Alcohol, Tobacco, and Other Drug Use
Among Youth in Rural Pennsylvania
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EXECUTIVE SUMMARY

This research examined alcohol, tobacco and other drug (ATOD) use among Pennsylvania’s rural youth. It was conducted to describe ATOD use in rural Pennsylvania, understand which risk and protective factors predict ATOD use, and identify differences in rural versus urban ATOD use that might impact policy decisions.

To complete the study, the researchers completed a literature review of rural ATOD use; conducted meetings with Pennsylvania government and academic policy stakeholders to gather information on their goals and priorities; reviewed Pennsylvania government websites to determine the extent to which information on rural ATOD issues was present; and analyzed the Pennsylvania Youth Survey (PAYS) data for 2001, 2003 and 2005.

According to the research, alcohol, tobacco, marijuana, and smokeless tobacco are the “Big Four” among rural youth. By the 12th grade, more than 80 percent of rural youth drank alcohol in their lifetime and more than 50 percent smoked cigarettes in their lifetime. Also by the 12th grade, 50 percent of rural males used smokeless tobacco at some point in their life and approximately 40 percent of rural youth smoked marijuana at least once in their lifetime.

In most cases, rural Pennsylvania youth used the Big Four substances at rates higher than their peers in urban areas and at the national level.

The research also showed that use trends tended to vary by the substance used; however, several trends appeared to be consistent. In general, use rates for the Big Four have slightly, but consistently, declined from year to year between 2001 and 2005. The one exception to this trend was smokeless tobacco use, which held steady or increased year to year.

Among rural youth, the median age of first-time alcohol use was 13 years. However, nearly 25 percent of rural males and 17 percent of rural females reported initiating alcohol consumption prior to age 10. In each of the three waves of the PAYS data, the median age for regular alcohol use was 15 years old, the median age for first-time cigarette use was 12 years, and the median age for first-time marijuana use was 14 years.

After examining several risk and protective factors associated with ATOD use, the researchers noted two surprising results: for three of the Big Four rural substances, community cohesion (typically associated with lower levels of ATOD use) was associated with increased ATOD use; and school support for pro-social involvement (typically associated with lower levels of ATOD use) had no influence on the use rates of any of the Big Four substances except smokeless tobacco.

The study results show there are differences in some aspects of ATOD use between rural and urban youth, depending on the substance and the grade and gender of youth. Therefore, the researchers suggest that state government should consider acquiring additional valid and reliable data related to why ATOD use, attitudes, trends, and behaviors differ between rural and urban youth.

The researchers also suggest that Pennsylvania continue to employ programs that encourage community assessment of risk and resilience in specific communities and then make decisions with the single county authority to select, implement, and evaluate prevention and intervention programs that best address the issues prevailing in that community; programs that address ATOD use start when children are younger, since a number of rural youth may start using at age 10 or under; and most of the commonwealth’s efforts for rural youth focus on the Big Four substances.
INTRODUCTION

National surveys find increasing prevalence of alcohol, tobacco, and other drug (ATOD) use among rural youth. National studies have also revealed an increasing convergence in the prevalence of ATOD use between urban and rural youth, with rural youth “catching up” with their urban peers in terms of use.

Understanding the prevalence of ATOD use among youth is important because it is associated with many negative health outcomes, particularly for early initiators. Health problems include increased heart rate and blood pressure, respiratory illness, heart attack, irreversible brain damage, and death. Mental health problems include drug abuse and dependence, anxiety, depression, impaired thinking and judgment, decreased ability to reason, and psychosis. Youngsters using ATOD are also more likely to be injured or killed in accidents. Also, school and social problems are common among ATOD-using youth and include dropping out of school, poor academic performance, and disruptive behavior. Moreover, ATOD-using youth who drop out of school are very likely to continue their drug use even when they are employed and/or in stable relationships. Criminal activity, engagement in violent acts, and other antisocial behaviors are also strongly related to youth ATOD use.

Since 2001, the Pennsylvania Commission on Crime and Delinquency (PCCD) has sponsored the Pennsylvania Youth Survey (PAYS), which surveys youth on violence, weapons use and risks associated with delinquent behavior and substance abuse. At the state level, several fairly consistent findings in relation to substance abuse have emerged from the PAYS over the last few years. These reports, however, have not examined ATOD use from a rural perspective.

Most of what is known about ATOD use among rural youth has been inferred from national data. It is clear at the national level that, in recent years, urban and rural ATOD use rates have been converging. There is evidence that for certain substances, rural youth are using at higher rates than their urban counterparts. However, national data may be of limited use when it comes to understanding a particular rural community and informing policy decisions in that community. This project provides information related to ATOD use among rural Pennsylvania youth.

METHODOLOGY

To describe ATOD use among Pennsylvania rural youth, the research identified changes and trends over a five-year period from 2001 to 2005 and compared them to use among urban youth. The research, conducted in 2007, also identified and analyzed factors that can predict ATOD use.

To accomplish these tasks, the researchers used data from the 2001, 2003, and 2005 Pennsylvania Youth Surveys and data from the National Center for Education Statistics’ Common Core of Data: The Pennsylvania Youth Survey (PAYS) – The PAYS questionnaire asks middle and high school students in 6th, 8th, 10th, and 12th grades about their socio-demographic characteristics, school experiences, and ATOD use. The ATOD section of the survey asks students about lifetime use (for example, have you ever used tobacco?) and prior 30-day ATOD use (for example, have you used tobacco in the last 30-days?). Students were also asked to indicate the frequency with which they used substances and the age at which they first used these substances. Students also were asked about the availability of ATOD in their community (for example, if you wanted to obtain drugs like cocaine, LSD, or amphetamines, how easy would it be for you to get some?). Finally, students are asked to indicate their standing on risk and nine protective factors, including community cohesion, community risk, and school support for pro-social involvement.

For the 2001 PAYS, researchers analyzed 43,889 responses; for 2003, they analyzed 42,608 responses; and for 2005, 12,429 responses. Although 2005 had the fewest number of responses, the data sampling methods produced results that were generalized to the student population more so than the other two surveys. Additional information on the PAYS survey sampling and methodology is available on the Pennsylvania Commission on Crime and Dequency website at www.pccd.state.pa.us. Common Core Data – Complied by the National Center for Education Statistics, the Common Core Data is an extensive database on elementary and secondary public education in the U.S. This database provides statistical information on total enrollment, pupil/teacher ratios, drop-out rates, and completion rates at both the school building and district levels. In addition, the Common Core Data provides data on students in special programs, dropouts and staffing. By overlapping data from the PAYS and the Common Core Data, the researchers created a more detailed picture of the predictors of rural youth ATOD use.

The research team also conducted a literature review on rural youth ATOD issues and interviewed state officials and academics for a more thorough understanding of ATOD policy issues.

The researchers used the Center for Rural Pennsylvania’s definitions of rural and urban to identify respondents: respondents lived in a rural school district if they attended a school in a district where the number of persons per square mile within the district was below the statewide average of 274 persons per square mile. Urban respondents were those who attended a school in a district where the number of persons per square mile was at or above the statewide population density.
RESULTS

The researchers used two indicators to measure ATOD use: lifetime prevalence and 30-day prevalence. For lifetime prevalence, students were asked if they had ever consumed the substances. For the 30-day prevalence, students were asked if they had consumed the substance at any time in the past 30 days. Past 30-day use is considered a more sensitive index of current or on-going use, although it is not a perfect indicator. Past 30-day prevalence is always less than lifetime prevalence because the number of students who report consumption in their lifetime may not have consumed ATOD in the last month.

Alcohol

Alcohol use among rural youth was higher than urban youth during each study year and for each grade. In 2005, rural females reported lifetime use that was approximately 7 percentage points higher than urban females, and rural males reported lifetime prevalence that was approximately 4 percentage points higher. This relationship holds for all grades except 12th grade in 2005 when urban prevalence exceeded rural prevalence. However, based on prevalence rates in the lower grades, it is possible that rural prevalence will exceed urban prevalence over the next few years. Importantly, the prevalence rates of lifetime drinking are largely declining year-by-year.

In many respects, alcohol consumption over the past 30 days mimics lifetime use. During most of the survey years and in most grades, rural youth reported higher use of alcohol. A major exception to this pattern was for 12th grade respondents in 2005, while urban use exceeded rural use by a wide margin. However, this trend may reverse in the next few years because of the higher rural use patterns in the lower grades.

While lifetime use increased sharply between the 6th and 8th grades, there were two periods of sharp increase in the 30-day use period. For rural females and males, there was an approximate four-fold increase in use between 6th and 8th grades and a doubling between 8th and 10th grades. Therefore, policies and programs directed at these two points in time may represent opportunities to intervene with at-risk rural youth.

Similarly to lifetime use, 30-day use rates are largely declining for rural youth year-by-year. There is some evidence of decline in use for urban youth as well; however, it is not as consistent as the decline seen among rural youth. With respect to alcohol consumption, use trends appear to be declining for rural youth but not as much for urban youth.

Tobacco

In virtually every survey year and in every grade, rural youth had higher lifetime smoking use than their urban peers. For example, in 2005, rural 10th grade females reported lifetime use of 46 percent while their urban peers reported use at 33 percent. This overall pattern reverses in the 12th grade in 2005 when urban use exceeded rural use for both females and males. However, based on the higher use by rural youth at the lower grade levels, rural rates may overtake urban rates over the next few years.

For rural youth, there has been a fairly consistent decline in lifetime smoking prevalence between 2001 and 2005. Urban youth also evidenced a downward trend.

Trends in the prevalence of past 30-day use for smoking were similar to those seen with lifetime prevalence. At virtually all survey dates and in all grades, rural use was greater than urban use. This pattern was particularly true for females. This trend reversed in the 12th grade in 2005 when urban use exceeded rural use for both females and males.

Smokeless Tobacco

The use of smokeless tobacco was more prevalent among rural youth than urban youth. There was, however, a significant shift toward increased smokeless tobacco among urban males in the 10th grade in 2005. The prevalence increased to nearly 50 percent for 12th grade urban males in 2005.

Nearly 12 percent of rural 12th grade females used smokeless tobacco in 2005, suggesting that smokeless tobacco is no longer a behavior relegated to males only. The smokeless tobacco prevalence reported by rural Pennsylvania youth far exceeded those reported at the national level.

For rural males, there were significant increases in lifetime prevalence between the 6th and 8th grades. Specifically, prevalence tripled between 6th and 8th grade and doubled between 8th and 10th grade. Prevalence doubled for rural females between 6th and 8th grade in both 2003 and 2005. The increase in prevalence slowed significantly for rural females between 8th and 10th, and 10th and 12th grades in 2005. At virtually every time point and in every grade, lifetime smokeless tobacco use increased for rural females and males. Smokeless tobacco, therefore, remained a significant and growing problem in rural Pennsylvania and it appeared to be a somewhat more severe problem in the commonwealth than nationally.

An analysis of past 30-day use confirmed that rural males are at particular risk for recent smokeless tobacco use. In the 12th grade, approximately 25 percent of rural males used smokeless tobacco, compared to no more than 15 percent of urban males. There were no clear overall trends in the past 30-day use prevalence data. In some years and in some grades, there were decreases in prevalence, while there were increases at other times and in other grades.

Marijuana

Urban youth reported significantly higher lifetime use of marijuana than rural youth. By the 12th grade, approxi-
mately half of urban Pennsylvania youth smoked marijuana, compared to about 36 percent of rural youth in 2005.

Rural youth reported substantial increases in lifetime prevalence between 6th and 8th and 8th and 10th grades. The PAYS data demonstrated steady year-to-year decreases in rural marijuana use in each grade and for both females and males, although the declines have been more notable in rural males during the study period.

In terms of prior 30-day use of marijuana, rural youth reported low levels of marijuana use relative to their urban peers. This difference was more pronounced by the 12th grade where urban youth reported twice the use of rural youth in 2005. It is also important to note that the trend for marijuana use in rural youth was in a pattern of decline.

**Inhalants**

The prevalence of inhalant use in most of the study period was higher for rural youth. For example, in 2005, rural males and females reported higher lifetime use than their urban peers. It appears there may be an upward trend for rural youth using inhalants. For urban youth, the trend appeared to be moving downward.

Past 30-day use of inhalants was low for all youth irrespective of where they lived. In most years and in most grades, less than 5 percent of rural youth reported recently using inhalants. There was a slight trending up for rural females in the 6th and 10th grades between 2001 and 2005 and a slight trending down in 8th and 12th grade. Rural male prevalence increased and decreased slightly and somewhat arbitrarily from year to year, making it difficult to discern a distinct trend.

At virtually each time point and grade level, 30-day prevalence was higher for rural than urban females and males. For rural youth, based on 2003 and 2005 data, prevalence peaked prior to the 12th grade and then declined to its lowest level. This suggests that there may be a period of early experimentation, but over time, youth are less attracted to this drug. Urban youth trends were similar in 2003. In 2005, however, use increased for 12th grade boys.

**Cocaine**

At virtually all time points and grade levels, rural females and males reported higher lifetime cocaine use prevalence than their urban peers. Approximately 5 percent of rural 12th graders used cocaine in 2005. For rural youth, the biggest increase in lifetime use was between the 8th and 10th grade. For example, in 2005, lifetime prevalence increased three-fold between 8th and 10th grade for females (1 percent and 3 percent, respectively) and four-fold for males (1 percent and 5 percent, respectively). For urban females, the primary increase in prevalence occurred between 6th and 8th grade, when there was a six-fold increase (0 percent and 1 percent, respectively). Urban males evidenced an eight-fold increase between 8th and 12th grade (1 percent and 6 percent respectively).

Overall, cocaine use by rural youth decreased. Between 2003 and 2005, prevalence for 12th grade rural males fell by nearly 50 percent and for rural females fell by approximately 34 percent. In the higher grades, there was an upward trend among lifetime cocaine use among urban youth.

PAYS results indicate that rural youth, irrespective of grade, reported relatively low recent use of cocaine. Moreover, they were generally less likely to report recent use than their urban peers (particularly for 2003 and 2005). There was a fairly clear downward trend in recent use for rural youth, and this was particularly true for females.

Cocaine use among urban youth tended to increase year-by-year, while use among rural youth tended to decline year-by-year. So, while lifetime prevalence tended to be higher for rural youth, recent use was more common among urban youth. This suggests that rural youth may try cocaine, but do not persist in its use. Urban youth appear more likely to persist in cocaine use.

**Crack Cocaine**

In 2005, less than 3 percent of rural females and less than 3 percent of rural males used crack cocaine. While crack typically was not seen as a rural problem, the results suggest that this was not necessarily true in Pennsylvania. In the commonwealth, rural and urban lifetime use of crack was quite similar. This pattern changed slightly in 2005 for urban males. In 8th grade, urban males had the same prevalence rates as rural males (1 percent). By 12th grade, rural males reported a prevalence rate of 2 percent while urban males reported a rate of 5 percent.

Overall, past 30-day use of crack cocaine was low for all youth. Essentially, less than 1 percent of youth reported using crack cocaine within the last month. As with a number of other harder drugs, rural youth tended to report lower prevalence rates. Rural females and males in the 10th grade demonstrated a slight year-to-year increase in recent crack use. In all other years and grades, however, rural youth demonstrated year-to-year declines, reporting their lowest use in 2005. In general, the biggest increase in recent crack use for both rural and urban youth occurred between the 6th and 8th grades.

**Non-Prescription Steroids**

In general, lifetime steroid use is a problem relegated to rural males. In all survey years and grades, rural males had higher lifetime use than their urban peers. On average, the use rate for rural males was 1 percentage point higher than for urban males. The trend for rural males, however, was declining. For example, 5 percent of rural males used steroids in 2001, 5 percent used in 2003, and 4 percent used in 2005. The trend for rural females

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was mixed. Urban males also demonstrated declining use year by year and urban females demonstrated inconsistent year-by-year declines.

Recent steroid use was not common among rural or urban youth. Moreover, the trends for both rural and urban youth steroid use declined year by year.

Heroin

In 2005, 2 percent of rural 12th grade males and 1 percent of rural 12th grade females used heroin. That same year, 4 percent of 12th grade urban males and 2 percent of 12th grade urban females used this narcotic. Rural and urban youth reported similar lifetime prevalence rates. The PAYS also found evidence of a 50 percent decrease in prevalence for 12th grade rural males between 2003 and 2005. It is important to note that because the use rates are so low, it is more difficult to have confidence in the findings. Nonetheless, the findings are relatively consistent across each time interval. This suggests the possibility that heroin use is quite rare among Pennsylvania youth. It may also be true that youth who use heroin were less likely to complete the PAYS or to admit their use on the survey.

For urban youth, in general, use rates declined. The primary exception to this was evidenced among 12th grade males, whose prevalence increased year to year from a low of 2 percent in 2001 to a high of 4 percent in 2005.

In terms of past 30-day use, rural and urban youth tended to report similar levels of use. Generally speaking, 30-day use was typically less than 1 percent at most grade levels and during most years.

Hallucinogens

Lifetime prevalence of hallucinogens, such as acid, LSD and mushrooms, was similar among rural and urban youth. However, there was one significant exception: 12th grade urban females and males reported higher use than their rural counterparts in 2005. For rural youth, the biggest grade-to-grade increase in use occurred between 6th and 8th grade, although in 2005, rural females reported their biggest increase between 8th and 10th grade. At most points in time, both rural and urban youth reported year-to-year declines at all grade levels. The most obvious exception to this pattern occurred with urban youth in 12th grade whose prevalence increased between 2003 and 2005.

Very few rural youth reported past 30-day use of hallucinogens. In 2005, 1 percent of females and 2 percent of males in the 12th grade reported using hallucinogens in the last 30-day period. Generally speaking, rural and urban youth reported similar rates of use. However, in 2005, the use rate for urban males was four times higher than that of rural males (8 percent vs. 2 percent, respectively). In the same year and grade, urban females reported use rates that were twice as high as their rural peers (2 percent vs. 1 percent, respectively). As with lifetime prevalence, 30-day prevalence generally held steady or declined for rural and urban youth. There was one exception to this pattern: urban male use increased between 2003 and 2005.

Methamphetamine

Methamphetamine is getting a significant attention across the country, particularly in rural areas. Increasingly, methamphetamine is seen as a rural problem, with a proliferation of production sites in rural areas being reported at the national level. However, the results from the PAYS suggest that this substance is not widely used by rural Pennsylvania youth. In 2005, the highest lifetime prevalence was reported by 10th grade males (3 percent) and 12th grade females (2 percent). Generally, the trends for rural use were down in virtually every year and grade. For example, use by 12th grade rural males dropped from a high of 7 percent in 2001 to 2 percent in 2005. Rural female use in the 8th grade dropped from a high of 3 percent in 2001 to less than 1 percent in 2005. There was no evidence in the prevalence data that suggested an upswing in methamphetamine use, except for the increases evidenced in urban males in the 10th and 12th grades between 2003 and 2005, and the increased use among urban females in the 6th and 12th grades in those same years.

Very few rural youth used methamphetamines in the past 30-days. In virtually every year and every grade, less than 1 percent reported recent use.

Club Drugs

“Club” drugs are those reported to be used widely by youth at all-night dance parties, such as “raves” or “trances,” dance clubs, and bars. The National Institute of Drug Abuse reports that the most commonly used of these drugs are MDMA (Ecstasy), GHB, Rohypnol, and LSD. The PAYS does not ask about each of these substances individually. Therefore, responses to questions regarding club drugs were somewhat difficult to analyze. In other words, the PAYS assumed that youth interpreted and responded to this question by grouping these drugs together.

The prevalence of lifetime club drug use was generally low and, for the most part, on the decline for both rural and urban youth. For example, in 2005, the highest prevalence was for 10th grade males (5 percent) and females (4 percent). Overall, use rates were declining for both rural and urban youth.

In terms of recent use, very few rural or urban youth reported recent use of club drugs. In 2005, 2 percent of urban females used club drugs in the last 30 days. Only 1 percent of rural males and 1 percent of urban males reported recent use. In general, all youth evidenced year-to-year declines in 30-day use.
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Alcohol and Marijuana Use
Prior to Driving

Respondents to the PAYS were asked if they had driven a car “while using” or “shortly after using” alcohol or marijuana. The vast majority of rural youth did not report drinking or using marijuana in combination with driving. For example, in 2005, 3 percent of rural females and 3 percent of rural males reported drinking and driving one-to-two times per year. It is interesting to note that, at virtually all time points, rural youth reported driving during or shortly after drinking more often than their urban peers. However, by 2005, urban youth engaged in this behavior more frequently, although marginally so. This shift was largely due to decreases in this behavior by rural youth and increases in the behavior among urban youth, particularly between 2003 and 2005.

In summary, the data related to substance use and driving revealed a “mixed bag.” The story was relatively good for rural youth. The absolute incidence of the behavior was quite low, and, at virtually all time points, the prevalence of the behavior was declining. However, rural females reported some increase in this behavior. Driving after marijuana use was also rare among rural youth.

Urban youth, especially females, reported increased engagement in these behaviors. Traditionally, risky behavior had been viewed as a male phenomenon. This trend may be changing with respect to driving after substance use, particularly among urban females.

Age of Initiation

Age of initiation represents the age at which an individual reports first trying a particular substance. The PAYS data asked respondents to indicate the age at which they first used alcohol, cigarettes, and marijuana. Respondents were also asked when they initiated “regular” use of alcohol.

Alcohol

The median age of first-time alcohol use was 13 years in 2001 and 2003, but fell to 12 years of age in 2005. Substantial numbers of rural youth reported using alcohol at 10 years of age or less. For example, in 2005, 26 percent of rural males reported using alcohol for the first time at age 10 or less. Nearly 17 percent of rural females reported first-time use at age 10 or less. In 2003 and 2005, the percentage of rural females who reported initiating at this age increased and in other years it decreased. No distinct pattern emerged for rural females.

Alcohol (Regular Use)

The median age for regular alcohol use was 15 years in each of the three years of the PAYS survey. The most common age for rural youth to report regular use was 15. In 2005, 26 percent of rural females and males regularly drank at 15. This was also the most common age for urban males to report regular use (24 percent). However, in 2005, the most common age for regular use among urban females was 16. This represented an important and positive trend for urban females. For most years, the second most common age to report regular drinking was 14, followed closely by 16. Interestingly, it is more likely that rural youth initiated regular drinking at age 13 than it was for them at age 17 or older.

In 2005, nearly 4 percent of females and 5 percent of males reported regular alcohol use at age 10 or less. In 2005, 17 percent of rural females and 15 percent of rural females reported first-time use at 10 or less in 2001, compared to 17 percent in 2005. This represented a decrease of 20 percent.

Exposure to alcohol, whether through family, peers, or media, was happening at very early ages. In 2005, 40 percent of rural males and 26 percent of rural females had tried alcohol for the first time by age 11. On a year-to-year basis, the percentage of rural females reporting alcohol use at age 11 or younger declined from a high of 11 percent in 2001 to 9 percent in 2005. The number of males using by this age held steady at 13 percent in 2001 and 2005.

In 2005, 50 percent of rural males and 40 percent of rural females reported using alcohol for the first time at age 12. Just under 50 percent of urban males and 38 percent of urban females reported using alcohol for the first time at this age. In two of the three waves of data, rural youth were more likely than urban youth to report initiating alcohol consumption by age 12. Between 2001 and 2003, the percentage of rural females who reported initiating at this age increased, but decreased between 2003 and 2005. The percentage of rural males who reported initiating at this age declined between 2001 and 2003 as well as between 2003 and 2005.

In 2005, by the age of 13, 65 percent of rural males and just over 56 percent of rural females tried alcohol for the first time. The percentage of rural females reporting initiating at this age decreased between 2001 and 2003 but then increased between 2003 and 2005. The percentage of rural males reporting initiating at this age increased from year to year.

Reviewing the rest of the initiation data, it became clear that for all ages, an increasing percentage of rural males reported initiating at each age. The picture for rural females was more mixed. In some years, the percentage reporting initiating at each age increased and in other years it decreased. No distinct pattern emerged for rural females.

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males, compared to 13 percent of urban females and 12 percent of urban males, reported regular alcohol use by age 10 or less. The percentage of rural females reporting this age of initiation decreased between 2001 and 2003, but increased between 2003 and 2005 to the same level reported in 2001. The percentage of rural males reporting regular use at this age decreased from year to year and, in 2005, it was at its lowest level (5 percent). Urban youth reporting regular use at this age had generally declined from year to year.

The percentage of rural females regularly using at age 11 held steady between 2001 and 2003, but increased between 2003 and 2005. The percentage of rural males reporting regular use at this age declined year to year.

Rural males and females more commonly reported regular use at 10 or less than did their urban peers. Age of initiation for regular use was substantially higher at virtually all ages below the age of 15 for rural youth compared to urban youth. After the age of 15, this trend largely reversed, although not consistently.

Cigarettes

The median age for first time cigarette use was 12 years in each of the three years of the PAYS. The most common age for youth to report initiating cigarette smoking was 10 or less. This was true for females and males and was true irrespective of whether youth were from rural or urban areas. However, rural females and males were more likely than urban peers to report initiating smoking at age 10 or less. For example, in 2005, 30 percent of rural males (compared to 25 percent of urban males) and 23 percent of rural females (compared to 18 percent of urban females) reported initiating at age 10. This pattern generally held true in 2001 and 2003. Over the three waves, the mean percentage of rural females and males initiating at this age was 25 percent and 29 percent, respectively, while it was 19 percent for urban females and 27 percent for urban males. The percentage of rural females initiating smoking at this age increased between 2001 and 2003 (26 percent vs. 27 percent), but decreased between 2003 and 2005 (27 percent vs. 23 percent). Between 2001 and 2003, the percentage of rural males reporting initiating at this age declined (31 percent vs. 30 percent), but held steady at 30 percent between 2003 and 2005.

Rural females also were more likely to initiate smoking at age 11. Rural males were more likely to initiate at ages 11 and 12. On the other hand, rural males were less likely to delay the initiation of smoking to later than 13 years. In 2005, the majority of rural (59 percent) and urban (51 percent) males initiated smoking by the age of 12. In the same year, 50 percent of rural females and 46 percent of urban females started smoking by age 12.

In general, between the ages of 14 and 16, there was a year-to-year shift toward later initiation of smoking. This trend continued for rural females who were 17 or older, but not for rural males.

Marijuana

The median age for first time marijuana use was 14 for each year of the PAYS. In 2005, the majority (64 percent) of rural males reported initiating marijuana use by age 14. The majority of rural females (54 percent) also reported initiating marijuana use by age 14. This was also true for urban females (53 percent) and males (63 percent). About 3 percent of rural females reported marijuana use at age 10 or less, while nearly 8 percent of rural males did.

About 5 percent of rural females and 6 percent of rural males began at age 11. Approximately 10 percent of rural females and 12 percent of rural males initiated at age 12. Approximately 18 percent of rural females and males initiated at 13. Few rural youth initiated marijuana use at age 17 or older.

Willingness to Try ATOD

Several interesting patterns emerged in the data on the willingness to try drugs. In each wave of data, rural youth reported being more willing to try alcohol than their urban peers. For example, in 2005, rural youth were approximately 10 percent more likely to report willingness to try alcohol. Rural youth also reported more willingness to try cigarettes than their urban peers. There was one exception to this pattern. In 2005, urban youth were more willing to try cigarettes than rural males. Rural youth tended to report slightly higher levels of willingness to try hallucinogens. In 2005, however, urban males in the 12th grade were more willing to try hallucinogens than rural males in the same grade. Rural youth were more willing to try inhalants than their urban peers. In 2005, rural youth were nearly twice as likely than urban youth to report willingness to try inhalants. Generally speaking, rural youth were less willing to try marijuana than their urban peers. The only exception to this occurred in 2003 when rural youth were more willing to try marijuana.

Risk and Resilience Factors

There are several well established risk and resilience factors associated with youth ATOD use. In this study, five risk and resilience factors were used:

- Community Cohesion: neighborhood attachment, community organization, community rewards for pro-social involvement;
- Community Risk: availability of drugs, community disorganization, norms favorable to drug use;
- School Support for Pro-Social Activities: school opportunities for pro-social activities, rewards for pro-social activities (hereafter refer to as “school support”);
- Anti-Social Peers: gang involvement, peer rewards for antisocial behavior, friends’ delinquency and use of drugs; and
- Risky Behavioral Tendencies: rebelliousness, poor social skills, sensation seeking (hereafter referred to as “risky behavior”).
The lifetime prevalence of the four substances most widely used by rural youth (alcohol, tobacco, marijuana, and inhalants) was used in these analyses. The predictors of poly-substance abuse (reported lifetime use of two or more substances) were also examined. Statistical analysis was used to estimate the association between lifetime prevalence and the five risk and resilience factors.

All five factors were significant predictors of rural youth alcohol use in 2001. Increases in community cohesion and school support for pro-social involvement lead to a decrease in lifetime alcohol use and an increase in risky behavior lead to an increase in lifetime alcohol use. Community risk was associated with an increase in lifetime alcohol use, as was anti-social peers. These relationships remained largely the same in 2003. However, in 2005, several reversals emerged. For example, in 2005, community cohesion was actually associated with an increase in alcohol use, while community risk was no longer predictive of alcohol use.

The positive association between community cohesion and lifetime alcohol use was an unexpected finding. Historically, community cohesion had been thought of as a protective factor against ATOD use.

In 2005, several interesting differences emerged between rural and urban respondents with respect to the predictive power of the five factors. In general, the researchers found mixed results: for example, they found that community cohesion was not predictive of alcohol consumption for rural respondents. However, it was a significant negative predictor for urban respondents meaning that increases in community cohesion lead to a decline of lifetime alcohol use. On the other hand, community risk was a stronger predictor of alcohol use for urban than for rural respondents. School support was not a significant predictor for rural students, but was a significant negative predictor for urban students. Anti-social peers along with attitudes and behaviors were larger predictors of alcohol use for rural than urban youth.

In terms of tobacco use, it appears that, in 2001, all five risk and protective factors were positive predictors of rural youth lifetime tobacco use. By 2003 and 2005, however, community risk and school support no longer predicted changes in tobacco consumption. However, youth attitudes toward risky behavior became a stronger predictor of smoking.

Across 2001, 2003, and 2005, youth attitudes toward risky behaviors were by far the strongest predictor of marijuana use. An increase in these attitudes and behaviors was associated with an increase in marijuana use in 2001, 2003 and 2005. Community cohesion was a positive predictor of marijuana use. Community risk positively associated with marijuana use in 2001 and 2003, but not in 2005. Anti-social peers were a positive predictor of marijuana use across all years, but became much less influential by 2005. School support, which was a weak negative predictor of marijuana use in 2001, no longer predicted marijuana use in 2003 and 2005. By 2005, individual risk became the overwhelming predictor of marijuana use. Community cohesion’s positive influence on marijuana consumption increased substantially over time becoming a more powerful predictor than anti-social peers. Again, this finding suggests that rural communities may coalesce in a manner which appears to support substance use.

School District Predictors of ATOD Use

Both the PAYS and the Communities that Care Survey asked a number of questions about youth perceptions of their school. The questions reflected student opinions regarding their connectedness to the school, the degree to which teachers were invested in them, opportunities for extracurricular activities, and more. To supplement this information, the researchers extracted several variables from the National Center for Education Statistics (NCES), which tracks each school district in the U.S. The researchers used NCES data for all the rural school districts in the study sample.

The NCES variables included academic support provided by the districts, such as financial support of academics (expenditures per student, revenues per student, teacher-to-student ratios, staff-to-student ratios), district academic success (percentage of high school completers, dropout rates), and commitment/connection to school (total expenditures on support services to students, student activity revenues, and Drug Free School Federal Revenue).

None of the school district variables examined as potential predictors of lifetime ATOD use were significant.

Interviews with Policy Leaders

The researchers interviewed nine officials in government agencies and academic institutions that focus on drug and alcohol prevention to gather policy relevant perspectives for the commonwealth. The agencies included the Pennsylvania Commission on Crime and Delinquency, the Pennsylvania Association of County Drug and Alcohol Administrators, and the Pennsylvania Bureau of Drug and Alcohol Prevention.

Several overlapping themes emerged from these interviews. The first was the need for information about what is happening with rural youth with respect to ATOD issues. Most of the officials said there was no good epidemiological data available and that this study would serve as a start. Also, most believed that, in the absence of good information, policy cannot be well informed.

There was a consistent feeling that ATOD issues were looked at by policy makers as a Philadelphia and Pittsburgh problem. A number of officials said that policy makers in the commonwealth need to consider the possibility that rural and urban ATOD use could substantively differ with respect to prevalence of use, predictors
of use, age of initiation, etc. They believed that policy makers need to start thinking about ATOD issues with sensitivity toward rural areas and the potentially unique needs of rural youth.

Most of the individuals interviewed expressed a great deal of support for better and more enhanced prevention and intervention focused on the very young. The results of this study support the notion that initiation into ATOD use occurs early in life for both rural and urban youth, but particularly early for rural youth. The individuals interviewed said the rural context has special challenges and opportunities that need to be better addressed through prevention and intervention programs.

The interviewees said that crime and delinquency issues in rural areas are best fought by providing early prevention and intervention around ATOD use so that demand for substances remains low. They also raised concerns regarding the movement of drug distribution hubs to more rural areas as the number of “drop cities” appears to be emerging. These are smaller cities and towns where large shipments of drugs are delivered for distribution to rural areas. The officials were concerned that larger, well-funded, and sophisticated drug dealers were moving away from urban centers as there is potentially less competition and new demand emerging in rural Pennsylvania.

Finally, all expressed concern about methamphetamine use and driving under the influence problems in rural Pennsylvania.

**CONCLUSIONS**

ATOD use between rural and urban youth appears to be different depending on the substance used, the grade level of the youth, and gender. In terms of prevalence, rural youth consistently used smokeless tobacco at substantially higher rates than their urban peers, but substantially less marijuana and slightly less methamphetamine and club drugs than their urban peers. Rural youth, and especially rural females, reported significantly higher rates of cigarette smoking than urban youth. In all but the 12th grade, rural youth had higher use rates for inhalants, crack, steroids, and hallucinogens, although these were all used at relatively low levels.

Rural youth were slightly more likely to drive after drinking alcohol and slightly less likely to drive after using marijuana. Trends for these post-use behaviors tend to be declining among rural youth but increasing among urban youth, particularly females.

Rural youth appear to initiate their ATOD use earlier in life than urban youth: this was particularly true for alcohol, tobacco, and smokeless tobacco.

For alcohol, cocaine, hallucinogens, and inhalants, rural youth were slightly more likely to express a willingness to try these substances than urban youth. This is an important finding because willingness to try substances is a positive predictor of actual use.

The study also provided preliminary evidence that the predictive power of risk and protective factors differ between rural and urban youth for some substances. For example, community cohesion was a significant negative predictor of alcohol consumption for urban respondents, but had no impact on rural youth. Community cohesion was a negative predictor for rural marijuana use but not for urban marijuana use.

The results of this analysis consistently indicate that rural youth use alcohol, tobacco, smokeless tobacco, and marijuana at higher rates than harder drugs. The prevalence of hard drug use among rural youth appeared to be low.

**POLICY CONSIDERATIONS**

Based on the results, the researchers suggest that the Department of Health and/or the Pennsylvania Commission on Crime and Delinquency consider acquiring additional valid and reliable data related to ATOD use, attitudes, trends, and behaviors among both rural and urban youth. The better the commonwealth understands the phenomenon of rural ATOD use, the more likely it is to better develop and support programs that would be more effective for rural youth. Continuing to gather and analyze the PAYS data is recommended. In addition, PCCD might consider having its vendor analyze the PAYS at the state, county, or sub-county levels.

Because there appear to be some rural versus urban differences in the risk and protective factors for ATOD use, the commonwealth should continue seeking a better understanding of the factors that may affect use patterns, attitudes, trends, and behaviors among rural and urban youth. Once researchers, clinicians, and healthcare and service providers better understand how ATOD use begins and is maintained among youth, more tailored prevention/intervention programs may be developed, implemented, and evaluated. The single county authorities would seem to be an excellent source of information regarding rural ATOD issues, since they have their “finger on the pulse” of local ATOD trends. Other agencies who should be involved include the Department of Health (Bureau of Drug and Alcohol Prevention, Bureau of Health Promotion and Risk Reduction, Bureau of Family Health), the Governor’s Advisory Councils (Rural Affairs, Children and Youth), the Pennsylvania State Police, the Office of the Attorney General, and the Bureau of Liquor Control.

As risk and resilience factors may predict rural youth ATOD use, the Communities that Care (CTC) risk-factor-based prevention approach should be continued or

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expanded. The single county authorities would be a logical partner in these efforts.

A number of rural youth began their ATOD use at 10 years of age or less. For many substances, there was a substantial increase in use between the 6th and 8th grades, suggesting that this may represent a critical period for ATOD use. Therefore investment in prevention and intervention efforts targeted at the very young may prove useful in reducing ATOD use.

Pennsylvania has been conducting work under the federally funded Strategic Prevention Framework State Incentive Grant (SPF-SIG). The SPF-SIG is designed to assist communities in assessing substance use and its consequences, and in planning and implementing evidence-based prevention programs, policies, and practices. Pennsylvania SPF-SIG Statewide Epidemiological Outcomes Workgroup has developed a statewide needs-assessment. Unfortunately, in its Profile on Substance Use and Consequences, the workgroup did not distinguish between rural and urban ATOD use. Nonetheless, it found high rates of alcohol, tobacco, and marijuana use among Pennsylvania youth. As the SPF-SIG continues, the researchers suggest that it conduct needs assessments that are sensitive to both rural and urban areas. Because rural and urban ATOD issues and needs may be different, the prevention and intervention programs implemented in communities may need to be different.

The researchers also noted that most prevention/intervention efforts should focus on the “Big Four” rural substances (alcohol, tobacco, marijuana, smokeless tobacco). These appear to be the most widely used substances by rural youth. While other substances, such as methamphetamine, receive a great deal of media attention, the Big Four should be the focus of most efforts. Obviously all ATOD use is a problem, particularly among youth. However, should the commonwealth be forced to make programming choices, it should consider focusing on these more widely used substances as many are considered to be gateways to the more dangerous substances.

Smokeless tobacco may need special attention from a prevention and intervention perspective. It showed the most discernible pattern of increase year by year.

The Pennsylvania Department of Health has set aggressive goals to reduce ATOD use by identifying and disseminating empirically supported prevention and intervention program to youth and families. However, there is not much evidence from reviewing the commonwealth’s website, interviews with individuals knowledgeable about ATOD issues, and reviewing existing literature that Pennsylvania is paying sufficient attention to ATOD use as a rural phenomenon. The researchers suggest that the state put more information on rural ATOD use on its website, given the use rates, early initiation, and attitudes held by rural youth.

References


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