Family Planning Perspectives
Volume 31, Number 1, January/February 1998

Condom Use and HIV Risk Behaviors Among U.S. Adults: Data from a National Survey

By John E. Anderson, Ronald Wilson, Lynda Doll, T. Stephen Jones and Peggy Barker

Context: How much condom use among U.S. adults varies by type of partner or by risk behavior is unclear. Knowledge of such differentials would aid in evaluating the progress being made toward goals for levels of condom use as part of the Healthy People 2000 initiative.

Methods: Data were analyzed from the 1996 National Household Survey of Drug Abuse, an annual household-based probability sample of the noninstitutionalized population aged 12 and older that measures the use of illicit drugs, alcohol and tobacco. The personal behaviors module included 25 questions covering sexual activity in the past year, frequency of condom use in the past year, circumstances of the last sexual encounter and HIV testing.

Results: Sixty-two percent of adults reported using a condom at last intercourse outside of an ongoing relationship, while only 19% reported using condoms when the most recent intercourse occurred within a steady relationship. Within ongoing relationships, condom use was highest among respondents who were younger, black, of lower income and from large metropolitan areas. Forty percent of unmarried adults used a condom at last sex, compared with the health objective of 50% for the year 2000. Forty percent of injecting drug users used condoms at last intercourse, compared with the 60% condom use objective for high-risk individuals. Significantly, persons at increased risk for HIV because of their sexual behavior or drug use were not more likely to use condoms than were persons not at increased risk; only 22% used condoms during last intercourse within an ongoing relationship.

Conclusions: Substantial progress has been made toward national goals for increasing condom use. The rates of condom use by individuals at high risk of HIV need to be increased, however, particularly condom use with a steady partner.

Family Planning Perspectives, 1999, 31(1):24-28

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John E. Anderson is sociologist, Lynda Doll is chief, Behavioral Intelligence Research Branch, and T. Stephen Jones is assistant director for science, all at the Division of HIV/AIDS Prevention - Intervention, Research and Support, National Center for HIV, STD and TB Prevention, Centers for Disease Control and Prevention (CDC), Atlanta. Ronald Wilson was formerly with the National Center for Health Statistics, CDC, Hyattsville, MD. Peggy Barker is survey statistician at the Office of Applied Studies in the Substance Abuse and Mental Health Services Administration, Rockville, MD.

The measurement of condom use and its correlates in population subgroups is essential for designing and evaluating effective HIV prevention programs. Promoting condom use has been a major goal of programs designed to prevent HIV infection and other sexually transmitted diseases (STDs),[1] and condom use has increased over the past 15 years.[2] Recent national surveys have provided a great deal of information regarding condom use, but nearly all of these surveys have been somehow limited: They were restricted to one sex or to a narrow age range, they did not include detailed

information on all major HIV risk behaviors or they had relatively small samples.[3]

In this article, we present results from a major survey of the U.S. adult population—the 1996 National Household Survey on Drug Abuse (NHSDA). This survey has a number of features that make it particularly valuable for examining condom use for HIV prevention: It includes adult men and women aged 18-59; information was obtained on a comprehensive set of sex- and drug-related HIV risk behaviors; and the sample size is large enough to enable us to analyze the relationship of condom use to characteristics that are relatively rare in the population, such as drug use. Our objectives are to use the NHSDA data to describe the frequency of condom use among U.S. adults, to determine how this varies by type of sex partner and by the characteristics of respondents (including their engagement in HIV risk behaviors), and to evaluate progress toward achieving specific goals for levels of condom use.

In defining HIV risk categories of interest, we have relied on the relatively few exposure categories that account for the source of nearly all recently reported adult and adolescent AIDS cases and HIV infections. Roughly one-half of these reports are from men who have had sex with men, one-third are from injecting drug users and one-sixth have resulted from other sexual behavior.[4]

We defined individuals at increased risk of HIV through sexual behavior as men who, in the past year, have had sex with other men; men and women who have had six or more partners (because of the association of large numbers of partners with reported STDs);[5] individuals who have knowingly had sex with an HIV-infected person; or those who have exchanged sex for drugs or money.

To measure persons with a drug-related HIV risk, we included respondents who had used illegal injection drugs in the past three years, who had exchanged sex for drugs during the past year or who used crack cocaine during the past year (because of the well-documented association between crack use and HIV).[6]

In addition to HIV risk behaviors, we look at differences in condom use by sex, race or ethnicity, age and socioeconomic variables such as education and income. Nearly all previous national studies have found differences in sexual behavior according to these categories (e.g., larger reported numbers of sex partners for males, younger respondents and blacks).[7] We also examine differences by region and metropolitan residence, since a number of regional differences in HIV risk have been found (such as higher HIV seroprevalence among drug injectors in the Northeast).[8]

Condom use that occurs within steady, ongoing relationships has different implications for prevention than condom use in casual sexual encounters in which the partners may not know each other well. A consistent finding in both population-based surveys[9] and studies of high-risk groups[10] has been that condom use is much lower with steady or regular partners than with other types of partners. For this reason, we present rates of condom use separately for sex occurring within and outside of ongoing relationships.

METHODS

The NHSDA, which is conducted annually by the Substance Abuse and Mental Health Services Administration, consists of a household-based probability sample of the civilian noninstitutionalized population aged 12 and older. The main purpose of this

survey is to monitor trends in the use of illicit drugs, alcohol and tobacco, to measure demographic correlates of drug use and to provide information on related topics, including drug treatment.

Survey interviews take place in the respondent's home. Some questions are administered in a traditional face-to-face interview, and the remainder are completed by the respondent using self-administered questionnaire answer sheets. (The items on sex, condom use and drug use analyzed in this article were obtained from the self-administered sections of the interview.) In 1996, response rates were 93% for household screening and 79% for completed interviews with selected respondents.[11]

The NHSDA does not ordinarily contain questions on sexual behavior and condom use. In 1996, for one year only, a personal behaviors section was added to the questionnaire, consisting of 25 questions about sexual activity in the past year. Respondents were asked to provide information about the numbers, relationship types and gender of their sex partners, the frequency of condom use in the past year, the circumstance of the last sexual encounter (condom use, type of partner, and reason for using or not using a condom), and experience with HIV testing. This self-administered section of the questionnaire was given to all respondents aged 18-59, and was completed by 95% of potential
respondents.

All estimates presented here make use of weighting factors to compensate for unequal probabilities of selection and for nonresponse. We present percentages in categories of interest, together with 95% confidence intervals and chi-square tests of differences between categories. In all statistical estimation, we used SUDAAN software to adjust for the effects of the complex sample design.[12]

For respondents who had sex in the past year, condom use at last intercourse is the main outcome measure. This measure requires relatively few questions and is somewhat easier for respondents to answer accurately than questions that require respondents to estimate their frequency of use during some time interval. Other questions provided information regarding the context of the last sexual encounter, such as relationship type and reason for using condoms.[13]

Although the most recent sexual encounter may be atypical for a given respondent, in the aggregate, this method measures the distribution of recent sex acts in the population, and has been found to yield similar results to other methods of asking about condom use.[14] This method can also be used to track the success of a number of stated prevention goals, such as increasing the rate of condom use at last intercourse to a specified level.[15]

The 1996 NHSDA obtained information on condom use during a sexual encounter that could have included anal, oral or vaginal sex. ("The last time you had sex, was a condom used? Remember, by 'sex,' we mean only vaginal, oral or anal sex.") No distinction was made regarding the gender of the last sexual partner.

Finally, respondents were asked whether the most recent experience was within or outside of an ongoing relationship. An ongoing sexual relationship was defined for respondents in the self-administered questionnaire as "anyone with whom you regularly have sex. This may include your husband or wife, or anyone else with whom

you are in an ongoing relationship." Based on this definition, an ongoing relationship need not be monogamous, or even involve frequent sex.

RESULTS

A total of 21% of all respondents reported using condoms in their most recent sexual encounter in the preceding year (95% confidence interval, 19.7-22.3%). The importance of relationship type to condom use is clearly indicated in Table 1: Among those asked about condom use during their last sexual experience, 19% reported using condoms when the most recent intercourse occurred within a relationship, while 62% did so when intercourse occurred outside a relationship. Nearly all respondents (95%) stated that their last intercourse was within an ongoing relationship. For this reason, estimates for condom use outside of ongoing relationships are based on a considerably smaller number of unweighted observations than for condom use within relationships.

Table 1. Among U.S. men and women aged 18-59 who had sex in the last year, percentage who used a condom at last sex, by selected characteristics, according to type of relationship, 1996 National Household Survey on Drug Abuse

Characteristic	Ongoing relationship		Casual relationship	
	%	N	%	N
Total	**18.7 (17.5-20.0)**	**9,270**	**62.1 (57.6-66.7)**	**755**
Gender				
Male	19.9 (18.0-21.8)	3,569	65.3* (59.6-71.1)	499
Female	17.7 (16.2-19.3)	5,701	54.4 (46.1-62.8)	256
Age				
18-25	36.3* (34.0-38.6)	2,779	66.3 (60.1-72.5)	379
26-34	23.2 (21.5-24.8)	4,125	64.4 (58.2-70.7)	271
>=35	12.1 (10.4-13.8)	2,366	52.8 (39.9-65.7)	105
Race/ethnicity				
White	16.2* (14.7-17.6)	4,545	62.0 (55.6-68.3)	315
Black	29.9 (27.3-32.6)	2,077	65.0 (56.7-73.2)	267
Hispanic	22.8 (20.5-25.1)	2,406	57.5 (47.7-67.3)	156
Other	29.6 (19.6-39.7)	242	66.3 (42.6-90.0)	17
Family income				
>=$20,000	15.8* (14.6-17.1)	6,007	61.7 (54.5-68.8)	342
<$20,000	24.2 (21.5-26.8)	2,289	57.5 (46.8-68.1)	172
Unknown	35.2 (29.8-40.7)	974	65.0 (56.9-73.0)	241
Education				
<high school	19.9 (17.2-22.6)	2,086	51.9* (42.4-61.3)	190

High school graduate	18.3 (16.2-20.4)	3,080	59.5 (50.7-68.4)	256
Some college	18.9 (16.5-21.2)	2,285	71.6 (63.3-79.9)	190
College graduate	18.5 (16.2-20.9)	1,819	66.2 (57.5-75.0)	119
Region				
Northeast	21.5 (18.5-24.5)	1,572	73.9* (64.7-83.2)	127
Midwest	16.6 (13.7-19.5)	1,766	50.9 (42.6-59.2)	153
South	19.1 (17.2-20.9)	3,648	61.4 (54.1-68.6)	314
West	18.2 (15.4-21.0)	2,284	67.5 (56.2-78.8)	161
Metropolitan status				
Large metro area	21.2* (19.1-23.4)	4,682	68.9* (62.4-75.5)	372
Small metro area	17.5 (15.5-19.5)	2,894	58.5 (50.6-66.4)	254
Nonmetro area	15.5 (12.8-18.2)	1,694	51.4 (41.6-61.2)	129
Six or more partners in past year				
Yes	38.4* (25.8-50.9)	79	51.5 (39.4-63.7)	106
No	18.6 (17.4-19.9)	9,191	63.6 (58.9-68.3)	649
Two or more partners in past year				
Yes	35.3* (31.6-39.0)	1,086	65.5* (59.7-71.2)	538
No	17.4 (16.2-18.6)	8,184	53.5 (44.6-62.5)	217
No. of sexual risks†				
>=1	25.0 (16.8-33.2)	245	61.1 (52.7-69.5)	180
None	18.6 (17.3-19.9)	9,025	62.5 (57.3-67.6)	575
No. of drug risks‡				
>=1	15.8 (5.6-25.9)	112	44.5 (25.3-63.8)	45
None	18.8 (17.5-20.0)	9,158	63.1 (58.2-68.1)	710
No. of combined sex and drug risks				
>=1	25.7 (3.6-47.7)	33	48.5 (26.7-70.4)	34
None	18.7 (17.5-20.0)	9,237	62.7 (57.9-67.6)	721
No. of HIV risks				
Any (sex or drug)	22.0 (15.2-28.9)	324	59.5 (51.4-67.6)	191
None	18.6 (17.4-19.9)	8,946	62.9 (57.7-68.2)	564

*p<.05 (chi-square test). †Sexual risks include having in the past year six or more partners, sex with an HIV-infected person, sex in exchange for money or drugs, or a male same-sex partner. ‡Drug risks include having sex in exchange for drugs, having used crack cocaine in the past year or having injected drugs in

the past three years. *Note:* Table only includes persons who gave legitimate responses.

Most of the respondents who used a condom at last intercourse reported a combination of reasons for doing so. (For this question, respondents were presented with a list of responses and could check as many as apply. Therefore, respondents could state that only disease prevention or contraception was their motivation, or that both were their motivations.) Most respondents who used condoms were interested in pregnancy prevention or disease prevention or both (Table 2). For those within ongoing relationships, pregnancy prevention had great importance: Only 10% stated that disease prevention was their only reason for using condoms. In contrast, for those whose last sexual encounter occurred outside of an ongoing relationship, disease prevention was most important: Only 11% stated that pregnancy prevention was their only reason for using condoms.

Table 2. Among U.S. men and women aged 18-59 who had sex during the past year, percentage giving selected reasons for having used or not having used a condom at last sex, all by type of relationship, 1996 National Household Survey on Drug Abuse

Use and reason	Ongoing relationship	Casual relationship
Reason for using condom	(N=2,472)	(N=478)
To prevent pregnancy	86.5 (84.0-89.1)	77.3 (70.6-83.9)
To prevent disease	49.2 (45.3-53.0)	87.8 (83.4-92.2)
To prevent pregnancy and disease	39.0 (35.7-42.2)	66.5 (60.3-72.8)
To prevent pregnancy only	47.6 (43.6-51.5)	10.7 (6.6-14.9)
To prevent disease only	10.2 (8.1-12.3)	21.2 (14.7-27.8)
Because less messy	19.4 (16.9-21.9)	20.1 (15.4-24.8)
Some other reason	1.7 (0.9-2.5)	3.1 (1.0-5.2)
Reason for not using condom	(N=6,798)	(N=277)
Seeking pregnancy	14.6 (13.3-15.9)	9.1 (5.1-13.0)
Only having sex with one person	71.6 (69.7-73.5)	30.7 (23.4-38.0)
Neither of us had disease	58.3 (56.2-60.3)	36.6 (29.5-43.6)
Used another birth control method	44.0 (41.7-46.3)	25.1 (18.7-31.6)
For religious reasons	3.4 (2.8-4.1)	2.7 (0.5-4.8)
Partner did not want us to use	11.4 (10.4-12.4)	18.8 (12.5-25.0)
Condom was not available or handy	7.7 (6.8-8.6)	37.1 (28.4-45.7)
Not sure how to use condom	2.1 (1.4-2.8)	3.0 (0.6-5.5)
The sex we had was not risky	16.4 (14.9-17.9)	12.6 (7.5-17.6)
Other reason	11.7 (10.3-13.2)	14.5 (8.6-20.4)

Note: Respondents could select as many responses as applied.

Respondents who had not used condoms at last intercourse were asked why they had not, and these reasons, too, differed by type of relationship (Table 2). The main

reasons respondents in ongoing relationships gave were having only one partner (72%), neither partner's having a disease (58%) and using other methods of contraception (44%). Among those having sex outside of an ongoing relationship, the largest proportions stated that they did not use condoms either because condoms were not available or because neither partner had a disease (37% each).

Among respondents whose last sexual experience was within an ongoing sexual relationship, condom use levels were significantly higher for respondents who were younger, black, of lower income and from large metropolitan areas. In addition, those with six or more partners in the past year and those with two or more partners in the past year had higher levels of condom use (Table 1).* In contrast, condom use at last intercourse outside of ongoing relationships was higher among males, the more highly educated, residents of the Northeast, those living in large metropolitan areas and those with two or more partners.

The NHSDA provides a number of indicators of increased risk for HIV infection as a result of both sexual activity and drug use. Persons who are at increased risk through some categories of sexual behavior—for example, having had two or more partners in the past year (and, for those whose last intercourse was within an ongoing relationship, by having six or more)—are more likely to have used condoms at last intercourse than are respondents with fewer partners. Table 1 indicates that there is no statistically significant relationship, however, between condom use and a measure of combined sexual risk (persons with one or more sexual risk behaviors). By our definition, this category includes 2.8% (confidence interval, 2.4-3.3%) of adults.

Individuals judged to be at increased risk of HIV infection as a result of drug use account for 1.2% of adults; Table 1 indicates such persons have higher levels of condom use than do persons who are not at risk because of drug use.

When we combine either sex- or drug-related HIV risk into a single category of increased risk—a category that includes 3.5% (3.0-4.1%) of the adult population—there is again no increased use of condoms compared to that among persons not in this category (Table 1). When we control for type of relationship, persons at increased risk for HIV are no more likely than others to use condoms. Even when we examine persons at risk through both drug use and sexual behavior, condom use is not significantly higher among those at risk (although this analysis is based on small numbers of observations).

The NHSDA results also can be used to help monitor progress toward the specific goals for condom use that have been stated as part of the Healthy People 2000 series of national health objectives.[16] For example, one of these objectives (objective 18.4) states that by the year 2000, 50% of sexually active, unmarried people should have used a condom at last sexual intercourse. By 1996, according to the NHSDA data, 40% of unmarried adults had used a condom the most recent time they had had sex in the preceding year (Table 3). The goals also state that 60% of injecting drug users should have used a condom at last intercourse. Of the NHSDA respondents who reported having injected illegal drugs in the past three years, 40% used condoms. These findings suggest that there is some distance to go before achieving this Healthy People 2000 objective.

Table 3. Among U.S. adults aged 18-59 who had sex during the past year, percentage who used condoms at last sex, by marital status and injecting drug use		
	%	N
Total	**21.0 (19.7-22.3)**	**10,102**
Marital status		
Married	12.1 (10.9-13.2)	5,361
Unmarried	40.4 (38.0-42.8)	4,741
Drug use history		
Ever injected drugs	23.1 (11.2-35.0)	130
Never injected drugs	21.0 (19.7-22.3)	9,972
Recent drug use		
Injected in past three years	40.2 (17.9-62.4)	28
No injection in past three years	20.9 (19.7-22.2)	10,074

DISCUSSION

The addition of questions on sexual behavior and condom use to the NHSDA has provided data that can be used for monitoring and understanding condom use by U.S. adults, particularly persons at increased risk for HIV infection. Much of what is known about behaviors related to HIV infection has come from studies of high-risk groups that have been sampled and recruited in various ways. Although much has been learned from these studies, answers to certain questions require large-scale population-based surveys.[17] These questions include, for example, whether the findings of local, nonrepresentative studies are relevant to the larger population, and whether prevention programs that may be successful locally appear to be having an impact at the general population level.

The results from the NHSDA data indicate, as earlier studies have, that condom use was higher with partners other than steady partners. Disease prevention also appears to be a major motivation for condom use with other partners, in addition to contraception.[18] Couples in long-term relationships may adopt more effective methods of contraception—which do not, however, provide protection against infections. Although the use of condoms in addition to other contraceptives may be valuable for many of these couples, the use of effective nonbarrier contraception has been found to deter condom use, even where condom use may be needed.[19]

The NHSDA data indicate that other findings of earlier studies regarding the correlates of condom use continue to hold—for example, that condom use was higher among blacks,[20] males,[21] younger persons[22] and persons with more sex partners.[23] The data also indicate findings that have not been noted before—for example, that condom use is greater in the Northeast and in metropolitan areas.

Perhaps our most striking finding is that in this national sample, once type of relationship is controlled, persons at increased risk for HIV are no more likely to use condoms than are other persons. For example, only 22% of persons at increased risk for HIV, by our definition, used condoms during last intercourse within an ongoing relationship. In other words, nearly 80% of the steady partners of these high-risk individuals were unprotected. This is of particular relevance in light of the increasing importance of heterosexually transmitted HIV, such as from male drug injectors to

their female sex partners.[24] It is also consistent with findings from studies of high-risk populations that have indicated that drug users are much more likely to adopt safer drug-related behavior than safer sex behavior.[25]

Because the NHSDA is a national probability sample, its strength is that the results are generalizable to the U.S. adult population. However, the results are subject to certain limitations. Like all large sample surveys, the NHSDA uses a household-based sampling frame, which does not include persons living outside conventional households. (Less than 2% of the population is estimated to be excluded from the NHSDA sampling frame.)

For most health-related measurements, limiting samples to the household population does not make much of a difference, but this is not true in estimating statistics for drug users. Because at any given time a fairly large percentage of hard drug users may be incarcerated, otherwise institutionalized or homeless, the bias associated with looking only at the population living in households may be higher for this group.[26] There is probably some undercount of drug users in the NHSDA data, therefore, and the results should be interpreted accordingly.

Because sexual behavior and drug use are very sensitive subjects, there may also be reporting errors for these items. The questions on drug use and sexual behavior were part of self-administered sections of the interview, and self-administered questionnaires have proven to provide higher rates of reporting of sensitive behaviors than interviewer-administered questionnaires.[27] That the NHSDA results are consistent with other national surveys in reporting the prevalence of sexual behaviors[28] and drug use[29] provides some level of support for the accuracy of the results, although similar errors may affect all interview surveys. Recently published work has indicated that computer-assisted self-interviewing methods, in which respondents listen to recorded questions using earphones, yield even higher levels of reported sensitive behaviors[30] than the self-administered questionnaires used in the 1996 NHSDA. Future rounds of the NHSDA will be converting to this methodology.

In addition to underreporting and underrepresentation of high-risk individuals in the sampling frame, another potential problem is that many of the behaviors of interest—drug use and high-risk sexual behavior—are relatively rare in the population. Despite the NHSDA's large sample size, many of our estimates are based on relatively small numbers of observations and are subject to greater sampling variability than might be desirable.

Finally, the potential effects of survey nonresponse on the results should be considered. Combining the response rate for the personal behaviors section with the household screening and interview completion rate yields an overall completion rate (70%) that is similar to rates from other large national surveys. Although published response rates are not always comparable, a review of the National Survey of Family Growth, National Survey of Adolescent Males, National Survey of Men, National Health and Social Life Survey, National Health Interview Survey-Youth Risk Behavior Supplement, General Social Survey and National AIDS Behavioral Survey suggests that overall completion rates (covering both household screening and interview completion) are 70-75%.[31]

Survey results always must be interpreted in light of the potential bias from nonresponse and other sources. The NHSDA, like other surveys, deals with this issue in a number of ways, including the use of poststratification weighting factors to adjust estimates for nonresponse within categories of age, sex, race and Hispanic origin.[32] In addition, because the NHSDA is an ongoing annual survey, a number of methodological studies of potential bias have been conducted on it. One such study of an earlier round of the NHSDA followed up nonrespondents and found them to be similar in terms of demographic characteristics and drug use to respondents who completed the interview.[33]

The results of the NHSDA regarding HIV risk and condom use are clear, even though they must be interpreted in view of the strengths and limitations of the survey. Persons whose sexual or drug use behavior puts them at particularly high risk for HIV infection do not use condoms at a higher rate than persons who are not at increased risk. Overall condom use has increased and substantial progress has been made toward national goals for increasing condom use, but adoption of condoms by high-risk individuals, including drug users, needs to be increased, particularly condom use with their steady partners.

These results also provide some context in which to interpret the results of local intervention studies for high-risk groups. Many of these programs have demonstrated success in changing the behavior of high-risk individuals.[34] Continued measurement of condom use and other preventive behaviors, and of HIV risk behaviors, in general population surveys will be needed to monitor and direct future HIV prevention efforts.

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*To look at the relationship between number of partners and condom use, we use two measures: having six or more partners, which represents about 1% of adults, according to the NHSDA data (95% confidence interval, 0.8-1.1%), and having two or more partners, which represents about 9% of adults (95% confidence interval, 8.5-10.0%). The latter group, of course, includes the first group.