



Published in final edited form as:

J Sex Med. 2017 April ; 14(4): 541–550. doi:10.1016/j.jsxm.2017.02.015.

Factors Associated with Condom Use Among Sexually Active U.S. Adults, National Survey of Family Growth, 2006-2010 and 2011-2013

Muazzam Nasrullah, MD, MPH, PhD^{1,*}, Emeka Oraka, MPH², Pollyanna R Chavez, PhD¹, Christopher H Johnson, MS¹, and Elizabeth DiNenno, PhD¹

¹Division of HIV/AIDS Prevention, National Center for HIV, Hepatitis, STD and TB Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia

²ICF International, Atlanta, Georgia

Abstract

Background—Condomless sex can increase the risk of acquiring or transmitting HIV.

Aim—This study characterized the prevalence of condom use at last sex, and identified factors associated with use of a condom at last sex among adults in the U.S.

Methods—A cross-sectional National Survey of Family Growth data from cycles 2006–2010, and 2011–2013 were analyzed for sexually active men and women aged 18–44 years who reported having sex (vaginal, anal or oral) with an opposite sex partner in the past 12 months. HIV-related sexual risk behaviors (SRB) in the past 12 months included sex with 4 opposite sex partners, exchanging sex for money or drugs, and sex with an injection drug user; an HIV-positive person; a male who previously had sex with a male [women only]; a male [men only]; or a partner who had sex with other partners.

Outcomes—The outcome for this analysis was condom use at last anal or vaginal sex.

Results—Overall prevalence of condom use was 24.8%; only 33.8% of adults with at least one SRB reported the use of a condom. Only 46.4% of unmarried/single men (vs. 14.7% married/cohabitating men) and 32.3% unmarried/single women (vs. 14.1% married/cohabitating women) with SRB reported using a condom at last sex, and were less likely to use a condom at last sex compared to those who did not report SRB. We did not find a significant relationship between using a condom and SRB among married/cohabitating men and women.

*Corresponding Author: Muazzam Nasrullah MD, MPH, PhD, Division of HIV/AIDS Prevention, National Center for HIV, Hepatitis, STD and TB Prevention, Centers for Disease Control and Prevention, 1600 Clifton Road, Mailstop E46, Atlanta, Georgia 30329, USA, Phone: +1 404 639 3271, Fax: +1 404 639 8640, snasrullah@cdc.gov.

Conflict of interest statement: No financial disclosures were reported by the authors of this paper.

Publisher's Disclaimer: The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention or the U.S. Department of Health and Human Services.

Ethical Approval: This manuscript involved secondary data analysis of a publically available dataset, therefore ethical approval from our respective institutions was not required.

Strengths and Limitations—Our analysis adds to the literature on how condom use varies by marital status. We measured use of condoms at last or most recent sexual act, which may not reflect individual's behavior of condom use in the past. Nonetheless, condom use at last sex has been documented in earlier studies as a valid proxy of condom use over-time.

Conclusion—Continued efforts are needed to promote condom use among heterosexual adults in the U.S., particularly those at high risk for HIV, namely individuals engaging in anal sexual acts and with multiple sex partners.

Keywords

Condom; HIV; Risk behaviors

Introduction

Consistent and correct use of condoms during sex has been shown to be an effective way to prevent sexually transmitted infections (STIs), including the human immunodeficiency virus (HIV) [1-3]. The Centers for Disease Control and Prevention (CDC) promotes condom distribution as a cost-effective component of high-impact HIV prevention [4]. However, it has been estimated that only 17 percent of sexually active heterosexual adults in the United States with multiple sexual partners, and 12.6 percent of those with risky sexual partners, used condoms consistently during sexual encounters in the past six months [5]. There may be a variety of factors associated with either the use of or failure to use condoms, including gender and marital status [6]. Reports from the 1996 National Household Survey of Drug Abuse [7], and the General Social Survey from 1996, 1998, and 2000 [8], estimate that the prevalence of condom use during the last sexual encounter among adults (≥ 18 years) in the U.S. ranges from 18.3 percent to 21.0 percent. In those reports, condom use was higher among unmarried adults as compared to married adults [7, 8]. Data from the National Survey of Sexual Health and Behavior showed that, in 2009, 24.7% of men and 21.8% of women aged 18-94 years reported condom use during their most recent vaginal intercourse with relatively high condom use among unmarried adults (46.7%) as compared to married adults (11.1%) [9].

Many heterosexual couples may choose not to use condoms for a variety of reasons including perceived or actual low risk of HIV, intent to have children, replacement of condoms with other forms of birth control, or in order to increase trust and intimacy with their partners [10]. Whatever the reasons heterosexuals do not use condoms, their non-use can increase the risk of acquiring or transmitting HIV, particularly for those at increased risk of HIV. Nonetheless, consistent and correct use of condoms remain an important method for HIV prevention. Monitoring patterns of condom use in different sub-populations continues to be important for understanding prevention program reach and newer prevention tools like preexposure prophylaxis (PrEP). Data from the National Survey of Family Growth (NSFG) provide a baseline measure of condom use from which to measure changes over time. The aim of this study was to use a nationally representative cross-sectional health survey to estimate the prevalence of condom use at last sex among sexually active men and women aged 18-44 years, and to determine the factors associated with use of a condom at last sex.

Methods and Materials

Data source and study population

The NSFG is a cross-sectional health survey representative of the civilian, non-institutionalized population of the United States aged 15–44 years. A representative sample of households and non-institutional quarters is selected via multi-stage probability sampling. Interviews are administered by trained interviewers to one randomly selected resident from each household [11]. A total of 15,218 male and 17,880 female participants completed the interview in the 2006–2010 and the 2011–2013 NSFG continuous cycles, with corresponding response rates of 77% and 72.8%, respectively. Details of the NSFG sample design, weighting methodology, and variance estimation are described elsewhere [11, 12]. Information on HIV-related sexual risk behaviors was collected using Audio Computer-Assisted Self-Interviewing to give respondents greater privacy when reporting this sensitive information. In order to capture all heterosexually active respondents, we included all respondents aged 18–44 years who reported having any sex (vaginal, anal, or oral) with a partner of the opposite sex in the past 12 months from the date of interview (13,588 women and 10,904 men). Since the question included those who only had oral sex, we excluded those participants by limiting the outcome variable to those who had vaginal or anal sex. The analysis was stratified by marital and cohabitation status (married/cohabiting vs. unmarried/single respondents) in order to describe condom use in the context of relationship type since public health messages may vary substantially when condom use occurs within steady, ongoing relationships compared to casual sexual encounters in which the partners may not know each other well.

Measures

Outcome variables—The outcome for this analysis, condom use at last anal or vaginal sex, was measured by the questions, “Was a condom used the last time you had vaginal intercourse with a male/female? (yes/no)” and “Was a condom used the last time you had anal sex with a male/female? (yes/no).” Participants were considered to have used a condom at last sex if they used a condom at last vaginal sex and, if they had anal sex, used a condom at last anal sex. Participants having both vaginal and anal sex, reporting condom use for one but not the other were considered to not have used a condom at last sex since the NSFG does not provide information regarding the order in which each type of sex occurred. Condom use at last sex has been used in other nationally representative surveys [8, 13], and has been documented as a valid proxy of condom use over time [14].

Independent Variables—Additional demographic and health-related covariates included race/ethnicity (non-Hispanic white, non-Hispanic black, other non-Hispanic race, and Hispanic); age range (18–24, 25–34, 35–44); marital status (married/cohabiting respondents were “married” or “not married but living together with” a partner of the opposite sex, and unmarried/single respondents were those who were never married, or were currently separated, divorced or widowed); education (less than a high school diploma, high school graduate, some college, and four or more years of college); income classified according to the Federal Poverty Guidelines (below poverty level, above poverty level) [15]; urbanicity (central city of a metropolitan statistical area, other metropolitan or suburban area, rural or

small town); self-reported sexual orientation (heterosexual, homosexual, bisexual); binge drinking in past 30 days (yes; no), and HIV-related sexual risk behaviors in the past 12 months (i.e. sex with 4 opposite sex partners, sex with an injection drug user, sex with an HIV-positive person, exchanged sex for money or drugs, sex with a male who had previously had sex with a male [women only], sex with a male [men only], or sex with a partner who had sex with other partners). We defined binge drinking for men, if they had 5 or more drinks on an occasion, and for women, if they had 4 or more drinks on an occasion.

We described the reported reasons for condom use at last vaginal sex, and the use of condoms at last vaginal and anal sex by gender and marital status categories. Reasons for condom use at last vaginal sex was measured by the question, “The last time you had vaginal intercourse with a male/female partner, did you use the condom to (prevent pregnancy, prevent diseases like syphilis, gonorrhea or AIDS, both reasons, or for some other reason)?”

Statistical analysis

The study sample was weighted to produce national U.S. estimates using methods and procedures recommended by the National Center for Health Statistics to account for selection probability, non-response and sampling differences between regions. All analyses were performed on weighted data using SUDAAN version 10.0.1 (Research Triangle Institute), a software package that accounts for the complex sampling design of the NSFG. Chi-square statistics were calculated to determine statistically significant differences ($p<0.05$) in the distribution of the study variables by gender. Logistic regression analyses were conducted separately for men and women, stratified by marital status, and then used to calculate prevalence ratios (PRs) and 95% confidence intervals (95% CIs) for each independent variable to assess the association with condom use at last sex. For the multivariable analyses, we ran separate logistic regression models for men and women stratified by marital status, controlling for all significant study variables ($p<0.05$) to calculate the adjusted prevalence ratios (APRs).

Results

The results of our weighted analysis of the 2006-2010 and 2011-2013 NSFG showed that 77.4% (95% CI:76.3–78.4) of individuals aged 18 to 44 in the United States were sexually active in the past 12 months with an opposite sex partner, of whom 35.5% (95% CI:34.0–37.0) were unmarried/single (data not shown). The remaining 23% who were not sexually active with an opposite partner were not included either because they were not sexually active during that period or they were sexually active only with same-sex partners. Among the sexually active individuals aged 18 to 44 with an opposite sex partner, the overall prevalence of condom use at last sex was 24.8% (95% CI:23.8%–25.8%) (data not shown), and 16.9% (95% CI:15.6%–18.3%) of men and 13.2% (95% CI:12.3%–14.2%) of women were engaged in at least one HIV-related sexual risk behavior (data not shown). Overall, 33.8% (95% CI:31.5%–36.2%) of respondents with at least one HIV-related sexual risk behavior (39.1% of men and 27.1% of women; 95% CI:35.9%–42.5% and 24.2%–30.2% respectively), reported the use of a condom at last sex.

Among all sexually active men regardless of marital status, 28.7% (95% CI:27.3%–30.0%) reported use of a condom at last sex. Among these men, use of a condom at last sex varied by age group, race/ethnicity, education, income, marital status, type of residence, future intention to have children, and HIV-related sexual risk behaviors (Table 1).

Compared with men, a smaller proportion of all sexually active women (21.0%; 95% CI: 19.8%–22.3%) reported using a condom at last sex. Similar to men, condom use at last sex varied by age group, race/ethnicity, education, income, marital status, type of residence, future intention to have children, and HIV-related sexual risk behaviors (Table 1).

Sexually active unmarried/single men and women

Overall, 51.0% (95% CI:48.9%–53.2%) of unmarried/single men and 36.8% (95% CI: 34.8%–38.9%) of unmarried/ single women reported using a condom during their last sexual encounter.

Among unmarried/single men, those aged 18-24 years compared with those aged 35-44 years, non-Hispanic blacks compared with non-Hispanic whites, and those who had an intention to have children in future compared with those who had no intention to have children in future were more likely to use a condom at last sex (Table 2). Unmarried/single men who reported at least one HIV-related sexual risk behavior were less likely to use a condom at last sex as compared to those who did not report any sexual risk behavior.

Unmarried/single women aged 18-24 years, compared with those aged 35-44 years, and non-Hispanic blacks, Hispanics or other non-Hispanic races compared with non-Hispanic whites were more likely to use a condom at last sex. Unmarried/single women who resided in rural areas compared with those living in central city, and those who reported at least one HIV-related sexual risk behavior compared to those who did not, were less likely to use a condom at last sex (Table 3).

Sexually active married/cohabitating men and women

Condom use among married or cohabitating respondents was lower than among unmarried or single respondents. Overall, 15.7% (95% CI:14.3%–17.2%) of married/cohabitating men and 13.1% (95% CI: 12.0%–14.2%) of married/cohabitating women reported using a condom during their last vaginal and anal sex.

Among married/cohabitating men, those aged 18-24 years compared with those aged 35-44 years, and non-Hispanic blacks, Hispanics, and persons of other non-Hispanic races compared with non-Hispanic whites were more likely to use a condom at last sex (Table 2). Men with only a high school diploma compared with those having 4 years of college education were less likely to use a condom at last sex.

Married/cohabitating women aged 18-24 years, and 25-34 years as compared with those aged 35-44 years, and Hispanics and those of other non-Hispanic races compared with non-Hispanic whites were more likely to use a condom at last sex (Table 3). Women who graduated from high school compared with those having 4 years of college education, and

those living in rural areas compared with those living in central city were less likely to use a condom at last sex.

We did not find any significant relationships between condom use among married/cohabitating men or women and HIV-related sexual risk behaviors.

Reasons for condom use at last sex, and condom use by type of sexual activity

Reasons for condom use are variable depending on marital status. Unmarried/single men and women who reported condom use at last vaginal sex had lower rates than married/cohabitating men and women of using a condom at last vaginal sex in order to control pregnancy (Figure 1). The opposite appears true for those saying the reason for using a condom at last vaginal sex was to prevent both pregnancy and STIs/AIDS: unmarried/single men and women had higher prevalence for this reason than did married/cohabitating men and women.

We also investigated condom use at last sex by type of sexual activity (Figure 2). In general, condom use was less prevalent for anal sex than vaginal sex; however, condom use also varied by gender and marital status. Single/unmarried men and women were most likely to use a condom for either vaginal or anal sex, but only 39.3% (95% CI:36.5%–42.2%) of single/unmarried men used a condom for anal sex compared with 58.2% (95% CI:56.0%–60.4%) who used a condom for vaginal sex. Single/unmarried women had lower rates than single/unmarried men, with 43.9% (95% CI:42.0%–45.9%) using a condom for vaginal sex and only 25.3% (95% CI:22.4%–28.4%) using a condom for anal sex. Married/cohabitating men and women had the lowest rates of using a condom at last vaginal or anal sex, but condom use for anal sex was slightly higher than vaginal sex for both genders (15.7%; 95% CI: 14.5%–17.0% and 16.4%; 95% CI:14.1%– 9.0% for vaginal sex and anal sex, respectively, for married/cohabitating women, and 19.8%; 95% CI:18.2%–21.6% for vaginal sex and 23.3%; 95% CI: 20.8%–26.0% for anal sex, for married/cohabitating men).

Discussion

Our results indicate that 1 in 4 heterosexually active adults aged 18-44 in the U.S. used condoms the last time they had sex during 2006-2010 and 2011-2013. To date there are few population-based studies that have estimated the prevalence of condom use among adults [7-9]. One study estimated the prevalence of condom use during the last sexual encounter among all sexually active adults (≥ 18 years) in the U.S. as ranging from 18.3% to 20.5% across three time periods [8], and another found that heterosexually active men had a higher prevalence of condom use than heterosexually active women (24.7% vs. 21.8%) [9]. Our analysis is consistent with these previous results.

More concerning is that only 1 in 3 heterosexually active adults aged 18-44 at increased risk for HIV reported the use of a condom at last sexual act. An important finding from this analysis is that only 46% of unmarried or single men and 32% of unmarried or single women with HIV-related sexual risk behaviors reported using a condom, and they were less likely to use a condom at last sex compared to those who did not report any sexual risk behavior, even after controlling for demographic and other health covariates. This is of

particular concern because of the increased risk of transmitting HIV as a result of risky sexual behaviors [16, 17]. Choosing less risky sexual behaviors, limiting the number of sex partners, using condoms correctly and consistently, and getting checked for STIs are some of the recommended measures to not only protect oneself from HIV but also to decrease the likelihood of transmitting infection to partners [16, 17]. Persons who engage in risk behaviors may also be screened for PrEP, which is a more recent HIV prevention approach in which oral antiretroviral drugs can be taken by an HIV negative high-risk adult to decrease the risk of infection resulting from HIV exposure [18]. Persons who are prescribed PrEP should continue to use condoms during sex.

We also found condom use decreased with increasing age. The greater use of condoms among younger individuals may be due to their perceived increased risk of contracting STIs and HIV [19, 20] and from the effect of national and local public health campaigns [4, 21] that have raised awareness among young adults of reducing the risk of contracting STIs and HIV/AIDS by using a condom. Nonetheless, many older adults may also be at risk of STIs, especially those who have multiple partners or other risk behaviors. Continued efforts are needed for sexual health promotion among older individuals.

We observed differential reasons for condom usage (e.g., pregnancy prevention versus STI prevention). Unmarried/single men and women appear to more commonly use condoms at last sex to prevent both STIs and pregnancy, while married/cohabitating men and women more frequently use condoms to prevent only pregnancy. Some potential reasons for this might be that married/cohabitating persons are less likely to view themselves at risk of STIs/HIV, and therefore would only use a condom for the purposes of pregnancy prevention, while unmarried persons have partnerships that are more casual and therefore appear to be more susceptible to STIs and HIV, which results in higher rates of unmarried persons saying they use condoms for both pregnancy and STI prevention. We focus on condom use because it is the only form of birth control that also prevents HIV.

We also found there was differential condom use for vaginal versus anal sex, which has been demonstrated in the literature [22]. Reasons why condom use is lower for anal sex may include the use of anal sex as a birth control method where a condom is not necessary; the inability of women to demand condom use for, and interest in pleasing partner through, anal sex; or a lack of understanding of the risk of STI and HIV infection via anal sex for heterosexuals. This is concerning since anal sex greatly increases HIV infection among heterosexuals [23].

Our analysis also adds to the literature on how condom use varies by marital status. The prevalence of condom use was significantly higher among unmarried or single adult men and women aged 18-44 years (51.0% and 36.8% respectively) as compared to married/cohabitating adult men and women (15.7% and 13.1% respectively). There are many reasons that couples, especially those that are married or cohabitating, may be less likely to use condoms, including being in a monogamous relationship, the availability of alternative contraceptive methods to prevent pregnancy [24], an interest in conceiving children, or the development of trust and intimacy that is often perceived to be incongruous with condom use [10]. However, outside of sexual abstinence, condoms are the only form of birth control

that afford significant HIV protection [1-3] for individuals who are not currently taking PrEP. Therefore, all sexually active adults would benefit from discussing their risk for HIV with their health care providers, and whether or not condoms or PrEP are appropriate for them. However, previous research has shown that some women may not be able to negotiate condom use with their male partners at all times [25]. Therefore, health care providers should assess for ability to negotiate condom use and take these factors into consideration when they counsel high-risk heterosexuals on condom use. Continued efforts are needed to promote messages for condom use or PrEP that resonate for couples who are married or partnered, and for couples that are not in primary relationships or at high risk for HIV.

This analysis is subject to several limitations. First, due to the cross-sectional design of the NSFG, we were not able to assess the temporal precedence between sexual risk behaviors (which is measured as “ever in past 12 months”) and condom use at last sex. Second, measures like condom use and HIV-related sexual risk behaviors are self-reported, and therefore subject to recall and social desirability bias by the participants. Third, since we limited our analysis to those aged 18-44 years, our findings are not generalizable to other age groups in the United States or those without an opposite sex partner. Fourth, we measured use of condoms at last or most recent sexual act, which may not reflect individual's behavior of condom use in the past. Nonetheless, condom use at last sex has been documented as a valid proxy of condom use over-time [14].

Conclusion

One-quarter of adults aged 18-44 in the U.S. used condoms at last sex, and only one-third of adults who were at increased risk for HIV infection used condoms at last sexual act. Unmarried or single men and women who reported HIV-related sexual risk behaviors were less likely to use condoms at last sex than those who did not report any sexual risk behavior. Use of condoms during anal sex, which carries high HIV infection risk for heterosexuals, is low. Continued efforts are needed to promote condom use among heterosexuals in the U.S., especially those at high risk for HIV, namely individuals engaging in anal sexual acts and with multiple sex partners.

Acknowledgments

Funding: None

References

1. Gallo MF, Steiner MJ, Warner L, Hylton-Kong T, Figueroa JP, Hobbs MM, et al. Self-reported condom use is associated with reduced risk of chlamydia, gonorrhea, and trichomoniasis. *Sex Transm Dis.* 2007; 34:829–33. [PubMed: 17579339]
2. Rietmeijer CA, Krebs JW, Feorino PM, Judson FN. Condoms as physical and chemical barriers against human immunodeficiency virus. *JAMA.* 1988; 259:1851–3. [PubMed: 2830416]
3. Smith DK, Herbst JH, Zhang X, Rose CE. Condom effectiveness for HIV prevention by consistency of use among men who have sex with men in the United States. *J Acquir Immune Defic Syndr.* 2015; 68:337–44. [PubMed: 25469526]
4. Centers for Disease Control and Prevention. [2016 January 27] Condom distribution as a structural level intervention: Scientific support for condom distribution. 2015. Available from: <http://www.cdc.gov/hiv/prevention/programs/condoms/>

5. Catania JA, Coates TJ, Stall R, Turner H, Peterson J, Hearst N, et al. Prevalence of AIDS-related risk factors and condom use in the United States. *Science*. 1992; 258:1101–6. [PubMed: 1439818]
6. Forste R, Morgan J. How relationships of U.S. men affect contraceptive use and efforts to prevent sexually transmitted diseases. *Fam Plann Perspect*. 1998; 30:56–62. [PubMed: 9561869]
7. Anderson JE, Wilson R, Doll L, Jones TS, Barker P. Condom use and HIV risk behaviors among U.S. adults: data from a national survey. *Fam Plann Perspect*. 1999; 31:24–8. [PubMed: 10029929]
8. Anderson JE. Condom use and HIV risk among US adults. *American Journal of Public Health*. 2003; 93:912–914. [PubMed: 12773352]
9. Reece M, Herbenick D, Schick V, Sanders SA, Dodge B, Fortenberry JD. Condom use rates in a national probability sample of males and females ages 14 to 94 in the United States. *J Sex Med*. 2010; 7(Suppl 5):266–76. [PubMed: 21029384]
10. Corbett AM, Dickson-Gomez J, Hilario H, Weeks MR. A little thing called love: condom use in high-risk primary heterosexual relationships. *Perspect Sex Reprod Health*. 2009; 41:218–24. [PubMed: 20444176]
11. Lepkowski, JM., Mosher, WD., Davis, KE., Groves, RM., JV, H. Vital and Health Statistics. Vol. 2. Hyattsville, MD: National Center for Health Statistics, U.S. Department of Health and Human Services; 2010. The 2006–2010 National Survey of Family Growth: Sample Design and Analysis of a Continuous Survey. Available from: http://www.cdc.gov/nchs/data/series/sr_02/sr02_150.pdf [2012 September 4]
12. Centers for Disease Control and Prevention. 2011–2013 National Survey of Family Growth: Users guide. Hyattsville, MD: National Center for Health Statistics, U.S. Department of Health and Human Services; 2014. Public use data file documentation. Available from: http://www.cdc.gov/nchs/data/2011-2013_NSFSG_UserGuide_MainText.pdf [2016 January 29]
13. Catania JA, Canchola J, Binson D, Dolcini MM, Paul JP, Fisher L, et al. National trends in condom use among at-risk heterosexuals in the united states. *J Acquir Immune Defic Syndr*. 2001; 27:176–82. [PubMed: 11404540]
14. Younge SN, Salazar LF, Crosby RF, DiClemente RJ, Wingood GM, Rose E. Condom use at last sex as a proxy for other measures of condom use: is it good enough? *Adolescence*. 2008; 43:927–31. [PubMed: 19149154]
15. Department of Health and Human Services (US). [2014 April 11] Prior HHS Poverty Guidelines and Federal Register References. Office of the Assistant Secretary for Planning and Evaluation. Available from: <http://aspe.hhs.gov/poverty/figures-fed-reg.cfm>
16. Centers for Disease Control and Prevention. [2014 October 17] HIV prevention. 2014. Available from: <http://www.cdc.gov/actagainststids/basics/prevention.html>
17. Patel P, Borkowf CB, Brooks JT, Lasry A, Lansky A, Mermin J. Estimating per-act HIV transmission risk: a systematic review. *AIDS*. 2014; 28:1509–19. [PubMed: 24809629]
18. [2015 August 21] Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guideline: U.S. Public Health Service. Centers for Disease Control and Prevention. 2014. Available from: <http://www.cdc.gov/hiv/pdf/PrEPguidelines2014.pdf>
19. Kellerman SE, Lehman JS, Lansky A, Stevens MR, Hecht FM, Bindman AB, et al. HIV testing within at-risk populations in the United States and the reasons for seeking or avoiding HIV testing. *J Acquir Immune Defic Syndr*. 2002; 31:202–10. [PubMed: 12394799]
20. Pollack LM, Boyer CB, Weinstein ND. Perceived risk for sexually transmitted infections aligns with sexual risk behavior with the exception of condom nonuse: data from a nonclinical sample of sexually active young adult women. *Sex Transm Dis*. 2013; 40:388–94. [PubMed: 23588128]
21. Centers for Disease Control and Prevention. [October 15 2014] Previous Conferences - 2000 (Milwaukee, Wisconsin) - African Americans Disproportionately Affected by STDs. 2003. Available from: <http://www.cdc.gov/stdconference/2000/media/afamericans2000.htm>
22. Baggaley RF, White RG, Boily MC. HIV transmission risk through anal intercourse: systematic review, meta-analysis and implications for HIV prevention. *Int J Epidemiol*. 2010; 39(4):1048–63. [PubMed: 20406794]
23. O'leary A, DiNenno E, Sansom S, Honeycutt A, Allaire B, Neuwahl S, Hicks K. Contribution of Anal Sex to HIV Prevalence Among Heterosexuals: A Modeling Analysis. *AIDS and Behavior*. 2017; Epub ahead of print. doi: 10.1007/s10461-016-1635-z

24. Jones, J., Mosher, W., Daniels, K. Hyattsville, MD: National Center for Health Statistics; 2012. Current contraceptive use in the United States, 2006–2010, and changes in patterns of use since 1995: National health statistics reports; no 60. Available from: <http://www.cdc.gov/nchs/data/nhsr/nhsr060.pdf> [2014 December 4]
25. Langen TT. Gender power imbalance on women's capacity to negotiate self-protection against HIV/AIDS in Botswana and South Africa. *Afr Health Sci*. 2005; 5:188–97. [PubMed: 16245988]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

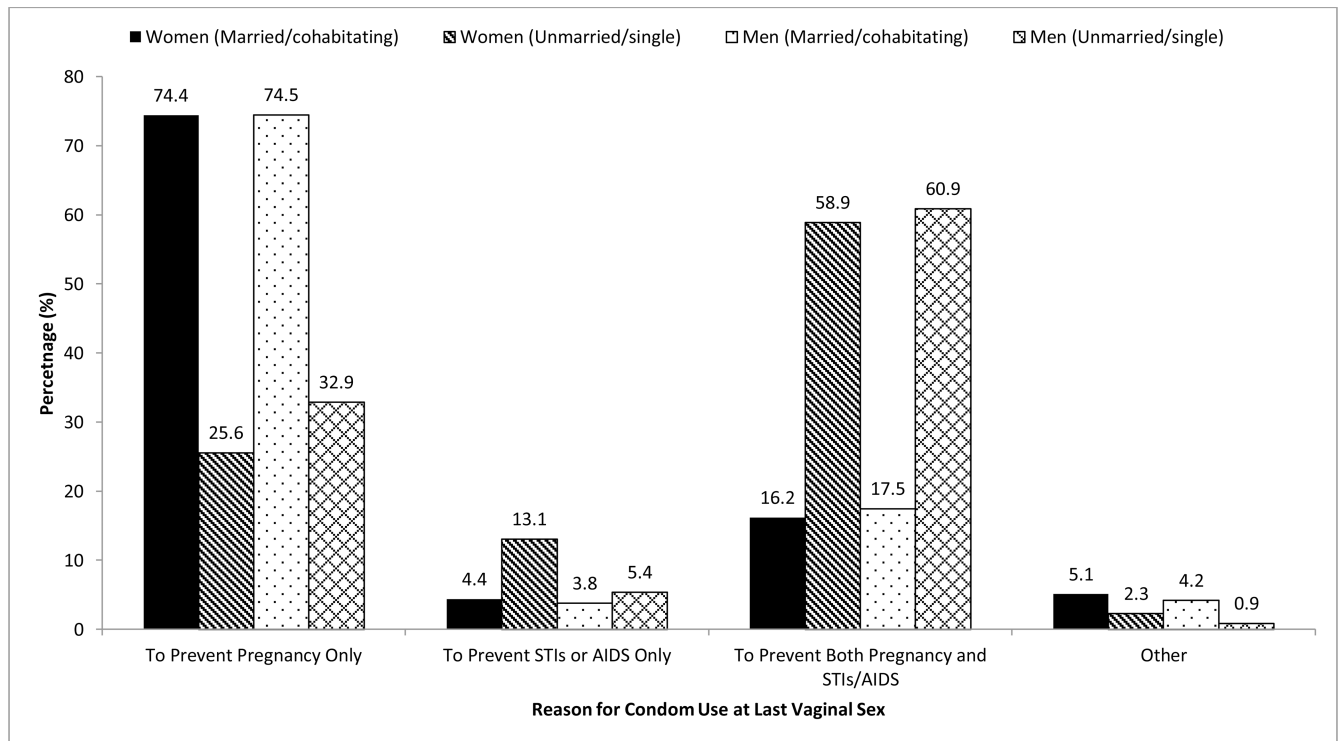


Figure 1.
Reasons for condom use at last vaginal sex among heterosexually active women and men aged 18–44 years, National Survey of Family Growth, 2006–2010, 2011–2013

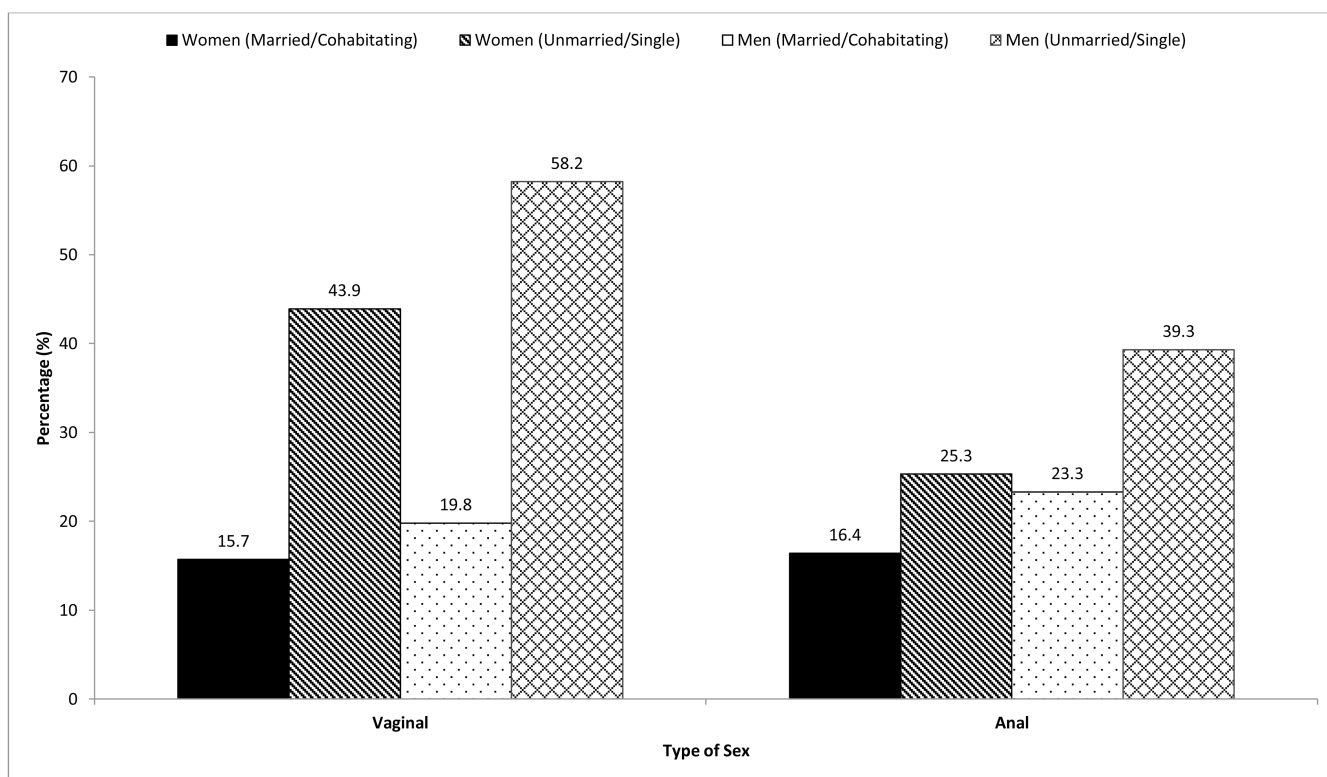


Figure 2.
Condom use at last vaginal or anal sex by gender and marital status among respondents aged 18–44 years, National Survey of Family Growth; 2006–2010, 2011–2013

Selected demographic characteristics and HIV-related risk behaviors by condom use at last vaginal or anal sex among heterosexually active women and men aged 18-44 years, National Survey of Family Growth, 2006-2010, 2011-2013

Table 1

Characteristics	Sexually active women (N=47,540,307)			Sexually active men (N=46,491,626)		
	Weighted Prevalence % [†]	95% CI	P-value	Weighted Prevalence % ^{††}	95% CI	P-value
TOTAL	21.0	19.8 – 22.3		28.7	27.3 – 30.0	
Age (years)			< 0.01			< 0.01
18-24	34.2	31.3 – 37.2		52.3	49.3 – 55.3	
25-34	20.0	18.3 – 21.8		25.7	23.7 – 27.8	
35-44	14.0	12.6 – 15.6		17.9	16.0 – 19.9	
Race/Ethnicity			< 0.01			< 0.01
Hispanic	22.9	20.8 – 25.2		32.8	29.6 – 36.1	
Non-Hispanic white	17.0	15.6 – 18.5		24.4	22.7 – 26.2	
Non-Hispanic black	33.3	30.5 – 36.1		39.8	36.7 – 42.9	
Non-Hispanic other	26.6	21.8 – 32.0		34.0	28.2 – 40.3	
Education level			< 0.01			< 0.01
Less than high school diploma	23.8	21.4 – 26.4		31.6	28.5 – 34.8	
High school graduate	21.3	19.2 – 23.7		29.0	26.9 – 31.2	
Some college education	22.0	20.1 – 24.1		31.0	28.4 – 33.6	
4 year college education	18.2	16.3 – 20.1		23.3	20.6 – 26.3	
Income as % of poverty level			< 0.01			< 0.01
Below poverty level	25.6	23.3 – 28.0		36.8	33.4 – 40.4	
Above poverty level	19.6	18.3 – 20.9		27.0	25.5 – 28.6	
Marital Status			< 0.01			< 0.01
Married/cohabitating	13.1	12.0 – 14.2		15.7	14.3 – 17.2	
Unmarried/single	36.8	34.8 – 38.9		51.0	48.9 – 53.2	
Type of Residence			< 0.01			< 0.01
Central city	25.6	23.4 – 27.8		33.3	30.8 – 36.0	
Other metropolitan/suburban	19.8	18.4 – 21.4		26.3	24.5 – 28.2	
Rural/small town	15.9	13.3 – 18.9		26.5	23.1 – 30.2	
Sexual Orientation			0.051			0.22

Characteristics	Sexually active women (N=47,540,307)			Sexually active men (N=46,491,626)		
	Weighted Prevalence % [†]	95% CI	P-value	Weighted Prevalence % ^{††}	95% CI	P-value
Heterosexual	20.7	19.5 – 22.0		28.6	27.3 – 30.0	
Homosexual	35.1	20.6 – 53.1		66.8	34.7 – 88.4	
Bisexual	24.1	19.3 – 29.5		29.1	19.0 – 41.8	
Future Intention to have children			<0.01			<0.01
Yes	24.9	23.2 – 26.7		34.6	33.0 – 36.2	
No	15.8	14.4 – 17.4		17.9	16.1 – 19.8	
Binge Drinking in the past 30 days			0.60			0.12
Yes	21.7	18.6 – 25.3		30.5	27.7 – 33.3	
No	20.8	19.6 – 22.1		28.0	26.6 – 29.5	
Any Sexual risk indicators, past 12 months			<0.01			<0.01
Yes ^{††††}	27.1	24.2 – 30.2		39.1	35.9 – 42.5	
No	20.1	18.8 – 21.4		26.5	25.1 – 28.0	

[†] Sexually active women who responded “Yes” to the questions of condom use at last sex (vaginal or anal)

^{††} Sexually active men who responded “Yes” to the questions of condom use at last sex (vaginal or anal)

^{†††} For men, if they had 5 or more drinks on an occasion, and for women, if they had 4 or more drinks on an occasion.

^{††††} HIV-related sexual risk behaviors include a ‘Yes’ response to any of the following:

Female Only: 4 or more opposite sex partners in the last 12 months; Sex with a male IDU in the last 12 months; Sex with an HIV-positive male in the last 12 months; Exchanged sex for money or drugs in the last 12 months; Had sex with a male who ever had sex with a male in the last 12 months; Had sex with a male who had other partners in the last 12 months

Male Only: 4 or more opposite sex partners in the last 12 months; Sex with a female/male IDU in the last 12 months; Sex with an HIV-positive female/male in the last 12 months; Exchanged sex for money or drugs in the last 12 months; 5) Had sex with a male in the last 12 months; Had sex with a female who had other partners in the last 12 months

Table 2

Results of bivariate and multivariable logistic regression models of the association of condom use at last vaginal or anal sex with selected demographic characteristics and HIV-related risk behaviors among married/cohabitating and unmarried/single heterosexually active men aged 18-44 years, National Survey of Family Growth; 2006-2010, 2011-2013

Characteristics	Married/cohabitating Men (N=29,438,291)		Unmarried/single Men (N=17,050,438)	
	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)
TOTAL	15.7		51.0	
Age (years)				
18–24	25.8	1.86 (1.40 – 2.46) [*]	62.2	1.56 (1.35 – 1.79) [*]
25–34	15.8	1.17 (0.96 – 1.42)	45.7	1.16 (0.99 – 1.34) [*]
35–44	13.6	Reference	35.7	Reference
Race/Ethnicity				
Hispanic	21.8	1.77 (1.40 – 2.23) [*]	53.6	1.11 (1.00 – 1.23)
Non-Hispanic white	12.1	Reference	47.1	Reference
Non-Hispanic black	20.6	1.66 (1.24 – 2.21) [*]	59.7	1.27 (1.17 – 1.38) [*]
Non-Hispanic other	22.8	2.00 (1.57 – 2.56) [*]	57.6	1.18 (0.96 – 1.45)
Education level				
Less than high school diploma	20.5	0.95 (0.74 – 1.21)	52.1	
High school graduate	13.9	0.71 (0.56 – 0.89) [*]	50.5	
Some college education	15.2	0.89 (0.70 – 1.13)	52.0	
4 year college education	14.7	Reference	49.1	
Income as % of poverty level				
Below poverty level	22.7	1.22 (0.96 – 1.54)	54.8	
Above poverty level	14.5	Reference	50.1	
Type of Residence				
Central city	18.9	Reference	53.6	
Other metropolitan/suburban	14.1	0.84 (0.68 – 1.05)	49.7	
Rural/small town	15.0	1.00 (0.77 – 1.29)	49.0	
Sexual Orientation				
Heterosexual	15.7		50.9	
Homosexual	— [‡]		73.2	
Bisexual	8.6		53.1	
Future Intention to have children				
Yes	17.4	1.09 (0.91 – 1.30)	54.7	1.24 (1.10 – 1.39) [*]
No	13.3	Reference	36.3	Reference

Characteristics	Married/cohabitating Men (N=29,438,291)		Unmarried/single Men (N=17,050,438)	
	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)
Binge Drinking^{††} in the past 30 days				
Yes	13.9		51.1	
No	16.2		51.0	
Any Sexual risk indicators, past 12 months				
Yes ^{†††}	14.7		46.4	0.85 (0.78 – 0.92) [*]
No	15.8		53.6	Reference

^{*} p<0.05

[‡] Suppressed because sample size below threshold established by the National Survey of Family Growth

[†] Row percent; sexually active men who responded “Yes” to the questions of condom use at last

^{††} For men, if they had 5 or more drinks on an occasion, and for women, if they had 4 or more drinks on an occasion.

^{†††} HIV-related sexual risk behaviors include a ‘Yes’ response to any of the following:

Female Only: 4 or more opposite sex partners in the last 12 months; Sex with a male IDU in the last 12 months; Sex with an HIV-positive male in the last 12 months; Exchanged sex for money or drugs in the last 12 months; Had sex with a male who ever had sex with a male in the last 12 months; Had sex with a male who had other partners in the last 12 months

Male Only: 4 or more opposite sex partners in the last 12 months; Sex with a female/male IDU in the last 12 months; Sex with an HIV-positive female/male in the last 12 months; Exchanged sex for money or drugs in the last 12 months; 5) Had sex with a male in the last 12 months; Had sex with a female who had other partners in the last 12 months

Table 3

Results of bivariate and multivariable logistic regression models of the association of condom use at last vaginal or anal sex with selected demographic characteristics and HIV-related risk behaviors among married/cohabitating and unmarried/single heterosexually active women aged 18–44 years, National Survey of Family Growth; 2006–2010, 2011–2013

Characteristics	Married/cohabitating Women (N=31,670,429)		Unmarried/single Women (N=15,864,892)	
	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)
TOTAL	13.1		36.8	
Age (years)				
18–24	18.2	1.81 (1.38 – 2.38) [*]	44.2	1.55 (1.31 – 1.83) [*]
25–34	14.6	1.39 (1.14 – 1.69) [*]	33.8	1.17 (0.99 – 1.38)
35–44	10.1	Reference	28.2	Reference
Race/Ethnicity				
Hispanic	15.5	1.28 (1.02 – 1.61) [*]	38.2	1.21 (1.03 – 1.43) [*]
Non-Hispanic white	11.6	Reference	31.2	Reference
Non-Hispanic black	14.2	1.18 (0.87 – 1.60)	46.4	1.53 (1.32 – 1.77) [*]
Non-Hispanic other	20.1	1.71 (1.25 – 2.32) [*]	40.4	1.28 (1.05 – 1.57) [*]
Education level				
Less than high school diploma	15.6	0.95 (0.73 – 1.25)	38.0	
High school graduate	10.8	0.73 (0.56 – 0.94) [*]	38.3	
Some college education	12.4	0.82 (0.68 – 1.00)	37.0	
4 year college education	14.3	Reference	33.0	
Income as % of poverty level				
Below poverty level	13.9		37.7	
Above poverty level	12.9		36.4	
Type of Residence				
Central city	15.3	Reference	40.2	Reference
Other metropolitan/suburban	13.0	0.94 (0.78 – 1.13)	36.3	0.97 (0.87 – 1.09)
Rural/small town	9.7	0.71 (0.54 – 0.93) [*]	30.0	0.83 (0.70 – 0.99) [*]
Sexual Orientation				
Heterosexual	13.0		36.6	
Homosexual	— [‡]		43.4	
Bisexual	10.7		39.5	
Future Intention to have children				

Characteristics	Married/cohabitating Women (N=31,670,429)		Unmarried/single Women (N=15,864,892)	
	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)	Weighted Prevalence % [†]	Adjusted Prevalence Ratio (95% CI)
Yes	15.0	1.11 (0.94 – 1.32)	40.1	1.12 (1.00 – 1.26)
No	10.8	Reference	30.5	Reference
Binge Drinking^{††} in the past 30 days				
Yes	12.1		34.4	
No	13.2		37.5	
Any Sexual risk indicators, past 12 months				
Yes ^{†††}	14.1		32.3	0.82 (0.73 – 0.92) [*]
No	13.0		38.7	Reference

* p<0.05

‡ Suppressed because sample size below threshold established by the National Survey of Family Growth

† Row percent; sexually active women who responded “Yes” to the questions of condom use at last sex

†† For men, if they had 5 or more drinks on an occasion, and for women, if they had 4 or more drinks on an occasion.

††† HIV-related sexual risk behaviors include a ‘Yes’ response to any of the following:

Female Only: 4 or more opposite sex partners in the last 12 months; Sex with a male IDU in the last 12 months; Sex with an HIV-positive male in the last 12 months; Exchanged sex for money or drugs in the last 12 months; Had sex with a male who ever had sex with a male in the last 12 months; Had sex with a male who had other partners in the last 12 months

Male Only: 4 or more opposite sex partners in the last 12 months; Sex with a female/male IDU in the last 12 months; Sex with an HIV-positive female/male in the last 12 months; Exchanged sex for money or drugs in the last 12 months; 5) Had sex with a male in the last 12 months; Had sex with a female who had other partners in the last 12 months