HHS Public Access

Author manuscript

*J Womens Health (Larchmt)*. Author manuscript; available in PMC 2019 September 11.

Published in final edited form as:

*J Womens Health (Larchmt)*. 2012 September ; 21(9): 910–916. doi:10.1089/jwh.2011.3441.

# Emergency Contraception and Risk for Sexually Transmitted Infections Among U.S. Women

**Melissa A. Habel, M.P.H.**, **Jami S. Leichliter, Ph.D.**

Centers for Disease Control and Prevention, Atlanta, Georgia.

## Abstract

**Background:** Since Food and Drug Administration (FDA) licensure of emergency contraception (EC) over-the-counter (OTC) in 2006, this is the first U.S. study to use a nationally representative sample of reproductive-aged women (15–44) to explore the relationship between receipt and use of EC and sexually transmitted infection (STI)-related health services.

**Methods:** Using a sample of 6329 women from the National Survey of Family Growth 2006–2008, we examined the relationship between lifetime EC use and recent receipt of EC and demographics, sexual behaviors, and STI-related services. Variables significant at $p < 0.10$ in bivariate analyses were examined using multivariable logistic regression models.

**Results:** Overall, 10% (704) of the sample had ever used EC. Most EC users had received EC from a family planning clinic (51%), drugstore (23%), or doctor's office (17%). In adjusted analyses, demographic factors associated with receipt of EC in the past 12 months included never married (adjusted odds ratio [AOR] 4.0) and living in a metropolitan statistical area (AOR 4.2). Women reporting multiple partners (2 +) (AOR 2.4), inconsistent condom use (AOR 3.4), and having recently been tested for chlamydia (AOR 2.0) had higher odds of receiving EC in the past 12 months. Findings among women ever reporting EC use were similar, except women who had 4 + lifetime partners (AOR 2.5) and had recently received a chlamydia diagnosis (AOR 2.2) had higher odds of ever having used EC.

**Conclusions:** EC recipients were no more likely than nonrecipients to have received STI counseling or screening despite greater numbers of sex partners in the past year. This research indicates that women are accessing EC in pharmacies, which may be a missed opportunity for counseling and testing.

## Introduction

When an Individual Seeks emergency contraception (EC), it is most likely because there has been a failure in contraceptive methods or failure to use contraceptive methods. Any failure in contraceptive methods represents an unprotected sex act that could potentially expose a woman to sexually transmitted infections (STIs) and unintended pregnancy. The prevalence

Address correspondence to: Melissa A. Habel, M.P.H., Division of STD Prevention, Centers for Disease Control and Prevention, 1600 Clifton Road, Mailstop E-44, Atlanta, GA 30333, mhabel@cdc.gov.

Disclosure Statement

The authors have nothing to disclose and are aware of no conflicts of interest. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

of receipt and use of EC and its relationship to STI-related services in the United States has not been extensively studied using national data. According to the National Survey of Family Growth (NSFG), the percentage of women who had used EC at least once has doubled from 4% in 2002 to 10% (5.2 million) in 2006–2008.[1] This increase may in part be a result of greater access to EC in the United States. In 2006, the Food and Drug Administration (FDA) approved over-the-counter (OTC) access of Plan B (the one-dose EC, or morning after pill) for women aged ≥ 18.[2] Since then, however, little research has been done in the United States to explore the STI risk of those who receive or use EC and where they are accessing EC.

Sexual risk and health-seeking behaviors of EC users have been examined more closely using national datasets outside the United States. Various European studies have found that EC users report higher numbers of sex partners[3–5] and condom use[3,4] and are less likely to have sought reproductive health services in the past year.[5,6] Black et al.[3] identified factors associated with EC use in the previous year using data from the United Kingdom's National Survey of Sexual Attitudes and Lifestyles (2000) study and found EC use was also more common among women with > 1 sexual partner in the past year and those using condoms for contraception. EC use was significantly associated with experience of abortion but not with STI diagnosis. Several other studies in Europe had similar findings but did find an association with STIs, especially Chlamydia.[4–7]

Findings in the United States have been conflicting, with some studies concluding that EC use was associated with sexual risk factors[8,9] and others citing the contrary.[10,11] One U.S. study found that women seeking EC were more likely to have had unprotected sex at last intercourse and less likely to have had a previous STI compared to women seeking general family planning services.[8] Another study explored characteristics for seeking EC at a university-based women's health clinic[9] and found that women requesting EC were significantly more likely than women who were at the clinic for services other than EC to be previous users (used EC > 2 times in the past year), to have had unprotected sex in the past 6 months, and to have had an unintended pregnancy in the past year. However, no difference was found for ever testing positive for an STI. Several other U.S. studies found no STI association for future STI acquisition[11] or history of STI diagnosis.[10] None of these studies examined EC use in the U.S. general population of reproductive-aged women.

Kavanaugh et al.[12] published data on EC users from the 2006–2008 NSFG upon which this study seeks to expand. From a reproductive health framework, Kavanaugh et al. explored EC use across the lifetime, particularly focusing on the prevalence of counseling about the use of EC, and examined the association of ever having used EC and receipt of EC counseling and reproductive health services in the past year(i.e., Pap test or pelvic examination). Sociodemographic and reproductive characteristics of women ever reporting EC use were presented. They found that the majority of lifetime EC users had only used EC once (61%) and 68% had obtained EC without a prescription. Primary reasons for EC use were not using a birth control method (49%) and worry that birth control would not work (39%). In the past year, only 3% of women reported counseling about EC. Among respondents reporting a Pap test or pelvic examination in the past year, only 4% said they were counseled about EC. At the bivariate level, being age 18–29; never married; having ever used the pill, patch, or ring;

having had a pelvic examination or Pap test (past year); having a previous abortion; and intention to have a(nother) child were closely associated with both having ever used EC and having received EC counseling in the past year. In multivariable analyses, receipt of EC counseling in the past year was associated with significantly increased odds of ever having used EC. The research also found that women who had > 1 lifetime partner had increased odds of ever using EC.

The literature fails to paint a clear picture of the STI-related risk of EC users, particularly in the United States. Kavanaugh et al.[12] examined demographic and reproductive health services correlates of lifetime EC use; however, information is still needed on condom use and STI-related health services (including counseling and testing and reported diagnosis) among lifetime EC users. Additionally, research has not yet explored how receipt of EC in the past 12 months is related to sociodemographic, sexual risk, and STI-related factors of U.S. reproductive-aged women. Given that some states allow persons < age 17 to obtain EC from pharmacists (i.e., pharmacists can legally write prescriptions),[13] more females may be accessing EC through a pharmacy setting rather than a medical setting, creating a missed opportunity for STI counseling and screening. Using a nationally representative sample of reproductive-aged women, this research further expands on the Kavanaugh study through a sexual health framework by examining EC use by receipt of sexual health services, such as STI counseling and testing and report of STI diagnosis in the past year.

## Materials and Methods

### Data

We used data from the 2006–2008 NSFG, a national probability survey that is representative of the reproductive-aged population (15–44 years) in the United States. NSFG includes oversampling of blacks/African Americans, Hispanics/Latinos, and adolescents (15–19 years old).[14,15] In 2006, NSFG implemented continuous interviewing that allows for additional questions to be added to the survey annually. From July 2006 through December 2008, data were collected through computer-assisted personal interview (CAPI) and through audio computer-assisted self-interview (ACASI) in respondents' households. A total of 7356 women were interviewed in English or Spanish, for a response rate of 76%. NSFG was approved by the Research Ethics Review Board in the National Center for Health Statistics at the U.S. Centers for Disease Control and Prevention (CDC). All respondents provided informed consent; adolescents provided assent subsequent to parental consent. A detailed description of the multistage sampling techniques used by NSFG has been reported in detail elsewhere.[15]

### Measures

The CAPI includes a series of items that measure a woman's use of EC. Women who reported having vaginal sex at least once in their lifetime (subsequently referred to as sexually experienced women) were asked about their use of EC in their lifetime and the receipt of EC in the past 12 months. Although too few women used EC in the past 12 months to include this variable in analysis, randomized controlled trials have shown that advance provision of EC yields increased and quicker use.[16,17] Sexually experienced women

who reported ever using EC were then asked the number of times EC was used and the primary reason for EC use the last time EC was used. Beginning in July 2007, women were also asked to report where they received EC the last time EC was used from a list of 13 sources and an other category. The CAPI also includes several measures of sociodemographics and sexual behavior that we included in this analysis. Relevant socio-demographic variables include age, current marital status, race/ethnicity, current religious affiliation, poverty income level (household income as a percentage of the U.S. Census-determined poverty threshold recoded as income less than 150%, 150% to 299%, and 300% or more of the poverty level), current insurance status, living in a metropolitan statistical area (MSA), and received public assistance (past 12 months). Sexual behaviors included in this analysis were limited to those that reported on vaginal sex with a male partner only. These measures included sexual debut (recoded as < 15 years and 15 years or older), consistency of condom use in the past 12 months (recoded as every time, inconsistent use, and none of the time), the number of lifetime sex partners (recoded as 1 partner, 2–3 partners, and 4 or more partners), and reported multiple sex partners in the past 12 months (recoded into a dichotomous variable).

Finally, we used several measures of receipt of sexual healthcare services and one measure of an STI diagnosis. From the CAPI, we used two measures of receipt of reproductive healthcare services in the past 12 months—received counseling, testing, or treatment for an STI and had a Pap test. Additionally, we created a dichotomous composite measure for ever had an unintended pregnancy using two response options (unwanted and too soon, mistimed) from a pregnancy question series that asked women about the degree to which each pregnancy was wanted at the time of conception. From the ACASI, we used two measures related to chlamydia services in the past 12 months. Women were asked if they had received a chlamydia test and if a healthcare provider told them that they had a chlamydial infection.

## Analyses

For this analysis, we used SAS (release 9.2, SAS Institute, Cary, NC) and SAS-callable SUDAAN (release 10.0, Research Triangle Institute, Research Triangle Park, NC) to adequately adjust for NSFG's multistage sampling procedures and to insure that the sample was appropriately weighted to represent the U.S. female population aged 15–44 years. First, we provide descriptive analyses of the sociodemographics of all sexually experienced women ($n$ = 6329). We examined receipt of EC use in the past 12 months and the lifetime prevalence of EC use. For sexually experienced women who reported ever using EC ($n$ = 703), we provide descriptive analyses for the number of times EC was used, the primary reason for EC use at last use, and where women received EC at last use (for women who completed the survey from July 2007 through December 2008, $n$ = 449). Then, we used chi-square analyses to examine bivariate associations, separately, for receipt of EC in the past 12 months and lifetime EC use by sociodemographics, sexual behavior, and receipt of healthcare services (in the past 12 months). For lifetime EC use, a previous study examined its relationship to sociodemographics and some sexual behaviors. Therefore, we controlled for sociodemographics and sexual behaviors; however, we present results for the STI-related services only, as this was our primary purpose. For all estimates, the relative standard error (RSE) was calculated. Estimates where the RSE was > 30% or the n denominator was < 50

were considered unstable. Variables that were significant in bivariate analyses at $p < 0.10$ were included in separate multiple logistic regression models (receipt of EC in past 12 months and lifetime EC use).

## Results

Overall, 10% (704, or 5,171,887 U.S. reproductive-aged women) (Table 1) of the sample had ever used EC; < 3% (or 1,156,443 U.S. women reproductive-aged women) had received EC within the past 12 months. Most women had only used EC once (62%); 14% had used EC ≥ 3 times (Table 2). Most EC users had received EC from a family planning clinic, community clinic, or school-based clinic (51%). More EC users obtained EC from a drugstore (23%) than from a private doctor's office (17%).

### Received EC in past 12 months

In bivariate analyses (Table 3), women in the following groups had increased odds of having received EC in the past 12 months: adolescent and young adult women, never married women, cohabitating women, Hispanic and white women, and women living in an MSA. No significant differences were found between recent receipt of EC and religion, poverty level, insurance type, or having received public assistance in the past 12 months.

When exploring sexual behavior characteristics, a significant bivariate relationship was found between receipt of EC in the past 12 months and condom use; inconsistent condom users had higher reports of having received EC (6%) than women who used condoms none of the time (1%) ($p < 0.0001$). As compared to other women, those with reports of higher numbers of lifetime partners (4 +) ($p = 0.04$) and multiple partners (2 +) in the past 12 months (9% vs. 1%, $p < 0.0001$) had higher reports of recent receipt of EC. In regard to receipt of sexual health services, women who received a Pap smear in the past 12 months (3% vs. 1%, $p = 0.006$) and reported receiving counseling, testing, or treatment for STIs over the past 12 months (6% vs. 1%, $p < 0.0001$) had higher reports of receiving EC in the past 12 months. Women who had been tested for chlamydia (5% vs. 1%, $p < 0.0001$) or received a chlamydia diagnosis (10% vs. 2%, $p = 0.03$) in the past 12 months had significantly higher reports of receiving EC than women who had not been tested or diagnosed with chlamydia. No association was found between recent receipt of EC and early sexual debut or history of unintended pregnancy; therefore, these variables were not included in the multivariable model.

In multivariable analyses the likelihood of receiving EC in the past 12 months was significantly higher among women who were never married (adjusted odds ratio [AOR] 4.0) or were cohabitating (AOR 2.8) compared to women who were married (Table 3). Women living in an MSA were more likely to have recently received EC than women living in a non-MSA (AOR4.2). Compared to black women, the odds of receipt of EC in the past 12 months were higher among Hispanic (AOR 4.3) and white women (AOR 2.0). No effect was found in regard to age. Women who had multiple partners (≥ 2) (AOR 2.4) and inconsistent condom use (AOR 3.4) had a higher odds of having received EC in the past 12 months compared to women with fewer partners and those who never used condoms. In bivariate analyses, recent receipt of EC was associated with receiving STI services and having had a

Pap test in the past 12 months but became insignificant in the model. Women who had been tested for chlamydia in the past 12 months (AOR 2.0) were more likely to report recent receipt of EC, but chlamydia diagnosis in the past 12 months was no longer significant in adjusted analyses.

### Lifetime EC users

In general, many of the same correlates significantly predicted receipt of EC in the past 12 months as for lifetime EC use; however, there were a few differences in regard to age, marital status, race/ethnicity, religion, poverty level, and MSA that have been published in elsewhere.[12] When exploring STI-related health services, women who received counseling, testing, or treatment for STIs over the past 12 months (17% vs. 8%, $p < 0.0001$) were significantly more likely to have used EC in their lifetimes. Specific to chlamydia, significantly more women who had been tested for chlamydia (18% vs. 7%, $p < 0.0001$) and diagnosed with chlamydia over the past 12 months (30% vs. 9%, $p = 0.03$) reported lifetime EC use. No association was found between EC use and early sexual debut or history of unintended pregnancy, and these variables were removed from the final multivariable model.

Similar findings with a few noteworthy variations were found in multivariable analyses among women reporting ever having used EC (Table 4). In adjusted analyses, the likelihood of ever using EC was elevated among women who had ≥ 4 lifetime partners (AOR 2.5) compared to those with only 1 partner and among women who reported inconsistent condom use (AOR 1.7) compared to never using condoms. Receipt of STI services was not significant in the model, but women who reported having received a chlamydia diagnosis in the past 12 months (AOR 2.2) were more likely to report lifetime EC use than women without a recent chlamydia diagnosis, and receipt of a test for chlamydia in the past 12 months approached significance (AOR 1.4, $p = 0.06$).

## Discussion

Consistent with previous findings,[3,4,8] this research found EC receivers and users were often young, unmarried or cohabitating women. Not surprisingly, those who have received and used EC also appear to have better access to care and services, as they tend to live in MSAs and have higher incomes, as related to the poverty level, than non-EC users. Consistent with previous findings,[3,12] we found that condom users were more likely to use EC, especially women who tended to use condoms inconsistently. It is possible that women who use condoms consistently would have less need for EC. Also as expected and comparable to previous studies,[3–5,12] EC users tended to have multiple partners in the past year and a higher number of partners across the lifetime.

Compared to black women, Hispanic women were more likely to have received EC. Recent data from the U.S. Census shows that a similar percentage of Hispanic and black families are living below the poverty level; however, a larger percentage of Hispanics were uninsured.[18] Thus, Hispanic women may be using EC because they do not have insurance or regular/consistent access to contraceptive methods. Kavanaugh et al.[12] found that Hispanic women had almost 2 times higher odds of receiving EC counseling compared to non-

Hispanic women, and EC counseling tends to be one of the strongest predictors of EC use.[12,19–23]

Our study found that having received a chlamydia diagnosis in the past year was significantly associated with lifetime EC use but not associated with having received EC in the past year. It is not surprising that chlamydia diagnosis in the past year among those who recently received EC was insignificant, given the small number of women who reported receiving a chlamydia test. Of note is the large number of women reporting inconsistent condom use who have used EC, which may explain the significant association between lifetime EC use and a chlamydia diagnosis in the past year. This finding suggests that healthcare providers should make sure to assess EC users for STI risk. Additionally, the CDC recommends annual chlamydia screening of women < 26 years.[24] Thus, when offering advance provision of EC, healthcare providers should counsel women < 26 years of age or at high risk about the need for annual testing for chlamydia.

Finally, this research reveals a number of women obtaining EC through drugstores, more so than through private doctors. Family planning clinics and community clinics still seem to be the most common venue for obtaining EC, but this could be because of advance provision of EC through a women's healthcare visit. Family planning doctors or primary care providers may be calling in EC prescriptions without seeing a patient or scheduling a follow-up visit. Although there was no difference in reports of STI counseling and testing among EC users compared to non-users, access through drugstores represents missed opportunities for counseling and testing.

### Limitations

Our study has several limitations. First, we cannot examine the temporal association or timing of sexual behaviors, accessing sexual and reproductive healthcare services (e.g., STI counseling and testing), and receipt of EC or lifetime EC use. Second, receipt of EC in the past year may not be the strongest proxy for EC use in the past year. Although we know that advanced provision of EC often facilitates increased and quicker use,[16,17] some research suggests that this is not always the case.[22,25] Additionally, we do not know the relationship status of the women in this study at the time they used or received EC. However, our findings demonstrate a relationship between women with a history of EC use and provision and some sexual behaviors that can place women at risk for STIs, including having multiple partners and inconsistent condom use. Finally, the small number of women who reported receiving a chlamydia diagnosis in the past 12 months resulted in an unstable estimate; therefore, these findings should be interpreted with caution. It should be noted, however, that even with this instability, the 95% confidence intervals for lifetime EC use did not overlap when comparing women with and without a chlamydia diagnosis. We suspect, therefore, that with a larger sample size overall, the chlamydia findings would hold.

## Conclusions

Despite the limitations, these findings highlight the importance of understanding the trends in EC receipt and use. Understanding the demographic and sexual risk profile of EC receivers and users is essential to providing the best possible reproductive and sexual health

services possible. Improving access to other contraceptive methods and condoms for Hispanic women should be considered. Given that walk-in clinics (e.g., MinuteClinic) are now in pharmacies where vaccinations are administered and medication is prescribed, it is important to explore and consider the possible expansion of STI screening programs, such as chlamydia and HIV screening, into similar real world settings where EC is dispensed without a prescription. Trials conducted in community and chain pharmacies in the United Kingdom suggest that testing and treatment are acceptable and feasible.[26–28] Similar pilot programs are in development and underway in the United States.[29–31]

## References


1. Mosher WD, Jones J. Use of contraception in the United States: 1982–2008. National Center for Health Statistics, Vital Health Statistics, 23, 2010.
2. U.S. Food and Drug Administration. FDA approves over-the-counter access for plan B for women 18 and older. August 24, 2006. Available at www.fda.gov/ScienceResearch/SpecialTopics/WomensHealthResearch/ucm134289.htm Accessed June 7, 2011.
3. Black KI, Mercer CH, Johnson AM, et al. Sociodemographic and sexual health profile of users of emergency contraception: Data from a British probability sample survey. Contraception 2006;74:309–312. [PubMed: 16982231]
4. Verhoeven V, Peremans L, Avonts D, et al. The profile of emergency contraception users in a chlamydia prevalence study in primary care in Belgium. Eur J Contracept Reprod Health Care 2006;11:175–180. [PubMed: 17056447]
5. Bajos N, Leridon H, Goulard H, et al. Contraception: From accessibility to efficiency. Hum Reprod 2003;18:994–999. [PubMed: 12721175]
6. Kettle H, Cay S, Brown A, et al. Screening for Chlamydia trachomatis infection is indicated for women under 30 using emergency contraception. Contraception 2002;66:251–253. [PubMed: 12413621]
7. Goulard H, Bajos N, Job-Spira N. Equipe Cocon, emergency contraception in France: The user profile. Gynecol Obstet Fertil 2003;31:724–799. [PubMed: 14499717]
8. Phipps MG, Matteson KA, Fernandez GE, et al. Characteristics of women who seek emergency contraception and family planning services. Am J Obstet Gynecol 2008;199: 111.e1–111.e5. [PubMed: 18355784]
9. Parrish JW, Katz AR, Grove JS, et al. Characteristics of women who sought emergency contraception at a university-based women's health clinic. Am J Obstet Gynecol 2009; 201:22.e1–7. [PubMed: 19426957]
10. Sander PM, Raymond EG, Weaver MA. Emergency contraceptive use as a marker of future risky sex, pregnancy and sexually transmitted infection. Am J Obstet Gynecol 2009; 201:146.e1–146.e6. [PubMed: 19646565]
11. Stewart HE, Gold MA, Parker AM. The impact of using emergency contraception on reproductive health outcomes: A retrospective review in an urban adolescent clinic. J Pediatr Adolesc Gynecol 2003;16:313–318. [PubMed: 14597021]
12. Kavanaugh ML, Williams SL, Schwarz EB. Emergency contraception use and counseling after changes in United States prescription status. Fertil Steril 2011; 30:95:2578–2581.
13. Kaiser Family Foundation. Emergency contraception. Women's Health Policy Facts 2005 Available at www.kff.org/womenshealth/upload/3344-03.pdf Accessed June 7, 2011.
14. Groves RM, Mosher WD, Lepkowski J, et al. Planning and development of the continuous National Survey of Family Growth, National Center for Health Statistics. Vital Health Stat 2009 Available at www.cdc.gov/nchs/data/series/sr_01/sr01_048.pdf
15. Lepkowski JM, Mosher WD, Davis KE, et al. The 2006–2010 National Survey of Family Growth: Sample design and analysis of a continuous survey, National Center for Health Statistics. Vital Health Stat 2010 Available at www.cdc.gov/nchs/data/series/sr_02/sr02_150.pdf

16. Meyer J, Gold M, Haggerty C, et al. Advance provision of emergency contraception among adolescent and young adult women: A systematic review of literature. J Pediatr Adolesc Gynecol 2011;24:2–9. [PubMed: 20869281]
17. Polis CB, Schaffer K, Blanchard K, et al. Advance provision of emergency contraception for pregnancy prevention: A meta-analysis. Obstet Gynecol 2007;110:1379–1388. [PubMed: 18055735]
18. DeNavas-Walt C, Proctor BD, Smith JC. U.S. Census Bureau current population reports, P60–238 Income, poverty, and health insurance coverage in the United States: 2009. Washington, DC: U.S. Government Printing Office, 2010.
19. Whittaker PG, Berger M, Armstrong KA, et al. Characteristics associated with emergency contraception use by family planning patients: A prospective cohort study. Perspect Sex Reprod Health 2007;39:158–166. [PubMed: 17845527]
20. Raine TR, Harper C, Leon K, Darney P. Emergency contraception: Advance provision in a young, high-risk clinic population. Obstet Gynecol 2000;96:1–7. [PubMed: 10862832]
21. Jackson RA, Schwarz EB, Freedman L, Darney P. Advance supply of emergency contraception: Effects on use and usual contraception—A randomized trial. Obstet Gynecol 2003; 102:8–16. [PubMed: 12850599]
22. Raine TR, Harper CC, Rocca CH, et al. Direct access to emergency contraception through pharmacies and effect on unintended pregnancy and STIs: A randomized controlled trial. JAMA 2005;293:54–62. [PubMed: 15632336]
23. Walsh TL, Frezieres RG. Patterns of emergency contraception use by age and ethnicity from a randomized trial comparing advance provision and information only. Contraception 2006;74:110–117. [PubMed: 16860048]
24. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2010. MMWR 2010;59(No. RR-12):1–114.
25. Raymond EG, Stewart F, Weaver M, et al. Impact of increased access to emergency contraceptive pills: A raondomized controlled trial. Obstet Gynecol 2006;108:1098–1106. [PubMed: 17077230]
26. Baraister P, Pearce V, Holmes J, et al. Chlamydia testing in community pharmacies: Evaluation of a feasibility pilot in south east London. Qual Saf Health Care 2007;16:303–307. [PubMed: 17693680]
27. Healthcare TN. Pharmacy Chlamydia Screening Pathfinder Evaluation (PCSPF) final. London: Department of Health, 2007.
28. Anderson C, Thornley T. A pharmacy-based private chlamydia screening programme: Results from the first 2 years of screening and treatment. Int J Clin Pharm 2001; 33:88–91.
29. Habel M, Scheinmann R, Verdesoto E, et al. Behind-the-counter emergency contraception: Exploring chlamydia and gonorrhea testing in the pharmacy setting. National STD Prevention Conference, March 2012, Minneapolis, MN.
30. Calderon Y, Cowan E, Molano F, et al. Assessing HIV testing in community pharmacies as a complementary community site to an HIV testing and counseling program based in a New York City emergency department. Conference on Retroviruses and Opportunistic Infections, 2011, Boston, MA.
31. Amesty S, Weidle PJ, Willis L, Sutton M, Lin S, Fuller C. Support for in-pharmacy HIV testing and prevention services among pharmacists registered in the New York State Expanded Syringe Access Program: Findings from the PHARM-HIV study. American Pharmacists Association Annual Meeting & Exposition, March 2012, New Orleans, LA.

**TABLE 1.**

SAMPLE DEMOGRAPHIC CHARACTERISTICS: SEXUALLY EXPERIENCED WOMEN ($n$ = 6329)

| | n | % (*SE*) |
|---|---|---|
| Age | | |
| 15–19 | 635 | 8.3 (0.7) |
| 20–24 | 1135 | 16.0 (0.4) |
| 25–29 | 1316 | 18.1 (0.9) |
| 30 + | 3242 | 57.6 (0.9) |
| Marital status | | |
| Currently married | 2478 | 50.7 (0.5) |
| Cohabitating | 808 | 12.8 (0.6) |
| Formerly married[a] | 765 | 9.7 (0.4) |
| Never married, not cohabitating | 2278 | 26.8 (0.4) |
| Race/ethnicity | | |
| Hispanic | 1405 | 17.2 (2.5) |
| Non-Hispanic white | 3295 | 61.6 (2.5) |
| Non-Hispanic black | 1286 | 14.4 (1.1) |
| Non-Hispanic other | 343 | 6.7 (0.9) |
| Religion | | |
| None | 1195 | 17.2 (1.3) |
| Catholic | 1647 | 25.1 (1.2) |
| Protestant | 2936 | 48.5 (1.4) |
| Other religion | 551 | 9.1 (1.6) |
| Poverty level income | | |
| < 150% | 2452 | 32.3 (1.6) |
| 150–299% | 1841 | 29.9 (0.9) |
| 300% + | 2036 | 37.8 (2.2) |
| Insurance | | |
| Private | 3514 | 61.1 (1.7) |
| Public | 1471 | 17.6 (1.1) |
| None/IHS[b] | 1344 | 21.3 (1.3) |
| Metropolitan statistical area (MSA) | | |
| MSA (urban/suburban) | 5122 | 78.0 (5.9) |
| Not-MSA (rural) | 1207 | 22.0 (5.9) |
| Received public assistance (past year) | | |
| Yes | 2318 | 29.3 (1.4) |
| No | 4011 | 70.7 (1.4) |

[a]Includes widowed, divorced, and separated.

[b]Also includes single payer.

IHS, Indian Health Service; SE, standard error.

**TABLE 2.**

PREVALENCE OF EMERGENCY CONTRACEPTION USE: SEXUALLY EXPERIENCED WOMEN

| | n | % (*SE*) | *Population total*[a] (*weighted* n) |
|---|---|---|---|
| Ever used EC (*n* = 6326) | | | |
| Yes | 704 | 9.7 (0.9) | 5,171,887 |
| No | 5623 | 90.2 (0.9) | 48,055,234 |
| Received EC in past 12 months (*n* = 6327) | | | |
| Yes | 175 | 2.1 (0.3) | 1,156,443 |
| No | 6151 | 97.8 (0.9) | 52,068,403 |
| No of times ever used (*n* = 703)[b] | | | |
| 1 | 431 | 61.9 (3.6) | 3,180,161 |
| 2 | 160 | 24.3 (2.4) | 1,248,453 |
| 3 + | 112 | 13.8 (3.0) | 709,209 |
| Where received EC (*n* = 449)[b,c] | | | |
| Private doctors/HMO | 74 | 16.5 (1.2) | 905,108 |
| Community clinic/FP clinic/school-based clinic | 232 | 50.8 (4.3) | 2,228,311 |
| Hospital facility or urgent care | 29 | 6.2 (1.1) | 342,076 |
| Friend, partner, or spouse | 13 | 2.3 (0.6) | 123,784 |
| Drugstore | 95 | 23.1 (2.5) | 1,266,920 |
| Other place | 6 | 1.0 (0.2) | 57,439 |

[a]Population totals reflect U.S. women aged 15–44 years.

[b]Of women who ever used emergency contraception (EC).

[c]Limited to women interviewed from July 2007 to December 2008.

FP, family planning; HMO, health maintenance organization.

**TABLE 3.**

FACTORS ASSOCIATED WITH RECEIPT OF EMERGENCY CONTRACEPTION IN PAST 12 MONTHS: SEXUALLY EXPERIENCED WOMEN ($n$ = 5708)

| | | *Bivariates* | | *Adjusted analyses AOR (95% CI)*[b] |
|---|---|---|---|---|
| | n[a] | *% (95%CI)* | *SE* | |
| Age | | | | |
| 15–19 | 41 | 5.4 (3.5–8.1) | 1.1 | 1.6 (0.7–3.8) |
| 20–24 | 62 | 4.7 (3.2–6.7) | 0.9 | 1.5 (.06–4.1) |
| 25–29 | 41 | 2.9 (1.7–5.0) | 0.8 | 1.8 (0.7–4.3) |
| 30 + | 31 | 0.8 (.04–1.4) | 0.2 | 1.0 |
| Marital status | | | | |
| Currently married | 20 | 0.6 (0.3–1.1) | 02 | 1.0 |
| Cohabitating | 25 | 2.8 (1.6–4.9) | 0.8 | 2.8 (1.1–6.9) |
| Formerly married | 10 | 1.1 (0.4–3.2) | 0.6 | 1.4 (0.5–3.9) |
| Never married, not cohabitating | 120 | 5.3 (4.0–7.0) | 0.7 | 4.0 (1.5–10.7) |
| Race/ethnicity | | | | |
| Hispanic | 56 | 3.4 (2.2–5.2) | 0.7 | 4.3 (2.3–7.8) |
| Non-Hispanic white | 77 | 1.7 (1.4–2.6) | 0.4 | 2.0 (1.0–3.8) |
| Non-Hispanic black | 32 | 1.6 (1.0–2.5) | 0.4 | 1.0 |
| Non-Hispanic other | 10 | 4.4 (1.9–10.1)[†] | 1.9 | 8.6 (3.1–24.3) |
| Religion | | | | |
| None | 46 | 2.8 (1.8–4.4) | 0.6 | |
| Catholic | 46 | 2.4 (1.5–3.7) | 0.5 | |
| Protestant | 69 | 1.8 (1.2–2.7) | 0.4 | |
| Other religion | 14 | 2.4 (1.0–5.6) | 1.0 | |
| Poverty level income | | | | |
| < 150% | 74 | 2.0 (1.1–2.9) | 0.5 | |
| 150–299% | 47 | 2.1 (1.4–2.7) | 0.3 | |
| 300% + | 54 | 2.4 (1.4–3.4) | 0.6 | |
| Insurance | | | | |
| Private | 86 | 2.2 (1.5–3.0) | 0.4 | |
| Public | 57 | 2.9 (1.8–4.7) | 0.7 | |

*J Womens Health (Larchmt)*. Author manuscript; available in PMC 2019 September 11.

| | Bivariates | | | Adjusted analyses AOR (95% CI)[b] |
|---|---|---|---|---|
| | n[a] | % (95%CI) | SE | |
| None | 32 | 1.6 (0.9–3.0) | 0.5 | |
| Metropolitan statistical area (MSA) | | | | |
| MSA (urban/suburban) | 167 | 2.6 (2.0–3.4) | 0.3 | 4.2 (1.3–13.0) |
| Not-MSA (rural) | 8 | 0.7 (0.2–2.3) | 0.4 | 1.0 |
| Public assistance in last 12 months | | | | |
| Yes | 69 | 2.2 (1.4–3.4) | 0.5 | |
| No | 106 | 2.2 (1.6–2.9) | 0.3 | |
| Early sexual debut | | | | |
| < 15 years | 39 | 2.9 (1.8–4.7) | 0.7 | |
| ≥ 15 years | 136 | 2.1 (1.6–2.8) | 0.3 | |
| Condom use in past year | | | | |
| Every time | 31 | 2.7 (1.4–4.9) | 0.8 | 1.6 (0.8–3.4) |
| Inconsistent use | 104 | 5.7 (4.1–8.0) | 1.0 | 3.4 (1.5–7.5) |
| None of the time | 39 | 0.8 (0.5–1.2) | 0.2 | 1.0 |
| Number of partners (lifetime) | | | | |
| 1 | 23 | 1.3 (0.8–2.1) | 0.3 | 1.0 |
| 2–3 | 39 | 2.1 (1.4–3.8) | 0.6 | 1.1 (0.4–2.6) |
| 4 + | 113 | 2.6 (1.9–3.7) | 0.5 | 1.02 (0.6–1.8) |
| Multiple Partners (past 12 months) | | | | |
| 0–1 | 95 | 1.3 (1.0–1.8) | 0.2 | 1.0 |
| 2 + | 80 | 8.5 (6.2–11.5) | 1.3 | 2.4 (1.4–4.0) |
| Received counseling, test, treatment for STI (past 12 months) | | | | |
| Yes | 73 | 5.7 (4.1–7.8) | 0.9 | 1.1 (0.6–2.1) |
| No | 102 | 1.4 (1.0–2.0) | 0.2 | 1.0 |
| Tested for chlamydia (past 12 months) | | | | |
| Yes | 95 | 5.4 (3.9–7.4) | 0.9 | 2.0 (1.1–3.7) |
| No | 78 | 1.2 (0.8–1.8) | 0.2 | 1.0 |
| Chlamydia diagnosis (past 12 months) | | | | |
| Yes | 16 | 10.1 (4.5–21.1)[†] | 4.0 | 1.4 (0.5–3.9) |
| No | 158 | 2.1 (1.6–2.7) | 0.3 | 1.0 |

| | Bivariates | | | Adjusted analyses AOR (95% CI)[b] |
|---|---|---|---|---|
| | n[a] | % (95%CI) | SE | |
| Had Pap test (past 12 months) | | | | |
| Yes | 132 | 2.6 (1.9–3.4) | 0.4 | 1.6 (0.9–2.9) |
| No | 43 | 1.3 (0.8–2.2) | 0.4 | 1.0 |
| Unintended pregnancy (ever) | | | | |
| Yes | 92 | 1.9 (1.3–2.8) | 0.4 | |
| No | 83 | 2.5 (1.7–3.5) | 0.5 | |

*n*, indicative of adjusted analyses.

[a] *n*, number who received EC.

[b] Factors with $p < 0.10$ in bivariate analyses were included in a multivariate model.

[†] Estimates are unstable as relative standard error (RSE) > 30% and/or $n_{denominator} < 50$, as described in Materials and Methods/*Analyses*, and discussed in Discussion/*Limitations*.

AOR, adjusted odds ratio; CI, confidence interval; STI, sexually transmitted infection.



*J Womens Health (Larchmt)*. Author manuscript; available in PMC 2019 September 11.

**TABLE 4.**

FACTORS ASSOCIATED WITH LIFETIME EMERGENCY CONTRACEPTION USE: SEXUALLY EXPERIENCED WOMEN ($n$ = 5709)

| | | *Bivariates* | | *Adjusted analyses AOR (95% CI)*[b] |
|---|---|---|---|---|
| | n[a] | *% (95% CI)* | *SE* | |
| Received counseling, test, treatment for STI (past 12 months) | | | | |
| Yes | 238 | 17.3 (14.1–21.0) | 1.7 | 0.9 (0.7–1.3) |
| No | 466 | 8.2 (6.9–9.6) | 0.7 | 1.0 |
| Tested for chlamydia (past 12 months) | | | | |
| Yes | 324 | 17.5 (14.6–20.8) | 1.6 | 1.4 (1.0–2.0) |
| No | 376 | 7.3 (6.0–8.7) | 0.7 | 1.0 |
| Chlamydia diagnosis (past 12 months) | | | | |
| Yes | 32 | 29.8 (14.5–51.5)[c] | 9.6 | 2.2 (1.1, 4.4) |
| No | 669 | 9.3 (8.1–10.7) | 0.6 | 1.0 |

*n*, indicative of adjusted analyses.

[a] *n*, number who used EC.

[b] Factors with $p < 0.10$ in bivariate analyses that were controlled for in a multivariate model included: age, marital status, race/ethnicity, religion, poverty level income, MSA, condom use in past year, number of lifetime partners, number of partners in the past 12 months, and having had a Pap test.

[c] Estimates are unstable as RSE > 30% and/or $n_{denominator} < 50$.