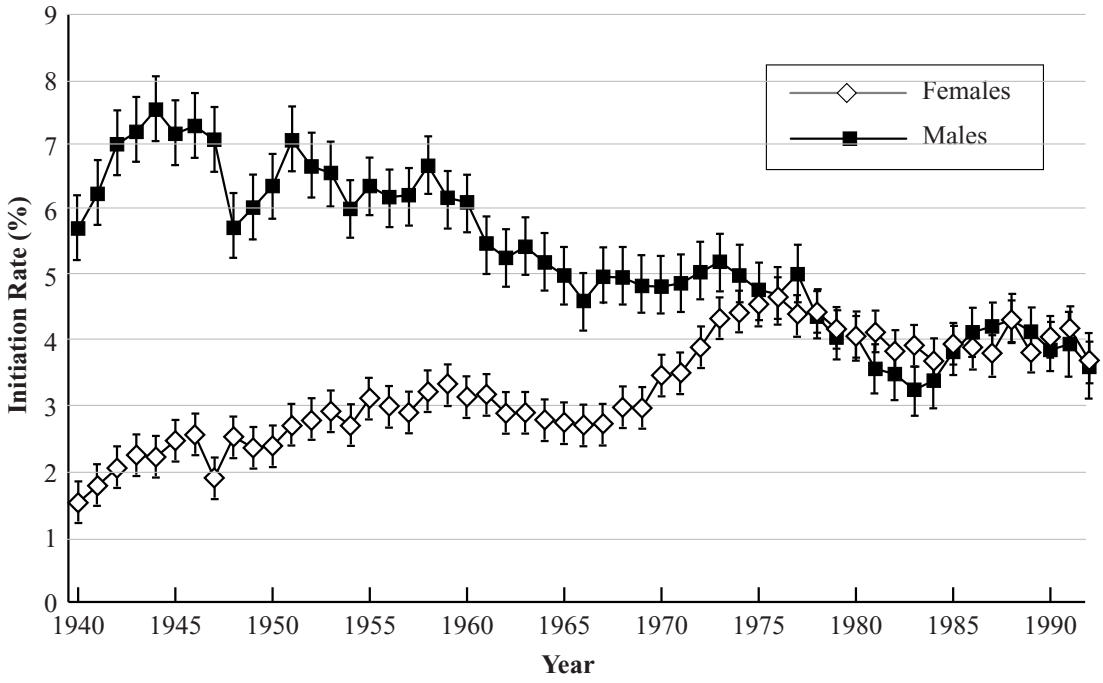


NOTE: Data from the most recent Monitoring the Future Study was used in this figure. Other sections of this monograph present older data available at the time the chapters were written.
SOURCE: Monitoring the Future Study, University of Michigan.

It is possible to estimate smoking initiation rates for the years prior to the availability of the cross-sectional survey data (*i.e.*, pre-1975) by using recall of the age of smoking initiation from surveys of adults (see Chapters 8 and 9). When gender-specific trends in adolescent smoking initiation over the last half-century are examined using this approach (See Chapter 9), rates of smoking initiation among adolescent males have decreased significantly since 1940 (Figure 1-2). Adolescent females, who had rates of initiation that were substantially lower than those for adolescent males prior to 1970, increased their rates of initiation between 1940 and 1960, and then their rates declined slightly during the early 1960s. Female adolescents aged 12-17 sharply increased their rates of initiation following Philip Morris' introduction and marketing of Virginia Slims brand of cigarettes in the late 1960s. Male and female adolescent initiation rates have been similar since the mid-1970s.

Most of the change in initiation seen over the last several decades can be attributed to the changes in rates among older 15- to 17-year-old adolescents, with rates among 12- to 14-year-old adolescents changing much less. This rise in adolescent smoking initiation during the late 1960s and early 1970s is confirmed by examining the age at which first regular smoking occurred as reported by 12th-grade students in the Monitoring the Future study (See Chapter 2).

Figure 1-2
Incidence of Smoking among 12- to 17-Year-Old Adolescents, 1940-1992

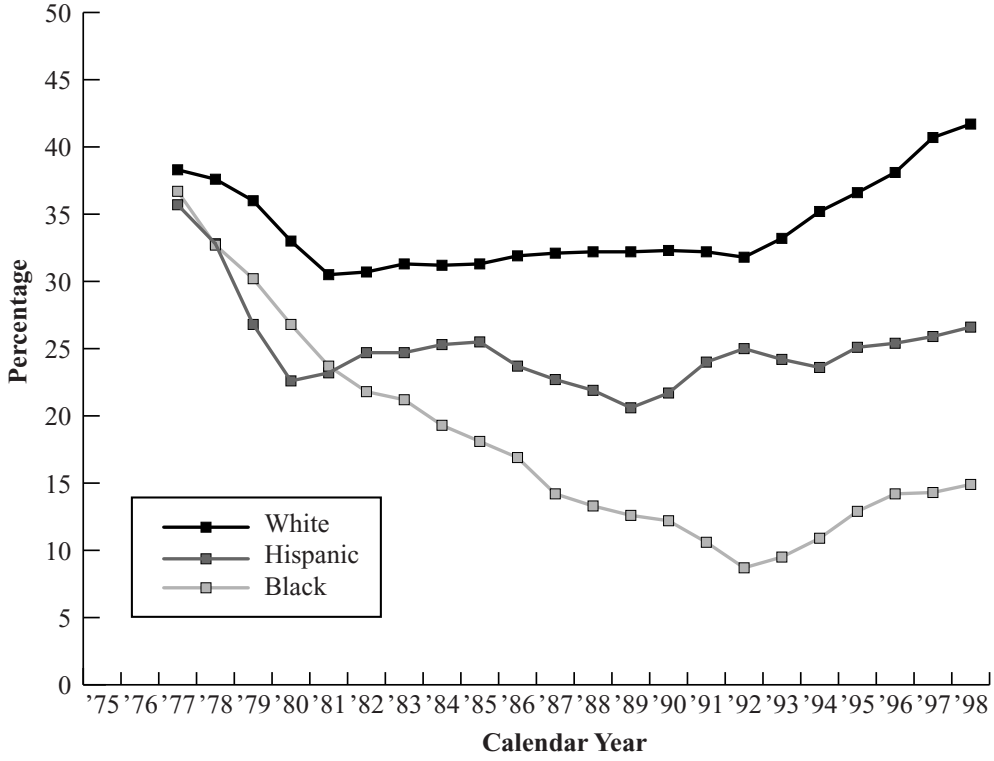


National estimates of current smoking within the last 30 days for adolescents have increased between 1991 and 1997 as measured by both the Monitoring the Future study (Figure 1-1; see Chapter 2) and the Youth Risk Behavior Survey (YRBS), and these trends occurred across all age groups of adolescents and in both genders. Recent data suggest that these trends of increasing prevalence are reversing (see Figure 1-1), but they remain a critical public health concern.

Demographic Composition of the Recent Increase in Adolescent Smoking Prevalence

Recent increases in adolescent smoking prevalence rates have occurred across all racial and ethnic groups, but the magnitude of the changes has not been uniform. Cross-sectional survey data from the Monitoring the Future study (see Chapter 2) show small differences in smoking prevalence rates among White, Hispanic, and African American 12th-grade adolescents in 1976, near the start of the study (Figure 1-3). However, during the period of general decline in use (1977–1981), smoking prevalence among Africa American and Hispanic 12th-grade students declined more than among Whites. Thereafter, through 1992, cigarette smoking prevalence rates among Hispanic adolescents remained stable, but at lower levels than among Whites. Smoking prevalence rates among African American students continued to decline steadily from 1981 to 1992, opening a very large differential with White smoking rates and a sizeable

Figure 1-3
Trends in 30-Day Prevalence of Cigarette Smoking by Race/Ethnicity for 12th-Graders, 1975-1998



Source: The Monitoring the Future Study, University of Michigan.

differential with Hispanic rates. After 1992, all three groups showed some increase in smoking, though the increase was smallest among Hispanics. There also was a change in smoking prevalence associated with population density; the increase in teen smoking prevalence during the 1990s was greatest in the non-urban areas.

These differences in smoking behavior are confirmed by analyses of the YRBS data (see Chapter 3) and of the NHSDA data (see Chapter 4). Reconstructed initiation rates from the adult Current Population Survey (CPS) (see Chapter 9) also suggest that there is a difference between age-specific initiation rates at every age of non-Hispanic White adolescents and those of Hispanic and African-American adolescents.

In contrast to the national data, which show that there has been a clear increase in smoking prevalence rates among African American adolescents, data from two states with strong tobacco control programs—California and Massachusetts (see Chapters 5 and 6, respectively)—show smaller increases in smoking prevalence rates. These states also do not show an increase in smoking prevalence rates among African American adolescents. In these states, the increase in smoking prevalence was most evident among non-Hispanic White and Asian adolescents.

Other demographic characteristics that are associated with differences in adolescent smoking trends are presented and discussed in Chapter 2, based on findings from the Monitoring the Future study. However, the greatest divergence in trends is that associated with race/ethnicity.

Changes in the Social Predictors of Adolescent Smoking

Educational aspirations and school performance have long been established as strong correlates of cigarette smoking (Bachman *et al.*, 1978; Johnston, 1973), and they define populations of adolescents who have clear differences in smoking prevalence (see Chapter 2). Self-described school performance is strongly correlated with smoking prevalence in the NHSDA (See Chapter 4), and the Monitoring the Future study demonstrates a clear difference in smoking prevalence between two groups of 12th-grade students with different educational aspirations (see Chapter 2). However, the increase in smoking prevalence that occurred in the mid-1990s was observed in both of these groups of 12th-grade students.

Data from California collected in 1990, 1993, and 1996 demonstrate an increase in smoking prevalence among adolescents (see Chapter 5) over this interval, and smoking prevalence was strongly associated with self-described below-average school performance. However, the prevalence of smoking among students with poor school performance did not change between 1990 and 1996. In contrast, there was an increase in smoking prevalence for adolescents who described their school performance as average or above average. This suggests that the increase in smoking prevalence in California occurred among those same students with whom smoking prevention efforts generally have been most successful. Parental smoking and sibling smoking were also strongly associated with adolescent smoking. Furthermore, the increases in smoking prevalence across the survey years occurred among adolescents with and without the influence of parental or sibling smoking.

Examining changes in adolescents' perception of the number of their friends who are smokers offers some insight into the reasons for the increase in adolescent prevalence (see Chapter 5). Adolescents who reported three or more friends who smoked had a smoking prevalence approximately ten times that of adolescents who reported that none of their friends smoked. However, there did not appear to be any increase between 1990 and 1996 in smoking prevalence within each category of number of friends who smoked. For example, the prevalence of smoking went from 4.4 percent in 1990 to 3.8 percent in 1996 among 16- to 17-year-old adolescents who had no male friends who smoked and from 41.0 percent in 1990 to 36.4 percent in 1996 among those who had three or more male friends who smoked. This would suggest that the power of perceived adolescent peer smoking to predict, and possibly influence, adolescent smoking prevalence had not increased between 1990 and 1996. What has changed is the fraction of adolescents who report that multiple friends smoke. For example, the percentage of 14- to 15-year-old adolescents who reported that none of their male friends smoked declined from 61.7 percent in 1990 to 38.1 per-

cent in 1996, while the percentage who reported that three or more of their male friends smoked increased from 13.1 percent in 1990 to 38.0 percent in 1996. This increase in reporting friends who smoked between 1990 and 1996 was evident for all age groups and for both male and female friends; and it demonstrates a dramatic rise in adolescents' perception of the number of their peers and friends who smoke. Part of this change in perception is likely to be based on an accurate assessment of the increase in adolescent smoking prevalence that has occurred in California between 1993 and 1996, but the magnitude of the increases in perception of adolescent smoking (a tripling of friends and doubling of peers) is vastly out of proportion with the real change in prevalence (from 9.2 percent in 1990 to 12 percent in 1996). This suggests that a change may have occurred over this interval in the perception of adolescents about how common smoking is among their peers. Tobacco industry advertising and promotional efforts may have been successful in convincing adolescents that smoking is the norm for their peer group, and certainly public health efforts to de-normalize tobacco use among adolescents were not successful in altering the perceptions of these adolescents.

Effects of Tobacco Industry Promotional Efforts

Tobacco advertising and promotional activities are an important catalyst in the smoking initiation process. A review of the existing evidence on the relationship between exposure to advertising or having a tobacco promotional item and smoking behavior (see Chapter 13) suggests that there is a causal relationship between tobacco marketing and smoking initiation. Tobacco advertisements may be particularly attractive to adolescents who are looking for an identity similar to that offered by the images in the ads. These are the youths who are likely to retain tobacco promotional items, while those whose identity needs are met in other ways would likely lose, discard, or forget about them. Owning the items offers the opportunity to the vulnerable group to "try on the image of a smoker" (Feighery *et al.*, 1998). Doing so is likely part of a longer term process of accepting the image and, eventually, the smoking behavior that goes with it.

Effects of Counter-Advertising and Other Tobacco Control Programs

In Florida (see Chapter 7), mean scale scores on an index of receptivity to tobacco company promotions declined by 10 percent from 2.0 in 1998 to 1.8 in 1999 among middle school students in conjunction with a state-wide intensive media tobacco-control program. Among high school students, mean scores declined by 20 percent from 2.0 in 1998 to 1.6 in 1999. Declines in receptivity were evident (and of similar magnitude) across all racial/ethnic groups. Over the same interval, the prevalence of current cigarette use declined among middle school students from 18.5 percent in 1998 to 15.0 percent in 1999, and among high school students, from 27.4 percent in 1998 to 25.2 percent in 1999. Among middle school students, declines in current cigarette use were substantial and significant for both males and females. Among high school students, however, the decline was statistically significant only among females. Among both middle and high school stu-

dents, the declines were most pronounced among non-Hispanic White students. The only difference across the two survey years in the models predicting cigarette use was a small, but statistically significant, decrement in the magnitude of the odds ratio for number of friends who smoked cigarettes in 1999 compared to 1998.

After the passage of Proposition 99 in California in 1988, which increased the tax on a pack of cigarettes by 25 cents, initiation rates among older Californian boys decreased significantly. In 1991, these rates were significantly lower than initiation rates among boys of the same age in the rest of the nation (see Chapter 9). This suggests that early tobacco control efforts in California, which were predominantly media intensive, may have differentially impacted this age group during the early years of the campaign. There did not appear to be a significant change in smoking initiation among Californian girls of any age after the passage of Proposition 99. Smoking prevalence among adolescents increased between 1990 and 1996 in California, but the magnitude of the increase was proportionately less than that for the nation as a whole.

A similar effect was observed in Massachusetts (see Chapter 6), where smoking rates for youths remained flat between 1993 and 1996, in contrast to the increase nationally. It is postulated that a large cohort of junior high school smokers advancing into high school may have overwhelmed a prevention program in Massachusetts based on de-normalization of smoking in junior high school. What is promising is that whatever pressure this smoking cohort might have exerted on younger students appears to have been mitigated by the tobacco control work in Massachusetts. The data are consistent with effectiveness of the Massachusetts tobacco control program in changing social norms and are supportive of behavior change in younger grades, among males, among African Americans, and possibly among girls. All grades showed increases from 1993 to 1996 in the proportion reporting that *many* of their friends disapprove of smoking. This is consistent with success in changing social norms, even if mitigated somewhat by a reduction in those reporting that *all* friends disapprove of smoking.

There is evidence that antismoking advertising can help to deter adolescents from smoking cigarettes, but, to date, the evidence is indirect. Research suggests that certain types of advertising messages work better than others. According to Pechmann and Goldberg's (1998) findings, three of the seven message types tested were efficacious in terms of reducing adolescents' intent to smoke: One of the negative consequences messages (Endangers Family) and both of the normative information messages (Negative Smoker Role Models, Positive Nonsmoker Role Models). Based on these findings, at least, it appears that antismoking messages that are directed at adolescents should focus on smoking's negative consequences on family members and on smoking-related norms.

Research clearly indicates that tobacco control interventions conducted at the macro level can be very effective in reducing cigarette smoking among adolescents. In particular, these include increased tobacco taxation and stronger tobacco control policies.

CONCLUSIONS

1. Cigarette smoking prevalence among adolescents increased during much of the 1990s, but more recently began to decline. The increase in smoking prevalence occurred across all racial and ethnic groups, but appears to have been somewhat lower among female, Hispanic, and African American adolescents.

2. The increase in smoking prevalence was accompanied by an increase in the fraction of adolescents reporting that their friends smoked, and this may indicate a re-normalization of tobacco use among adolescents.

3. Evidence on the relationship between exposure to advertising or having a tobacco promotional item and smoking behavior suggests that there is a causal relationship between tobacco marketing and smoking initiation.

4. Tobacco control interventions conducted at the macro level can be very effective in reducing cigarette smoking among adolescents.

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