

# Condom Use for Disease Prevention Among Unmarried U.S. Women

By John E. Anderson, Robert Brackbill and William D. Mosher

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*Among a nationally representative sample of 932 sexually experienced unmarried women aged 17–44, 41% reported using condoms for protection against sexually transmitted diseases, and 30% said they used condoms for this reason every time or most times they had intercourse. While 67% of unmarried condom users cited disease prevention as their primary motivation for choosing this method, only 4% said contraception was their sole reason for using condoms; the remaining 29% gave both reasons. Condom use for disease prevention appeared most common among young women, never-married women, those with the highest incomes, women at an early stage of their reproductive career, women who had not been surgically sterilized and were not using oral contraceptives, those who believed in the effectiveness of condoms and women who had intercourse infrequently. Results of logistic regression analysis showed that black women and those who believed condoms and spermicides are effective in protecting against disease were about twice as likely as their counterparts to use condoms for disease prevention every time or most times they had sex; women who had intercourse two or more times a week, who used the pill or who had been pregnant were about half as likely as others to do so.*

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(Family Planning Perspectives, 27:25–28 & 39, 1995)

The use of condoms has been recommended for preventing the spread of the human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs),<sup>1</sup> and encouragement of condom use is an important part of many prevention programs for these diseases. The U. S. Public Health Service has set the goal that by the year 2000, 50% of the partners of unmarried women will have used condoms the last time they had sex.<sup>2</sup> Many nationally representative surveys relating to sexual behavior and reproduction have included questions on condom use,<sup>3</sup> but most have not explored whether the specific motivation for condom use has been contraception, disease prevention or both.

The 1990 telephone reinterview of participants in the 1988 National Survey of Family Growth (NSFG) was the first national survey that asked U.S. women of reproductive age their reason for relying on condoms, and this feature allows for analyses that were not possible previously. Using these data, we have measured the extent of condom use for disease pre-

vention among unmarried women in the United States and identified the characteristics of sexually experienced unmarried women who are particularly likely to use condoms for disease prevention. In this article, we describe these analyses and discuss the implications of our findings for STD and HIV prevention efforts.

## The Study

For the 1988 NSFG, a household-based national survey, 8,450 women aged 15–44 participated in personal interviews in their homes; 5,359 of these women were reinterviewed in a 1990 telephone survey.<sup>4</sup> Half of the respondents (2,672) to the follow-up survey were randomly assigned to a subsample that asked detailed questions related to STDs and HIV. Of these women, 932 were not married or in a common-law union and were sexually experienced; this group (of whom 64% reported having had intercourse in the month before the interview) was the focus of our analysis.

With regard to condom use for disease prevention, respondents in the subsample were specifically asked whether, during the last three months in which they were having intercourse, they and their partners had used condoms to avoid getting diseases such as genital herpes, gonorrhea and AIDS. If so, they were asked whether they had used condoms for this reason every time they had intercourse,

on most occasions, about half of the time or less than half of the time.

Because consistency of condom use is important for disease prevention, we defined our main outcome measure as reported use of condoms every time or most times during the most recent three months of intercourse.\* The NSFG offers a large number of predictor variables from which to choose. Clearly, background characteristics that have been found to be associated with contraceptive use and sexual behavior (including age, marital status and race or ethnicity) need to be considered in any analysis of this type. Differences by other characteristics, such as area of residence and socioeconomic measures, need to be examined because they are of interest to prevention program efforts.

While the NSFG was not designed to test particular theories of behavior change, various measures assessed in the survey are relevant to theoretical models of behavior change. A useful example is the AIDS Risk Reduction Model,<sup>5</sup> which postulates a progression of three stages in adopting safer behavior.

The first stage of this model involves the individual's recognizing his or her susceptibility. Relevant NSFG variables include knowledge of HIV and AIDS, history of STDs, knowing someone with HIV, HIV testing history and self-perceived risk for HIV.

In the second stage of the model, the individual develops a commitment to change behavior; this involves weighing the costs and benefits of the new behavior. Since condoms are a good method of disease prevention, but are not the most effective contraceptive method, the decision to use condoms for disease prevention entails weighing reproductive outcomes against potentially life-threatening health outcomes. Among the applicable NSFG variables are desire for future births, adoption of effective contraceptive methods, and belief in the effectiveness of condoms for preventing STDs and HIV.

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\*Thus, under our definition, a woman is counted as a consistent user not only if she always uses the condom, but also if she missed using the condom only once or twice. To test the implications of this definition, we recalculated our results using other definitions; the results are described in the discussion section.

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John E. Anderson is a sociologist, and Robert Brackbill is a scientific information specialist, in the Division of STD Prevention, National Center for HIV, STD and TB Prevention, Atlanta. William D. Mosher is chief of the Family Growth Survey Branch, National Center for Health Statistics, Hyattsville, Md. All are with the Centers for Disease Control and Prevention.

**Table 1. Percentage of sexually experienced unmarried women (and 95% confidence interval), by selected characteristics, 1990 NSFG telephone reinterview (N=932)**

Characteristic	%
Age-group	
17–24	41.9 (38.6–45.3)
25–34	33.6 (28.9–38.3)
35–44	24.5 (20.5–28.4)
Race/ethnicity	
White	65.1 (61.9–68.3)
Black	23.4 (21.0–25.7)
Hispanic	7.3 (4.2–10.3)
Other	4.2 (2.2–6.2)
Has never married	68.0 (63.8–72.2)
Has been pregnant	51.7 (47.5–56.0)
Intends more births	55.1 (51.7–58.5)
Is surgically sterile	15.6 (13.0–18.3)
Uses oral contraceptives	23.3 (19.8–26.8)
Has ever had PID	14.5 (11.8–17.2)
Perceives some HIV risk	18.7 (15.9–21.5)
Believes condom/ spermicide is effective	59.1 (55.4–62.7)
Has ever had an STD†	6.1 (4.1–8.0)
Had ≥2 partners in last 3 months	11.4 (8.5–14.4)
Has had ≥10 lifetime partners	19.5 (16.6–22.5)
Has sex ≥2 times/week	23.7 (20.5–27.0)

†In this table and in Table 3, STD refers to gonorrhea, chlamydia, genital warts or genital herpes.

The final stage of the model consists of actually taking steps to adopt the behavior. NSFG variables measuring access to health care, including the use of publicly funded family planning programs, are of interest for this stage.

All estimates presented in this article were made using weighting factors designed to compensate for unequal selection probabilities and nonresponse, and to produce nationally representative estimates.<sup>6</sup> In addition, the software used to calculate confidence intervals and to conduct chi-square tests and the logistic regression analysis takes into account the effects of the complex sample design.<sup>7</sup> Logistic regression modeling was conducted using stepwise methods to produce a final model in which all terms were significant at  $p < .05$ . The final model was evaluated for goodness of fit using the Hosmer-Lemeshow chi-square statistic, which indicated adequate goodness of fit.<sup>8</sup>

## Results

### Characteristics of Respondents

As Table 1 indicates, the women in the sample were distributed throughout the age range 17–44. More than half had been

\*Because women who were at an early stage in their reproductive life (i.e., who had never been pregnant or given birth, or who intended more births) were more likely than others to use condoms for disease prevention, we were concerned that such a factor might mediate the effects of other variables included in the regression. Thus, we calculated cross-product interaction terms between the intention to have more births and other potential predictors; none of the interaction effects were significant at the 5% level in the final model.

pregnant, more than half intended to have additional births, one in six had been surgically sterilized (for either medical or contraceptive reasons) and one-fourth were pill users. A minority of women appeared to be at elevated risk for STDs, as indicated by lifetime experience with pelvic inflammatory disease (PID) and STDs, and by at least some self-perceived risk of HIV infection. One in nine reported they had had two or more sexual partners in the last three months during which they had intercourse, and one-fourth reported having had sex twice or more per week.

### Reason for Using Condoms

Table 2 reveals that 14% of respondents were using condoms for contraception; 41% had used a condom for disease prevention at least once during the last three months in which they were having sex. In all, 30% of respondents used condoms for disease prevention every time or most times they had intercourse. While this measure is not directly comparable with the Healthy People 2000 goal of a 50% level of condom use at last intercourse, it suggests that the 1990 level of use is probably somewhat lower than the goal.

Among unmarried condom users, disease prevention was cited more often than contraception as the motivation for using condoms: Whereas 67% said they used condoms solely for disease prevention, 4% used them for contraception only; 29% used condoms for both reasons.

### Bivariate Associations

The results of bivariate analyses of the association between a wide array of characteristics and the outcome measure are shown in Table 3. Women aged 17–24 were significantly more likely than older women to use condoms to prevent disease (38% vs. 23–25%), and never-married women were more likely than previously married women to do so (32% vs. 24%). No other background factors showed significant associations with condom use for disease prevention. Among socioeconomic characteristics, only income had a significant effect: Women whose income was at least three times the poverty level were more likely than others to use condoms to avoid STDs (34% vs. 25%).

Fertility-related variables were strong predictors of condom use for disease prevention. Respondents who had never given birth, had never been pregnant, intended more births, or were not surgically sterile or using oral contraceptives were relatively likely to be using condoms for disease protection. Even among women

who were sterile or who were using oral contraceptives, however, about 20% reported using condoms to avert disease.

Characteristics related to STD risk (early age at first intercourse and ever having had PID or an STD) were not associated with condom use for disease prevention. (In part, this result may be due to difficulty in measuring these relationships in a cross-sectional analysis, since, for example, a past predisposition not to use condoms could be related to both past STD infections and current nonuse of condoms.) Likewise, most items related to HIV knowledge and awareness were not associated with condom use. However, the proportion of unmarried women using condoms for disease prevention was significantly higher among those who believed that condoms and spermicide are effective against HIV infection than among those who did not share this belief (35% vs. 22%), and among those who believed in the effectiveness of condoms alone than among those who did not (38% vs. 26%).

Indicators of health care use and most measures of sexual behavior were not associated with condom use. The exception was that the level of condom use for disease prevention was higher among those having intercourse less than twice a week than among those having more frequent intercourse (33% vs. 18%).

### Logistic Regression Analysis

In Table 4 (page 28), we present results of logistic regression analyses conducted to determine which factors are associated with the use of condoms for disease prevention when other variables are controlled statistically.\* Using stepwise meth-

**Table 2. Percentage of sexually experienced unmarried women (and 95% confidence interval), by condom-use measures**

Measure	%
Currently uses condom for contraception	14.1 (11.5–16.7)
Used condom for disease prevention in past 3 months†	40.5 (37.0–44.0)
How often used condoms for disease prevention	
Every time	18.5 (15.0–21.9)
Most times	11.2 (9.1–13.4)
Half of the time	5.1 (3.4–6.9)
<half of the time	5.7 (4.1–7.4)
Never	59.4 (56.0–62.9)
Reason for using condom‡	
Disease prevention only	66.6 (60.9–72.2)
Contraception only	4.1 (1.4–6.8)
Disease prevention and contraception	29.3 (23.7–35.0)

†The most recent three-month interval in which respondents were having sex. ‡Based on the 395 women who currently use condoms for contraception or used condoms for disease prevention in the past three months.

ods, a final model was obtained in which all variables are significant at the 5% level. The results indicate that black women and those who believed that condoms and spermicides are effective against STDs were twice as likely as their counterparts to use condoms for disease prevention (odds ratios of 1.6 and 2.0, respectively). In contrast, women who had sex two or more times per week, pill users and women who had been pregnant were about half as likely as others to do so. None of the other variables shown in Table 3 were significantly associated with condom use for disease prevention.

## Discussion

Our findings underscore the importance of the competing concerns women may have in reaching a decision to use condoms for disease prevention. Women who were using oral contraceptives, who had been pregnant or had given birth, who had been surgically sterilized, who intended future births and who were older were relatively unlikely to be using condoms for disease prevention. These factors are all related to a woman's stage in her reproductive life. It appears that condom use for disease prevention is most prevalent among young women who have not yet started their families and who intend future births. As women get older, and perhaps have a number of children, they may feel the need to adopt methods that are more reliable for preventing pregnancy than condoms. Such methods (including oral contraceptives and surgical sterilization) do not offer any disease prevention, however.

This progression is reflected in findings that condoms are the method most frequently used at first intercourse,<sup>9</sup> but the pill and sterilization are the most common methods among all users.<sup>10</sup> In many cases, sexually active unmarried women may need to use both condoms and other contraceptive methods. In fact, our data suggest that some do: About 20% of unmarried respondents who rely on surgical sterilization or oral contraceptives use condoms as well. In general, however, those who use these methods are unlikely to use condoms for disease prevention. Prevention programs need to recognize this and to promote condom use among women who are using contraceptives that do not protect against STDs.

Higher rates of condom use with non-steady partners than with steady partners have been reported in numerous studies, including general population surveys<sup>11</sup> and studies of high-risk populations.<sup>12</sup> Neither the number of lifetime partners nor the

**Table 3. Percentage of sexually experienced unmarried women who use condoms for disease prevention every time or most times they have intercourse (and 95% confidence interval), by selected characteristics**

Characteristic	N	%	Characteristic	N	%
<b>Total</b>	<b>932</b>	<b>29.6 (26.3–33.0)</b>	<b>Total</b>	<b>932</b>	<b>29.6 (26.3–33.0)</b>
<b>BACKGROUND FACTORS</b>			<b>HIV/STD RISK INDICATORS</b>		
<b>Age-group*</b>			<b>Had first intercourse by age 15</b>		
17–24	345	37.7 (32.2–43.1)	Yes	212	24.8 (16.7–32.9)
25–34	329	22.8 (16.9–28.6)	No	720	30.9 (27.4–34.5)
35–44	258	25.2 (17.1–33.4)	<b>Has had PID</b>		
<b>Marital status*</b>			Yes	152	28.6 (19.3–37.9)
Never-married	629	32.4 (28.2–36.6)	No	780	29.8 (26.1–33.5)
Previously married	303	23.8 (18.1–29.4)	<b>Has had an STD</b>		
<b>Race/ethnicity</b>			Yes	49	35.6 (16.4–54.9)
White	454	29.7 (25.7–33.6)	No	883	29.2 (25.7–32.8)
Black	421	32.6 (27.6–37.7)	<b>HIV KNOWLEDGE/ATTITUDES</b>		
Hispanic	39	26.2 (6.8–45.6)	<b>Has been tested for HIV</b>		
<b>Attends church</b>			Yes	285	32.8 (26.8–38.9)
≥1 time/month	529	29.9 (25.1–34.8)	No	647	28.3 (24.2–32.3)
<1 time/month	403	29.3 (24.0–34.6)	<b>No. of HIV items correct</b>		
<b>Region</b>			<11	171	24.2 (14.8–33.6)
Northeast	187	38.3 (31.4–45.1)	11–15	761	30.4 (26.8–34.0)
South	344	25.6 (20.4–30.8)	<b>Knows person with HIV/AIDS</b>		
Midwest	260	29.2 (22.8–35.7)	Yes	245	32.7 (25.2–40.2)
West	141	27.4 (17.7–37.0)	No	687	28.5 (24.4–32.6)
<b>Residence</b>			<b>Self-perceived HIV risk</b>		
Central city	363	29.4 (23.0–35.8)	≥some	182	33.0 (24.4–41.6)
Metropolitan area outside central city	411	31.1 (26.2–36.0)	Little/none	750	28.9 (25.3–32.4)
Nonmetropolitan area	158	25.8 (17.4–34.3)	<b>Believes condom/spermicide is effective*</b>		
<b>SOCIOECONOMIC FACTORS</b>			Yes	534	34.6 (30.1–39.1)
<b>Poverty status*</b>			No	398	22.4 (17.1–27.7)
<300% poverty	528	25.5 (21.3–29.8)	<b>Believes condom only is effective*</b>		
≥300% poverty	404	33.7 (28.4–39.0)	Yes	282	38.0 (31.1–44.9)
<b>Education</b>			No	650	25.7 (21.8–29.7)
<high school	127	29.3 (18.8–39.7)	<b>HEALTH CARE USE INDICATORS</b>		
Completed high school	329	25.1 (19.9–30.3)	<b>Has health insurance</b>		
>high school	476	32.6 (28.2–36.9)	Yes	616	31.2 (27.1–35.3)
<b>Employment</b>			No	316	25.6 (19.8–31.3)
Full-time	530	28.6 (23.8–33.5)	<b>Had STD education in school</b>		
Not full-time	402	31.2 (26.2–36.2)	Yes	650	30.8 (26.3–35.3)
<b>FERTILITY AND CONTRACEPTION</b>			No	282	26.9 (21.1–32.7)
<b>Has had birth*</b>			<b>Attended Title X clinic in past year</b>		
Yes	468	22.5 (18.0–27.0)	Yes	68	28.4 (14.1–42.8)
No	464	34.6 (30.0–39.1)	No	864	29.7 (26.3–33.1)
<b>Has been pregnant*</b>			<b>Made family planning visit in past year</b>		
Yes	556	23.7 (19.1–28.3)	Yes	347	25.2 (19.9–30.4)
No	376	36.0 (30.8–41.1)	No	585	32.2 (27.5–36.9)
<b>Intends more births*</b>			<b>SEXUAL BEHAVIOR</b>		
Yes	450	32.7 (27.8–37.6)	<b>≥10 lifetime partners</b>		
No	482	25.8 (21.3–30.3)	Yes	175	28.2 (20.1–36.4)
<b>Is surgically sterile*</b>			No	757	30.0 (26.2–33.7)
Yes	199	21.0 (13.2–28.9)	<b>≥2 partners in past 3 months</b>		
No	733	31.2 (27.5–35.0)	Yes	98	36.8 (25.6–48.0)
<b>Uses oral contraceptives*</b>			No	834	28.7 (25.2–32.2)
Yes	194	19.2 (13.0–25.4)	<b>Partner has other partners</b>		
No	738	32.8 (29.1–36.5)	Yes	88	33.4 (20.0–46.7)
			No	844	29.3 (25.8–32.7)
			<b>Frequency of sex*</b>		
			≥2 times/week	214	18.0 (12.8–23.1)
			<2 times/week	718	33.3 (29.2–37.3)

\*Difference among subgroups is statistically significant at  $p < .05$ . For age-group, the difference between women aged 17–24 and all older women is significant at  $p < .05$ .

number of recent partners was a significant predictor of condom use for disease prevention among the unmarried NSFG respondents. However, our finding that un-

married women who had intercourse relatively frequently were less likely than others to use condoms to avoid STDs, which is consistent with the association between

**Table 4. Odds ratios (and 95% confidence intervals) indicating the likelihood that sexually experienced unmarried women use condoms for disease prevention every time or most times they have intercourse, by characteristic**

Characteristic	Odds ratio
Black	1.6 (1.1–2.2)
Has sex $\geq 2$ times/week	0.4 (0.3–0.7)
Believes condom/ spermicide is effective	2.0 (1.4–2.8)
Uses oral contraceptives	0.4 (0.3–0.7)
Has been pregnant	0.5 (0.3–0.7)

Note: All variables are dichotomous; the comparison group for blacks is women of all other races.

condom use and infrequent intercourse found in one clinic-based study,<sup>13</sup> also is consistent with these findings, in that we speculate that these women probably were in more committed relationships.

The higher rate of condom use among black respondents found in our analysis is consistent with results of a national survey of men,<sup>14</sup> a population-based survey in the District of Columbia<sup>15</sup> and a national longitudinal study of adolescent males.<sup>16</sup>

Favorable attitudes toward the effectiveness of condoms were also strongly predictive of condom use among NSFG respondents. Although measurements vary, similar results have emerged previously in general population studies,<sup>17</sup> a street-based sample<sup>18</sup> and clinic-based studies.<sup>19</sup>

Throughout this analysis, we have looked at condom use for disease prevention every time or most times in the last three months in which the respondent was sexually active. When we confined our attention to use at every act of intercourse, the same relationships were observed, with one exception: The regression analysis did not show black women to be significantly more likely than others to use condoms for disease prevention every time. Furthermore, when we included in the regression model only women who were sexually active in the month prior to the interview (rather than all sexually experienced women), all of the same factors remained statistically significant, even though the sample size was reduced from 932 to 599.

The 1990 NSFG telephone survey has a number of strengths as a data source for studying condom use: It is a large, nationally representative sample of women of reproductive age, with a large number of variables, a rigorous sample survey methodology and statistical methods for determining the precision of estimates. Nevertheless, the data have limitations.

While the 1988 and 1990 data combined form a longitudinal data set, the question of interest for our analysis was asked only

in 1990; the result is a cross-sectional design, which limits the ability to estimate causal relationships. Since the NSFG is primarily concerned with reproductive health and contraceptive use, specific variables that might be desired for testing theoretical models of behavior change related to the prevention of HIV and other STDs are not available. Furthermore, there may be reporting errors in self-reported condom use, although this problem would affect any study measuring condom use, since direct observation is not possible.

The 1990 reinterviews included only 63% of the original survey respondents. The nonresponse has been carefully evaluated,<sup>20</sup> and compensating weighting factors have been used in all estimates presented in this article. Comparison of the weighted data for the 1990 respondents with data for all 1988 respondents suggests that differences in basic characteristics are small.

Our results have a number of implications for HIV and STD prevention efforts. Condom promotion programs clearly need to be developed in the context of all of the reproductive health choices facing women who may be at risk of STDs. Prevention programs should develop messages for women who have had births or completed their families and have adopted effective contraceptive methods.

The NSFG data do not show an association between condom use and HIV and STD knowledge, self-perceived risk or other risk-related factors, although these may be important in how women reach a decision to use condoms. Among NSFG respondents, the belief that condoms are effective was a strong predictor of use; prevention programs should promote knowledge of the effectiveness of condoms in disease prevention among high-risk populations.

Finally, while the NSFG provides very useful data that are not available elsewhere, these data allow only limited assessments of theoretical models of behavior change. Such assessments will require more in-depth studies of the determinants of condom use for disease prevention, including more thorough measurement of the psychosocial processes involved in adopting safer sexual behavior.

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