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Measuring HIV risk in the U.S. population aged 15–44: Results from Cycle 6 of the National Survey of Family Growth

By John E. Anderson, Ph.D., National Center for HIV, STD, and TB Prevention; William D. Mosher, Ph.D., and Anjani Chandra, Ph.D., National Center for Health Statistics

Abstract

Objective—This report presents national estimates of the percentage and number of persons in the U.S. population aged 15–44 who report behaviors that place them at increased risk for acquiring or transmitting human immunodeficiency virus, or HIV. The report also contains data on condom use and HIV testing by persons who report risk behaviors. In addition, estimates of self-reported risk for HIV from the Cycle 6 National Survey of Family Growth (NSFG) are compared with data from other recent national surveys.

Methods—Data from the NSFG Cycle 6, conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS), are based on interviews with a national sample of the household population of the United States. In-person, face-to-face interviews were conducted in the homes of 12,571 males and females 15–44 years of age in 2002. Most of the data were collected by Computer-Assisted Personal Interviewing (CAPI), in which a laptop computer is used to select and present the questions, which an interviewer reads to the respondent. The more sensitive data, including the risk behavior items on which this report is based, were collected by Audio Computer-Assisted Self-Interviewing (ACASI), in which the respondent listens to a recording of each question and enters his or her own answers into the computer without involving an interviewer.

Results—Overall, 8.9 percent of persons 15–44 years of age had engaged in sexual behaviors in the past year that put them at increased risk of HIV, and 1.5 percent had engaged in drug use behaviors that put them at risk. In all, an estimated 9.9 percent engaged in either drug use or sexual behavior that placed them at increased risk for HIV. Including those who were treated for a sexually transmitted disease (STD) in the past year, 11.9 percent of persons 15–44 years of age—13.0 percent males and 10.8 percent of females—were at risk of HIV in 2002. The 11.9 percent at risk is equivalent to an estimated 14.4 million persons aged 15–44 at higher risk of HIV through drug use, sexual behavior, or having been treated for an STD in the past year. Persons who were at increased risk reported greater condom use and higher rates of HIV testing, but among those at risk, 33.6 percent had never been tested for HIV and 60.4 percent did not use condoms at last sex.

Keywords: HIV • HIV risk behavior • HIV testing • National Survey of Family Growth

Overview

This report is intended to provide reliable national estimates of some basic statistics on certain types of sexual and drug use behavior, in order to estimate the size and characteristics of populations at elevated risk for acquiring or transmitting human immunodeficiency virus or HIV, the virus that causes acquired immunodeficiency syndrome (AIDS). The approach follows previous survey analyses in classifying persons by whether they report behaviors that have been found to be closely linked to transmission of HIV in epidemiologic studies (1,2). The data used for this report are from the National Survey of Family Growth (NSFG) conducted in 2002, the sixth in a series of national reproductive health surveys that have been conducted since 1973. The survey was based on in-person interviews conducted between March 2002 and March 2003 in the homes of 12,571 people (4,928 men and 7,643 women) 15–44 years of age in the household population of the United States. The response rate for the survey was 79 percent. The demographic characteristics used in this report were collected by an interviewer, but the



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National Center for Health Statistics

measures of drug and sexual behavior reported here were collected in the self-administered portion of the Cycle 6 NSFG survey in which respondents read the questions (or heard them through headphones) and entered their own answers into a laptop computer, thus ensuring their privacy. Tables A–D are summary tables embedded within the text, and Tables 1–10, which provide greater detail on these topics, are shown at the end of the text.

Highlights

- Among males and females 15–44 years of age, 8.9 percent were at risk of HIV because of their sexual behavior in the last 12 months. As defined for this report, persons at “behavioral risk of HIV” include those who had five or more opposite-sex partners in the last year, persons who had sex with an injecting drug user, persons who had sex with an HIV-infected person, those who exchanged sex for money or drugs, men who had sex with other men, and women who had sex with a man who has sex with men (Table A).
- Drug-related risk in the past year (illicit drug injection or use of crack cocaine) put 1.5 percent at risk of HIV, and together sexual or drug risk in the past year was reported by 9.9 percent of persons 15–44 years of age. In total, 11.9 percent were estimated to be at increased risk for HIV by having reported sexual or drug-related risk behavior or having reported treatment for a sexually transmitted disease (STD) in the past year. This results in an estimate of 14.4 million persons at increased risk of HIV in the age group 15–44 (Table A).
- Males reported higher proportions at risk than females. For example, 13.0 percent of males 15–44 were estimated to be at risk through reported sexual behavior or drug use or having been treated for an STD compared with 10.8 percent of females (Figure 1).
- The overall measure of risk through behavior or STD was higher for certain sociodemographic categories than others: non-Hispanic African-

Table A. Estimated percentage and estimated number (in thousands) of persons 15–44 years of age at increased risk of HIV, with standard errors by type of risk: United States, 2002

Type of HIV risk	Percent	Standard error	Number in thousands	Standard error
Risk from sexual behavior	8.9	0.420	10,734	653
Risk from drug use.	1.5	0.167	1,843	205
Risk from sexual behavior or drug use	9.9	0.458	12,015	699
Risk from sexual behavior, or drug use, or indicated by STD treatment.	11.9	0.476	14,358	745

NOTE: HIV is human immunodeficiency syndrome and STD is sexually transmitted disease.
SOURCE: National Survey of Family Growth Cycle 6 (2002).

Americans (20.4 percent) were more likely to be at risk than non-Hispanic white persons (9.7 percent); persons without a high school diploma or GED (15.8 percent) compared with college graduates (8.4 percent), those below 150 percent of the poverty level (16.7 percent) compared with persons at 400 percent of the poverty level or higher (10.0 percent), and

those in the central cities of the 12 largest metropolitan areas (15.8 percent) compared with rural residents (9.1 percent) (Table 3).

- Drug-related risk was strongly related to sexual risk behavior: Among those who injected drugs or used crack cocaine, 31.3 percent reported sexual risk behavior compared with 8.5 percent of others (Table B).

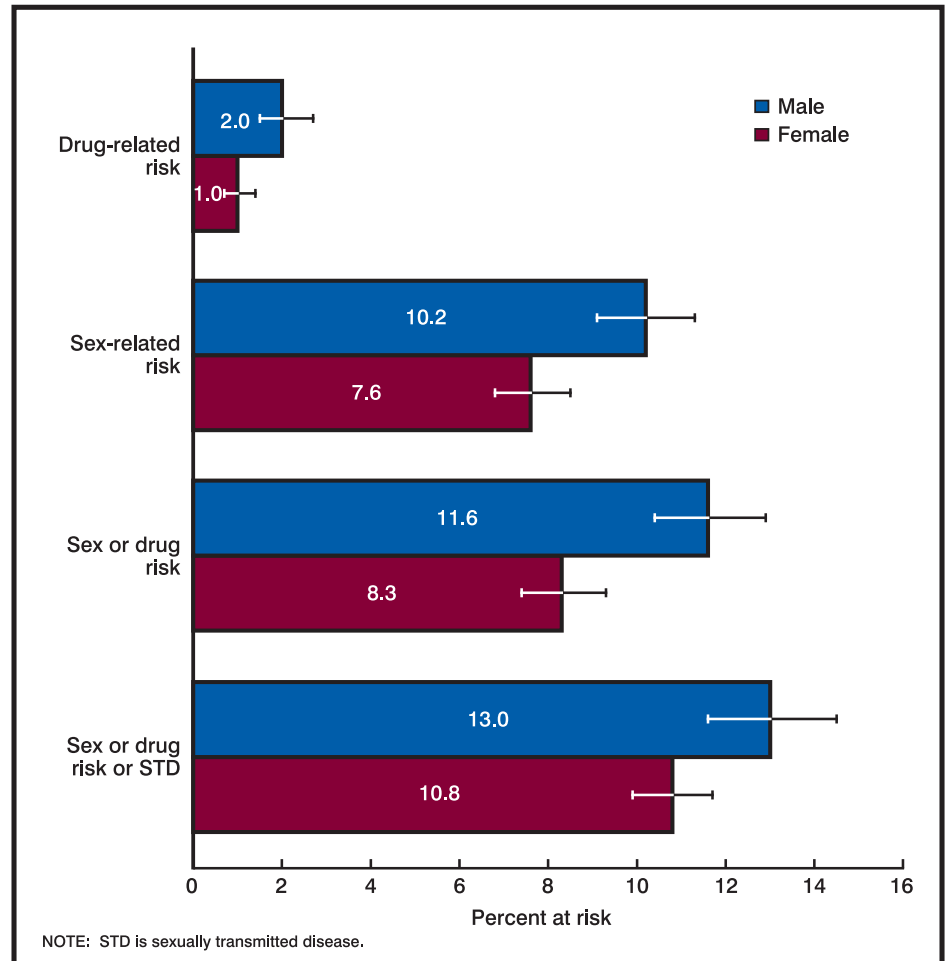


Figure 1. Percent of persons 15–44 years of age at risk for HIV through sex and drug-related behavior, and 95 percent confidence intervals, by sex: United States, 2002

Table B. Percentage of males and females 15–44 years of age who report sexual risk behaviors in the past year and the (standard error of the percent), by whether they used crack or injected drugs in the past year and type of sexual risk behavior: United States, 2002

Type of sexual risk behavior	Total	Used crack or injected drugs	All others
Male and female			
Numbers in thousands	122,335	1,843	120,491
A. 5 or more sex partners	3.5 (0.254)	*14.3 (3.767)	3.3 (0.239)
B. IDU sex partner	2.6 (0.191)	*12.4 (3.087)	2.5 (0.175)
C. Sex in exchange for money and/or drugs	2.3 (0.181)	*16.2 (2.504)	2.1 (0.174)
D. Sex with HIV+ partner.	0.5 (0.091)	0.7 (0.47)	0.5 (0.092)
E. Any sex risk in past year	8.9 (0.420)	*31.3 (4.456)	8.5 (0.408)
Male only			
Numbers in thousands	61,147	1,233	59,694
F. Male-to-male sex	2.7 (0.325)	9.9 (4.622)	2.6 (0.308)
Female only			
Numbers in thousands	61,561	610	60,798
G. Sex with man who has sex with men	2.3 (0.221)	5.4 (3.392)	2.3 (0.212)

* The difference between drug users and others is significant at .05 or better using a weighted Chi-square test.

NOTE: IDU is Injecting drug user.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table C. Estimated percentage and number of persons 15–44 years of age who have never been tested for HIV outside of blood donation, by whether at risk for HIV: United States, 2002

Risk status	Never tested for HIV outside of blood donation			
	Percent	Standard error	Number in thousands	Standard error
Total 15–44 years of age.	49.3	0.806	59,917	1,973
At risk from sexual behavior, or drug use, or STD treatment	33.6	1.677	4,797	347
All others	51.2	0.819	54,168	1,711

NOTE: HIV is human immunodeficiency syndrome and STD is sexually transmitted disease.

- Condom use during last sex was higher among those at risk (39.6 percent) compared with those not at risk (25.6 percent), but condoms were used by a minority of at-risk persons (Table 7).
- HIV testing was reported to a greater degree by persons at risk, but 33.6 percent of those who reported past year sexual or drug-related risk behaviors that put them at increased risk for HIV, or who had been treated for an STD, reported that they had never been tested for HIV (Table C). This is equivalent to 4.8 million at-risk untested persons aged 15–44.

Introduction

Prevention of HIV infection is a national health priority, and it has been recognized that accurate population-based measurement of behaviors that put

persons at risk for acquiring or transmitting HIV is an essential part of tracking the epidemic and developing successful prevention efforts (3). The use of national surveys to produce estimates of the prevalence of behaviors linked to HIV transmission has a relatively long history (1,2, 4–10), but there are few ongoing, large-scale surveys collecting data on a range of specific drug and sex-related behaviors. The National Survey of Family Growth has a number of advantages for producing estimates of this type. It has a long record of collecting sensitive reproductive-related information. In comparison to other national health surveys, it collects considerably more detailed information on risk behaviors related to HIV, it includes both drug and sexual behaviors related to HIV risk, and it uses data collection methods that

enhance the degree of privacy for respondents in answering questions on these sensitive topics.

The objectives of this report are to use the data collected in the NSFG Cycle 6 to:

- Determine the number and percentage of individuals age 15–44 years who are at increased risk for HIV because of various sexual and drug-related behaviors that were reported on the survey
- Determine the demographic and other characteristics that are associated with HIV risk
- Determine the prevalence of preventive behaviors (HIV testing and condom use) for these populations
- Compare estimates of the size of HIV risk categories with estimates from other national surveys

Methods

Measuring HIV risk

The risk categories used in this report are based on known HIV transmission routes and epidemiologic studies. The behaviors used here to define increased risk are based on the HIV/AIDS Reporting System (HARS), which defines a route of transmission for each case of HIV and AIDS (11). HARS defines transmission in terms of broad categories (male-to-male sexual contact, injection drug use, heterosexual contact) and not specific acts; the HARS procedure has been followed in this report. This method of defining persons at increased risk for HIV has been used in previous analytic studies that make use of self-reported survey data (1,2).

In 2003, 45 percent of new cases of HIV and AIDS reported to CDC were to men who had sex with men (MSM), 19 percent to injecting drug users, and 34 percent were accounted for by heterosexual contact. Based on this, injecting drug use and male-to-male sex in the previous year have been used to define respondents as being at increased HIV risk. Regarding drug use, users of crack cocaine have also been classified as being at increased risk. Unlike drug injection, crack use does not provide a direct route for HIV transmission but it is widely considered an HIV risk factor because of its strong association with high-risk sexual behavior and other drug use and its consistent linkage to HIV infection in epidemiologic studies (12–21). Persons with five or more heterosexual sex partners in the past year were defined as at increased risk because of findings that larger numbers of sex partners tend to be associated with greater risk for sexually transmitted infections (22–25). Also considered to be at risk are persons who had any high-risk sex partner in the past year; this includes women who had male sex partners who had sex with other men, persons having sex with an injecting drug user (IDU), persons having an HIV-positive sex partner, and those who exchanged sex for drugs or money during the past year (26,27). A final category of risk is reporting past year treatment for an STD.

To summarize, the following categories of past year HIV risk behavior have been defined:

- Risk related to sexual behavior in the past year:
 1. Five or more opposite sex partners
 2. Men having sex with other men
 3. Sex with an injecting drug user (IDU)
 4. Sex with an HIV-infected person
 5. Exchange of sex for money or drugs
 6. For females, sex with a man who has sex with other men
- Risk related to drug use in the past year:
 1. Illicit drug injection
 2. Crack cocaine use
- In addition, composite categories were defined based on the above behaviors in the past year:
 1. Any risk related to sexual behavior (sexual behavior risk)
 2. Any risk related to drug use (drug use risk)
 3. Any risk from sexual behavior or drug use
 4. Any risk related to sexual behavior or drug use or as indicated by treatment for an STD in the past year

The specific wording of the questions used to define these items is shown in the “[Technical Notes](#).”

In addition to drug- and sex-related HIV risk behaviors, measures of HIV preventive behavior have been defined. HIV testing is an important part of HIV prevention strategies, which seek to identify infected persons in order to provide appropriate treatment and prevention services (28). A measure of HIV testing was defined that includes the percentage who had ever received an HIV test other than those conducted automatically as part of blood donation (29). Condom use, for those who had been sexually active in the year before interview, was measured as the percentage reporting use during the last time they had had vaginal intercourse or (for males only) during the last episode of male-to-male oral or anal sex for males who reported that behavior. Males who reported sex with both females and

males were categorized as condom users if they reported use during their most recent sex with either a male or a female.

Data

NSFG has been conducted six times by NCHS: in 1973, 1976, 1982, 1988, 1995, and 2002. The NSFG conducted in 2002, the sixth in the series, is referred to as Cycle 6. In 1973–95, the interviews were done with national samples of women 15–44 years of age. In Cycle 6, the national sample included both women and men 15–44 years of age.

Each time, the interviews have been conducted in person by trained female interviewers in the selected persons’ homes. In Cycle 6, the sample was a nationally representative multistage area probability sample drawn from 121 areas across the United States. Large areas (counties and cities) were chosen first; within each large area or “primary sampling unit,” groups of adjacent blocks, called segments, were chosen at random. Within segments, addresses were listed and some addresses were selected at random. The selected addresses were visited in person, and a short “screener” interview was conducted to see if anyone 15–44 years of age lived there. If so, one person was chosen at random for the interview and was offered a chance to participate. To protect the respondent’s privacy, only one person was interviewed in each selected household. In Cycle 6, teenagers and black and Hispanic adults were sampled at higher rates than others.

All respondents were given written and oral information about the survey and were informed that participation was voluntary. Adult respondents 18–44 years of age were asked to sign a consent form but were not required to do so. For minors 15–17 years of age, signed consent was required first from a parent or guardian, and then signed assent was required from the minor. Respondents were guaranteed that the confidentiality of their information would be protected. The response rate for the survey was 79 percent—80 percent for women and 78 percent for men.

Over 200 female interviewers were hired and trained by the survey contractor, the University of Michigan's Institute for Social Research, under the supervision of NCHS. Interviewing occurred between March 2002 and February 2003. Some of the data in this report were collected by CAPI, administered by an interviewer. The most sensitive items, on which estimates of HIV risk are based, were collected using ACASI, in which the respondent listened to the questions on headphones (or read them on the computer screen) and entered the responses directly into the computer, with no involvement of the interviewer. Respondents in the Cycle 6 survey were offered \$40 as a "token of appreciation" for their participation. The NSFG questionnaires and materials were reviewed by the CDC/NCHS Research Ethics Review Board and the University of Michigan Institutional Review Board. The female questionnaire lasted an average of 85 minutes, and the male questionnaire an average of 60 minutes. More detailed information about the methods and procedures of the study has been published elsewhere (30).

Strengths and limitations of the data

The data in this report are primarily from Cycle 6 of the NSFG, which has a number of strengths for studying sexual behavior in the U.S. population:

- The NSFG has a rigorous probability sampling design, which allows the estimates to be generalized to the national household population.
- The response rate for the NSFG was 79 percent, which is considered high, and suggests that the data for most statistics can be generalized to the household population with confidence.
- Questions asked on the NSFG have undergone intensive testing and review in an effort to make them understandable to persons participating in the survey.
- Sensitive questions on sexual behavior, reproductive health, or substance use were collected using ACASI methods, which have been found to yield more complete

reporting of sensitive behaviors, and to avoid the large amounts of missing data often found on paper-and-pencil self-administered questionnaires (31,32).

- The questionnaire was administered in both English and Spanish; those who preferred to answer the interview in Spanish were interviewed by bilingual interviewers. The translation of the questionnaire into Spanish was done with particular attention to making it understandable and culturally appropriate to major Hispanic groups—including Mexicans, Puerto Ricans, recent immigrants, and those with limited education (30,33). The ACASI section of the interview was administered in Spanish or English according to the preference of the respondent, regardless of the language of the main interview.

The data included in this report also have a number of limitations:

- As a household-based sample survey, the NSFG excludes from the sampling frame the homeless, persons who are incarcerated or otherwise institutionalized, and those living on military bases in the United States. The results cannot be generalized to those populations; they may have different patterns of sexual and drug use behavior.
- As in any survey, nonresponse error could affect the results. The NSFG makes use of extensive quality control procedures to try to minimize the effects of such errors.
- The results could be affected by underreporting of sensitive behaviors, although using ACASI, as used in the NSFG, has been found to yield more complete reporting of these items than other types of questionnaires (31,32).
- The NSFG provides national estimates but cannot provide state or local estimates of the behaviors described in this report.
- The age range of the NSFG is 15–44 years of age. Therefore, it is not possible to measure the behavior of those under age 15 or over 44 years of age, even though HIV risk behavior exists outside of this age

range.

- Given the sample size of the Cycle 6 NSFG, the numbers of men and women in the sample who reported specific risk behaviors, although larger than in most other general population surveys, are still relatively small, resulting in larger sampling errors for these groups. It also means that the amount of subgroup analysis (for example, by age, race and ethnicity, and other characteristics) that can be done for these populations is limited.

Statistical analysis

In the tables included in this report, the percentage and estimated number of persons in HIV risk categories have been computed for the total target population and for major population subgroups defined by sociodemographic categories. The percentage reporting HIV testing and condom use by categories of HIV risk have also been estimated. Each percentage estimate is shown with its standard error. Standard errors can be converted to confidence intervals by following procedures outlined in the "[Technical Notes](#)."

The statistical significance of bivariate associations has been evaluated using global Chi-square tests, testing the null hypothesis that the percentages in all the categories of a variable are equal. A significant test indicates that the categories being compared are not all equal, at the 0.05 level, and therefore, there is significant variation by that variable. Whereas the global Chi-square has been used throughout the report, in the text when two subgroups are contrasted, the statistical significance between the two subgroups has been assessed.

All estimates are based on weighting factors designed to produce unbiased estimates for the U.S. population. SUDAAN, release 9, software was used to adjust estimates and statistical tests for the complex sample design (34).

Comparative survey data

NSFG data on HIV risk were compared with data from four other national surveys. NSFG estimates of

drug use behavior were compared with data on illegal drug injection and crack cocaine use from the National Survey on Drug Use and Health (NSDUH). NSDUH (formerly titled National Household Survey on Drug Abuse) is an annual national household-based survey conducted in all states that measures the prevalence and correlates of drug use in the United States among persons 12 years and over. Similar to the NSFG, the 2002 NSDUH was conducted using face-to-face interviews with computer-assisted interviewing techniques, and the most sensitive drug use items (including those included in this report) were collected using ACASI methods. The total sample size of the 2002 NSDUH was 54,079 (of whom 37,247 were 18–44 years of age), and the overall response rate was estimated to be 79 percent (35).

Estimates of the number of opposite sex partners and reported male-to-male sex in the past year are compared with estimates from the General Social Survey (GSS). GSS, a national household-based probability sample of U.S. adults aged 18 and over, is designed to collect information on a variety of topics of social importance. GSS began asking questions on HIV-related behavior in 1988 as part of a special self-administered, paper-and-pencil section of the interview completed by respondents following the main interviewer-administered interview (36). In recent years, GSS has been conducted in alternating years with samples of about 2,500 respondents. The overall response rates for recent GSS surveys have averaged around 70 percent. The percentages computed from the GSS that are presented here exclude those respondents who did not complete the self-administered questionnaire.

The National Health Interview Survey (NHIS) provides an estimate of the extent of self-reported STD treatment and also an indirect overall measure of the percentage of adults at increased HIV risk, with which to compare the NSFG estimates. (In the indirect measure of HIV risk, respondents are shown a list of HIV risk categories and are asked if any of these apply to them, without stating which

one; wording is shown in the “[Technical Notes](#).”) NHIS is conducted annually and had a 2002 sample of 31,044 adults aged 18 and over, including 15,722 adults 18–44 years of age. It covers a range of general health topics using in-person, face-to-face household interviews, uses a household-based nationally representative sample, and has gathered data about HIV testing since 1987. In 2002, the overall response rate was 74.3 percent (37).

The Behavioral Risk Factor Surveillance System (BRFSS) also furnishes an indirect measure of overall HIV risk similar to the method used by the NHIS described previously (see “[Technical Notes](#)”), which can be compared with the NSFG estimates. BRFSS is a series of state surveys conducted annually in all states, uses telephone sampling, and conducts telephone interviews on a variety of health topics (38). The individual state response rates ranged from 42.2 to 82.6 percent (39). In 2002, a total of 188,952 adults aged 18–64 in all states were asked questions about HIV risk.

Results

Risk behaviors

[Table 1](#) shows the percentages of the population 15–44 years of age who reported each of the detailed risk behaviors for HIV. The following percentages reported behaviors in the past year that put them at risk of HIV: 3.0 percent had STD treatment in the past year; 3.5 percent reported five or more sexual partners; 2.6 percent had a sexual partner who injected illicit drugs; 2.3 percent had sex in exchange for money or drugs; and 0.5 percent reported sex with an HIV-infected person ([Table 1](#)). Among males, 2.7 percent reported sex with another male in the past year and 2.3 percent of females reported sex with a man who had sex with other men. Summary measures of risk from sexual behavior (“sex risk”) and risk from drug use or sexual behavior (“sex or drug risk”) were higher for males ([Figure 1](#)). For example, 13.0 percent of males reported any sex or drug risk or had been treated

for an STD in the past year compared with 10.8 percent of females.

The summary risk measures in [Table 1](#) indicate that overall 8.9 percent of persons 15–44 years old reported sexual behavior that increases their risk of HIV and 1.5 percent reported drug use that increases their risk of HIV; 9.9 percent reported either drug or sex behaviors that increased their risk. In the largest risk category, 11.9 percent reported either drug or sex risk or had been treated for an STD in the past year. The estimated number of persons at increased risk was 14.4 million persons aged 15–44, through drug use, sexual behavior, or having been treated for an STD in the past year ([Table 1](#)); a 95 percent confidence interval for this value would be approximately 13–16 million persons.

As [Figure 2](#) indicates, overall measures of HIV risk vary greatly by race and ethnic group. Among Hispanics, 14.8 percent reported HIV risk behavior or STD treatment in the past year. The percentage at behavioral risk of HIV among non-Hispanic white persons was 9.7 percent and among non-Hispanic black persons, 20.4 percent. This is consistent with findings that Hispanic and non-Hispanic black persons have higher rates of HIV and AIDS cases in disease surveillance data (11).

To clarify the specific risk behaviors that account for these differences by Hispanic origin and race, these behaviors are shown for each of these groups in [Table 2](#). The percentage at risk of HIV because of sexual behavior was higher for non-Hispanic black persons than for non-Hispanic white persons, in part, because of differences in the proportions who reported having five or more sex partners in the past year and in the proportions who had sex in exchange for money or drugs ([Table 2](#)). The percentage among both sexes who reported five or more previous year sex partners was 4.4 percent among Hispanic persons, 2.6 percent among non-Hispanic white persons, and 7.6 percent among non-Hispanic black persons. Reported levels of male-to-male sex were not significantly different among the three major race and

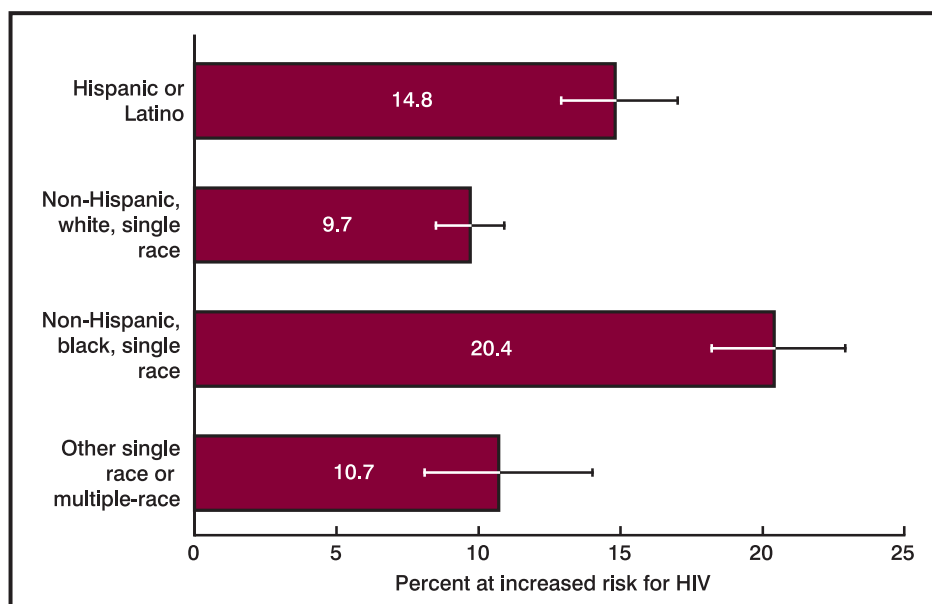


Figure 2. Percent of persons 15–44 years of age at increased risk for HIV and 95 percent confidence intervals, by Hispanic origin and race: United States, 2002

ethnicity categories, nor were measures of drug risk.

As Table 3 shows, measures of HIV risk behavior in the past year are not evenly distributed among major sociodemographic subgroups. Most differences among categories of the measures of sex and drug risk behaviors are statistically significant. Large differences in this measure of risk can be observed for a number of contrasting groups. For example, 16.5 percent of persons 20–24 years of age were at risk compared with 10.7 percent of those over age 30. Among those with less than a high school education, 15.8 percent were at risk compared with 8.4 percent of college graduates. Among those who were below 150 percent of the poverty level, 16.7 percent were at risk compared with 10.0 percent of those at 400 percent of the poverty level or greater. The data in Figure 3 also show that there was a strong association between risk behavior and residence. Among residents of the central cities of the 12 largest metropolitan areas, 15.8 percent were at risk compared with 9.1 percent of those in rural, nonmetropolitan areas. Finally, among males 25–44 years of age, 18.1 percent of those who had ever been incarcerated were at risk of HIV compared with 9.5 percent of those who had not been incarcerated.

Table 4 shows risk separately for males and females. Males generally reported higher levels of risk but the same patterns of differences are

observable within gender categories, with risk higher at younger ages, among African Americans, in the lowest income categories, and in the central cities of metropolitan areas.

Table 5 shows differences in overall risk separately for the major race and ethnic groups. The percentage at risk is significantly higher for younger persons (15–24 years of age compared with 25–44 years of age) and for those in central cities of metropolitan areas—but only among non-Hispanic white persons, not among non-Hispanic black persons. A different pattern is apparent for non-Hispanic black persons, among whom statistically significant differences in risk are not observed by age or metropolitan residence. But black persons who had a bachelor’s degree or higher, for example, had 13.5 percent in the at-risk category compared with 29.5 percent for those without a high school diploma or GED. Differences by education were not observed for Hispanic or non-Hispanic white persons.

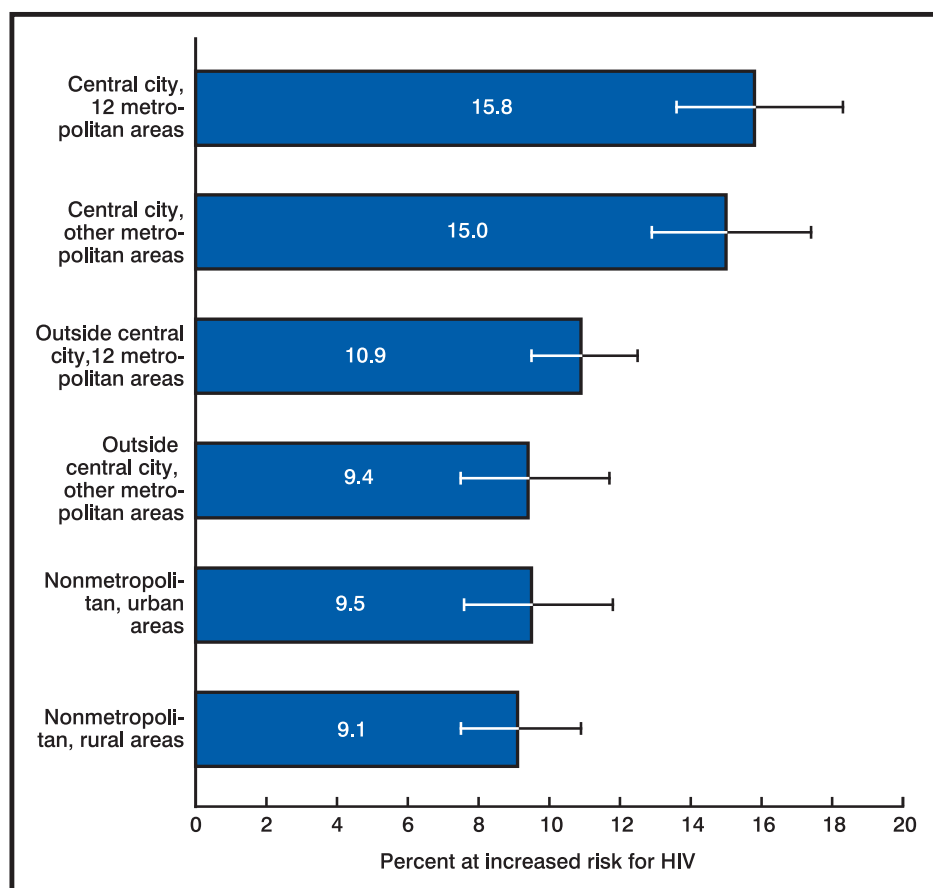


Figure 3. Percent of persons 15–44 years of age at increased risk for HIV and 95 percent confidence intervals, by metropolitan residence: United States, 2002

NSFG provides a good opportunity to illustrate the strong association between sex and drug-related risk behaviors. [Table B](#) contains the percentage reporting sexual risk behaviors among those who reported drug injection or crack cocaine use in the past year, and generally shows considerably higher sexual risk behaviors among drug users compared with others. HIV risk from sexual behavior (“any sex risk”), for example, was reported by 31.3 percent of crack users and injectors compared with 8.5 percent of others. In the case of [Table B](#), some cell sizes are quite small so that some apparent large differences are not statistically significant.

HIV testing by HIV risk

The NSFG can provide information about the HIV testing experience of persons at increased behavioral risk for acquiring HIV. HIV prevention strategies emphasize testing to identify infected persons and ensure access to appropriate medical care, treatment, and prevention services (28). It has been estimated that 1.0–1.2 million HIV-infected persons are living in the United States (40). As many as one in four of these may be unaware of their infection status (28). In addition, many HIV-infected persons become aware of their status late in their infection (3, 40). Information about the number and characteristics of at-risk persons who have never been tested is therefore important for prevention programs.

NSFG data indicate that overall about one-half of persons 15–44 years of age reported that they had never been tested for HIV outside of blood donation ([Table 6](#)). Females were less likely than males to report having never been tested: 45.1 percent of females compared with 53.4 percent of males. This reflects the recommendation that all women be tested during pregnancy and the fact that one-third of HIV tests among women are obtained for reasons of pregnancy (29). In general, persons at increased risk for HIV through specific drug or sex behaviors were less likely to report having never been tested. For example, 33.6 percent of those who reported sex or drug risk behavior or who had been

treated for an STD in the past year reported that they had never had an HIV test outside of blood donation compared with 51.2 percent of others. As indicated in [Table C](#), the 33.6 percent never tested in the high-risk group is equivalent to 4.8 million people who were at risk of HIV and had never been tested.

HIV risk and condom use

Promotion of condom use by persons at risk of acquiring or transmitting HIV or other sexually transmitted diseases to their sexual partners has been an important part of HIV prevention strategies (41). As shown in [Table 7](#), 27.7 percent of persons 15–44 years of age reported using condoms the last time they engaged in vaginal or (for males) oral or anal sex. The NSFG data indicate that measures of sex risk and overall risk were strongly associated with condom use but measures of drug risk behavior were not. Among persons who reported any drug risk behavior as defined here, 23.4 percent reported using condoms during last sexual encounter compared with 27.7 percent of others, a difference that was not statistically significant. In contrast, 43.2 percent of persons with any sexual risk behavior reported condom use at last sex compared with 25.6 percent for others, a large and significant difference.

Comparisons with other surveys: Reported drug use

The components of drug risk included here—past year illegal injection and crack cocaine use—can be compared for the age group 15–44 with data from the 2002 National Survey on Drug Use and Health (NSDUH). Generally, the NSFG and NSDUH both report that overall reported use of crack is more common than injection, and that males are more likely to use crack than females ([Table 8](#)). The percentage reporting drug injection in the past year is low for both surveys, 0.4 percent in the NSFG and 0.2 percent in the NSDUH, and the difference between surveys is statistically significant. However, the questions used are different (see “[Technical Notes](#)”), and for NSDUH, illegal drug injection is

limited to “cocaine, heroin, or stimulants,” whereas the NSFG asks about any “nonprescription” drug injection, so the percentage reported might be expected to be somewhat higher. Both surveys indicate higher injection and crack use among males, but neither survey found statistically significant differences in the measures of drug use by Hispanic origin or race.

Comparisons with other surveys: Risk from sexual behaviors

Comparisons with data from the combined 2000–02 General Social Survey (GSS) indicate similar patterns for the percentage reporting two or more heterosexual sex partners in the past year. [Table 9](#) shows that in both surveys, a higher percentage of males than females were at risk. The percentage reporting two or more partners was significantly higher in the GSS (19.3 percent) than in the NSFG (16.6 percent). The percentage reporting five or more partners—3.6 percent in the NSFG and 3.1 percent in the GSS—was not significantly different in the two surveys. A greater percentage of females 18–44 years of age in the NSFG (2.4 percent) reported five or more partners in the past year than in the GSS (0.7 percent). Among males in the NSFG, 2.8 percent reported sex with a man in the past year compared with 4.5 percent in the GSS, a relatively large difference that was not statistically significant, probably related to the smaller sample size in the GSS.

Comparisons with other surveys: Recent STD treatment

The percentage reporting recent treatment for STDs can be compared with an estimate from the NHIS, which asked about treatment in the previous 5 years, not the past year as in NSFG. A small percentage reported treatment in both surveys. Despite using a 1-year time frame, the percentage is slightly higher in the NSFG—3.0 percent overall compared with 2.2 percent for NHIS for the last 5 years ([Table 10](#)). Given that NSFG asked about a shorter time interval and used ACASI data collection methods compared with the face-to-face interview conducted in NHIS, suggests

that recent STD treatment may be more completely reported in the NSFG. NHIS found higher reporting of STD treatment among females compared with males, but in the NSFG, the percentages of males and females reporting STD treatment were similar.

Summary risk measures for four surveys

Measures that indicate some degree of increased risk for HIV infection are computed by a number of health surveys. These indicators of risk are of value for data analysis, in particular in examining behaviors related to prevention, such as HIV testing and condom use, but these measures vary widely from survey to survey in how they are measured and constructed. Because of these differences in the ways that the questions were asked, the estimates of the level of HIV risk from these four surveys are not strictly comparable, but there is some benefit in assessing the overall level of risk implied by the differing methodologies.

For two surveys, the NSFG and GSS, the measures of risk are based on individual questions on self-administered questionnaires, asking about recent drug and sex-related behavior. These are direct measures of risk. Two general health surveys, the NHIS and the BRFSS, do not ask about specific risk behaviors, but present respondents with a list of behaviors and ask if any apply to the respondent without asking the respondent to state which one. These may be considered an indirect measure of risk. The direct measure from the

NSFG results in an overall estimate of 10.2 percent of 18–44 year olds at risk; using the direct measure in the GSS, 7.2 percent were classified as being at increased risk (Table D). The surveys provide similar estimates of risk among males (11.9 and 12.7 percent) but differing levels among females (8.5 percent from the NSFG and 2.3 percent from the GSS).

The two indirect measures from the NHIS and BRFSS yield remarkably similar overall levels of increased risk, 4.9 and 5.1 percent, despite the fact that they are based on different lists of risk behaviors and time periods (Table D). The four surveys suggest that using varying methods of defining risk results in a range of estimates of between 5–10 percent of persons 18–44 years of age in the United States being at increased risk for HIV.

Discussion

Using the methods described here, in 2002, an estimated 11.9 percent of persons aged 15–44 in the United States could be considered to be at some increased behavioral risk for acquiring or transmitting HIV infection, representing 14.4 million persons. The levels of risk estimated from the NSFG were of a similar order of magnitude but tended to be somewhat higher than the results of other national surveys, which using various methods estimated 5–7 percent at behavioral risk. Many of the component risk behaviors are highly sensitive and subject to underreporting in surveys. The ACASI methods employed by the NSFG have been

found to be associated with higher (and presumably more complete) reporting of sensitive behaviors than other modes of interviewing (31,32).

Although these NSFG estimates of HIV risk behaviors appear to be of good quality, they also may be affected by some degree of underreporting. For example, survey estimates of self-reported illegal drug injection are usually understood to be underestimates of the actual numbers injecting and methods using other data have been developed to adjust them (42,43). One such adjusted estimate of the total number of persons in the United States who have injected drugs in the past year is 1.4 million (43), which can be compared with the NSFG estimate of 329,000–657,000 past year injectors for the limited age range of 15–44.

Similarly, behaviors such as male-to-male sex in the last year also may be underreported to some degree. The NSFG estimate of 2.7 percent is similar to other large surveys that have generally found about 2–3 percent of men reporting this behavior in the last year (5,7,8, 45–47). One review of data has suggested that the percentage might be about 4–6 percent—two times this level (47).

In addition to possible underreporting of sensitive behaviors, the NSFG results are subject to other limitations of a survey of the household population of the United States: most military personnel, the homeless, and persons who are incarcerated or otherwise institutionalized are excluded from the sample. It is possible that those populations have disproportionate

Table D. Estimated percentages of adults 18–44 years of age at increased risk for HIV, with standard errors and number of sample cases in the survey in four National Surveys: United States

Surveys	Total			Male			Female		
	Percent	Standard error	Sample number	Percent	Standard error	Sample number	Percent	Standard error	Sample number
Direct measures:									
Cycle 6 National Survey of Family Growth (NSFG)	10.2	0.505	11,070	11.9	0.713	4,199	8.5	0.516	6,871
2000–02 General Social Survey (GSS)	7.2	0.736	2,426	12.7	1.388	1,107	2.3	0.573	1,319
Indirect measures:									
2002 National Health Interview Survey (NHIS)	4.9	0.179	15,722	5.8	0.332	7,042	4.1	0.255	8,680
2002 Behavior Risk Factor Surveillance Survey (BRFSS)	5.1	0.153	101,451	5.6	0.230	41,934	4.6	0.153	59,517

Definitions:
 NSFG males: In past year: drug injection or crack cocaine use, five or more sex partners, male-to-male sex, sex partner who is: injecting drug user (IDU), exchange partner, HIV+ partner.
 NSFG females: In past year: drug injection or crack cocaine use, five or more sex partners, sex partner who is: MSM, IDU, exchange partner, or HIV+ partner.
 GSS: IDU or crack cocaine in past 3 years, in past year: five or more partners, male-to-male sex, sex in exchange for money.
 NHIS: Any statement is true: have hemophilia, ever had male-to-male sex, ever injected drugs, ever exchanged sex for drugs and/or money, HIV positive; or have a high or medium chance of acquiring HIV.
 BRFSS: Any statement is true: in past year IDU, treated for sexually transmitted disease (STD), sex in exchange for money and/or drugs, unprotected anal intercourse.

percentages at increased risk for HIV. Nonresponse error also could affect the results, but the NSFG makes use of weighting factors to compensate for nonresponse and unequal selection probabilities.

The method of defining HIV risk used here is only one possible method for using the NSFG data, and other researchers could choose different approaches. The method presented in this report is based on route-of-transmission categories in CDC's HIV/AIDS reporting system (HARS), which emphasizes exposure to certain types of sex partners rather than types of sexual activity. The sexual information collected by the NSFG in the ACASI section are more detailed than those collected on other general population health surveys, but are limited in the ability to study sexual behavior in detail. The NSFG collects numbers of opposite-sex partners in the last year with whom respondents had vaginal, oral, or anal sex, but it is not possible, for example, to determine the number of partners with whom they had anal sex in the past year. The definitions used here are supported by previous epidemiologic studies, and the approach has been used in other analytic studies. Increased risk for HIV, as defined here, is strongly associated with HIV preventive behavior (HIV testing, condom use), as well as other factors known to be associated with HIV infection, including race and ethnicity, sex, and socioeconomic variables. The focus of this report is limited to sexual and drug use behaviors that are closely linked to HIV transmission. Other reports based on Cycle 6 of the NSFG present results on a wider range of sexual behaviors (48), as well as other descriptive statistics related to the individual risk behaviors analyzed here (49,50).

The NSFG data reported here illustrate the value of collecting survey data on HIV risk together with data on HIV preventive behaviors such as HIV testing and condom use. HIV prevention strategies emphasize HIV testing because studies have shown that many infected persons are unaware of their infection status, or have become aware late in the infection (40, 51,52). The

Cycle 6 NSFG data indicate that one-third of persons who reported increased risk for HIV also report that they have never been tested for HIV, which is equivalent to about 4.8 million persons. Similarly, the survey data indicate that persons at increased risk were more likely to use condoms (particularly those at risk through sexual behavior), but that most at-risk persons (60.4 percent) did not use condoms during their most recent sexual encounter.

The importance of survey research assessments to the success of HIV prevention efforts has been recognized (3). Additional work is ongoing to evaluate and improve measurement techniques, to collect data needed to evaluate programs, and to identify those population groups most at risk. Nationally representative, population-based surveys such as NSFG can play an essential role, in combination with local surveys and surveys of high-risk populations, in measuring the overall effectiveness of HIV prevention strategies.

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Table 1. Number of males and females 15–44 years of age and percentage at risk of HIV by type of risk, with the standard error of each percentage: United States, 2002

Type of risk	Total	Male	Female
Numbers in thousands.	122,708	61,147	61,561
		Percent at risk (standard error)	
A. STD treatment	3.0 (0.216)	*2.6 (0.322)	3.4 (0.210)
B. Male-to-male sex . . . . .	. . .	2.7 (0.325)	. . .
C. Women with male partners who had sex with other males . . . . .	. . .	. . .	2.3 (0.221)
D. 5 or more opposite sex partners	3.5 (0.254)	*4.6 (0.387)	2.4 (0.246)
E. IDU sex partner	2.6 (0.191)	2.3 (0.302)	2.9 (0.238)
F. Sex in exchange for money or drugs	2.3 (0.181)	2.6 (0.248)	2.0 (0.207)
G. HIV-positive sex partner	0.5 (0.091)	0.5 (0.155)	0.5 (0.093)
H. Any sex-related risk behavior (B,C,D,E,F,G)	8.9 (0.420)	*10.2 (0.568)	7.6 (0.449)
I. Any illicit drug injection	0.4 (0.068)	0.5 (0.116)	0.3 (0.087)
J. Crack cocaine use	1.3 (0.156)	*1.8 (0.274)	0.8 (0.149)
K. Any drug related HIV risk (injection or crack use)(I,J)	1.5 (0.167)	*2.0 (0.293)	1.0 (0.164)
L. Any sex or drug related risk (H,K)	9.9 (0.458)	*11.6 (0.642)	8.3 (0.471)
M. Any sex/drug related risk or treated for STDs (A,L)	11.9 (0.476)	*13.0 (0.710)	10.8 (0.432)

* Values for males and females are different; p<.05, Weighted Chi-Square statistically significant.

. . . Category not applicable.

NOTE: IDU is injecting drug user and STD is sexually transmitted disease.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table 2. Number of males and females 15–44 years of age by race and ethnic group, and percentage at risk of HIV by type of risk (with the standard error of each percentage): United States, 2002

Type of risk	Hispanic or Latino	Non-Hispanic white	Non-Hispanic black
Both sexes			
Numbers in thousands	19,295	78,237	15,190
	Percent (standard error)		
A. STD treatment	*4.1 (0.598)	2.2 (0.262)	5.3 (0.487)
B. Male-to-male sex . . . . .	. . .	. . .	. . .
C. Female with MSM partner ¹ . . . . .	. . .	. . .	. . .
D. 5 or more opposite sex partners	*4.4 (0.490)	2.6 (0.328)	7.6 (0.924)
E. IDU ² sex partner	*2.9 (0.386)	2.1 (0.266)	4.7 (0.402)
F. Sex in exchange for money or drugs	*2.7 (0.363)	1.7 (0.228)	5.1 (0.472)
G. HIV positive sex partner	*0.8 (0.293)	0.3 (0.105)	0.8 (0.183)
H. Any sex-related risk behavior (B,C,D,E,F,G)	*10.5 (0.721)	7.2 (0.537)	16.0 (1.027)
I. Any illicit drug injection	0.5 (0.143)	0.4 (0.081)	0.6 (0.266)
J. Crack cocaine use	1.6 (0.398)	1.0 (0.183)	1.8 (0.352)
K. Any drug related HIV risk (injection or crack)(I and J)	1.9 (0.434)	1.2 (0.194)	2.1 (0.363)
L. Any sex or drug related risk (H and K).	*12.1 (0.826)	8.1 (0.598)	17.2 (1.125)
M. Any sex or drug related risk, or STD treatment (A and L)	*14.8 (1.033)	9.7 (0.604)	20.4 (1.202)
Male			
Numbers in thousands	10,188	38,738	6,940
A. STD treatment	*4.1 (0.862)	1.8 (0.396)	5.4 (0.617)
B. Male-to-male sex	2.9 (0.466)	2.7 (0.421)	3.0 (0.721)
C. Female with MSM partner . . . . .	. . .	. . .	. . .
D. 5 or more opposite sex partners	*6.3 (0.926)	3.2 (0.445)	10.9 (1.685)
E. IDU sex partner	3.4 (0.592)	1.8 (0.407)	3.1 (0.463)
F. Sex in exchange for money or drugs	*3.6 (0.577)	1.8 (0.318)	5.9 (0.733)
G. HIV positive sex partner	1.2 (0.506)	0.3 (0.183)	0.5 (0.213)
H. Any sex-related risk behavior (B,D,E,F,G)	*13.4 (1.196)	8.4 (0.730)	17.4 (1.525)
I. Any illicit drug injection	0.4 (0.233)	0.5 (0.143)	0.9 (0.542)
J. Crack cocaine use	2.3 (0.679)	1.5 (0.347)	3.0 (0.675)
K. Any drug related HIV risk (injection or crack)(I and J)	2.6 (0.753)	1.7 (0.376)	3.2 (0.693)
L. Any sex or drug related risk (H and K).	*15.6 (1.367)	9.6 (0.851)	19.1 (1.600)
M. Any sex or drug related risk, or STD treatment (A and L)	*17.6 (1.591)	10.7 (0.926)	22.0 (1.729)
Female			
Numbers in thousands	9,107	39,498	8,250
A. STD treatment	*4.1 (0.526)	2.7 (0.265)	5.3 (0.667)
B. Male-to-male sex . . . . .	. . .	. . .	. . .
C. Female with MSM partner	*2.7 (0.41)	1.8 (0.260)	3.3 (0.609)
D. 5 or more opposite sex partners	*2.2 (0.343)	2.0 (0.327)	4.8 (0.819)
E. IDU sex partner	*2.4 (0.399)	2.4 (0.357)	6.1 (0.668)
F. Sex in exchange for money or drugs	*1.6 (0.318)	1.6 (0.261)	4.4 (0.679)
G. HIV positive sex partner	*0.4 (0.168)	0.3 (0.100)	1.1 (0.281)
H. Any sex-related risk behavior (C,D,E,F,G)	*7.4 (0.657)	6.0 (0.543)	14.9 (1.220)
I. Any illicit drug injection	*0.6 (0.156)	0.3 (0.127)	0.3 (0.168)
J. Crack cocaine use	0.8 (0.272)	0.5 (0.134)	0.8 (0.248)
K. Any drug related HIV risk (injection or crack)(I and J)	1.1 (0.278)	0.7 (0.167)	1.1 (0.269)
L. Any sex or drug related risk (H and K).	*8.2 (0.695)	6.5 (0.555)	15.6 (1.287)
M. Any sex or drug related risk, or STD treatment (A and L)	*11.7 (0.833)	8.6 (0.522)	19.1 (1.344)

* Indicates that the differences in the percents between the categories of race and ethnicity are significant at the .05 level using a weighted Chi-Square test.

¹MSM is man who has sex with men.²IDU is injecting drug user.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table 3. Number of males and females 15–44 years of age, and percentage at risk of HIV because of STD treatment, sexual behavior, drug use, or any of these, with the standard error of each percentage, by selected characteristics: United States, 2002

Characteristic	Numbers in thousands	STD treatment in past year		Risk from sexual behavior		Risk from drug use		Risk from sexual behavior or drug use		Risk from sexual behavior or drug use or STD	
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total, both sexes	122,708	3.0	0.216	8.9	0.420	1.5	0.167	9.9	0.458	11.9	0.476
Sex											
Male	61,147	*2.6	0.322	*10.2	0.568	*2.0	0.293	*11.6	0.642	*13.0	0.710
Female	61,561	3.4	0.210	7.6	0.449	1.0	0.164	8.3	0.471	10.8	0.432
Age											
15–17 years	11,567	*3.2	0.650	*7.0	0.788	*1.1	0.338	*7.6	0.776	*9.9	0.965
18–19 years	8,475	3.9	0.681	10.1	1.164	2.1	0.496	11.7	1.225	14.5	1.367
20–24 years	19,723	5.3	0.654	11.5	1.139	1.8	0.458	13.1	1.140	16.5	1.235
25–29 years	18,475	2.6	0.406	8.8	0.970	0.7	0.200	9.1	0.947	10.9	1.024
30–44 years	64,467	2.2	0.249	8.3	0.507	1.6	0.262	9.4	0.597	10.7	0.623
Hispanic origin and race											
Hispanic or Latino	19,295	*4.1	0.598	*10.5	0.721	1.9	0.434	*12.1	0.826	*14.8	1.033
Not Hispanic or Latino:											
White, single race	78,237	2.2	0.262	7.2	0.537	1.2	0.194	8.1	0.598	9.7	0.604
Black or African American, single race	15,190	5.3	0.487	16.0	1.027	2.1	0.363	17.2	1.125	20.4	1.202
Other single race or multiple race	9,986	3.1	0.696	8.2	1.392	2.3	0.828	9.7	1.415	10.7	1.480
Education ¹											
Bachelor's degree or higher	25,452	2.1	0.328	*6.7	0.652	*0.3	0.106	*6.8	0.659	*8.4	0.679
Some college, no bachelor's degree	27,382	2.7	0.427	9.0	0.792	1.2	0.415	9.9	0.909	11.4	0.879
High school diploma or GED	29,923	2.3	0.320	9.1	0.747	2.3	0.414	10.9	0.867	12.1	0.865
No high school diploma or GED	11,982	3.9	0.780	11.8	1.200	2.1	0.489	13.1	1.327	15.8	1.536
Percent of poverty level ²											
0–149 percent	25,614	*4.9	0.637	*12.1	0.943	*2.4	0.464	*13.8	1.007	*16.7	1.145
150–299 percent	28,952	2.0	0.271	8.2	0.535	1.6	0.421	9.4	0.682	10.8	0.726
300–399 percent	16,650	2.3	0.383	7.5	0.810	1.0	0.322	8.2	0.873	9.9	0.903
400 percent or more	31,449	2.4	0.335	8.0	0.881	0.9	0.222	8.6	0.891	10.0	0.882
Region											
Northeast	18,065	3.3	0.357	*9.5	0.703	*1.2	0.273	*10.1	0.738	12.1	0.862
Midwest	26,866	2.8	0.505	6.9	0.621	0.9	0.204	7.7	0.698	9.8	0.900
South	47,481	2.6	0.270	9.6	0.836	1.5	0.209	10.5	0.892	12.1	0.877
West	30,295	3.6	0.586	9.0	0.757	2.2	0.539	10.9	0.908	13.2	0.934
Metropolitan residence											
Central city 12 metropolitan areas	16,851	*3.8	0.637	*11.8	0.916	2.1	0.553	*13.5	1.055	*15.8	1.191
Central city other metropolitan areas	28,273	4.0	0.459	11.6	1.238	1.7	0.233	12.6	1.239	15.0	1.133
Outside central city, 12 metropolitan areas	27,825	2.3	0.342	8.6	0.626	1.1	0.269	9.4	0.662	10.9	0.759
Outside central city, other metropolitan areas	27,495	2.5	0.469	6.4	0.658	1.3	0.443	7.4	0.904	9.4	1.052
Nonmetropolitan, urban areas	10,131	2.9	0.578	6.3	0.751	1.7	0.575	7.5	0.818	9.5	1.046
Nonmetropolitan, rural areas	12,133	2.2	0.544	6.9	1.099	1.2	0.627	7.9	0.801	9.1	0.839

See footnotes at end of table.

Table 3. Number of males and females 15–44 years of age, and percentage at risk of HIV because of STD treatment, sexual behavior, drug use, or any of these, with the standard error of each percentage, by selected characteristics: United States, 2002—Con.

Characteristic	Numbers in thousands	STD treatment in past year		Risk from sexual behavior		Risk from drug use		Risk from sexual behavior or drug use		Risk from sexual behavior or drug use or STD	
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Incarceration status ³											
Ever incarcerated	12,342	*2.8	0.523	*13.5	1.442	*5.6	1.125	*17.1	1.736	*18.1	1.693
Others	28,547	1.6	0.358	8.4	0.770	0.4	0.125	8.6	0.775	9.5	0.874
Military experience ³											
Ever in military	5,214	1.4	0.730	8.8	1.598	4.4	2.038	11.5	2.378	11.8	2.352
Others	35,824	2.0	0.355	10.1	0.829	1.6	0.305	11.1	0.867	12.2	0.913

* Within survey, categories are different; $p < .05$. Weighted Chi-Square statistically significant.

¹Limited to persons 22–44 years of age at time of interview. GED is General Educational Development diploma.

²Limited to persons 20–44 years of age at time of interview.

³Limited to males 25–44 years of age at time of interview.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table 4. Number of males and females 15–44 years of age and percentage at risk of HIV with the standard error of each percentage, by selected characteristics: United States, 2002

Characteristic	Past year sex or drug risk or STD treatment					
	Male			Female		
	Numbers in thousands	Percent	Standard error	Numbers in thousands	Percent	Standard error
Total	61,147	13.0	0.710	61,561	10.8	0.432
Age						
15–24 years.	20,091	14.8	1.008	19,674	*13.5	0.909
25–44 years.	41,056	12.1	0.879	41,887	9.5	0.485
Hispanic origin and race						
Hispanic or Latino	10,188	*17.6	1.591	9,107	*11.7	0.833
Not Hispanic or Latino:						
White, single race.	38,738	10.7	0.926	39,498	8.6	0.522
Black or African American, single race	6,940	22.0	1.729	8,250	19.1	1.344
Other single race or multiple race	5,280	9.1	2.257	4,706	12.4	1.860
Education ¹						
Bachelor's degree or higher	11,901	10.2	1.294	13,551	*6.9	0.737
Some college, no bachelor's degree.	13,104	12.6	1.534	14,279	10.3	0.767
High school diploma or GED	15,659	13.6	1.323	14,264	10.4	1.039
No high school diploma or GED	6,355	15.9	2.476	5,627	15.6	1.552
Percent of poverty level ²						
0–149 percent	11,032	*19.2	2.072	14,582	*14.9	1.109
150–299 percent.	14,451	12.4	1.204	14,502	9.3	0.752
300 percent or more	25,457	11.5	0.956	22,643	8.2	0.732
Region						
Northeast	8,361	13.2	1.260	9,704	11.2	0.900
Midwest	12,766	10.2	1.187	14,100	9.4	0.900
South.	24,543	13.3	1.225	22,939	10.9	0.793
West	15,477	14.8	1.626	14,818	11.5	0.770
Metropolitan residence						
Central city 12 metropolitan areas	8,313	*17.9	1.534	8,538	*13.8	1.221
Central city other metropolitan areas	14,191	16.8	1.721	14,082	13.2	1.102
Outside central city, 12 metropolitan areas	13,844	11.7	0.955	13,981	10.0	1.050
Outside central city, other metropolitan areas	13,415	10.5	1.727	14,079	8.3	0.792
Nonmetropolitan, urban areas.	4,931	9.0	1.767	5,200	9.9	1.164
Nonmetropolitan, rural areas	6,453	9.3	1.928	5,680	8.8	1.438

* Indicates that the differences in the percents between the categories of that variable are significant at the .05 level using a Weighted Chi-Square test.

¹Limited to persons 22–44 years of age at time of interview. GED is General Educational Development diploma.

²Limited to persons 20–44 years of age at time of interview.

NOTE: STD is sexually transmitted disease.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table 5. Number of males and females 15–44 years of age and percentage at risk of HIV, with the standard error of the percentage, by Hispanic origin and race: United States, 2002

Hispanic origin and race	Past year sex or drug risk or STD treatment Hispanic			Past year sex or drug risk or STD treatment non-Hispanic white			Past year sex or drug risk or STD treatment non-Hispanic black		
	Numbers in thousands	Percent	Standard error	Numbers in thousands	Percent	Standard error	Numbers in thousands	Percent	Standard error
Total, both sexes.	19,295	14.8	1.033	78,237	9.7	0.604	15,190	20.4	1.202
Sex									
Male	10,188	*17.6	1.591	38,738	*10.7	0.926	6,940	22.0	1.729
Female	9,107	11.7	0.833	39,498	8.6	0.522	8,250	19.1	1.344
Age									
15–24 years.	6,732	*18.1	1.763	24,318	*11.5	0.946	5,355	22.1	2.082
25–44 years.	12,563	13.0	1.148	53,919	8.8	0.651	9,835	19.6	1.320
Education ¹									
Bachelor's degree or higher	1,637	15.3	2.923	19,404	7.7	0.778	1,787	*13.5	2.213
Some college, no bachelor's degree.	3,128	12.1	1.667	18,333	10.5	1.213	3,517	16.5	1.850
High school diploma or GED	4,705	14.8	1.662	18,555	8.3	1.095	4,603	23.9	2.468
No high school diploma or GED	5,204	13.4	1.974	4,665	14.0	2.673	1,600	29.5	3.723
Percent of poverty level ²									
0–149 percent	7,166	16.8	2.280	11,298	11.8	1.560	4,579	*29.0	2.465
150–299 percent.	5,124	12.2	1.469	17,803	9.1	1.000	3,700	18.5	1.896
300 percent or more	3,857	14.9	1.585	36,741	9.3	0.876	4,149	14.0	1.648
Region									
Northeast	2,089	*20.3	1.714	11,790	8.2	1.045	2,880	*23.4	2.221
Midwest	1,446	10.0	3.320	21,069	8.3	0.872	2,848	23.2	3.567
South.	7,229	14.5	1.957	28,548	9.5	1.165	8,321	19.4	1.632
West	8,531	14.6	1.442	16,829	12.5	1.477	1,141	13.5	2.267
Metropolitan residence									
Central city 12 metropolitan areas	5,487	*17.1	2.094	6,184	*12.7	1.512	3,580	23.0	2.342
Central city other metropolitan areas	4,186	16.5	2.726	17,214	13.6	1.591	4,680	20.5	2.216
Outside central city, 12 metropolitan areas	5,577	13.4	1.371	16,631	8.6	0.834	3,420	19.5	2.578
Outside central city, other metropolitan areas	2,626	8.8	1.217	21,066	8.7	1.216	2,039	17.0	4.169
Nonmetropolitan, urban areas.	754	13.5	4.574	8,189	7.8	1.083	513	22.3	6.946
Nonmetropolitan, rural areas	665	22.4	5.913	8,953	5.7	0.677	958	20.3	4.600
Incarceration status ³									
Ever incarcerated	1,854	13.5	2.395	*7,836	*16.0	2.325	1,612	*33.6	3.703
Other.	4,719	14.5	2.202	18,516	7.9	1.123	2,748	17.3	2.569
Military experience ³									
Ever in military	606	12.9	4.202	3,443	10.1	3.330	786	22.8	5.591
Other.	6,002	14.4	1.964	22,967	10.4	1.192	3,604	23.3	2.750

* Indicates that the differences in the percents between the categories of that variable are significant at the .05 level using a Weighted Chi-Square test.

¹Limited to persons 22–44 years of age at time of interview. GED is General Educational Development diploma.²Limited to persons 20–44 years of age at time of interview.³Limited to males 25–44 years of age at time of interview.

NOTE: STD is sexually transmitted disease.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table 6. Number of persons 15–44 years of age and percentage never tested for HIV with the standard error of the percentage, by type of risk for HIV: United States, 2002

Risk for HIV	Both sexes			Male			Female		
	Numbers in thousands	Percent	Standard error	Numbers in thousands	Percent	Standard error	Numbers in thousands	Percent	Standard error
Total	122,708	49.3	0.806	61,147	53.4	1.232	61,561	45.1	0.881
STD treatment in past year ¹	3,650	*25.9	3.002	1,575	*23.9	5.307	2,075	*27.4	3.682
Others	118,549	50.0	0.806	59,303	54.2	1.244	59,246	45.8	0.886
Drug injection or crack use	1,843	*27.6	4.357	1,233	*30.1	5.584	610	*22.4	6.004
Others	120,491	49.6	0.793	59,694	54.0	1.221	60,798	45.4	0.881
Male-to-male sex . . . . .	...	...	...	1,651	*30.9	4.042	...	...	...
Others . . . . .	...	...	...	58,719	53.9	1.282	...	...	...
Females with MSM partner ². . . . .	...	...	...	...	...	...	1,405	*29.0	4.739
Others . . . . .	...	...	...	...	...	...	59,468	45.5	0.874
5 or more opposite sex partners	4,265	*35.7	3.357	2,801	*38.3	4.103	1,464	*30.8	4.431
Others	117,742	49.7	0.816	57,924	54.1	1.248	59,818	45.4	0.888
Any IDU sex partners ³	3,186	*39.0	3.647	1,386	46.1	6.529	1,801	*33.6	3.996
Others	118,831	49.6	0.815	59,462	53.6	1.293	59,369	45.5	0.879
Exchange sex for drugs or money	2,821	*33.0	3.227	1,572	*38.5	4.428	1,249	*25.9	4.203
Others	119,357	49.6	0.812	59,308	53.8	1.261	60,050	45.5	0.869
Any sexual risk behavior	10,734	*35.1	1.798	6,106	*37.7	2.401	4,629	*31.6	2.524
Others	110,197	50.5	0.831	53,974	54.9	1.362	56,222	46.3	0.889
Any sex or drug risk behavior	12,015	*34.4	1.802	6,953	*36.8	2.433	5,063	*31.1	2.334
Others	108,848	50.8	0.815	53,124	55.3	1.346	55,724	46.4	0.880
Sex or drug risk, or STD treatment in past year ¹	14,358	*33.6	1.677	7,809	*36.0	2.339	6,549	*30.7	2.103
Others	106,580	51.2	0.819	52,282	55.7	1.361	54,297	46.8	0.880

* Indicates that the differences between risk categories and others are significant at the $p < .05$, using a Weighted Chi-Square test.

... Category not applicable.

¹STD is sexually transmitted disease.

²MSM is men who have sex with men.

³IDU is injecting drug user.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table 7. Number of persons 15–44 years of age who had at least one sexual partner in the past 12 months, and percentage who used a condom at their last sexual encounter, by type of risk for HIV: United States, 2002

Risk for HIV	Both sexes			Male			Female		
	Numbers in thousands	Percent	Standard error	Numbers in thousands	Percent	Standard error	Numbers in thousands	Percent	Standard error
Total	99,906	27.7	0.655	50,510	30.3	0.987	49,396	24.9	0.723
STD treatment in past year ¹	3,314	*41.1	3.099	1,391	*52.5	6.480	1,923	*32.9	3.081
Others	96,592	27.2	0.665	49,119	29.6	1.006	47,473	24.6	0.748
Drug injection or crack use	1,640	23.4	3.199	1,088	24.5	4.270	552	21.2	4.672
Others	98,258	27.7	0.663	49,419	30.4	0.989	48,840	25.0	0.726
Male-to-male sex . . . . .	...	...	...	1,651	*52.4	4.807	...	...	...
Others . . . . .	...	...	...	48,636	29.4	0.993	...	...	...
Females with MSM partner ². . . . .	...	...	...	...	...	...	1,350	*38.1	4.412
Others . . . . .	...	...	...	...	...	...	47,624	24.3	0.749
5 or more opposite sex partners	4,201	*50.9	3.189	2,801	*58.5	4.010	1,401	*35.7	4.311
Others	95,755	26.6	0.653	47,747	28.7	0.982	48,008	24.6	0.737
Any IDU sex partners ³	3,116	31.7	3.608	1,369	38.4	6.083	1,747	26.4	4.176
Others	96,655	27.5	0.670	49,132	30.1	1.020	47,524	24.8	0.735
Exchange sex for drugs or money	2,773	*42.3	3.232	1,556	*49.4	4.996	1,216	33.2	5.053
Others	97,153	27.2	0.659	48,969	29.7	1.004	48,184	24.7	0.731
Any sexual risk behavior.	10,541	*43.2	1.807	6,079	*50.0	2.676	4,462	*34.0	2.882
others	88,740	25.6	0.690	44,228	27.5	1.031	44,512	23.8	0.762
Any sex or drug risk behavior.	11,623	*40.6	1.749	6,780	*46.3	2.537	4,843	*32.5	2.706
Others	87,632	25.8	0.698	43,498	27.7	1.031	44,134	23.9	0.766
Sex or drug risk, or STD treatment	13,637	*39.6	1.500	7,457	*45.5	2.349	6,180	*32.5	2.158
Others	85,673	25.6	0.700	42,826	27.5	1.049	42,847	23.6	0.775

* Indicates that the differences between risk categories and others are significant at the $p < .05$, using a Weighted Chi-Square test.

... Category not applicable.

¹STD is sexually transmitted disease.

²MSM is men who have sex with men.

³IDU is injecting drug user.

NOTE: For females, the table reflects condom use at last vaginal intercourse, and for males, it reflects condom use at last sex of any kind (vaginal, oral, or anal sex). See Definitions of Terms for further details.

SOURCE: National Survey of Family Growth Cycle 6 (2002).

Table 8. Estimated percentage with standard error of persons 15–44 years of age using drugs in the past year, by type of drug use, sex, and Hispanic origin and race, from the Cycle 6 National Survey of Family Growth and the National Survey of Drug Use and Health: United States, 2002

Characteristic	2002 NSFG		2002 NSDUH		Difference between survey estimates
	Percent	Standard error	Percent	Standard error	
A. Past year drug injection					
Total	0.4	0.068	0.2	0.039	0.2
Sex:					
Male	0.5	0.116	0.3	0.067	0.2
Female	0.3	0.087	0.2	0.041	0.2
Hispanic origin and race:					
Non-Hispanic white	0.4	0.081	0.3	0.056	0.1
Non-Hispanic black	0.6	0.266	0.2	0.116	0.4
Hispanic	0.5	0.143	0.1	0.050	0.4
Other	0.2	0.117	0.1	0.079	0.1
B. Any crack use in past year					
Total	1.3	0.156	0.9	0.086	0.3
Sex:					
Male	*1.8	0.274	*1.3	0.153	0.5
Female	0.8	0.149	0.6	0.080	0.2
Hispanic origin and race:					
Non-Hispanic white	1.0	0.183	0.9	0.094	0.0
Non-Hispanic black	1.8	0.352	1.5	0.360	0.2
Hispanic	1.6	0.398	0.6	0.218	1.0
Other	2.1	0.748	0.8	0.266	1.4
C. Any injection or crack use in past year					
Total	1.5	0.167	1.1	0.091	0.4
Sex:					
Male	*2.0	0.293	*1.5	0.160	0.6
Female	1.0	0.164	0.7	0.088	0.3
Hispanic origin and race:					
Non-Hispanic white	1.2	0.194	1.1	0.105	0.1
Non-Hispanic black	2.1	0.363	1.6	0.361	0.5
Hispanic	1.9	0.434	0.7	0.222	1.2
Other	2.3	0.828	0.8	0.266	1.5

* Within a survey, categories are different at the .05 level with a Weighted Chi-Square. Statistically significant differences between surveys are shown in **bold**.

NOTES: National Survey of Family Growth is NSFG (n = 12,571). National Survey of Drug Use and Health is NSDUH (n = 32,247).

Table 9. Percentage of persons 18–44 years of age reporting selected sexual behaviors in the past year the standard errors of each percentage in the 2002 National Survey of Family Growth and the 2000–02 General Social Survey, and the difference in the survey estimates: United States

Sex and race and ethnicity	2002 NSFG			2000–02 GSS			Difference
	Percent	Standard error	Unweighted number	Percent	Standard error	Unweighted number	
A. 2 or more opposite sex partners in past year							
Total	16.6	0.603	11,181	19.3	1.118	2,461	-2.7
Sex:							
Male	*18.8	0.876	4,251	*25.7	1.831	1,124	-6.9
Female	14.5	0.668	6,930	13.5	1.293	1,337	1.0
Hispanic origin and race:							
Non-Hispanic white	*14.7	0.766	5,992	*18.0	1.295	1,743	-3.2
Non-Hispanic black	27.7	1.535	2,181	25.3	3.200	371	2.4
Hispanic	17.8	1.002	2,427	23.8	3.810	248	-5.9
Other	10.6	1.507	581	11.2	4.503	97	-0.6
B. 5 or more opposite sex partners in past year							
Total	3.6	0.268	11,181	3.1	0.494	2,461	0.4
Sex:							
Male	*4.8	0.414	4,251	*5.9	0.977	1,124	-1.2
Female	2.4	0.262	6,930	0.7	0.300	1,337	1.7
Hispanic origin and race:							
Non-Hispanic white	*2.6	0.338	5,992	2.8	0.550	1,743	-0.2
Non-Hispanic black	7.8	0.973	2,181	5.0	1.701	371	2.8
Hispanic	4.5	0.518	2,427	4.0	1.702	248	0.5
Other	2.5	0.808	581	1.0	1.264	97	1.5
C. Male sex partner in past year, males only							
Total	2.8	0.352	4,225	4.5	0.871	1,002	1.7
Hispanic origin and race:							
Non-Hispanic white	2.7	0.452	2,223	4.1	0.962	738	1.4
Non-Hispanic black	3.3	0.809	800	6.2	2.713	129	2.9
Hispanic	3.0	0.512	968	6.2	3.445	99	3.2
Other	1.7	1.095	234	2.6	3.345	34	0.9

* Within survey, categories are different; p<.05, Weighted Chi-Square statistically significant; differences between surveys shown in **bold**.

NOTE: NSFG is National Survey of Family Growth and GSS is General Social Survey.

Table 10. Percentage of persons 18–44 years of age reporting treatment for Sexually Transmitted Disease in the 2002 National Survey of Family Growth and in the 2002 National Health Interview Survey, by sex and Hispanic origin and race: United States, 2002

Sex and race and ethnicity	2002 NSFG: STD treatment in past year			2002 NHIS: STD in past 5 years			Difference
	Percent	Standard error	Unweighted number	Percent	Standard error	Unweighted number	
Total	3.0	0.214	11,210	2.2	0.134	15,722	0.8
Sex							
Male	2.7	0.316	4,267	*1.6	0.162	7,042	1.1
Female	3.3	0.209	6,943	2.7	0.203	*8,680	0.6
Hispanic origin and race							
Non-Hispanic white	*2.2	0.246	6,009	*2.1	0.176	9,209	0.1
Non-Hispanic black	5.1	0.432	2,185	3.8	0.385	2,300	1.3
Hispanic	4.4	0.643	2,435	1.7	0.252	3,495	2.7
Other	3.1	0.904	581	0.7	0.270	718	2.4

* Within survey, categories are different; p<.05, Weighted Chi-Square statistically significant; differences between surveys shown in **bold**.

NOTES: NSFG is National Survey of Family Growth (n=11,210). NHIS is National Health Interview Survey (n=15,722).

Technical Notes

Computing confidence intervals from standard errors

The tables contain estimates of percentages and the standard error of these percentages. Percentages presented here are ratio estimates and the actual confidence intervals for these estimates will tend to be slightly asymmetrical, particularly for percentages near 0 or 100 (53).

To compute the confidence intervals, follow the steps listed below (54):

1. Convert the percentage to a proportion (“p”) by dividing by 100 and convert its standard error to the standard error of the proportion (“se”) by dividing it by 100.

2. Compute the logit transformation of p, referred to as f(p):

$$f(p) = \ln(p) - \ln(1-p).$$

3. Compute the standard error of the logit estimate:

$$s[f(p)] = se/p(1-p)$$

4. The lower and upper confidence limits of the logit estimate (“Lf” and “Uf”) are given by:

$$\begin{aligned} Lf &= f(p) - t_{\alpha/2} * s[f(p)] \\ Uf &= f(p) + t_{\alpha/2} * s[f(p)] \end{aligned}$$

where $t_{\alpha/2}$ is value from the t distribution for a given level of alpha and degrees of freedom, for example, 1.96 for 2-tailed test with alpha=.05 and a large sample.

5. The next step is to convert the limits of the confidence interval of the logit to an interval for the proportion (“Lp” and “Up”).

$$\begin{aligned} Lp &= \exp(Lf) / (1 + \exp(Lf)) \\ Up &= \exp(Uf) / (1 + \exp(Uf)) \end{aligned}$$

6. Finally, multiplying these values by 100 will convert the upper and lower limits to percentages.

The percentage of male respondents who reported five or more sex partners in the past year can be used as an example; this percentage for males is 4.6 and the standard error is 0.387, as shown in Table 1.

1. Converting these to proportions by dividing by 100 yields estimates of

0.046 and 0.00387 for the proportion and its standard error.

2. The logit transformation is $f(p) = \ln(.046) - \ln(1-.046) = -3.032$.

3. The standard error of the logit estimate:

$$\begin{aligned} s[f(p)] &= .00387 / ((.046) \\ & \quad (1-.046)) = .088. \end{aligned}$$

4. The lower and upper confidence limits of the logit estimate (“Lf” and “Uf”) for a 95 percent confidence are:

$$\begin{aligned} Lf &= -3.032 - 1.96 * .088 = -3.205 \\ Uf &= -3.032 + 1.96 * .088 = -2.859 \end{aligned}$$

5. The lower and upper confidence limits for the logit can be transformed to limits for a proportion by exponentiation and dividing appropriately:

$$\begin{aligned} Lp &= \exp(-3.205) / (1 + \exp(-3.205)) = 0.039. \\ Up &= \exp(-2.859) / (1 + \exp(-2.859)) = 0.054. \end{aligned}$$

6. Finally, multiplying these values by 100 will convert the upper and lower limits to percentages, 3.9 and 5.4 percent.

In this example, the estimated 95 percent confidence interval around the point estimate of 4.6 percent would be 3.9–5.4 percent. Generally, confidence intervals will be more asymmetrical for values below 10 percent and above 90 percent. In cases where the lower bound of the confidence interval is negative, or the upper bound would exceed 1.0, the logit transformation is suggested.

Sample design and fieldwork procedures

Cycle 6 of the National Survey of Family Growth, or NSFG, was based on 12,571 interviews with men and women 15–44 years of age in the household population of the United States. The interviews were administered in person by trained female interviewers in the selected persons’ homes. The Cycle 6 sample is a nationally representative multistage area probability sample drawn from 121 areas across the country. The sample is designed to produce national, not state, estimates.

Persons were selected for the NSFG in five major steps:

- Large areas (counties and cities) were chosen first.
- Within each large area or “primary sampling unit,” groups of adjacent blocks, called segments, were chosen at random.
- Within segments, addresses were listed and some addresses were selected at random.
- The selected addresses were visited in person, and a short “screener” interview was conducted to see if anyone 15–44 years of age lived there.
- If so, one person was chosen at random for the interview and was offered a chance to participate.

To protect the respondent’s privacy, only one person was interviewed in each selected household. In Cycle 6, teenagers and black and Hispanic adults were sampled at higher rates than others.

The NSFG questionnaires and materials were reviewed and approved by the NCHS/CDC Research Ethics Review Board (formerly known as an Institutional Review Board or IRB), and by a similar board at the University of Michigan. The female questionnaire lasted an average of about 85 minutes, and the male questionnaire lasted an average of 60 minutes. All respondents were given written and oral information about the survey and were informed that participation was voluntary. Adult respondents 18–44 years of age were asked to sign a consent form but were not required to do so. For minors 15–17 years of age, signed consent was required first from a parent or guardian, and then signed assent was required from the minor. The response rate for the survey was 79 percent—about 80 percent for women and 78 percent for men.

Over 200 female interviewers were hired and trained by the survey contractor, the University of Michigan’s Institute for Social Research, under the supervision of NCHS. Interviewing occurred from March 2002 through February 2003. The demographic characteristics in this report were collected by computer-assisted personal interviewing, or CAPI. The questionnaires were programmed into

laptop computers and administered by an interviewer. The measures of sexual behaviors and drug use, however, were collected by Audio Computer-Assisted Self-Interviewing, or ACASI, in which the person being interviewed reads the question and response categories on a computer screen (or hears them through headphones) and then enters his or her response directly into a computer. ACASI provides greater privacy for the respondent.

Respondents in the Cycle 6 survey were offered \$40 as a “token of appreciation” for their participation. More detailed information about the methods and procedures of the study have been published in a separate report (30).

In this report, each percentage estimate is shown with its standard error and an estimate of the number of persons in the population in this category.

Readers should pay close attention to the relative size of the standard error for small groups, for example, separate race and ethnic categories shown for metropolitan status residential categories.

The measures of risk behaviors in this report are based on a reference period of the 12 months before interview, specified in the actual wording of the questions, for example, for male respondents interviewed in June 2002, the question would read, “Thinking about the last 12 months, that is, since June 2001, how many female sex partners have you had?”

Definitions of terms

ACASI—Audio Computer-Assisted Self-Interviewing. A data collection method in which the respondent reads the question and response categories on a computer screen (or hears them through headphones) and then enters his/her response directly into a computer, providing greater privacy for the respondent. Because ACASI presents the appropriate questions to the respondent, it also reduces the amount of missing data compared with paper and pencil self-administered questionnaires. Most of the data on sexual behavior in this report were collected using ACASI.

Age (*recode=AGER*)—In this report, “age” is classified based on the respondent’s age as of the date of the interview as reported in CAPI. Sampled persons were eligible for the Cycle 6 NSFG if they were 15–44 years of age at the time of the household screener, and with the exception of a few respondents who may have turned 45 by the time of interview, all were still 15–44 at interview.

Education: highest grade or degree (*recode=HIEDUC*)—This is based on a series of questions that measure the highest degree received as well as the highest grade or year of school completed. The categories of HIEDUC were defined as follows:

- No high school diploma or general equivalency diploma (GED): The person interviewed has not received a high school degree, GED, or college diploma.
- High school diploma or GED: The highest degree obtained is a high school diploma or GED, and his or her highest completed grade of school is 12 or lower.
- Some college, no bachelor’s degree: The highest degree the man or woman obtained is a high school diploma or GED, but the highest grade of school completed is higher than 12, or the highest degree is an associate’s degree.
- Bachelor’s degree or higher: The person reported having a college or university degree at the bachelor’s level or higher, regardless of highest grade completed.

The tables in this report show data by education only for those 22–44 years of age, because large percentages of those 15–21 years of age are still attending school. Using the full age range of 15–44 would understate the eventual educational attainment of those 15–21 years of age.

Ever been in jail, prison, or juvenile detention center—In ACASI, male respondents were asked:

“Have you ever spent time in a jail, prison, or juvenile detention center?”

In this report, statistics are shown for males 25–44 years of age because the most common age at incarceration is in the 20s; using the 15–44 age range

would mean that the “never been in jail or prison” category would contain proportionately more teenage respondents. This question on jail or prison time was not asked of female respondents in the NSFG because incarceration rates for women are lower than they are for men, and the NSFG is not large enough to produce reliable estimates of women who have been incarcerated.

Hispanic origin and race (*based on the CAPI recode HISPRACE and raw variable NUMRACE*)—The recode HISPRACE provided on the public-use file classifies respondents as Hispanic, Non-Hispanic white, Non-Hispanic black, or Non-Hispanic other race, based on two other recoded variables, HISPANIC and RACE. All respondents who answered “yes” to the following question were coded as “Hispanic”:

“Are you Hispanic or Latino, or of Spanish origin?”

The RACE recode was based on the following question:

“Which of the following groups describe your racial background? Please select one or more groups.”

The racial groups shown were:

- American Indian or Alaskan Native
- Asian
- Native Hawaiian or other Pacific Islander
- Black or African American
- White

Because of limited sample size, Asian, Pacific Islander, Alaskan native and American Indian respondents are not shown as separate categories in this report, but are included in the totals of all tables. These are referred to as “Non-Hispanic other races.”

Office of Management and Budget (OMB) guidelines on the classification of race require statistical reports to separate those who reported only one race from the small proportion of the population who reported more than one race. Large data sets such as the U.S. Census, the National Vital Statistics System, and some very large surveys can produce reliable statistics on these respondents who report more than one race. Unfortunately, the NSFG’s sample size of 12,571 respondents cannot produce reliable statistics for very small

subgroups such as respondents who report more than one race, or “multiple-race” respondents. Men and women who reported only one race are classified based on the HISPRACE Recode described previously. All non-Hispanic men and women who reported more than one race are included in the totals of all tables but cannot be shown separately because of insufficient sample sizes. The categories shown in this report are as follows:

- Hispanic or Latino
- Not Hispanic or Latino:
 - White, single race
 - Black or African American, single race

Interpretation of data by race and Hispanic origin—Hispanic origin and race are associated with a number of indicators of social and economic status. Differences among white, black, and Hispanic men and women in the tables are often related to differences in income, education, (54), access to health care and health insurance, the communities in which they live (55), and other factors.

Metropolitan residence (at interview)—This variable classifies the location of the respondent’s address at the time of interview according to year 2000 Census Bureau population counts and definitions of metropolitan statistical areas set forth by OMB. The code categories are:

- 1 = Central city of one of the 12 largest metropolitan areas (listed below)
- 2 = Central city of any other metropolitan area
- 3= In one of the 12 largest metropolitan areas, but not the central city
- 4= In any other metropolitan area, but not the central city
- 5 = Not in a metropolitan area

Categories 3 and 4 are sometimes referred to as “suburbs of metropolitan areas” in the text. Category 5 is further divided in the tables into rural and urban areas, also as defined by the Census Bureau. The 12 largest metropolitan areas (in population size) as of the 2000 census were:

(1) New York-Northern New Jersey-Long Island (NY, NJ, CT, PA)

- (2) Los Angeles-Riverside-Orange County, CA
- (3) Chicago, IL-Gary, IN-Kenosha, WI
- (4) Washington, DC-Baltimore, MD
- (5) San Francisco-Oakland-San Jose, CA
- (6) Philadelphia, PA-Wilmington, DL-Atlantic City, NJ
- (7) Boston-Worcester-Lawrence, MA
- (8) Detroit-Ann Arbor-Flint, MI
- (9) Dallas-Ft Worth, TX
- (10) Houston-Galveston-Brazoria, TX
- (11) Atlanta, GA
- (12) Miami-Ft. Lauderdale, FL

The smallest of these areas, Miami-Ft. Lauderdale, contained about 3.9 million people in 2000; the total population of these 12 areas in the year 2000 was about 97 million people, about one-third of the population of the United States.

Military service—Males 18 years of age and over were asked in CAPI:

“Have you ever been on active duty in the Armed Forces for a period of 6 months or more?”

In this report, data by military service are only shown for males 25–44 years of age because most of those 15–19 are too young to have served in the Armed Forces. Thus, the group that has “never served” would be disproportionately 15–19, and, therefore, younger on average, than those reporting past military service. Data on military service were not collected from females in the NSFG because the NSFG is not large enough to produce reliable estimates of females who have served in the military.

Poverty level at interview (recode=POVERTY)—The poverty level index (or percentage of poverty level as it is labeled in the tables) was calculated by dividing the total family income, as reported in ACASI, by the weighted average threshold income of families whose head of household was under 65 years of age, based on the 2001 poverty levels defined by the U.S. Census Bureau. This definition of poverty status takes into account the number of persons in the family. Total family income includes income from all

sources for all members of the respondent’s family. For example, for a family of four in 2001, the poverty level was \$18,104. So, if a family of four had an income of \$40,000, their poverty level income would be

$(\$40,000/18,104) \times 100$, or 220 percent.

This respondent would be classified in the category “150–299 percent of poverty level.”

The tables in this report show data by poverty level income only for those 20–44 years of age at interview. This is because reports of income by teenagers are likely to be less accurate.

For 1,044 of the 12,571 respondents, or 8.3 percent, total family income at the date of the NSFG Cycle 6 interview was not ascertained and was imputed. Imputation procedures are described in a separate report (56).

Region (of residence at interview)—The REGION recode classifies region of residence at the time of the interview into the four major census regions: Northeast, Midwest, South, and West. These regions are as follows:

- Northeast Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania
- Midwest Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas
- South Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas
- West Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii.

Question wording on HIV risk and related variables, Cycle 6 NSFG and four surveys used for comparison

Items from Cycle 6 NSFG:

Number of partners in the past 12 months—For both males and females, this measure was based on the ACASI questions that asked about numbers of opposite-sex partners with whom the respondent had any sexual contact, not limited to vaginal intercourse. The questions below followed a series of questions asking about types of sexual activity.

For females, number of partners in the last 12 months comes from the ACASI (self-administered) file variable PARTS12M_1, which was based on question JF-2:

“Thinking about the last 12 months, that is, since (month/year), how many male sex partners have you had? Please count every partner, even those you had sex with only once.”

For males, it comes from the ACASI file variable PARTS12_1, which was based on question KG-2:

“Thinking about the last 12 months, that is, since (month/year), how many female sex partners have you had? Please count every partner, even those you had sex with only once.”

Male-to-male sex in the past 12 months—This item is defined for males based on the number of reported male oral or anal sex partners in the past year, item MALPRT12 on the male ACASI file, based on question KJ-2. Male respondents who had reported that they had ever had male sex partners were asked:

“During the last 12 months, that is, since (month/year), how many male sexual partners have you had?”

Women with male sex partners in the past 12 months who had sex with other men—This measure for females only is based on the item BISEXPRT, question JF-3 of the female ACASI questionnaire:

“(Now please think about all of your male sexual partners in the last 12

months, that is since (month/year)).

Have any of your male partners in the last 12 months ever had sex with other males?”

Respondents with at-risk sex partners in the past year—Risk behavior items were defined for respondents who reported in the past year having sex with injecting drug users, persons known to be HIV infected, and exchanging sex for drugs or money. These are based on a series of ACASI questions that are worded somewhat differently for males and females. The male data are based on items FEMSHT12, JOHNFREQ, PROSTFREQ, HIVFEM12 (questions KG-6 through KG-9):

“In the last 12 months, have you had sex with a female who takes or shoots street drugs using a needle?”

“In the last 12 months, have you given a female money or drugs in exchange for having sex with you?”

“In the last 12 months, has a female given you money or drugs to have sex with her?”

“In the last 12 months, have you had sex with a female who you knew was infected with the AIDS virus?”

For females these data are based on items MALSHT12, PROSTFRQ, JOHNFREQ and HIVMAL12 (questions JF-6 through JF-9):

“In the last 12 months, have you had sex with a male who takes or shoots street drugs using a needle?”

“In the last 12 months, has a male given you money or drugs to have sex with him?”

“In the last 12 months, have you given a male money or drugs to have sex with you?”

“In the last 12 months, have you had sex with a male who you knew was infected with the AIDS virus?”

STD treatment in the past year—Throughout this report, the term STD or sexually transmitted disease has been used in referring to the results of the question on whether respondents had been treated for a sexually transmitted disease in the past year. This measure

was derived from responses to the item STDTRT12 (question KK-8 for males and question JH-5 for females):

“In the past 12 months, have you been treated or received medication from a doctor or other medical care provider for a sexually transmitted disease like gonorrhea, chlamydia, herpes, or syphilis?”

The term sexually transmitted infection (STI) is preferred to STD by some, because infections may be asymptomatic, and therefore not “disease.” Others use the terms STD and STI interchangeably. The term STD has been used here to be consistent with the question wording, which specifically uses the term “disease” and refers to interaction with a health care provider to receive treatment or medication.

Any illicit drug injection in past 12 months—This variable is based on the item INJECT12- question KC-6 on the male questionnaire and question JC-9 on the female questionnaire:

“During the last 12 months, how often have you taken nonprescription drugs using a needle, that is, you took them only for the experience or feeling it caused? This includes ‘shooting up’ and ‘skin-popping.’”

Use of crack cocaine—Use of crack cocaine in the past year was measured using the data item CRACK12 derived from the questions KC-5 (male) and JC-8 (female):

“During the last 12 months, how often have you used crack?”

HIV testing (outside of blood donation)—This was based on the item HIVTEST (question HE-2 for females and IF-2 for males):

“(Apart from testing that may have been done with your blood donations,) have you ever had your blood tested for HIV, the virus that causes AIDS?”

Condom use during last sexual encounter—This was defined for males on last vaginal intercourse (CONDVAG) or during last male-to-male oral or anal intercourse (for males who reported this

behavior) (CNDLSML), based on questions KE-3 and KJ-3:

“Did you use a condom the last time you had vaginal intercourse with a female?”

“The last time you had oral or anal sex with a male partner, was a condom used?”

Males who reported both male and female partners in the past year were classified as condom users if they used a condom during their last sexual encounter with either male or female partner.

For females, this measure was based on item CONDVAG, from question JD-4:

“Was a condom used the last time you had vaginal intercourse with a male?”

Comparative items from other surveys:

Crack cocaine use and drug injection in the past year, National Survey of Drug Use and Health (NSDUH)—These measures were based on the following items from the 2002 NSDUH. Use of crack is based on questions CK01 and CKLAST3:

The next questions are about ‘crack’, that is cocaine in rock or chunk form, and not the other forms of cocaine.

“Have you ever, even once, used ‘crack’?”

“How long has it been since you last used ‘crack’?”

Illicit drug injection in the past year is based on questions asked separately about the injection of heroin, cocaine, methamphetamine, and other stimulants:

HERNEEDL

“Have you ever, even once, used a needle to inject heroin?”

HRNDLREC

“How long has it been since you last used a needle to inject heroin?”

COCNEEDL

“Have you ever, even once, used a needle to inject cocaine?”

CONDLREC

“How long has it been since you last used a needle to inject cocaine?”

MTHNEEDL

“Have you ever, even once, used a needle to inject Methamphetamine, Desoxyn, or Methedrine when it was not prescribed for you or that you took only for the experience or feeling it caused?”

MTNDLREC

“How long has it been since you last used a needle to inject Methamphetamine, Desoxyn, or Methedrine when it was not prescribed for you or that you took only for the experience or feeling it caused?”

OSTNEEDL

“Have you ever, even once, used a needle to inject any other stimulant/a stimulant when it was not prescribed for you or that you took only for the experience or feeling it caused?”

OSTNLREC

“How long has it been since you last used a needle to inject (any other stimulant/any stimulant) when it was not prescribed for you or that you took only for the experience or feeling it caused?”

NEDLRECR—Recoded variable based on above items:

“Most recent time used cocaine, heroin, or stimulants with a needle.”

Number of sex partners and male-to-male sex in the past year, General Social Survey (GSS)—Estimates were based on data from the combined 2000–02 GSS. Numbers of past year sex partners is based on the question:

“How many sex partners have you had in the last 12 months?”

Male-to-male sex in the past year was based on responses of males to the following question, which was asked of both sexes:

“Have your partners in the last 12 months been exclusively male, both male and female, or exclusively female?”

Sexually transmitted disease (STD) in past 5 years, from the National Health Interview Survey (NHIS)—This measure was based on question

ADS.160 from the 2002 NHIS:

“The next questions are about other sexually transmitted diseases or STDs. STDs are also known as venereal diseases or VD. Examples of STDs are gonorrhea, chlamydia (CLUH-MIH-DEE-UH), syphilis, herpes, and genital warts.

In the past 5 years, have you had an STD other than HIV or AIDS?”

Composite indirect measure of HIV risk behavior, National Health Interview Survey (NHIS)—This is based on question ADS.150 on the 2002 NHIS:

“Tell me if ANY of these statements is true for YOU. Do NOT tell me WHICH statement or statements are true for you. Just IF ANY of them are.

- (a) You have hemophilia and have received clotting factor concentrations.*
- (b) You are a man who has had sex with other men, even just one time.*
- (c) You have taken street drugs by needle, even just one time.*
- (d) You have traded sex for money or drugs, even just one time.*
- (e) You have tested positive for HIV (the virus that causes AIDS).*
- (f) You have had sex (even just one time) with someone who would answer yes to any of these statements.”*

Composite indirect measure of HIV risk, Behavioral Risk Factor Surveillance System (BRFSS)—This measure is based on the item HIVRISK2 from the BRFSS 2002 data set, which is derived from question 17.08:

“I’m going to read you a list. When I’m done, please tell me if any of the situations apply to you. You don’t need to tell me which one. You have used intravenous drugs in the past year. You have been treated for a sexually transmitted or venereal disease in the past year. You have given or received money or drugs in exchange for sex in the past year. You had anal sex without a condom in the past year. Do any of these situations apply to you?”

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