Change and stability in contraceptive use patterns among US women over a 12-month period: analysis using the 2013–2015 National Survey of Family Growth life history calendar

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Objective: To improve understanding of contraceptive use over 1 year among women in the United States. Study design: We used the 2013–2015 National Survey of Family Growth to examine monthly contraceptive use patterns over a 12-month period. We focused on use of contraception during months in which non-sterilized women were sexually active and not pregnant; our outcomes were contraceptive use in every month, some months, and no months. We used simple and multivariate logistic regression to examine socio-demographic and method use characteristics associated with contraceptive use patterns.

Results: Some 72% of non-pregnant, non-surgically sterile women used contraception in every sexually active month. After controlling for other demographic and individual characteristics, adolescents had higher odds (aOR=2.45) of using contraception in each sexually active month compared to women aged 25–29. Other groups more likely to use contraception monthly included those with some college (aOR=1.58) compared to less than high school and non-cohabiting unmarried women (aOR=1.49) compared to married women. Those with gaps in insurance coverage during the past year (aOR=0.70), women who were not sexually active all 12 months (aOR=0.42), and those with more than two male sexual partners (aOR=0.49), were less likely to use contraception every sexually active month. Nearly half (46%) of contraceptive users in our sample used more than one type of contraceptive method over the 12-month period.

Conclusions: The majority of women use contraception every month they are sexually active, although there is variation between socio-demographic groups. However, over a one-year period, many women used dynamic contraceptive strategies.

Implications: Health care providers should recognize that contraceptive use patterns are dynamic and change over a relatively short time period for many women.

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1. Introduction

The overwhelming majority of adults in the US use contraception at some point in their lives [1]. Among women using contraception in 2014, the method most commonly used at last sex was (self and/or partner) sterilization (28%) followed by the pill (25%) [2]. Women were equally likely to rely on condoms (15%) and long-acting reversible methods of contraception (LARC) (14%).

Quantitative research assessing contraceptive use patterns is dynamic and change over a relatively short time period for many women.

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This study builds on prior research that examines contraceptive use as a dynamic process [6,7]. We use the 2013–2015 National Survey of Family Growth (NSFG) to examine contraceptive use, non-use, and method choice patterns over a 12-month period among US women aged 15–44. We examine the relationships between contraceptive patterns and their associations with socio-demographic factors.

2. Materials and methods

2.1. Data source

We used publicly available data from the 2013–2015 National Survey of Family Growth (NSFG). This nationally representative, cross-sectional survey collected retrospective data from individuals aged 15–44 during in-person interviews in respondents' homes. The NSFG uses a multistage probability sampling design to oversample black and Hispanic individuals and adolescents aged 15–19. More detailed information on the survey methodology, sampling design, response rates, fieldwork procedures and variance estimation is published elsewhere [8]. We used the female respondent file, which includes survey responses from 5699 women; we relied primarily on the Life History Calendar data, which includes retrospective self-reports of all contraceptive practices, intercourse, and pregnancies for up to 4 years prior to interview. Women fill out the calendar only if they have used contraception previously; 44 respondents had had intercourse but never used a contraceptive method, meaning these women could not be included in our analysis.

2.2. Analytic sample

We limited the analyses to the 12-month period preceding the interview. Using monthly reports, we further limited analyses to respondents who were sexually active in at least 1 month during that period, which removed 1003 women from the sample. We only considered months in which the respondent was neither pregnant nor surgically sterile. Our analytic sample includes 650 respondents who reported a pregnancy over the 12-month period, but we only took into account the months in which they were sexually active and not pregnant.

Due to inconsistencies between reported sterility, sterilizing operations, and sterility as a contraceptive method, we disregarded reports of female sterilization in the contraceptive method calendar. Instead, we used the dates for respondents' sterilization operations to determine sterility in each month of the timeframe. The final analytic sample included 3619 non-surgically sterilized, sexually active female respondents.

2.3. Outcomes and covariates

Based on contraceptive use reported in the Life History Calendars, we categorized respondents into three outcome groups: those who used contraception in every sexually active month, some sexually active months, or no contraceptive use during any sexually active months (non-users). Respondents, based on this woman-level categorization, are the unit of analysis throughout the study. The calendar data reflect all contraceptive use during a given month, so respondents who were monthly contraceptive users did not necessarily use the same method during all intercourse and may not have used any contraception during some acts of intercourse.

We sorted contraceptive users into seven categories: LARC, hormonal, condom, withdrawal, other, multiple (LARC/hormonal), and multiple (other). Categories were not mutually exclusive and respondents could be grouped into multiple categories. We also grouped the contraceptive methods into five types in order to better understand the relationship between recent use of these method types (i.e., at least once during the 12 months) and general contraceptive use patterns. Here we distinguish between LARC, which is composed of intravaginal devices (IUDs) and implants; hormonal contraceptives, which include contraceptive pills, patches, rings, and injectables; condoms; withdrawal; and other methods, which encompass a wide range of methods including diaphragms, jellies or creams, and fertility awareness-based methods. Finally, we distinguished multiple method type users from single method type users; multiple method type users reported use of at least two method types over the past year, which represents both dual use and switching throughout the year. Because of the size of and diversity within the multiple method user group, we further separated the group into those who used LARC or hormonal methods in the last 12 months and those who did not.

We examined outcomes by a number of respondent characteristics, all measured at survey administration. Demographic characteristics include age, highest level of education, race and ethnicity, poverty level, consistency of insurance coverage for the past 12 months, and nativity (US or non-US). Relationship dynamics can influence contraceptive use patterns [4], and we incorporated the measures of union status, number of male partners in the past year, and a categorical measure of number of months sexually active in the past year (1–5, 6–11 or 12 months). Finally, pregnancy avoidance is strongly associated with contraceptive use [7,9], so we included a measure of respondents' reaction to the idea of becoming pregnant (very pleased, a little pleased, a little upset and very upset).

2.4. Analytic strategy

We performed all analyses using Stata version 15.1 and applied sampling weights to obtain estimates representative of the US civilian, non-institutionalized, household population of women aged 15–44 (61.5 million). We first examined contraceptive use patterns overall and according to population characteristics, using survey weights to obtain weighted proportions with confidence intervals. We used multivariable logistic regression to identify statistically significant relationships between each contraceptive use group and the covariates, which were only included in the multivariable models if they were found to be statistically significant in our simple logistic regressions (not shown). We next limited the analysis to respondents who had used a method during the 12-month period and used multivariable logistic regression to compare contraceptive use patterns between users and non-users of each method type category.

Given LARC users’ longer-term coverage as compared to other types of method users, we also conducted a sensitivity analysis by removing LARC users from these models. The distribution of non-LARC users into our outcome groupings was similar and we found our results were virtually unchanged.

3. Results

Overall, the majority of non-surgically sterilized women who had had sex in the last year (72%) used a contraceptive method in every sexually active month (**monthly**); 16% used a method some months and 12% never used a method over the 12-month period (Table 1). Around a
of monthly use (82.6%; 95% CI=76.7–87.3%) and the lowest proportion of nonuse (1.8%; 95% CI=0.7–2.9%) among all age groups. Monthly usage was particularly high among women who would be slightly or very upset if they found out they were pregnant (81.9%, 78.8%). Contraceptive use during some, but not all, sexually active months was more prevalent among women who had gaps in insurance coverage during the year (21.7%; 95% CI=17.0–27.3%) and women with more than two male sexual partners in the past year (29.3%; 95% CI=21.8–38.0%). Overall, rates of non-use were highest among women aged 40–44 (18.9%, 95% CI=13.9–25.1%) and women who would be very pleased if they found out they were pregnant (23.3%, 95% CI=19.7–27.5%).

We found many of these differences in contraceptive use patterns to be statistically significant in our regression models (Table 2). Compared to women aged 25–29, adolescents were more likely to use a method each sexually active month (aOR=2.45; 95% CI=1.61–3.75) and less likely to be non-users (aOR=0.11; 95% CI=0.03–0.40). On the other hand, women aged 30–34 and 40–44 were more likely to forgo contraceptive use during all sexually active months (aOR=1.66, 95% CI=1.06–2.61; aOR=2.29, 95% CI=1.25–4.18).

Formerly and never married individuals were more likely to use contraceptives than married individuals (aOR=2.61; aOR=2.29, 95% CI=1.25–4.18). Women who had breaks in health insurance during the last year were less likely to have used contraception every month compared to consistently insured women (aOR=0.70; 95% CI=0.50–0.99).

Engaging in more than two male–female sexual partnerships was associated with lower odds of monthly contraceptive use (aOR=0.49; 95% CI=0.31–0.79) and higher odds of using contraceptives during some but not all sexually active months (aOR=2.25; 95% CI=1.37–3.64). Women who were sexually active fewer than
they were to become pregnant at the time of the interview, all other groups were significantly less likely to be non-users and more likely to be monthly contraceptive users. Of women who would be very upset if they became pregnant, 23% experienced at least one sexually active month in the past year without using contraception (not shown). At the same time, over half (59%) of women who would be very pleased if they became pregnant used contraception in every sexually active month.

### 3.2. Contraceptive use patterns by methods used

Most women who used contraception (excluding non-users) did so every sexually active month (82%) (not shown). Those who used LARC or hormonal contraception were more likely to use a method every sexually active month than their counterparts who only used other methods (Table 3). Condom users, however, were less likely to use a method each month than women whose contraceptive use did not include condoms (79% vs 85%; aOR = 0.71). Of note, nearly half (46%) of all contraceptive users employed use of more than one type of method in the past year (not shown). Women using multiple modes that included LARC or hormonal methods were more likely to be monthly users than all others (87% vs 80%; aOR = 1.89). Conversely, women using multiple types not including LARC or hormonal methods were less likely to use monthly than other contraceptive users (73% vs 84%; aOR = 0.49).

Among multiple method type users (n = 1267), more than 1 in 4 used some combination of hormonal methods and condoms (Fig. 1). The most common combinations included condoms, withdrawal, and/or hormonal methods. Multiple method type use encompasses a wide range of contraceptive behaviors including dual use, switching and gaps in use (not shown).

### 4. Discussion

Our findings are in line with prior research [3,10]. Over a one-year period, nearly three-quarters of women used a contraceptive method every month they had sex; 16% used a method some months but not others, and 12% did not use contraception in any month they were sexually active. Also similar to prior studies [6], we found that a substantial minority of respondents (46%) used more than one contraceptive

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1. Analyses are limited to non-surgically sterilized women who had sex in the last year and had used contraception.

2. Multivariable analysis controls for all of the following variables: age at interview, level of education, race/ethnicity, relationship status, poverty status, insurance coverage, number of male partners in the last 12 months, number of months sexually active and reaction to becoming pregnant.

12 months were less likely to use a method every sexually active month compared to women who were sexually active for the entire year (aOR = 0.42, 95% CI = 0.31–0.56; aOR = 0.41, 95% CI = 0.29–0.59).

Feelings about becoming pregnant were also related to contraceptive use patterns. Compared to women who would be very pleased if...
method type over the course of the year. In fact, this group was larger than any who used only one method type over a 12-month period. Some of the associations we found were unexpected. Even after controlling for other characteristics, among sexually active, non-sterile women who have used a contraceptive method, adolescents were most likely to use a method every month they had sex compared to older age groups and also had the lowest levels of nonuse over the 12-month period. Adolescents are less likely than older individuals to be in long-term marital or cohabiting relationships, and, in turn, less likely to be trying to get pregnant [11]. While the multivariate analyses included a measure of sexual activity, it may have been too crude to account for these dynamics. It is important to interpret this result in the context of the analytic sample, as we excluded surgically sterile women who fall mostly into older age groups and may otherwise be considered monthly contraceptive users.

It is perhaps not surprising that inconsistent insurance coverage was associated with a lower likelihood of using a contraceptive method in every month — for example, loss of insurance may make prescription methods unaffordable. That individuals with no coverage did not differ from those with consistent coverage may be due to the fact that they had access to contraception via Title X or other programs intended to provide access to economically disadvantaged individuals [12,13].

Almost half of contraceptive users (46%) relied on more than one method type in the year before interview. These dynamic contraceptive strategies are often not captured in cross-sectional studies. Our results suggest that women often choose to combine or change methods over time, and, with the exception of LARC users, such women are more likely to use contraception on a monthly basis than if they were to use any single method type. We recognize, however, that monthly contraceptive use is not necessarily a superior outcome, considering that we lack any information about respondents’ ideal contraceptive use or non-use.

Our analysis has several shortcomings. Some covariates measure response characteristics at time of interview that may have changed over the year prior to interview. Pregnancy desire in particular is a quickly fluctuating factor that affects contraceptive use patterns [14]; however we were unable to determine if individuals were seeking, or at least not avoiding, pregnancy over the 12-month period, and our inclusion of reaction to becoming pregnant at the time of interview is a weak proxy. It is possible that some methods, such as withdrawal, may be under-reported [15] and this would inflate observed levels of non-use. Our study only assessed whether individuals used a method in a month they had sex and did not assess whether they used methods correctly or every time they had sex. Finally, the information on contraceptive use and sexual activity were collected retrospectively. Though we limited our analysis to a 12-month time period, some recall bias may have been present or some information may have been inaccurately reported.

Contraceptive use and method choice patterns are dynamic and change over a relatively short time period for many women. Health care providers should take these dynamics into account when communicating with patients about contraception options and pregnancy planning.

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