Original Research Article in *Fertility and Sterility* – Author Version

Changes in use of long-acting contraceptive methods in the U.S., 2007–2009

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Received 4 April 2012. Revised 18 June 2012. Accepted 19 June 2012. Available online 13 July 2012.

Volume 98, Issue 4 , Pages 893-897, October 2012

doi:10.1016/j.fertnstert.2012.06.027

Abstract available from *Fertility and Sterility* here.

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CAPSULE

The proportion of U.S. contraceptors using the IUD and implant increased from 2.4% in 2002 to 3.7% in 2007 and 8.5% in 2009, more than offsetting decreases in sterilization.

ABSTRACT

Objectives: To examine trends in use of long-acting reversible contraceptive (LARC) methods — the IUD and implant — and the extent to which these methods have replaced permanent sterilization and less-effective short-acting methods.

Design: We tabulated data from female survey respondents overall and by demographic subgroups. We performed t-tests of the differences in the proportions of female contraceptors using LARC in 2007 and 2009. We also looked at use of LARC, sterilization, other methods and no method among women at risk of unintended pregnancy.

Setting: Secondary analysis of the 2002 and 2006–2010 National Survey of Family Growth, an in-home, nationally representative survey of women 15–44.

Patients: All female respondents to the surveys.

Interventions: None.

Main outcome measures: Current use of LARC methods in 2009, and change in use from 2007.

Results: The proportion of contraceptors using LARC increased significantly from 2.4% in 2002 to 3.7% in 2007 and 8.5% in 2009. The increase occurred among women in almost every age, race, education and income group. Among women at risk of unintended pregnancy, increases in LARC use more than offset decreases in sterilization.

Conclusions: LARC methods (primarily IUDs) are contributing to an increase in contraceptive effectiveness in the United States.

Key Words: Long-acting contraception, IUD, implant, unintended pregnancy, United States

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INTRODUCTION

Unintended pregnancy is a seemingly intractable problem in the United States. The unintended pregnancy rate of 52 per 1,000 women of reproductive age in 2006 is high compared to many other industrialized countries, and about half of all pregnancies are unplanned (1). Many reproductive health researchers, advocates and clinical authorities have argued for increased use of long-acting reversible contraceptive (LARC) methods such as IUDs and implants among women of all ages as a way to reduce unintended pregnancy. LARC methods require little intervention on the part of the user and do not interfere with sex. The failure rate for IUDs is about equal to permanent sterilization, and the failure rate for the implant is actually lower (2). These are thus two of the most efficacious contraceptive methods available. They are also two of the most cost-effective methods currently available — IUDs can be used for up to 10 years and implants for up to three, allaying high upfront costs through long-term benefits to yield a much more economical method of preventing unintended pregnancy (3).

Unintended pregnancy rates are particularly high among sexually active teenagers and women 20–24 years (1;4). This is in part due to changes in Americans' sexual and relationship patterns. The median age at first marriage has shifted later, whereas timing of sexual initiation has changed little. As a result, the period between first sex and first birth has lengthened, exposing younger women to greater risk of unintended pregnancy and associated morbidities (5;6). However, long-acting methods have traditionally been seen as appropriate only for women who have completed their childbearing. For example, the Mirena IUD is not labeled for nulliparous women. These constraints have resulted in low use of these methods by young women in the past and greater use of less-effective methods such as the pill and condom.

The lengthening of the typical time between first sex and first birth allows for a reframing of this period. Rather than focusing only on condoms and pills, the period before childbearing can now be considered suitable for long-acting methods. Reproductive health experts and clinical authorities have attempted to convey this point. Guidelines from the American Congress of Obstetricians and Gynecologists (ACOG) cite these methods as "first-line" choices for all women and encourage their use by adolescents and young adults seeking longer acting methods (7). In addition, revised ACOG recommendations for less frequent Papanicolaou smear screenings (8), coupled with adolescents' and young adults' declining use of reproductive health services (9), suggest the need for methods that do not rely on frequent or repeat visits to a health care provider to ensure better reproductive health outcomes. Furthermore, the Center for Disease Control and Prevention's recently released Medical Eligibility Criteria for Contraceptive Use guidelines concluded after extensive scientific review that IUDs are safe and effective for younger and nulliparous women (10).

The above paragraphs describe one potential benefit of shifting to long-acting methods: increased contraceptive protection for those who shift away from less-effective methods. There is a second potential benefit for women who are not comfortable with sterilization. Women younger than 30 years at the time of sterilization report especially high levels of post-sterilization regret, and are almost twice as likely to report regret as those older than 30 years after adjustments for other factors (11). Greater use of long-acting methods among younger parous women could reduce the incidence of sterilization regret.

American women and men may be responding to this increased clinical focus as well as increased public awareness of these methods through advertising (2): Use of long-acting contraception increased from 2.4% of all method use in 2002 to 5.6% in 2006–2008 (12). Still,

LARC use remains relatively low among contraceptive users, and these methods may be particularly underused by young women. In this report, we analyze newly available data to determine whether this pattern has continued, to identify groups where the change has been the most prominent, and to look at whether LARC is taking the place of sterilization or less-effective methods.

MATERIALS AND METHODS

We examined data from the 2002 and 2006–10 National Surveys of Family Growth (NSFG), nationally representative in-home surveys of women aged 15–44 years and arguably the best available sources of information on US contraceptive use. The NSFG also surveys men, but our analyses were limited to female respondents because their responses to questions about contraceptive use are considered to be more accurate. We previously published estimates using a partial version of this dataset, the 2006–08 NSFG (12). This earlier version contained data from interviews with 7,356 women between June 2006 and December 2008. Since that time, a complete version of the dataset has been released that contains 12,279 interviews conducted from June 2006 to June 2010. Unlike the previous version, the new data can be weighted into two 2-year periods: June 2006 to June (not December) 2008 and July 2008 to June 2010. The reference years represented by these two periods are 2007 and 2009, respectively, and the numbers of respondents were 5,851 and 6,428, respectively. In this article, we present estimates for these two periods. Institutional Review Board approval was not necessary for this secondary analysis of deidentified public-use NSFG data.

We defined long-acting methods as those that last longer than three months, which includes the IUD and implant but excludes the injectable. The NSFG does not distinguish between

specific types of IUDs or implants. We tabulated the proportion of all contraceptive users who were currently using long-acting methods at the time of interview, for all women and by several demographic and reproductive health characteristics. We also looked at the proportion of long-acting method use that each of these two methods represented. We performed t-tests of the difference between the proportions reporting use of LARC in 2007 and in 2009.

The analyses used all current contraceptors as the denominator. To determine how changes in LARC use have affected method use overall, we conducted a second set of analyses on a larger sample: all women at risk of unintended pregnancy, including those who were not currently using any method. Among this group, we looked at how changes in LARC use related to use of nonreversible sterilization, other methods, and no method over the same period, by age and parity. We performed t-tests comparing the proportions using each of these method groups in 2007 and 2009, which allowed us to compare the proportion using a specific method, as well as χ^2 tests comparing the overall distributions in 2007 and 2009.

The NSFG distinguished between male and female sterilization, but did not distinguish between different types of female sterilization (e.g., tubal ligation vs. tubal occlusion). We report all those relying on female or male sterilization as one group. “Other” methods include all other hormonal and barrier methods, as well as fertility awareness methods.

RESULTS

The proportion of all contraceptors using LARC increased significantly and substantially between 2007 (3.7%) and 2009 (8.5%; Table 1). As in the past, LARC use continued to be nearly synonymous with IUD use, although implant use approached 1% of contraceptors in 2009.

The proportion of contraceptors using LARC increased among almost every subgroup. Women of almost all ages, races, marital and educational statuses, income levels, and religions saw significant increases. Increases were also observed for both women who had visited a family planning provider in the past year and women who had not, as well as for both parous and nulliparous women. The highest levels of use were seen among women aged 25–39, married and cohabiting women, women covered by Medicaid, and women with a religious affiliation other than Catholic or Protestant and those with no affiliation. Even among women aged 15–19, use of LARC tripled from 1.5% to 4.5%; virtually all of this increase occurred among women aged 18–19 years. Discrepancies by race and ethnicity seen in 2002 continued through 2007 but were largely eliminated by 2009. The latest figures also show no real differences by income level. Women born in the United States appear to be "catching up" to women born outside the United States, who already had a higher level of use, likely due to a greater prevalence of these methods in Mexico.

The increase in LARC use was only partially accounted for by decreases in the proportion of women who were sterilized (Fig. 1). Among all women at risk of unintended pregnancy (including those who were not using any method), the proportion who were currently relying on sterilization declined from 34% to 32% between 2007 and 2009, but this change was not statistically significant, and was just a 2% decline compared with the 4% increase in LARC users. The proportion of at-risk women using any method increased by about 1% over the period, an increase that appears to be due to increased LARC use.

Among women under 30 years, negligible decreases in sterilization use were more than offset by increases in LARC use. This was also true for older women, although their level of sterilization use is much higher. For women younger than 25, we found increases in overall

method use, which appear to be driven by LARC. For most 5-year groups, there was an increase in the percentage of women using highly effective methods (either sterilization or LARC).

Analyses by age and parity together (Fig. 1) echo Table 1 in showing that most of the increase in LARC use has taken place among women with at least one child. However, among parous women, the increase was greater among those younger than 30 years. The percentage of women who used LARC methods increased from 8% to 17%, while the percentage relying on sterilization declined from 58% to 51%. Parous women older than 30 years continued to rely heavily on sterilization.

DISCUSSION

Use of LARC methods in the United States increased significantly between 2007 and 2009, a trend primarily driven by the use of IUDs, which have been on the market longer than the implant. The more popular levonorgestrel IUD (Mirena, Bayer) was approved for use in 2000, and since being marketed in 2001 has seen a heavy direct-to-consumer advertising campaign. Although the copper IUD (ParaGard, Teva Women's Health) has been available in the United States since 1988, its manufacturer's marketing efforts have also increased in more recent years. Meanwhile, the implant available to US consumers during this period, Implanon, was not approved until 2006, and may not have benefited from the same levels of awareness among American women.

Despite the increases reported in the present article, LARC use in the United States is among the lowest of any developed country (13;14). Data for the mid-to-late 2000s indicate that these two methods are used by 15% of contraceptors worldwide, including 11% of British users, 23% of French users, 27% of Norwegian users, and 41% of Chinese users. The majority are IUD

users (15). The US rates of LARC use are much lower than our European counterparts likely because sterilization is more common in the United States than in many other developed nations (15), and because Mirena (Bayer) is not labeled for use by nulliparous women in the United States. However, increases in LARC use would increase overall contraceptive effectiveness only to the extent that the methods substitute for less-effective methods rather than permanent sterilization. The increase in LARC use in 2009 more than offset the decrease in sterilization use for the same time period.

In the context of high national unintended pregnancy rates, the substantial increase in use of these highly effective, long-acting methods between 2007 and 2009 is a promising indicator, especially if this increase marks the beginning of a larger upward trend in LARC use. Increasing LARC utilization could diversify the overall method mix and present women with options that better meet their contraceptive needs at different life stages. Because unintended pregnancy rates are highest among women 18–24 and younger sexually active teens, the displacement of short-term methods by more effective LARC methods represents enhanced ability to prevent unintended pregnancy and/or delay childbearing among this group. Among nulliparous women, the method allows for effective contraception without preventing future fertility, and those with children avoid the potential for regret that some women experience after undergoing sterilization. As such, providers should rely on theCenter for Disease Control and Prevention's Medical Eligibility Criteria for Contraceptive Use guidelines to ensure that these methods are part of the method mix available to all women, and especially young and nulliparous women, who have so far had smaller increases in use of these methods.

Women who had experienced one or two live births, and particularly those under 30 years, saw some of the largest increases in LARC use in 2009, which may indicate a provider-level bias

for LARC methods toward women who have already reached their fertility goals and towards cohabiting and married women, who are more likely to be monogamous. However, older women may also benefit from the increased focus on LARC as simpler and safer than sterilization, without the risk of regret. For women aged 35–39, who may have experienced a compression of their childbearing years into a later and shorter time period, thus reaching their fertility goals as they near the end of their fecund period, the increased use of both LARC and sterilization underscores the deliberateness of women's family planning decisions and the need for a variety of effective methods at all ages.

When used for their full 3- to 10-year term, LARC methods offer exceedingly economical options for preventing unintended pregnancy. The high level of LARC use among women on Medicaid (16) suggests that women will make use of these methods if they can afford them. Insurance plans should facilitate access to these methods, and in fact, a provision of the Affordable Care Act requires most plans, starting in August 2012, to cover the full range of contraceptive methods, including LARC, with no patient cost-sharing. This requirement could eliminate the economic barriers for many women who might be interested in using LARC. Public education efforts should highlight these methods' safety and efficacy, as established by a substantial body of evidence, in order to increase "mindshare" — a willingness to consider these methods along with condoms, pills, and other choices — among women and men of all ages. Although no method is right for every woman or couple, increased use of LARC methods could enable more American women to have a method that best fits their reproductive goals.

ACKNOWLEDGMENTS

The authors thank David Hubacher and Susheela Singh for reviewing and commenting on this manuscript.

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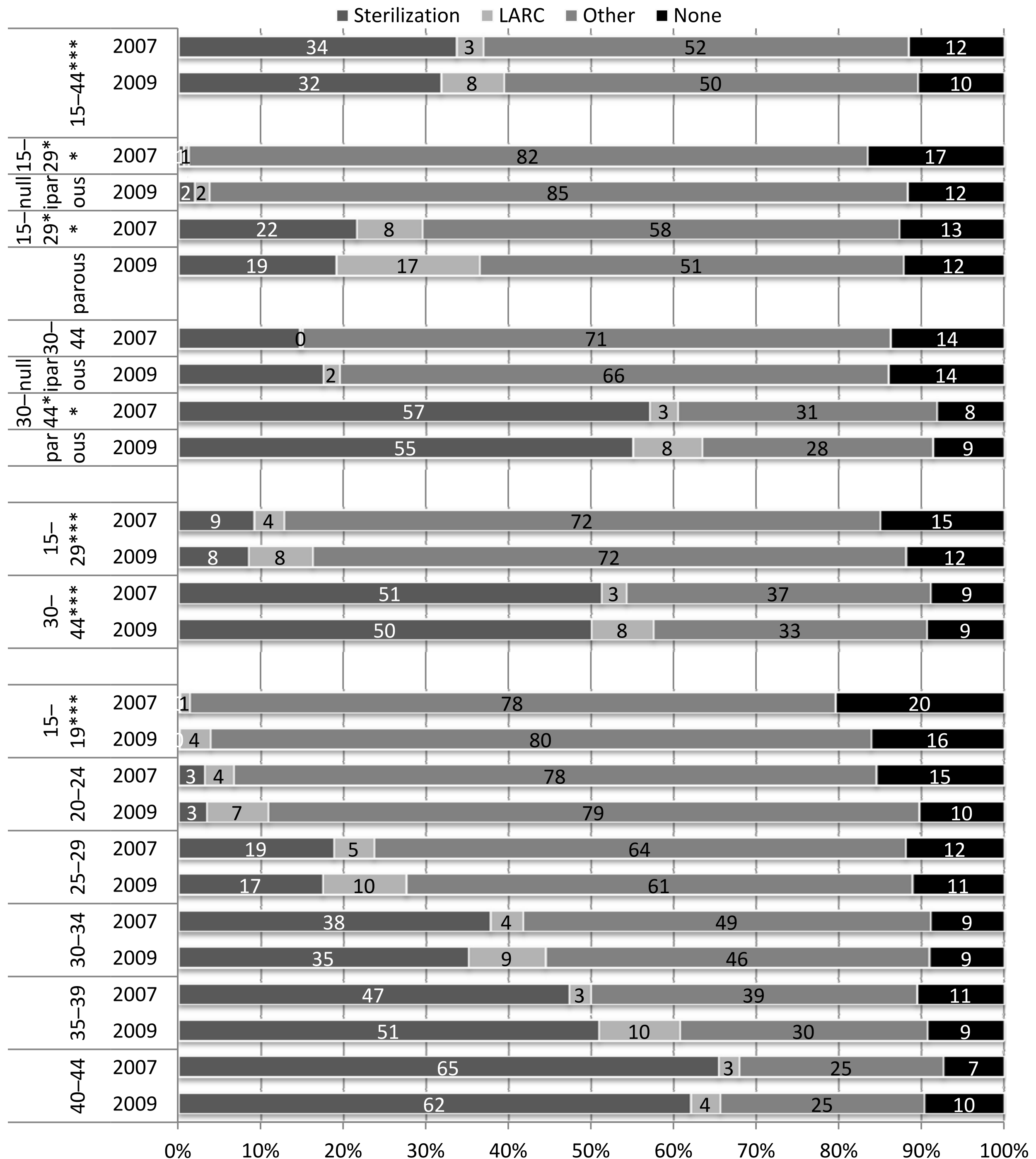
Table 1. Percentage of current contraceptors who are currently using long-acting reversible contraception (LARC), including intrauterine devices (IUDs) and implants, by selected demographic characteristics, 2002, 2007 and 2009; and p-values from t-tests of the difference between 2007 and 2009

Characteristic	**2002**	**2007**	**2009**	**p-value '07 vs '09**
All	2.4	3.7	8.5	**<.001**
IUD	2.0	3.5	7.7	**<.001**
Implant	0.4	0.1	0.8	**.003**
Age				
15–19	0.3	1.5	4.5	.077
15-17	0.6	0.8	0.6	.751
18-19	0.0	1.9	6.6	**.007**
20–24	1.9	4.2	8.3	**.018**
25–29	4.8	5.5	11.4	**.004**
30–34	3.8	4.4	10.3	**.003**
35–39	1.7	3.0	10.8	**<.001**
40–44	1.4	2.7	4.0	.354
Race/ethnicity				
Non-Hispanic white, single race	1.6	3.4	8.3	**<.001**
Non-Hispanic black, single race	1.5	2.3	9.2	**<.001**
Non-Hispanic other or multiple race	2.9	4.2	9.2	.082
Hispanic	7.1	5.5	8.5	**.021**
Born outside the U.S.				
No	1.6	3.1	8.3	**<.001**
Yes	7.5	6.9	9.5	.199
Relationship status				
Not married or cohabiting	1.4	1.9	5.7	**.001**
Married	3.1	5.1	10.2	**<.001**
Cohabiting	2.5	2.2	10.2	**<.001**
Education				
No	4.2			
Yes	2.3			

Education				
Not high school graduate	3.3	1.3	7.3	**<.001**
High school graduate or GED	2.5	4.5	7.9	**.023**
Some college	2.2	3.9	9.1	**.001**
College graduate	2.1	4.0	9.2	**.002**
Characteristic	**2002**	**2007**	**2009**	**p-value '07 vs '09**
Employment				
Not working full-time	2.4	4.0	9.2	**<.001**
Working full-time	2.5	3.3	7.6	**<.001**
Income as a percent of poverty				
<100%	4.7	3.4	8.1	**.003**
100–199%	3.0	4.1	9.6	**.001**
200–299%	1.9	4.1	7.7	**.014**
≥300%	1.5	3.3	8.3	**<.001**
Current insurance coverage				
Private	1.9	3.1	7.1	**<.001**
Medicaid	3.8	4.6	11.5	**.002**
Other	1.0	5.5	8.1	.489
None	4.5	4.7	10.6	**.001**
Religious affiliation				
None	2.8	5.6	9.4	.086
Catholic	3.3	3.6	7.6	**.005**
Protestant	1.9	2.5	7.6	**<.001**
Other	2.2	6.1	16.1	**.018**
Number of live births				
0	0.6	0.7	2.1	**.035**
1–2	3.4	6.0	15.0	**.000**
3 or more	3.0	3.4	6.3	**.021**
Visited clinic in past 12 months for family planning services?				
No	1.6	2.2	6.1	**<.001**
Yes	4.4	7.1	13.8	**.002**

Figure 1. Among all women at risk of unintended pregnancy, percent using each type of method, by age, 2007 and 2009



Asterisks indicate significant difference between 2007 and 2009 at *p<.05, **p<.01, ***p<.001.