Alcohol, Tobacco, and Other Drug Use among Rural/Small Town and Urban Youth: A Secondary Analysis of the Monitoring the Future Data Set

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ABSTRACT

Objectives. This study compared prevalence of substance use among high school seniors in rural and urban areas from 1976 through 1992.

Methods. We used data collected for these years from urban (n = 75 916) and rural (n = 51 182) high school seniors. Thirty-day prevalence for alcohol, cigarettes, marijuana, cocaine, LSD, and inhalant use, binge drinking, smoking a pack or more of cigarettes a day, and daily alcohol and marijuana use were evaluated.

Results. Substance use declined from 1976 through 1992. In 1976, urban students had greater prevalence for most substances, but by 1992, rural and urban students were similar, with rural students having higher prevalence for alcohol and cigarette use (particularly excessive use). Trends were similar for both sexes, though rural girls showed a later catch-up to use levels of urban girls.

Conclusions. Rural students are currently at risk approximately equal to that of urban students. Other studies have demonstrated the association of substance use with increased morbidity and mortality. Policy alterations and health education programs should address this pattern in the nation's rural areas. (*Am J Public Health.* 1997;87:760–764)

Introduction

In recent years, both the scientific literature and the popular press have devoted attention to the problem of youth alcohol and other drug use; the continuing social concern with this issue is reflected in the document *Healthy People 2000,* which devotes separate priority areas to tobacco, alcohol, and other drugs. In addition, other priority areas (e.g., unintentional injury, cancer, maternal and child health) are directly linked to substance-abuse behavior.[1] The majority of public and scientific attention has focused on urban and suburban youth because drug use has been thought of primarily as an urban problem, arising in poor American neighborhoods and ghettos. In contrast, rural America has been assumed to be somewhat immune to such problems. This perception may have been true in the early years of our country's development. However, recent studies have shown that in different regions, with different populations, and at different times, certain substance-use behaviors are prevalent among rural youth. For example, Swaim et al.,[2] in their study of three small rural communities in the Rocky Mountain region, found that the 12th-grade students in their sample had significantly higher rates of alcohol and LSD use when compared with national data, but lower rates of use for marijuana, uppers, downers, and tranquilizers. Sarvela et al.[3] studied age of first use of alcohol and other drugs in a sample of approximately 4000 central and southern Illinois junior and senior high school students and found that use rates for most substances were similar to national data. However, rural youth began drinking alcohol earlier than their urban counterparts. In addition, 58% of high school seniors had driven after drinking or using other drugs.[4]

Evidence from the local and regional level is corroborated by data reported in the summary tables for the Monitoring the Future study, a large, probability-based study of high school seniors from the contiguous 48 states conducted each year from 1975 on.[5] Data contrasting substance-use rates by Standard Metropolitan Statistical Area (SMSA) suggest that rural and urban areas have become more similar from 1975 through 1992 for use prevalence rates for many substances, and use rates for alcohol, cigarettes, smokeless tobacco, and stimulants are higher in areas that are not SMSAs. Moreover, recent data (from 1991 and 1992) on use rates in lower high school grades show excess prevalence for daily alcohol use and binge drinking (drinking more than five drinks in a row) for areas that are not SMSAs in the 10th and 12th grades. Prevalence for daily smoking and for smoking more than a half pack daily in the 8th, 10th, and 12th grades is substantially greater for areas that are not SMSAs, and the increase for these two prevalence rates from the 8th through the 12th grade is also greater for these areas.[5]

The present study further characterizes urban-rural differences in substance-use rates using data from the Monitoring the Future study collected from 1976 through 1992. Data on 30-day prevalence for use of selected substances (alcohol, tobacco, marijuana, LSD, cocaine, and inhalants) by high school seniors are analyzed for urban-rural differences.

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Methods

Overview

The Monitoring the Future study[6,7] is a national, probability-based study conducted on an annual basis since 1975. (The public tapes, however, have data only from 1976 onward. Partly for that reason, our study deals only with data beginning in 1976. Another reason for starting with 1976 data is that the Monitoring the Future study follows up about half of each year's sample in the following year. This built-in longitudinal component allows a check on reliability as well as a check on the consistency of sampling for that year. The follow-up could not, of course, be done the first year.) The sampling design uses a three-stage process (geographic area, school, and individual). Approximately 16 000 students from 125 schools are selected each year, with over 287 000 students participating from 1976 to 1992. To provide coverage for the 1300 items assessed, six questionnaires covering substance use, educational experience, attitudes, and other topics are administered to different subsamples of students each year. A core of 115 variables focusing on alcohol and other drug use behavior, demographic characteristics, and some other areas are administered to all study participants. Data collection is carried out within the schools by a trained representative and takes about 45 minutes. Response rates are about 83%[7] for the whole sample.

Data Analysis Procedures

All analyses for this study were conducted with the variables included on the core data set. Because we wished to maximize the contrast along the urban-rural continuum, we classified as rural those students who lived outside of an area classified as an SMSA at the time they were surveyed, and who reported living in a rural farm, rural nonfarm, or small town (less than 50 000 population) during most of their lives. Only students who resided in SMSAs at the time of the survey, and who reported living in large (100 000 to 500 000) or very large cities (≥ 500 000) or their suburbs during most of their lives were classified as urban. Students living in smaller cities and medium-sized towns (50 000 to 100 000 residents) were thus excluded from the current analysis.

We examined substance use in the last 30 days because of the greater reliability of responses about recent activities. Our analysis focused on use of alcohol, cigarettes, marijuana, LSD, stimulants, cocaine, and inhalants. Prevalence figures for any use were constructed by coding all individuals as having used or not used a particular substance over the past 30 days, regardless of use frequency. We also evaluated excessive use of alcohol, cigarettes, and marijuana more closely because of the greater health significance of these behaviors. For alcohol and marijuana, daily use (≥ 20 uses per month) were evaluated. Binge drinking (the number of times an individual consumed five or more drinks in a row over the last 2 weeks) was also assessed in a separate question from any alcohol use in the Monitoring the Future protocol. Excessive cigarette use was defined as smoking more than a pack of cigarettes per day.

We analyzed trends from 1976 through 1992 and urban-rural and gender differences within each of the time periods. The data were grouped into 3- and 4-year intervals, which allowed for greater stability of prevalence estimates. Urban-rural and gender differences were evaluated with a z test for difference between proportions[8] with the use of 95% confidence intervals and effective sample sizes presented by Johnston and coworkers,[9(pp 414–432)] which correct for the effect of cluster sampling (i.e., sampling within high schools).

TABLE 1—Selected Demographic Characteristics of the Subsample of Urban and Rural High School Seniors from the Monitoring the Future Data Set Sampled from 1976 through 1992[a]

	Urban (n = 75 916), %	Rural (n = 51 182), %
Gender		
Males	51.3	49.8
Females	48.7	50.2
Race/ethnicity		
White	79.1	88.8
Black	20.9	11.2
Father's education[b]		
≤8th grade	5.3	9.9
Some high school	11.5	18.2
Completed high school	27.1	37.0
Some college	17.1	13.4
College and beyond	38.9	21.5
Interval of study		
1976–1979	24.0	26.8
1980–1982	19.0	19.4
1983–1985	15.0	18.8
1986–1988	17.8	15.2
1989–1992	24.2	19.9

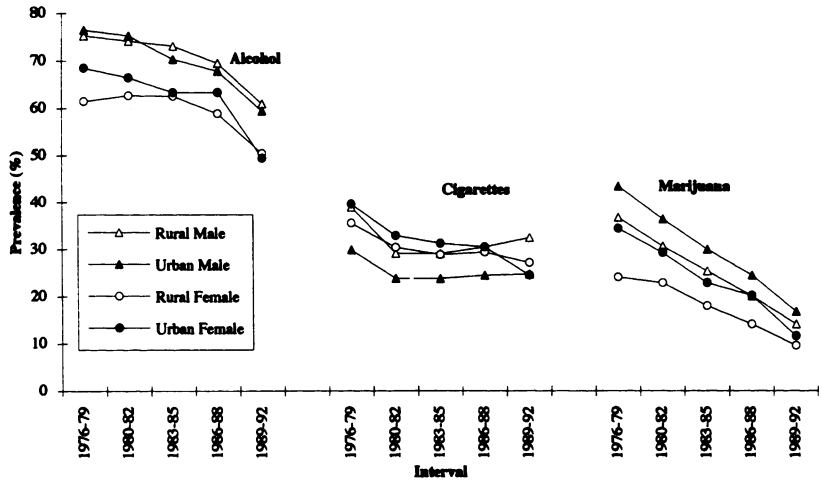
[a]The Monitoring the Future study (carried out by the Institute for Social Research at the University at Michigan) has annually surveyed a national probability sample of high school seniors on lifestyle behaviors and attitudes, including substance use.
[b]Distributions for mother's education did not differ from those for father's education.

Results

Sample Characteristics

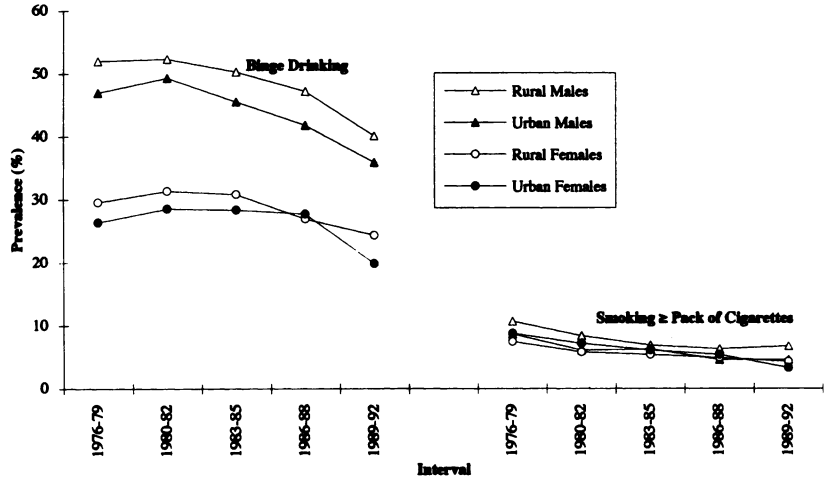
The total sample included in the present analysis was 127 098 (rural n = 51 182; urban n = 75 916). Table 1 shows breakdowns for the sample on a number of demographic characteristics. Except for ethnicity, variation in total sample sizes across the various characteristics is due to missing data (even for gender). Ethnicity information on those classified as "other" (i.e., non-White or non-Black) is not included on the public-access data tapes because of the small overall numbers and the risk of breaching confidentiality for these individuals.

There is an even gender distribution in the two urbanicity categories. The percentage of Blacks was greater in the urban sample (21%) than in the rural–small town sample (11%), and there were more college-educated fathers of students in the urban (39%) than in the rural–small town group (22%). In the urban sample, those reporting having grown up mostly in a large city or large city suburb represented more than 60%. For the rural sample, more than half were from small



Source. Data are from the Monitoring the Future study.[6]

FIGURE 1—30-day prevalence of alcohol, smoking, and marijuana use for male and female high school seniors in urban and rural areas.



Source. Data are from the Monitoring the Future study.[6]

FIGURE 2—30-day prevalence of binge drinking and smoking one or more packs of cigarettes per day for male and female high school seniors in urban and rural areas.

towns. Demographic characteristics for students from medium-sized cities (excluded from this analysis) resembled those for rural–small town areas, with about 12% of Black students and a smaller proportion of parents completing college and postgraduate work.

The final group of subentries in Table 1 shows sample sizes for each of the five intervals used in the analysis. The first and last intervals (each encompassing 4 years) have larger sample sizes than the three intervening intervals, each encompassing only 3 years.

30-Day Prevalence of Selected Substances by Urbanicity and Gender

Figures 1 through 4 show 30-day prevalence (in percentages) for selected substances from 1976 through 1992 for males and females in the urban and rural samples. Prevalence rates were greater for males for all substances except cigarettes at all times and in both groups. For most substances, prevalence rates were highest in 1976 and declined through 1992. Declines for smoking and smoking a pack or more per day were modest, and inhalant use appears to have increased. Among the various substances and behaviors, alcohol use, binge drinking, smoking, and marijuana use were most prevalent. Rates for cocaine, LSD, and inhalants never exceeded 7% and were usually less than 3%.

Licit Substances. Urban-rural differences in alcohol use (Figure 1) crossed over during this interval, with rural students initially lower but ending with similar 1992 prevalence rates. Rates of binge drinking (Figure 2) and daily alcohol use (Figure 3) were higher among rural students, particularly males, throughout most of this period.

Gender and urbanicity differences were complex for cigarette smoking. In the earlier period, any use was highest in urban males and lowest in urban females, but by 1992, rural males and females had higher rates. For smoking one pack or more per day, differences were small, though rural males had the highest rates. It is notable that among rural students, those in rural farm and nonfarm areas had higher rates of cigarette use, but lower rates of use of other substances than students from small towns.

Inhalant use increased from 1% to 2% up to a high of 2% to 3% by 1992. Urban-rural differences were small throughout this period.

Illicit Substances. Among the substances considered, rates of marijuana and daily marijuana use showed the greatest declines. Rates for urban and rural students for daily marijuana use converged in 1992. Temporal trends for LSD and cocaine were more complex. While LSD-use prevalence fell slightly for both samples through the middle interval, there was an increase for the urban sample in the final two intervals (from 1.4% to 1.8%). With a z test for difference of proportions, the differences between the urban and rural students (genders combined) were significant only for the 1989-to-1992 interval.

Cocaine-use prevalence peaked for each sample in the second two intervals and then dropped by the last interval. Cocaine use rates were statistically significantly higher by z test for urban students than for rural students (genders combined) throughout this period, with a greater contrast in cocaine use rates in the earlier years.

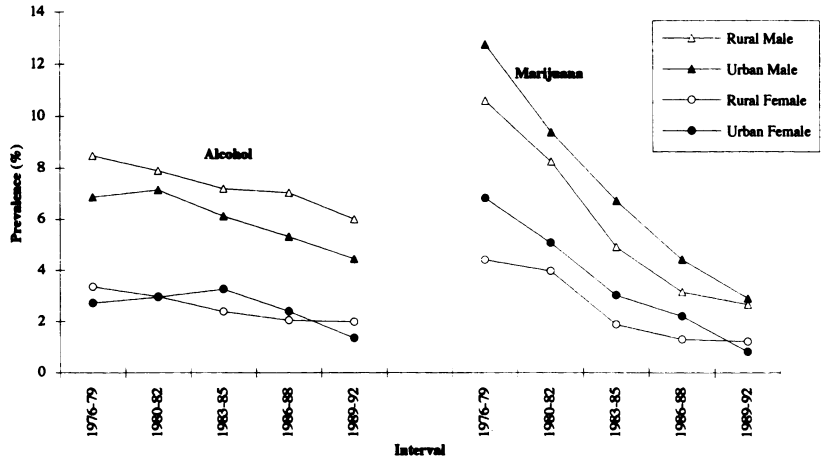
Discussion

The present study analyzed data on drug use among high school seniors from a large probability-based sample drawn each year from 1976 through 1992 in order to compare use patterns among rural and urban students. As has been noted in the annual reports on the Monitoring the Future study and other publications (e.g., O'Malley et al.[10]), prevalence rates for alcohol, marijuana, and LSD have declined over the last decade and a half in both urban and rural areas. Cigarette use declined from 1976 through 1982, with relatively stable use rates thereafter, particularly among rural students. Cocaine-use prevalence peaked in the mid-1980s, then, in the early 1990s, returned to a level slightly lower than that observed in the 1970s. Urban and rural rates for marijuana and cocaine, including daily marijuana use, converged by 1992. Finally, inhalant use rose slightly across the period considered here. The increasing use of inhalants, particularly among younger adolescents, has been commented on in the literature,[11] and lifetime-use prevalence is estimated to be between 4% and 10%.[12,13] However, the reasons for this trend are not well understood.[14]

In general, the findings here indicate two notable types of trends in differences between urban and rural high school students. First, for the two licit substances considered (alcohol and cigarettes), rural students tend to have similar or higher use prevalence than urban students throughout the whole time period. This contrast is most striking for binge drinking and 30-day smoking prevalence. The rural excess prevalence in binge drinking is apparent in both sexes. The urban-rural difference in daily alcohol use parallels that for binge drinking in males, but not in females. It is notable that the overall gender difference exceeds the urban-rural contrast, and this suggests that factors protecting females from higher levels of alcohol use cross-cut the urban-rural continuum. A gender difference for alcohol[15–17] and for use of other substances[16,17] was also noted by other investigators.

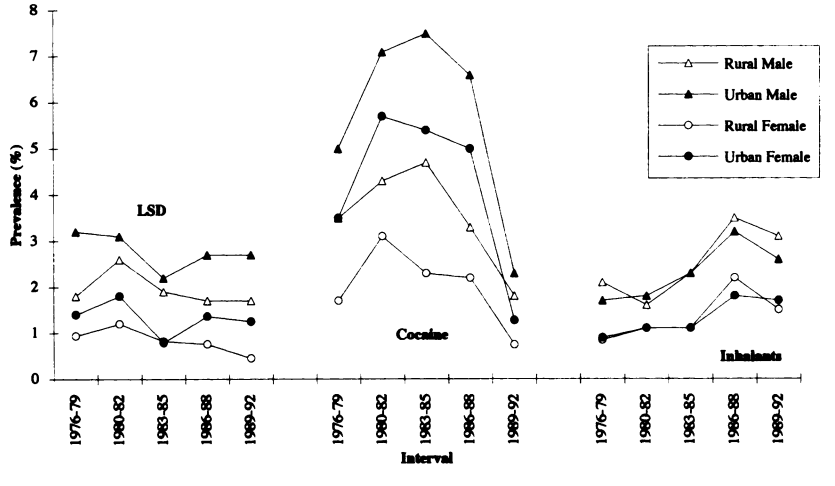
A number of other studies on smaller regional samples corroborate the finding of greater alcohol use among rural students. For example, Thomas[15] reported substance-use rates for a semiurban midwestern community. Use of most illicit substances as well as abstinence levels also compared favorably with national and statewide levels. However, results showed that the most serious problems were in use of alcohol and tobacco. Rates similar to those reported in the national study were seen in this study. However, the rates of drinking level (e.g., binge drinking) were most outstanding, with once-a-month binge drinking reported by 5% of 9th graders and 26% of 12th graders. Moreover, most adverse behavioral consequences (e.g., arguments, trouble with parents and friends) were associated with alcohol use. Thomas speculates that the risk and protective factors supporting use patterns for illicit drugs do not apply to alcohol because of the social context in which alcohol consumption is modeled by and approved for those over 21. These findings are noteworthy because excessive use of alcohol and binge drinking show associations with increased risk for violent behavior, fetal alcohol syndrome, and other health problems.

When patterns of smoking and smoking a pack or more per day are analyzed by gender, a complex set of changes is



Source. Data are from the Monitoring the Future study.[6]

FIGURE 3—30-day prevalence of daily alcohol and marijuana use for male and female high school seniors in urban and rural areas.



Source. Data are from the Monitoring the Future study.[6]

FIGURE 4—30-day prevalence of LSD, cocaine, and inhalant use for male and female high school seniors in urban and rural areas.

apparent. In rural areas from 1976 through 1988, 30-day smoking prevalence was similar in each sex through the 1983-to-1985 interval, after which rural males began a shallow upward trend. For the same period, smoking prevalence was higher for urban females than for urban males. By the final interval, urban male and female smoking prevalence was about the same, owing to a notable decline in urban females from the 1986/1988 to the 1989/1992 intervals. This trend is corroborated by other data reported for large national surveys.[18] Males are responsible for most of the rural excess prevalence for smoking a pack or more per day. Rural females had rates lower than urban males and females for all but the last interval under consideration here, when their rates approximated those of urban males. The difference between urban and rural students appears to be due to a combination of declines in urban students, particularly females, and attenuated or absent decreases in rural students. Decline in smoking among females may be due to increased perception of its harmfulness and/or more conservative norms.[18] However, these data suggest that whatever influences have affected urban females have had less impact on rural adolescent girls.

A second type of urban-rural contrast is apparent for marijuana and cocaine. For each of these substances, and for daily use of marijuana, prevalence in urban areas exceeded that in rural areas at the beginning of the period considered, but the difference was much reduced by the last interval. Data previously presented in the Monitoring the Future report[5] have shown that daily use of marijuana was greater in non–SMSAs in 1992.

This study indicates that use of licit substances in rural areas is similar to or exceeds that for urban areas. Rural use of some illicit substances in the early 1990s was similar to that in urban areas, and this differs from trends characteristic in the 1970s and 1980s. These findings contrast with the popularly held notion that rural youth are more protected against the use and abuse of drugs by their distance from the factors supporting drug use in urban environments (crime, social disorganization, poverty, drug availability). Of particular note is the convergence of urban and rural rates of use in the face of declining overall use rates for most substances. This suggests that substance availability has changed in rural areas, that prevention efforts are less common or less effective, or that social factors protecting rural youth from drug use and abuse have changed from 1976 to 1992. Alternatively, youth from urban areas may have reduced use levels because of a greater awareness of problems associated with substance use.

Most notable and of concern among the findings reported here are those dealing with legal substances that enhance the risk of morbidity and death for the individual. Rural students show more stable and substantially higher prevalence for excessive use of cigarettes, a substance associated with increased mortality. Daily use of alcohol and binge drinking, often associated with automobile accidents and death, and increased risk for violent behavior, show the greatest excess among rural students, particularly males, as compared with urban students.

Policy specialists must focus on the needs of rural populations and develop policy that enhances positive health behaviors. Policymakers must acknowledge that the use of alcohol and other drugs is a problem for both urban and rural youth. Policy especially related to alcohol and tobacco use must be developed for rural populations. From morbidity, mortality, and economic perspectives, these drugs cost our society much more than other drugs, and they appear to be a greater problem in rural than in urban areas. Prevention programs based on multiple components implemented through comprehensive community health strategies must be emphasized. As Nelson et al.[18] have suggested in relation to adolescent tobacco use, we must use antismoking education programs, reduce access to tobacco products, devise environmental approaches, and increase cigarette excise taxes. Similar methods can be used for alcohol use. Policymakers must encourage the use of education programs that have been shown through carefully designed and controlled evaluation studies to be effective. Unfortunately, as pointed out by Ennett and colleagues,[19] popular programs that show limited effect, such as DARE (Drug Abuse Resistance Education), are often implemented in place of other, more beneficial programs. □

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