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Co-occurrence of Substance Use Behaviors in Youth

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This Bulletin analyzes the prevalence and overlap of substance-related behaviors among youth, with comparisons by age group, gender, and race/ethnicity. It uses data from the first two waves of the 1997 National Longitudinal Survey of Youth (NLSY97)—self-reports gathered in 1997 and 1998 from a nationally representative sample of youth ages 12–17. The data are from questions asking about drinking alcohol during the previous 30 days, using marijuana during the previous 30 days, and ever selling or helping to sell marijuana (pot, grass), hashish (hash) or other hard drugs such as heroin, cocaine, or LSD.

The central finding of the analysis is that, given one substance-related behavior, other substance-related behaviors became much more likely. For example, 9% of all youth ages 12–17 reported marijuana use and 8% said they had sold drugs. Among youth who reported drinking alcohol (23% of all youth ages 12–17), the level of marijuana use was 32% and the level of drug selling was 23%. In contrast, among youth ages 12–17 who did not report recent alcohol use, the level of marijuana use was 2% and the level of drug selling was 3%. Other findings include:

- Of youth who reported marijuana use, 81% said they drank alcohol and 45% said they had sold drugs.
- Of youth who reported drug selling, 68% said they drank alcohol and 54% reported marijuana use. In contrast, among youth who said they had not sold drugs, 19% reported drinking alcohol and 6% reported using marijuana.
- Among those who sold drugs, both white and Hispanic youth were more likely than African Americans to also report alcohol use; white youth who sold drugs were also more likely than African Americans who sold drugs to report using marijuana.

Prevalence of substance-related behaviors was tied to age

In general, the levels of reported substance-related behaviors climbed steadily with increasing age. From age 12 to age 17, alcohol use in the previous 30 days increased more than eightfold, from 5% to 43% of youth, as did marijuana use in the previous 30 days (from 2% to 17%). The lifetime prevalence of reported drug selling rose from 1% at age 12 to 16% at age 17.

A Message From OJJDP

The issue of co-occurrence of problem behaviors among juveniles is of vital importance to all who are concerned with identifying and evaluating these behaviors, making decisions about placement and treatment, and delivering services. Because substance-related behaviors such as drinking alcohol, using marijuana, and selling drugs can have such serious consequences for youth, understanding how these behaviors co-occur is especially important.

Based on self-report data from the first two waves of the 1997 National Longitudinal Survey of Youth, this Bulletin answers co-occurrence questions such as "If a youth has recently used alcohol, what is the likelihood that he has also used marijuana?" or "If a youth has sold drugs, what are the chances that she also drinks alcohol and uses marijuana?" It also compares co-occurrence findings by age group, gender, and race/ethnicity.

The analysis shows that a youth who engages in one substance-related behavior is much more likely to engage in another. For example, the percentages of youth who used marijuana or sold drugs were much greater among youth who drank alcohol than those who did not. These and other findings reported in this Bulletin contribute to our understanding of substance-related behaviors among youth and provide useful input for prevention and treatment efforts.

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NLSY97: a new opportunity to examine behaviors of U.S. youth

Analysis of data from the 1997 National Longitudinal Survey of Youth can provide criminal justice practitioners and policymakers with timely insights into delinquent careers, overlap among law-violating behaviors, the relative impact of a variety of risk and protective factors on substance use, and variation across subpopulations defined by age, gender, race/ethnicity, labor force status, and household composition. The NLSY is a large, nationally representative, continuing study of adolescents who were ages 12 through 16 as of December 31, 1996. NLSY interviewers gather responses from youth to questions about a wide array of behaviors, including undesirable or delinquent activity. Combined, the 1997 and 1998 waves include more than 15,300 observations of youth who were ages 12 through 17 at the time of the interview (the sample used in this Bulletin excludes 17-year-olds from the 1997 wave of interviews because they were disproportionately "young" 17-year-olds, with an average age of 17 years and 3 months). The NLSY97 includes oversamples of both African American (3,951 interviews) and Hispanic (3,239 interviews) youth; weighted analysis controlled for this oversampling to produce nationally representative estimates of youth behavior overall and within age, gender, and race/ethnicity groups. The sample was also weighted to produce equal proportions of youth for each year of age, ignoring minor fluctuations by year of age (among 12- to 17-year-olds) in the size of the 1997–98 U.S. population.

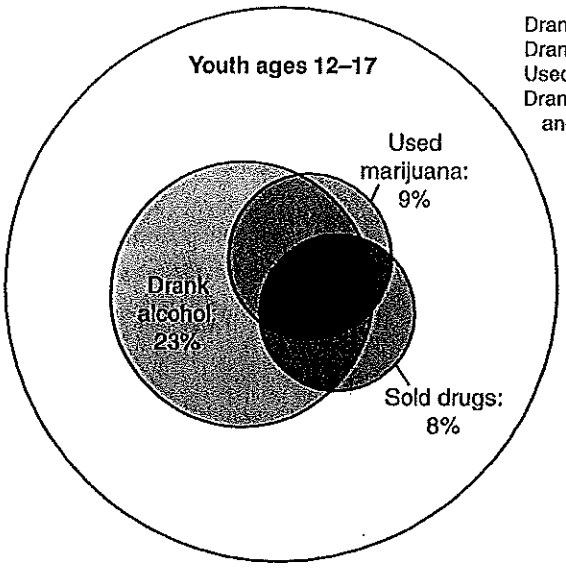
For more information about NLSY, refer to the Compendium of National Juvenile Justice Data Sets on OJJDP's Statistical Briefing Book Web site at http://www.ojjdp.ncjrs.gov/ojstatbb/Compendium/index.html.

Prevalence and frequency of substance-related behaviors were correlated

Among youth ages 12–14, 11% reported drinking alcohol, 4% reported marijuana use, and 3% said they had sold drugs; the levels for those ages 15–17 were 35%, 14%, and 12%, respectively.[1] Just as the percentage of youth who reported substance-related behaviors increased with age, so did the frequency of the reported behaviors. Youth ages 12–14 who drank alcohol did so on an average of 3.4 days over a 30-day period, in contrast to 4.5 days for youth ages 15–17. Youth ages 12–14 who used marijuana did so on an average of 6.8 days across 30 days, compared to 9.3 days for youth ages 15–17. Youth ages 12–14 who sold drugs did so an average of 10.5 times in the previous year, in comparison to 16.7 times for youth ages 15–17.

[1] All references to significant differences in this report imply a 95% (or greater) level of confidence.

Of youth ages 12–17, 27% reported drinking alcohol, using marijuana, or selling drugs

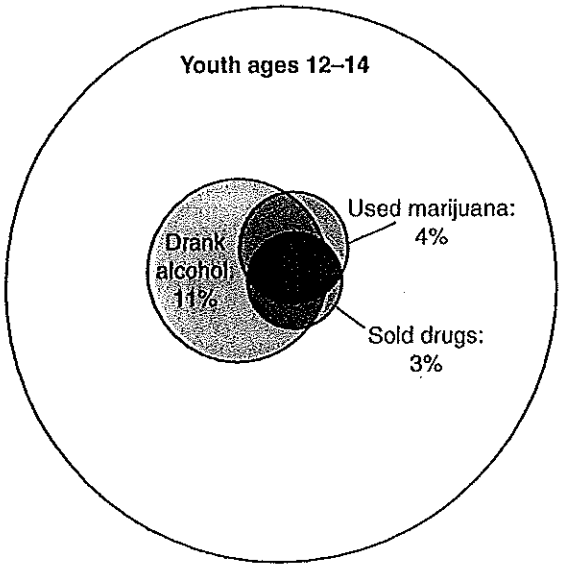


- Among all youth ages 12–17, 23% said they drank alcohol during the previous 30 days, 9% said they used marijuana during the previous 30 days, and 8% said they had ever sold drugs.

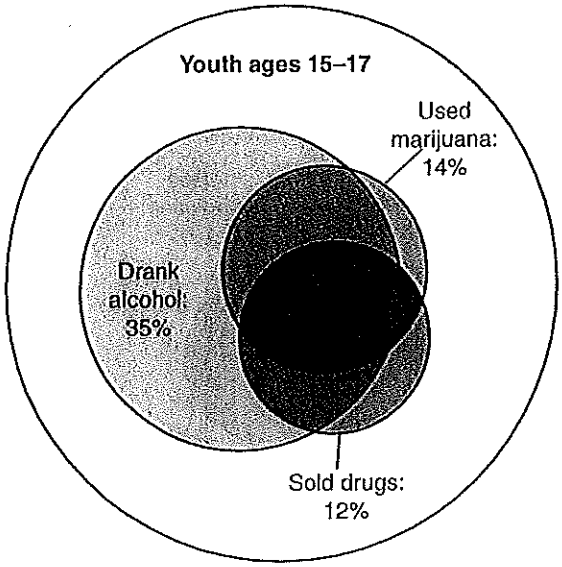
About the diagrams in this Bulletin

The diagrams displayed throughout this Bulletin depict both the prevalence and co-occurrence of drinking alcohol, using marijuana, and selling drugs. The total area within the white circle represents all youth within the indicated category, such as "Youth ages 12–17" in the diagram on this page. The areas of the shaded circles within the white circle represent the percentage of youth within the indicated category who reported a particular behavior. For example, in the diagram on this page, among all youth ages 12–17, 23% reported that they drank alcohol within the 30 days prior to being interviewed. The area of overlap for two circles shows the percentage of youth who engaged in both behaviors; the area of overlap for three circles shows the percentage of youth who engaged in all three behaviors. For example, in the diagram on this page, among youth ages 12–17, 4% reported all three behaviors.

The majority of marijuana users and drug sellers also drank alcohol, regardless of age group



Drank alcohol and used marijuana: 3%
Drank alcohol and sold drugs: 2%
Used marijuana and sold drugs: 2%
Drank alcohol, used marijuana, and sold drugs: 1%



Drank alcohol and used marijuana: 12%
Drank alcohol and sold drugs: 9%
Used marijuana and sold drugs: 7%
Drank alcohol, used marijuana, and sold drugs: 6%

- Youth in the older age group (15–17) were more likely than those in the younger age group (12–14) to report drinking alcohol, using marijuana, or selling drugs.
- Across age groups, there was substantial overlap of drinking alcohol, using marijuana, and selling drugs.

Substance-related behaviors were correlated with other problem behaviors

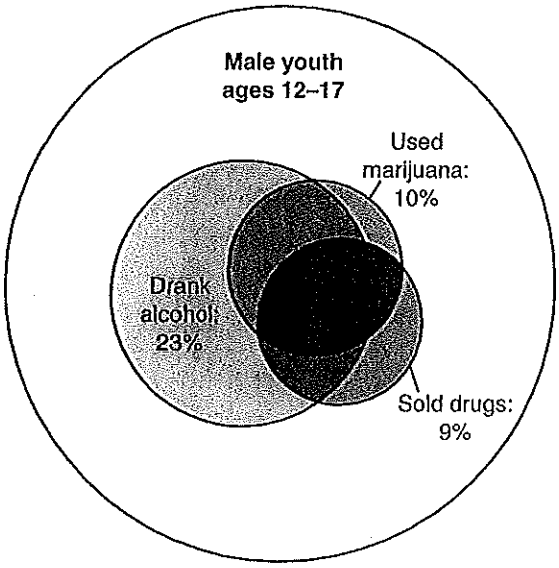
NLSY97 gathered data on a number of different problem behaviors. As indicated in the accompanying table, substance use was associated with a range of other problems. Across all behaviors listed, and for both the younger and the older age groups, there were significant differences between the problem behavior levels reported by users and nonusers. For example, 31% of youth ages 12–14 who drank alcohol and 18% who did not drink alcohol reported having been suspended from school, and 21% of 15–17-year-olds who had used marijuana during the previous 30 days also said they had been arrested during the previous year, as opposed to 5% of those who had not used marijuana in the previous 30 days.

Higher levels of problem behaviors and delinquency appeared among substance users, across age groups

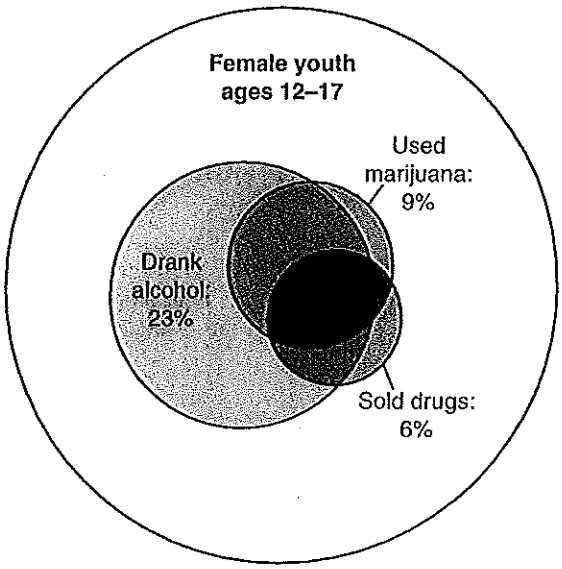
	Drank alcohol 30 days		Used marijuana 30 days		Sold drugs ever	
Behavior	No	Yes	No	Yes	No	Yes
Youth ages 12–14						
Suspended from school	18%	31%	19%	46%	19%	55%
Vandalize property	13	37	14	50	14	56
Major theft	2	11	2	20	2	27
Attack/assault	8	28	9	36	9	53
Belong to a gang	1	7	1	16	1	18
Carry handgun	4	12	4	20	4	25
Arrested	2	8	3	16	2	22
Youth ages 15–17						
Suspended from school	27%	38%	27%	52%	27%	63%
Vandalize property	10	23	11	33	11	40
Major theft	3	10	4	17	3	23
Attack/assault	8	21	10	29	9	37
Belong to a gang	1	5	1	9	1	12
Carry handgun	4	10	5	15	5	18
Arrested	5	12	5	21	5	26

Notes: The timeframe for "Suspended from school" was ever; for the other items, it was the past 12 months. The value in the "Yes" column differs significantly ($p<.05$) from the value in the "No" column for all column pairs within substance behavior and age groups.

The level of drug selling among males was higher than among females, but the levels and overlap of alcohol and marijuana use were similar for males and females



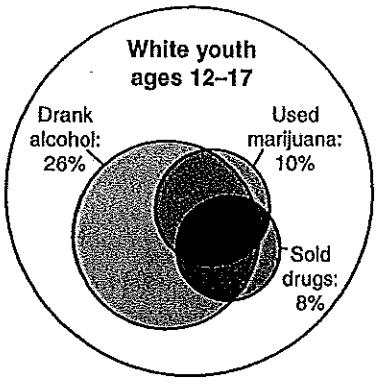
Drank alcohol and used marijuana: 8%
Drank alcohol and sold drugs: 6%
Used marijuana and sold drugs: 5%
Drank alcohol, used marijuana, and sold drugs: 4%



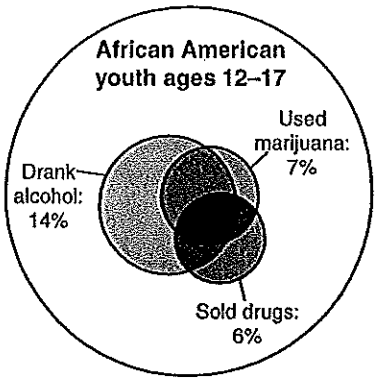
Drank alcohol and used marijuana: 7%
Drank alcohol and sold drugs: 4%
Used marijuana and sold drugs: 3%
Drank alcohol, used marijuana, and sold drugs: 3%

- The patterns of substance-related behavior co-occurrence among females closely resembled those among males.

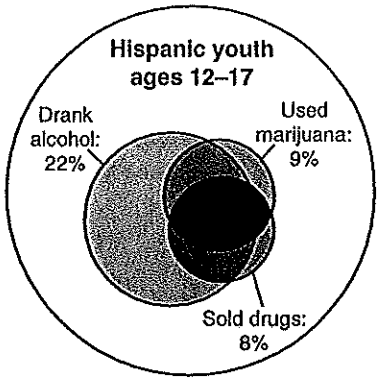
There was significantly less overlap of drug selling, alcohol use, and marijuana use among African American youth than among white or Hispanic youth



Drank alcohol and used marijuana: 8%
Drank alcohol and sold drugs: 6%
Used marijuana and sold drugs: 5%
Drank alcohol, used marijuana, and sold drugs: 4%



Drank alcohol and used marijuana: 5%
Drank alcohol and sold drugs: 2%
Used marijuana and sold drugs: 2%
Drank alcohol, used marijuana, and sold drugs: 2%



Drank alcohol and used marijuana: 7%
Drank alcohol and sold drugs: 5%
Used marijuana and sold drugs: 4%
Drank alcohol, used marijuana, and sold drugs: 4%

- Both white and Hispanic youth were significantly more likely than African American youth to report any substance-related behavior (29%, 26%, and 19%, respectively); whites and Hispanics were both more likely than African Americans to report drinking alcohol; whites were more likely than African Americans to report either marijuana use or drug selling.

Note: Racial categories do not include persons of Hispanic ethnicity. Youth of Hispanic ethnicity may be of any race.

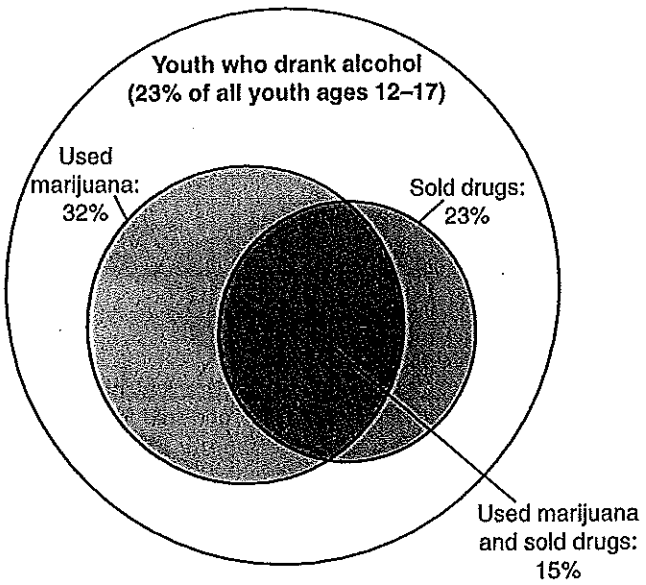
Among youth who drank alcohol, 32% also used marijuana, 23% sold drugs, and 15% did both

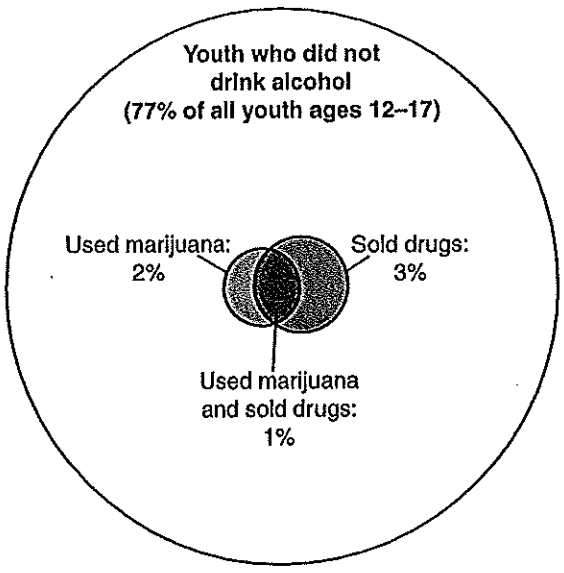
Behavior	All youth ages 12–17	Age group		Gender		Race/ethnicity		
		12–14	15–17	Male	Female	Non-Hispanic White	Non-Hispanic African American	Hispanic
Drank alcohol	23%	11%[a]	35%[b]	23%[a]	23%[a]	26%[a]	14%[b]	22%[c]
Youth who reported drinking alcohol								
Drank alcohol only	60	69[a]	58[b]	58[a]	63[a]	60[a]	63[a]	60[a]
Used marijuana	32	27[a]	34[b]	33[a]	31[a]	32[a]	34[a]	33[a]
Sold drugs	23	17[a]	25[b]	27[a]	18[b]	24[a]	16[a]	23[a]
Used marijuana and sold drugs	15	12[a]	16[a]	18[a]	13[b]	16[a]	12[a]	16[a]
Youth who did not report drinking alcohol								
Used marijuana	2	1[a]	4[b]	3[a]	2[b]	2[a]	3[a]	2[a]
Sold drugs	3	1[a]	6[b]	4[a]	2[b]	3[a]	4[a]	4[a]
Used marijuana and sold drugs	1	<1[a]	1[b]	1[a]	<1[a]	1[a]	1[a]	1[a]

[a, b, c] Cell entries with different superscripts within age, gender, or race subsamples are significantly different at $p<.05$. For example, among youth who reported drinking alcohol, the proportion that only drank alcohol was not significantly different for males (58%) and females (63%), but the proportion that also used marijuana and sold drugs was significantly different for males (18%) and females (13%), although the difference in the percentages was the same in both examples.

Note: Racial categories do not include persons of Hispanic ethnicity. Youth of Hispanic ethnicity may be of any race.

- Most youth ages 12–17 who drank alcohol neither used marijuana nor sold drugs—32% used marijuana and 23% sold drugs.
- However, regardless of age, gender, or race/ethnicity, youth who did not drink alcohol were much less likely than those who did to report marijuana use (2% vs. 32%), drug selling (3% vs. 23%), or both marijuana use and drug selling (1% vs. 15%).
- Males were more likely than females to say they had ever sold drugs. This was true for males and females who drank alcohol (27% vs. 18%) and for males and females who did not (4% vs. 2%).
- Youth ages 15–17 were more likely than youth ages 12–14 to say they used marijuana. This general pattern was found among youth who drank alcohol (34% vs. 27%) and among those who did not drink alcohol (4% vs. 1%).
- Youth ages 15–17 were more likely than youth ages 12–14 to say they ever sold drugs. This general pattern was found among youth who drank alcohol (25% vs. 17%) and among youth who did not drink alcohol (6% vs. 1%).
- Regardless of whether youth reported drinking alcohol, the proportion who reported marijuana use was similar across the three racial/ethnic groups.
- Equal proportions of white, African American, and Hispanic youth who did not drink alcohol reported they sold drugs. This was also true among youth who drank alcohol.





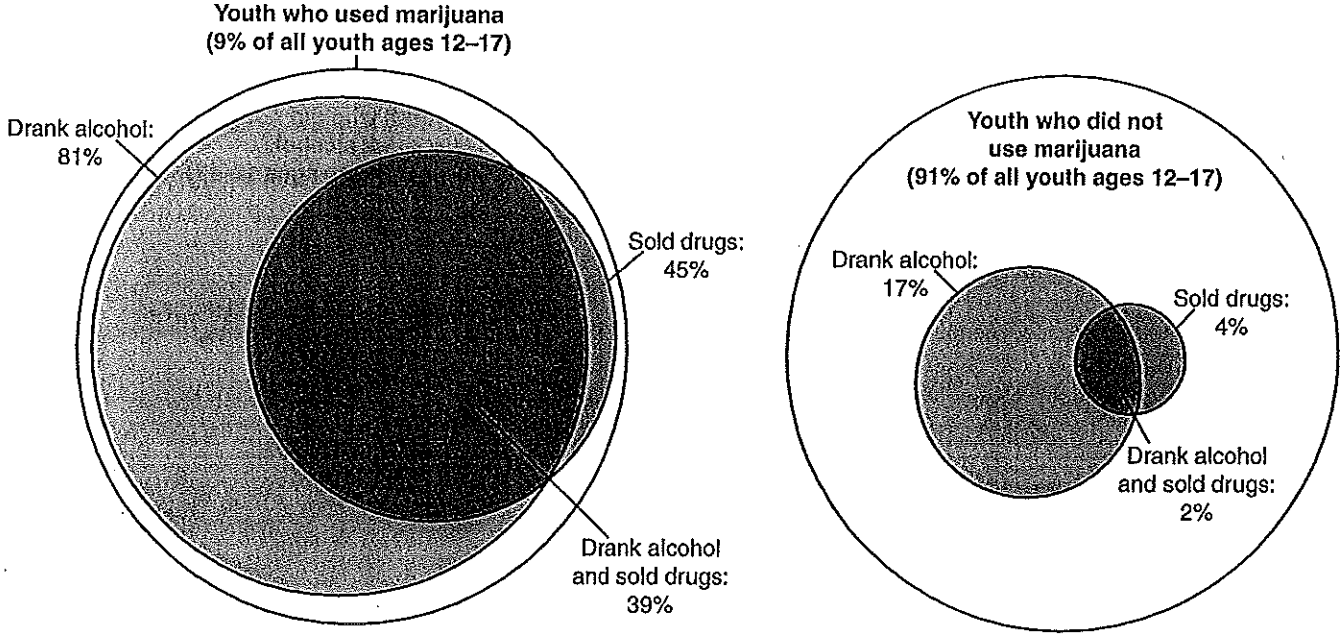
Among marijuana users, 81% also drank alcohol, 45% sold drugs, and 39% did both

Behavior	All youth ages 12–17	Age group		Gender		Race/ethnicity		
		12–14	15–17	Male	Female	Non-Hispanic White	Non-Hispanic African American	Hispanic
Used marijuana	9%	4%[a]	14%[b]	10%[a]	9%[a]	10%[a]	7%[b]	9%[ab]
Youth who reported marijuana use								
Marijuana only	12	20[a]	10[b]	13[a]	12[a]	10[a]	22[b]	14[ab]
Drank alcohol	81	74[a]	83[b]	79[a]	84[a]	84[a]	68[b]	80[a]
Sold drugs	45	39[a]	47[a]	51[a]	38[b]	47[a]	35[a]	47[a]
Drank alcohol and sold drugs	39	33[a]	40[a]	42[a]	34[a]	41[a]	25[b]	40[a]
Youth who did not report marijuana use								
Drank alcohol	17	9[a]	27[b]	17[a]	17[a]	20[a]	10[b]	16[c]
Sold drugs	4	2[a]	6[b]	5[a]	3[b]	4[a]	4[a]	4[a]
Drank alcohol and sold drugs	2	1[a]	3[b]	2[a]	1[a]	2[a]	1[b]	2[a]

[a, b, c] Cell entries with different superscripts within age, sex, or race subsamples are significantly different at $p<.05$.

Note: Racial categories do not include persons of Hispanic ethnicity. Youth of Hispanic ethnicity may be of any race.

- In general, a greater proportion of marijuana users than nonusers reported drinking alcohol and selling drugs. More specifically, compared with marijuana users, youth ages 12–17 who did not use marijuana were far less likely to drink alcohol (17% vs. 81%) or sell drugs (4% vs. 45%). This general distinction between marijuana users and nonusers held for youth regardless of age group, gender, or race/ethnicity.
- For marijuana nonusers, older youth (ages 15–17) were more likely than younger youth (ages 12–14) to drink alcohol or sell drugs. Similarly, for marijuana users, a greater proportion of older youth than younger youth reported drinking alcohol (83% vs. 74%). In contrast, the proportions of older and younger marijuana users who reported selling drugs (47% vs. 39%) were not statistically different.
- For youth who reported using marijuana, similar proportions of males and females reported drinking alcohol (79% vs. 84%), although males were more likely to report selling drugs (51% vs. 38%). A similar pattern held for those who said they did not use marijuana, although their levels of drinking alcohol and selling drugs were substantially lower than those of marijuana users.
- For youth who reported using marijuana, statistically equal proportions of white, African American, and Hispanic youth reported they had sold drugs (47%, 35%, and 47%, respectively). A similar pattern held for those who said they did not use marijuana, although their levels were substantially lower than those of marijuana users.



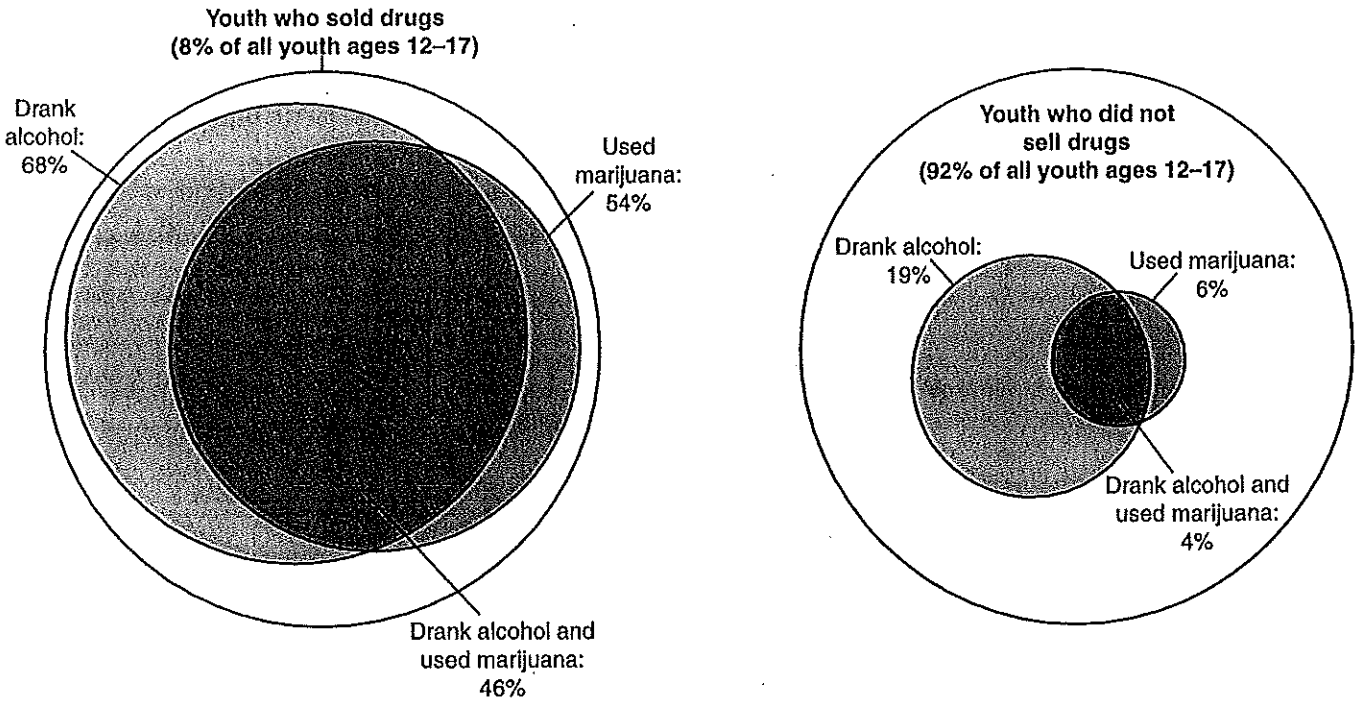
Among youth who sold drugs, 68% drank alcohol, 54% used marijuana, and 46% did both

Behavior	All youth ages 12–17	Age group		Gender		Race/ethnicity		
		12–14	15–17	Male	Female	Non-Hispanic White	Non-Hispanic African American	Hispanic
Sold drugs	8%	3%[a]	12%[b]	9%[a]	6%[b]	8%[a]	6%[b]	8%[ab]
Youth who reported they ever sold drugs								
Sold drugs only	24	32[a]	22[a]	25[a]	22[a]	19[a]	50[b]	28[a]
Drank alcohol	68	60[a]	70[a]	66[a]	72[a]	74[a]	38[b]	65[a]
Used marijuana	54	51[a]	55[a]	53[a]	55[a]	56[a]	41[b]	53[ab]
Drank alcohol and used marijuana	46	43[a]	47[a]	44[a]	49[a]	49[a]	30[b]	45[ab]
Youth who did not report they ever sold drugs								
Drank alcohol	19	10[a]	30[b]	19[a]	20[a]	22[a]	12[b]	18[c]
Used marijuana	6	3[a]	9[b]	5[a]	6[a]	6[a]	5[a]	5[a]
Drank alcohol and used marijuana	4	2[a]	7[b]	4[a]	5[a]	5[a]	3[b]	4[ab]

[a, b, c] Cell entries with different superscripts within age, sex, or race subsamples are significantly different at $p<.05$.

Note: Racial categories do not include persons of Hispanic ethnicity. Youth of Hispanic ethnicity may be of any race.

- Among all youth ages 12–17, those who sold drugs were much more likely than those who did not sell drugs to say they drank alcohol (68% vs. 19%), used marijuana (54% vs. 6%), or both drank alcohol and used marijuana (46% vs. 4%).
- For youth reporting they never sold drugs, greater proportions of older youth (ages 15–17) than younger youth (ages 12–14) reported they drank alcohol (30% vs. 10%) or used marijuana (9% vs. 3%). These age differences were not found among youth who reported they sold drugs.
- Among youth who sold drugs, there were no statistically significant gender differences in the proportions that reported using alcohol (66% of males and 72% of females) or the proportions that reported using marijuana (53% of males and 55% of females). This lack of gender differences was also found when focusing on youth who did not sell drugs.
- Drinking alcohol was reported by a greater proportion of white youth who sold drugs than African American youth who sold drugs (74% vs. 38%). This racial difference was also found among youth who did not sell drugs (22% vs. 12%).
- Marijuana use was also reported by a greater proportion of white youth who sold drugs than African American youth who sold drugs (56% vs. 41%). However, this racial difference was not found among youth who did not sell drugs.



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How do NLSY97 results compare to other drug use survey results?

Prevalence estimates for substance use produced from NLSY97 data tend to fall between those derived from the two major, federally funded drug use surveys—the National Survey on Drug Use and Health (NSDUH, formerly the National Household Survey on Drug Abuse) and Monitoring the Future (MTF). NLSY97 estimates (for 1997 and 1998) match the 1998 NSDUH estimate of the percentage of youth ages 12–17 who used marijuana during the 30 days before the interview (30-day prevalence): 9% for NSDUH and 9% for NLSY97. Reported levels of drinking alcohol were also similar; the NSDUH 1998 estimate of 30-day alcohol prevalence was 21%, whereas the NLSY97 estimate was 23%. In contrast, MTF prevalence estimates are higher than those from the NLSY97 (or from the NSDUH). For example, the 1997 30-day marijuana prevalence estimate for 10th graders from MTF was 20%, compared with 13% for NLSY97; for 30-day alcohol prevalence, the MTF 10th grader estimate was 40% and the NLSY97 estimate was 32%.

Acknowledgments

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