Data Brief ■ No. 4 ■ June 2020

Reproductive Health

Delaware Profile 2012-2018

The data brief provides an overview of reproductive health among women of childbearing ages 15 to 44 years of age in Delaware. It uses the Behavior Risk Factor Surveillance System and Pregnancy Risk Assessment Monitoring System to assess progress in Delaware's efforts on reproductive health activities and strategies. As per the WHO's definition, "reproductive health… implies that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so…Implicit in this are the right of men and women to be informed of and to have access to safe, effective, affordable and acceptable methods of fertility regulation of their choice, and the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant" [1].

Overview

According to the CDC, one of the cornerstones of reproductive health is safe motherhood, which begins "before conception with proper nutrition and a healthy lifestyle and continues with appropriate prenatal care and the prevention and treatment of complications when possible" [2]. One in two women of reproductive age report at least one risk factor, such as smoking or obesity, that negatively impact future pregnancies [3].

The American College of Obstetrics and Gynecology (ACOG) in 2005, the Centers for Disease Control and Prevention (CDC) in 2006, and the American Academy of Family Physicians (AAFP) in 2007 recommended that physicians incorporate reproductive life plans into primary care for women of reproductive age, and that, based on a woman's individual goals, she receive personalized contraception and/or preconception care [4]. One of the priority areas of reproductive health is to increase the percentage of pregnancies that are intended [2] as "births that follow unintended

Importance

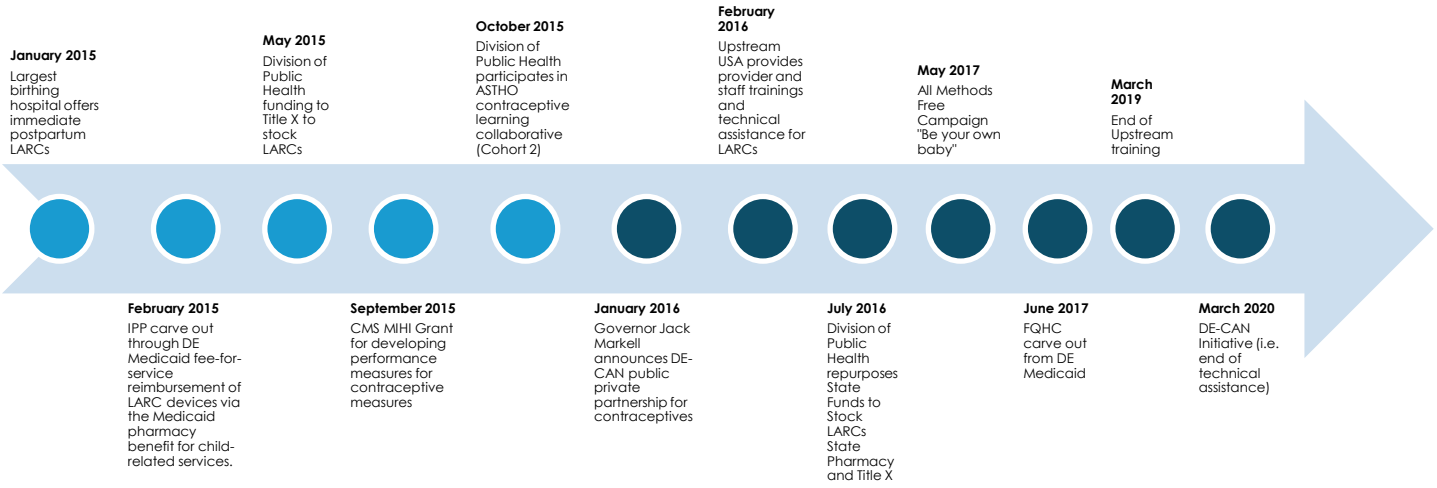
Key findings

- As per the BRFSS results, between 2017 and 2018, there was about seven-percentage point increase in use of moderately effective methods of contraception (14.7% to 21.4%) in Delaware. Approximately 12,436 women at risk for unintended pregnancy indicated using moderately effective methods in 2018, as compared to 8,435 women in 2017.
- As per the PRAMS results, in Delaware, during 2012 to 2018, there was a 17% increase in the percent of Delaware women with a recent live birth indicating that their pregnancy as "wanted then or sooner" and during the same time-frame, there was approximately 29% decrease in the percent of women indicating that their pregnancy as "wanted later or unwanted."
- Among Delaware women who had a live birth, there was a 107% increase in reversible methods of contraception during 2012-2018. There was an 89% increase in intrauterine devices and 162.5% increase in use of contraceptive implants.

conceptions have been found to be associated with increased risk of many negative health and social outcomes, independently or because of their association with women's disadvantaged social and economic status" [5]. Studies have also reported increased risks of physical and mental health in children of women who have unplanned pregnancies and as such several U.S. policies and programs focus on reducing the rate of unintended pregnancy and associated adverse health outcomes [6]. It is well-known that half of all pregnancies in the United States are unintended and contribute to significant morbidities among women of childbearing age (15-44 years) as well as costs to the health care system [7, 8].

Pregnancies comprise of a live birth, induced termination of pregnancy or abortion, and miscarriage or a fetal loss. Most recent state level estimates on unintended pregnancy suggests that Delaware had one of the highest unintended pregnancy rates [9]. This data brief provides an overview of Delaware's efforts in reducing the rate of unintended births through variety of strategic efforts that include public-private partnerships, participation in learning collaboratives, and state-based Title X programs. The data brief draws from two specific surveillance systems from the CDC: Behavior Risk Factor Surveillance System (BRFSS) and Pregnancy Risk Assessment Monitoring System (PRAMS). The details of these systems are found elsewhere [10, 11]. An important difference in these surveillance systems is that BRFSS focuses on the adult non-institutionalized population of (18 and older), while PRAMS specifically focuses on women who recently had a live birth. Figure 1 provides a timeline of initiatives that directly and/or indirectly addressed reproductive health.

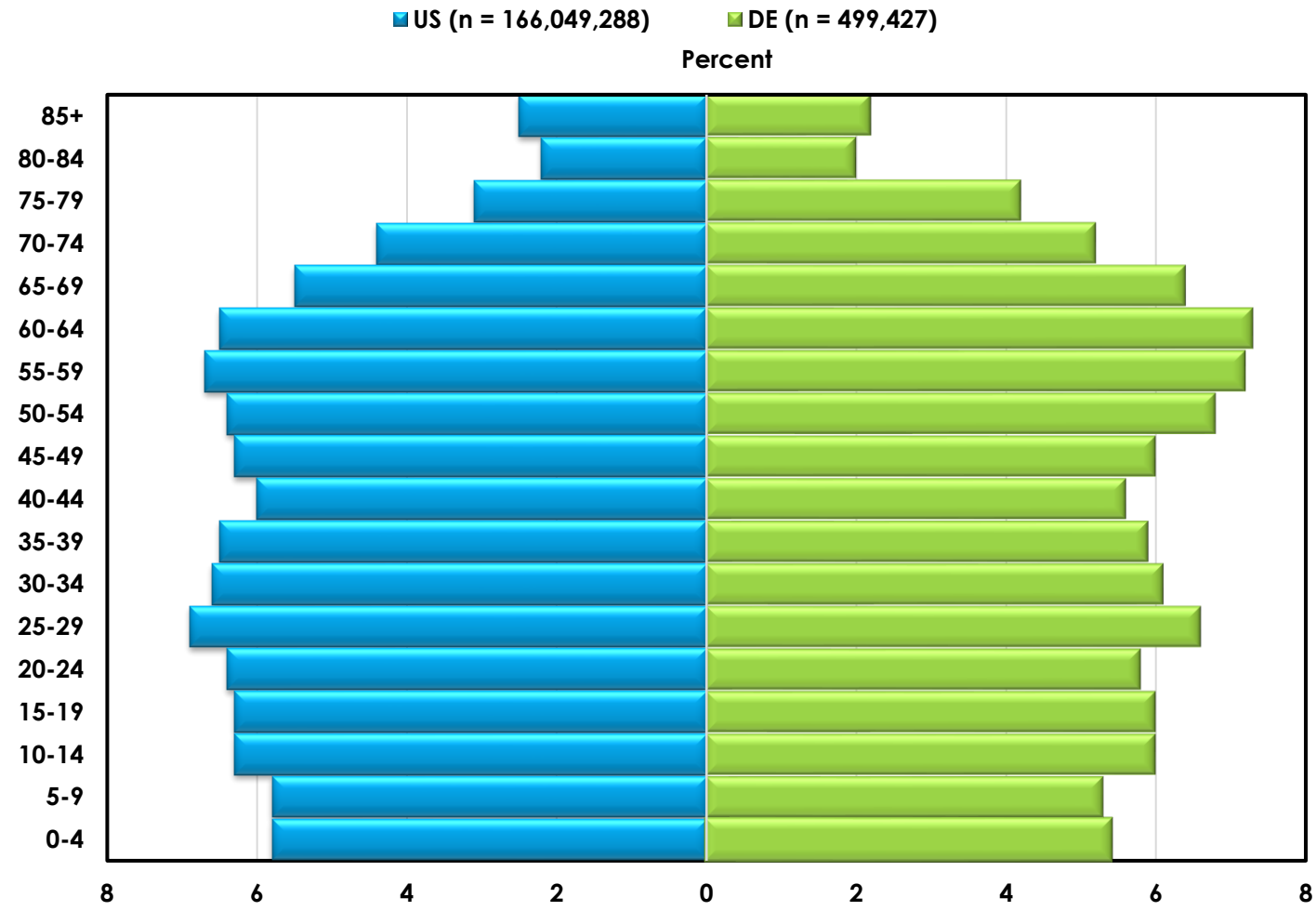
Figure 1. Timeline of initiatives addressing reproductive health in Delaware



Notes: Light blue represents 2012-2015 "pre-intervention" time-period and dark blue 2016 and later the "post-intervention" time-period. Long acting reversible contraceptives (LARCs) include contraceptive implants such as Implanon® and Nexplanon® and intrauterine devices (IUDs) such as Paragard®.

To understand Delaware's efforts with regards to reproductive health it is important to understand the demographic context of Delaware. Figure 2 displays the population distribution by age for Delaware and the U.S.

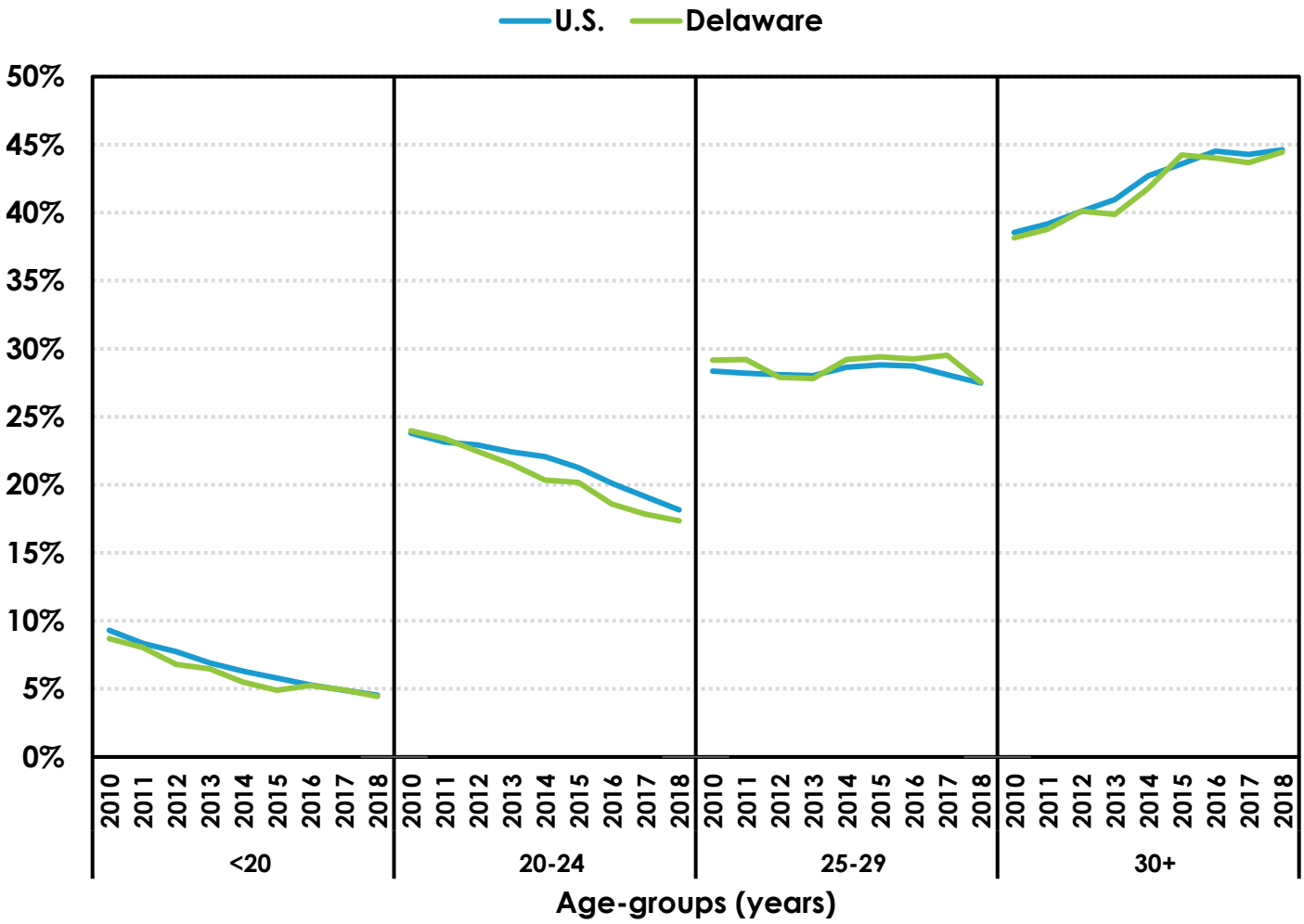
Figure 2. Population distribution of women in the U.S. and in Delaware, 2018



Source: American Community Survey, 2018 single-year estimates

While Delaware's population seems to mirror that of the U.S., there are subtle but important differences in the age-distribution of women of childbearing ages (i.e., 15-44 years). For instance, there is three-tenths of one percent difference between the U.S. (6.3%) and Delaware (6.0%), among women 15-19 years of age. However, there is a six-tenths of one percent difference between the U.S. (6.4%) and Delaware (5.8%) among women, 20-24 years of age, and five-tenths of one percent difference between the U.S. (6.6%) and Delaware (6.1%) among women, 30-34 years. These differences in the population distribution perhaps are attributable to some fertility differences in women in specific age-groups as well as access to contraceptive methods. Figure 3 displays the annual U.S. and Delaware birth trends for the 2010-2018 time-period.

Figure 3. Live birth trends in the U.S. and in Delaware by age-groups, 2010-2018



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2010-2018

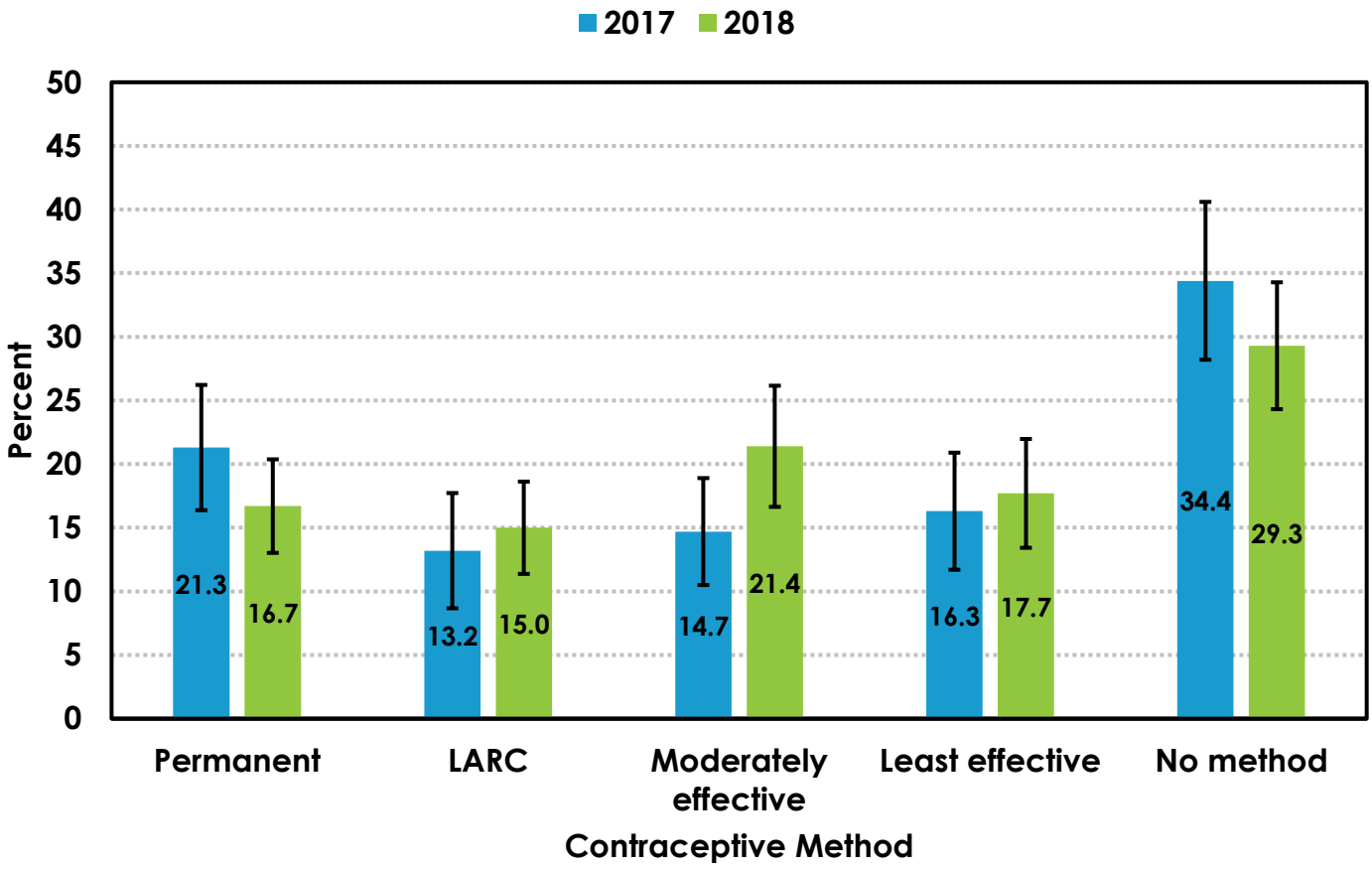
While birth rates for women less than 25 years old have generally declined during the past decade, the birth rates for women older than 30 have increased and birth rates for women 25-29 years of age have remained relatively stable.

Contraceptive use

Contraceptive use is captured in the BRFSS through the optional preconception health and family planning module and is available to states for inclusion based on state priorities. Because this is an optional module and contingent upon state participation, no national estimates are available. Hence, only Delaware data are shown. In the optional module eligible women (i.e., 18-49 years of age, who did not have an hysterectomy, who is not pregnant) are asked "*What did you or your partner do the last time you had sex to keep you from getting pregnant?*" with response options: 1) female sterlization; 2) male sterlization; 3) contraceptive implant (i.e., Nexplanon, Implanon, etc.); 4) Levonorgestrel (LNG or contraceptive implant (e.g. Mirena); 5) copper-bearing IUD (e.g. Paragard);

6) IUD unknown type; 7) shots (e.g. Depo-Provera); 8) birth control pills, any kind; 9) contraceptive patch; 10) contraceptive ring; 11) male condoms; 12) diaphragm, cervical cap, sponge; 13) female condoms; 14) not having sex at certain times (rhythm or natural family planning); 15) withdrawal; 16) foam, jelly, film, or cream; 17) emergency contraception (morning after pill); 18) other method; 19) don't know/not sure; 20) refused. Responses 1 and 2 are considered "permanent" methods, and 3, 4, 5, and 6 are considered "reversible" or long acting reversible methods (LARCs). Both permanent and LARC methods when combined are referred to as "most" effective methods, while response 7, 8, 9, and 10 are considered "moderately" effective methods. Other responses are coded either "least" or no method. Figure 4 displays contraceptive use among Delaware women 18-49 years of age for 2017-2018 from the BRFSS dataset.

Figure 4. Percentage of contraceptive use* among Delaware women 18-49 years, 2017-2018



Source: Delaware Department of Health and Social Services, Division of Public Health, DE BRFSS 2017-2018 data. Interpret data with caution when the 95% confidence intervals (CIs) are wide.
**Did you or your partner do anything the last time you had sex to keep you from getting pregnant? (Yes/No) ...If "YES" then...what did you or your partner do the last time you had sex to keep you from getting pregnant?*
DENOMINATOR: Population at risk of unintended pregnancy
EXCLUDES: Women who report they are currently pregnant, would not mind being pregnant or are seeking to be pregnant; Women who are not sexually active with a male partner (not sexually active or same sex partner); Women who have had a hysterectomy.

Between 2017 and 2018, there were increases in use of LARCs (13.2% to 15.0%) and moderately effective methods (14.7% to 21.4%) and approximately five percentage point decrease (34.4% to 29.3%) in no method and permanent methods (21.3% to 16.7%) among women 18 to 49 years of age. There was no statistically significant difference in any other category except the "moderately" effective method category (i.e.; 2017 prevalence 14.7%; 95% CI: 10.5-19.0 vs. 2018 prevalence 21.3%; 95% CI: 16.6-26.1). The seven-point difference in the "moderately" effective method was statistically significant p = 0.04 Rao-Scott Chi-square statistic 4.17(1). Approximately 12,436 (95% CI: 9,349-15,522) women at risk for unintended pregnancy indicated using moderately effective methods in 2018 as compared to 8,435 (95% CI: 5,894-10,977) in 2017 in Delaware.

To better understand the differences in socio-demographic characteristics of women 18 to 49 years of age, 2017-2018 BRFSS data were combined for adequate sample sizes. Table 1 provides contraceptive use prevalence rates stratified by age, race and ethnicity, education, marital status and county.

As expected, permanent methods such as male/female sterilization increased with age. For instance, 20% (95% CI: 14.8-26.0) of women 28 to 37 years of age indicated having used permanent methods as compared to 29% (95% CI: 23.9-34.8) of women 38 to 49 years of age. There were small differences in LARC use among women with different age-groups. However, use of moderately effective and least effective methods, were higher in younger women as compared to older women. For instance, 28% (95% CI: 19.6-35.7) of women 18 to 27 years of age as compared to 21% (95% CI: 15.2-25.8) of women 28 to 37 years and 8% (95% CI: 5.0-11.7) of women 38 and older indicated using moderately effective methods. Similarly, 21% (95% CI: 14.3-28.2) of women 18 to 27 years of age as compared to 18% (95% CI: 12.7-23.8) of women 28 to 37 years and 13% (95% CI: 8.5-16.6) of women 38 and older indicated using least effective methods.

Except for use of least effective methods and no method category, white (non-Hispanic) women had higher prevalence of permanent, LARC, and moderately effective methods. Although the relative standard error for blacks (non-Hispanic) was large (27%), the prevalence of LARCs was lowest among black (non-Hispanic) women (9.3%; 95% CI: 4.2-14.3) as compared to other race and ethnic groups. No method was highest among Hispanic women (40.3%; 95% CI: 31.7-49.0), followed by blacks non-Hispanic (35.9%; 95% CI: 26.9-44.8). Use of the least effective methods of contraception was higher among other race and ethnic groups (28.7%; 95% CI: 12.2-45.3), albeit the large relative standard error (~30%) makes the estimate unreliable.

With the exception of no method, women with higher levels of education had higher prevalence of most effective (permanent and LARCs), moderately effective, and least effective methods. Prevalence of moderate (24.1%; 95% CI: 17.7-30.5) and least effective (23.6%; 95% CI: 17.3-30.0) methods was higher among never married women, and no method was highest (35.4%; 95% CI: 27.4-43.4) among women with other statuses (i.e., divorced, separated, partner, etcetera). Prevalence of no method was also highest in women who indicated their residence as Sussex county (39.2%; 95% CI: 31.2-47.2).

Table 1. Contraceptive use prevalence among women 18 to 49 years of age in Delaware, 2017-2018

Characteristics	Permanent†		Long acting reversible contraceptives (LARC)‡		Moderately effective¶		Least effective§		No method	
	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)
Age (in years)										
18 to 27	10 (1.3)	3.2 (0.7-5.7)	30 (2.7)	13.0 (7.6-18.4)	57 (4.1)	27.7 (19.6-35.7)	55 (3.5)	21.2 (14.3-28.2)	72 (4.8)	34.9 (25.4-44.4)
28 to 37	71 (2.8)	20.4 (14.8-26.0)	52 (2.7)	15.6 (10.3-20.9)	81 (2.7)	20.5 (15.2-25.8)	64 (2.8)	18.2 (12.7-23.8)	103 (3.0)	25.2 (19.2-31.2)
38 to 49	125 (2.8)	29.3 (23.9-34.8)	59 (2.2)	13.3 (9.1-17.5)	35 (1.7)	8.3 (5.0-11.7)	56 (2.0)	12.5 (8.5-16.6)	183 (3.0)	36.5 (30.7-42.3)
Race and ethnicity										
White, non-Hispanic	130 (2.2)	21.5 (17.2-25.8)	82 (2.1)	15.8 (11.6-19.9)	103 (2.2)	19.5 (15.2-23.9)	82 (1.9)	14.3 (10.7-18.0)	163 (2.8)	28.9 (23.4-34.3)
Black, non-Hispanic	33 (3.3)	16.8 (10.4-23.3)	18 (2.6)	9.3 (4.2-14.3)	29 (3.6)	17.0 (10.0-24.0)	38 (3.9)	21.0 (13.5-28.6)	74 (4.6)	35.9 (26.9-44.8)
Hispanic	32 (2.8)	12.8 (7.2-18.4)	33 (3.1)	15.1 (9.1-21.2)	32 (3.2)	15.3 (9.0-21.6)	41 (4.2)	16.5 (8.2-24.8)	97 (4.4)	40.3 (31.7-49.0)
Other race and ethnicities	11 (5.8)	16.8 (5.4-28.2)	8 (5.7)	13.4 (2.1-24.6)	9 (7.4)	14.6 (0.0-29.2)	14 (8.4)	28.7 (12.2-45.3)	24 (7.2)	26.6 (12.5-40.6)
Education										
< 12 years of school	20 (4.4)	15.7 (7.1-24.3)	21 (4.8)	13.8 (4.4-23.1)	16 (4.6)	13.0 (4.0-22.0)	27 (3.5)	14.6 (7.8-21.4)	64 (6.4)	42.9 (30.3-55.6)
High school graduate	56 (3.3)	20.2 (13.8-26.6)	21 (2.4)	9.5 (4.8-14.2)	36 (3.3)	16.0 (9.6-22.4)	37 (3.1)	15.8 (9.7-21.9)	96 (4.5)	38.5 (29.7-47.2)
> 12 years of school	130 (2.0)	19.2 (15.3-23)	99 (1.9)	16 (12.3-19.8)	121 (2.1)	20.0 (15.9-24.1)	111 (2.1)	18 (13.8-22.2)	198 (2.3)	26.8 (22.3-31.3)
Marital Status										
Married	127 (2.8)	28.5 (23.1-33.9)	64 (2.1)	13.8 (9.6-17.9)	57 (2.3)	14.5 (9.9-19.1)	54 (2.1)	12.2 (8.1-16.3)	158 (2.8)	31.0 (25.5-36.6)
Never married	30 (1.6)	7.0 (4.0-10.1)	46 (2.5)	14.4 (9.5-19.3)	70 (3.3)	24.1 (17.7-30.5)	78 (3.2)	23.6 (17.3-30.0)	98 (3.9)	30.8 (23.3-38.4)
Other	49 (3.5)	20.6 (13.8-27.3)	31 (3.6)	14.2 (7.2-21.1)	46 (2.5)	14.7 (9.9-19.6)	43 (2.8)	15.1 (9.7-20.5)	102 (4.1)	35.4 (27.4-43.4)
County										
Kent	63 (3.0)	20.6 (14.8-26.5)	37 (2.4)	12.6 (7.8-17.3)	56 (2.8)	20.4 (14.9-25.9)	52 (3.0)	19.2 (13.3-25.1)	94 (3.1)	27.2 (21.2-33.2)
New Castle	83 (2.2)	18.7 (14.5-22.9)	65 (2.1)	15.2 (11.1-19.4)	72 (2.3)	18.4 (13.8-23.0)	71 (2.3)	16.7 (12.2-21.2)	140 (2.9)	31.0 (25.4-36.6)
Sussex	60 (3.0)	18.3 (12.5-24.1)	39 (2.4)	11.8 (7.1-16.4)	45 (2.7)	14.9 (9.6-20.1)	52 (2.5)	15.9 (10.9-20.9)	124 (4.1)	39.2 (31.2-47.2)

Source: Delaware Department of Health and Social Services, Division of Public Health, Behavior Risk Factor Surveillance System, 2017-2018

†Permanent methods include male/female sterilization.

‡Long acting reversible contraception include Nexplanon, Implanon (harmonal implants), and Intrauterine devices (IUDs).

¶Moderately effective methods include DepoProvera, patch/rings, pills.

§Least effective methods include male/female condoms, diaphragm, withdrawal, rhythm or natural family planning and other methods.

Notes: n is unweighted counts with standard error (SE). Percent who endorsed the category. 95% confidence intervals (95%CI) are estimated using recreated weights for combined years of data accounting complex survey design. Use caution in interpreting wide confidence intervals (i.e. relative standard errors >30%). Relative standard error (RSE) is calculated dividing the standard error (SE) by estimate and multiplying by 100.

While BRFSS is a robust dataset to examine trends in contraceptive use vis-à-vis reproductive health and generalizable to population of 18 and older women, the small sample size, the reliance on an optional module on reproductive health with only

two years of data make it difficult to examine trends as well as examine any pre and post intervention (i.e., policy changes) differences in outcomes.

Pregnancy intentions and postpartum contraceptive use

The following analyses draws from a PRAMS dataset that provides a more robust picture of contraceptive use vis-à-vis reproductive health among Delaware women who recently gave birth. A fundamental difference between BRFSS and PRAMS is that the latter surveillance system includes Delaware women who had a recent live birth (i.e., sampled from birth certificate data), while the former samples all adults (include women) 18 and older in Delaware. Although a BRFSS dataset contains pregnancy intentions the data have not been collected consistently for Delaware to draw any meaningful inferences.

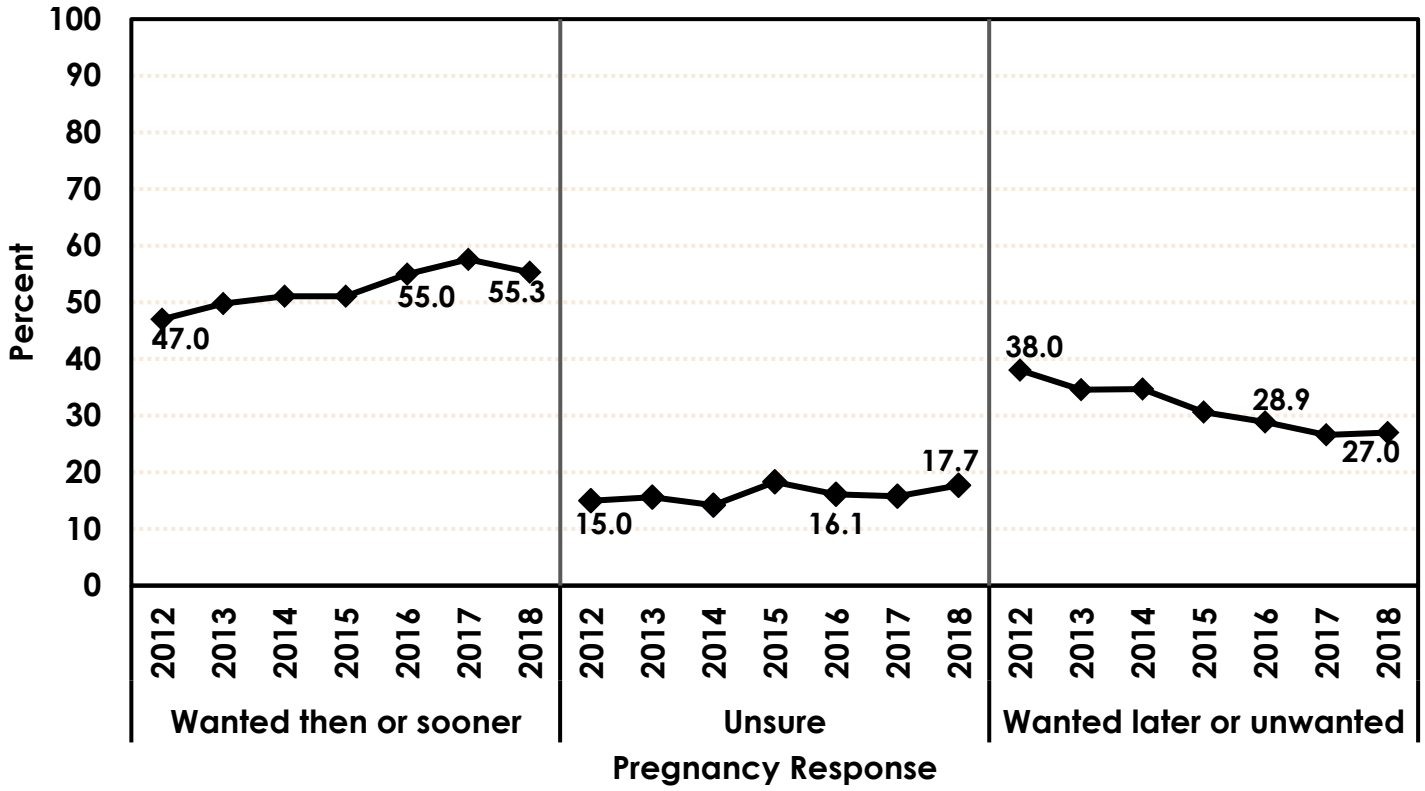
PRAMS data contains pregnancy intentions as well as contraceptive methods. Pregnancy intentions are retrospective in nature, while contraceptive use is prospective. For instance, for pregnancy intentions, respondents are asked, "*Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?*" with response choices: 1) *I wanted to be pregnant later*; 2) *I wanted to be pregnant sooner*; 3) *I wanted to be pregnant then*; 4) *I didn't want to be pregnant then or at any time in the future*; 5) *I wasn't sure what I wanted*. With regards to contraceptive use, respondents are asked, "*Are you or your husband or partner doing anything now to keep from getting pregnant?*" with response options yes and no. If a respondent indicates "yes" then the woman is prompted to answer, "*what kind of birth control are you or your husband or partner using now to keep from getting pregnant?*" Response choices include: 1) Tubes tied or blocked (female sterlization, Essure®, Adiana ®); 2) Vasectomy (male sterlization); 3) Birth control pills; 4) Condoms; 5) Injection (Depo-Provera®); 6) Contraceptive implant (Implanon®); 7) Contraceptive path (OrthoEvra®) or vaginal ring (NuvaRing®); 8) intrauterine device (IUD) such as (Mirena® or ParaGard®); 9) Natural family planning (including rhythm method); 10) withdrawal; 11) not having sex; 12) other method (specify).

The concept of "pregnancy intentions" and its measurement has been extensively discussed in the literature, most notably by Santelli et al. [12], Kost et al. [13], and Bachrach and Morgan [14], and has been fraught with controversy [15-22]. The pregnancy intention measure described here is consistent with use of PRAMS data in other studies [13, 23, 24] as "wanted then or sooner" (i.e., items 2 and 3); "unsure" (i.e., item 5); and "wanted later or unwanted" (i.e., items 1 and 4) discussed above.

Figure 5 provides pregnancy responses of Delaware women with a live birth who indicated "wanted then or sooner," "unsure," and "wanted later or unwanted" from 2012 to 2018. The trends in pregnancy responses are self-evident as there was an increase in "wanted then or sooner" and decrease in "wanted later or unwanted". For instance, between 2012 and 2018, there was a 17% increase in the percent of women indicating that their pregnancy as "wanted then or sooner" and during the same time-frame, there was approximately 29% decrease in the percent of women indicating that their pregnancy as "wanted later or unwanted." The percent change between

2016 and 2018 was 6.5% for pregnancy response "wanted later or unwanted" and about 10% (9.9%) for "unsure" category.

Figure 5. Percentage of pregnancy responses* among Delaware women who had a live birth, 2012-2018



Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

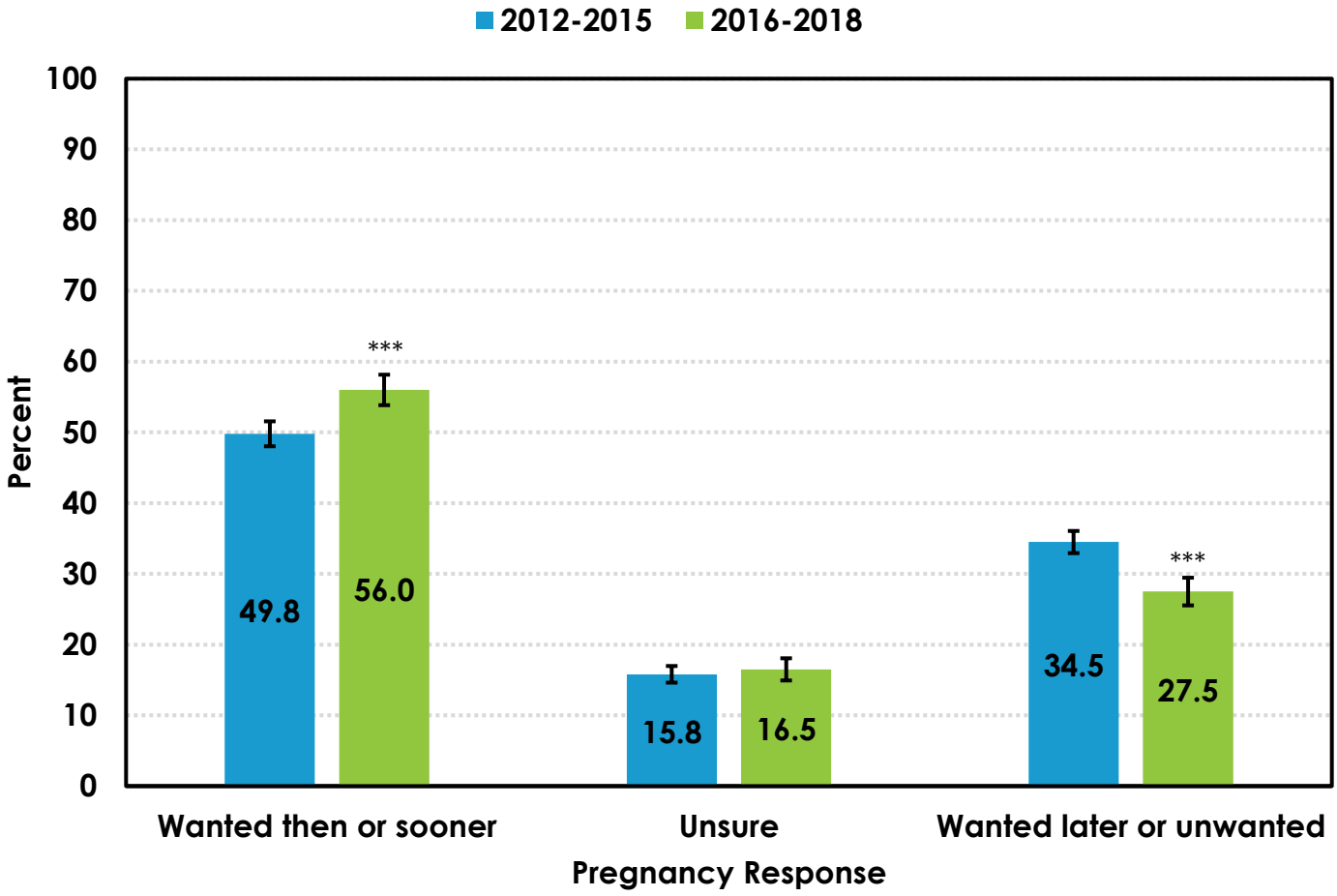
**Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" with response choices: 1) I wanted to be pregnant later; 2) I wanted to be pregnant sooner; 3) I wanted to be pregnant then; 4) I didn't want to be pregnant then or at any time in the future; 5) I wasn't sure what I wanted*

Notes: Items 2 and 3 indicate "wanted then or sooner"; items 1 and 4 indicate "wanted later or unwanted" and item 5 is "unsure." Percent are weighted with 95% confidence intervals (95% CI not shown) using recreated weights for combined years of data accounting complex survey design.

Figure 6 displays the pregnancy responses between "pre-intervention" (i.e., 2012-2015) and "post-intervention" (2016-2018) phases. It is evident that there was a statistically significant change between the time-periods for both the "wanted then or sooner" and "wanted later or unwanted" pregnancy response categories. For instance, the prevalence of "wanted then or sooner" during 2012-2015 was 50% (95% CI: 48.1-51.5) and 2016-2018 was 56% (95% CI: 53.9-58.0). Similarly, the prevalence of "wanted later or unwanted" during 2012-2015 was about 35% (95% CI: 32.8-36.1) and 2016-2018 was about 28% (95% CI: 25.6-29.4). Between the 2012-2015 and 2016-2018 there was six percentage point increase in pregnancy response for "wanted then or sooner" and seven

percentage point decrease in pregnancy response for "wanted later or unwanted" among Delaware women.

Figure 6. Percentage of pre and post-intervention pregnancy responses* among Delaware women who had a live birth, 2012-2018



Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

**Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" with response choices: 1) I wanted to be pregnant later; 2) I wanted to be pregnant sooner; 3) I wanted to be pregnant then; 4) I didn't want to be pregnant then or at any time in the future; 5) I wasn't sure what I wanted*

***p < .0001 Rao-Scott Chi-Square 20.25(1) "wanted then or sooner" and Rao-Scott Chi-Square 28.90(1) for "wanted later or unwanted" for the difference between time-periods 2012-2015 and 2016-2018.

Notes: Items 2 and 3 indicate "wanted then or sooner"; items 1 and 4 indicate "wanted later or unwanted" and item 5 is "unsure." Percent are weighted with 95% confidence intervals (95% CI) shown using recreated weights for combined years of data accounting complex survey design.

Table 2 provides an overview of prevalence of pregnancy responses stratified by age, race and ethnicity, education, marital status, and county. Prevalence of responses for pregnancy as "wanted then or sooner" increased with age, while the prevalence of responses for pregnancy for the "unsure" category and "wanted later or unwanted" decreased with age. "Wanted then or sooner" was higher in white non-Hispanic women (60.4%; 95% CI: 58.7-62.2) as compared to other

race and ethnic groups. Conversely, "unsure" (34.5%; 95% CI: 31.9-37.1) and/or "wanted later or unwanted" (41.3%; 95% CI: 38.6-44.1) was higher in black non-Hispanic women as compared to other race and ethnic groups. Pregnancy responses for "wanted then or sooner" were higher in women with 12 or more years of education (62.3%; 95% CI: 60.7-64.0) and lowest for "unsure" (11.9%; 95% CI: 10.8-13.1) and "wanted later or unwanted" categories (25.7%; 95% CI: 24.2-27.2). Among women who indicated that the payer of delivery was Medicaid, pregnancy responses for "unsure" (22.0%; 95% CI: 20.3-23.6) and "wanted later or unwanted" (42.8%; 95% CI: 40.8-44.7) was higher as compared to non-Medicaid counterparts. With regards to county of residence, there was no discernible pattern except for "wanted then or sooner" category. Women who indicated their county of residence as New Castle had higher prevalence (54.2%; 95% CI: 52.5-56.0) as compared to their counterparts in Kent and Sussex counties.

Table 2. Pregnancy responses* prevalence and characteristics of Delaware women who had a live birth, 2012-2018

Characteristics	Wanted then or sooner†		Unsure‡		Wanted later or unwanted¶	
	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)
Age (in years)						
< 20	58 (2.3)	17.9 (13.4-22.5)	70 (2.5)	21.3 (16.4-26.1)	195 (3.0)	60.8 (55.0-66.6)
20 to 24	439 (1.5)	34.8 (32.0-37.7)	255 (1.2)	19.6 (17.2-22.0)	574 (1.5)	45.5 (42.5-48.5)
25 to 34	2,243 (0.9)	59.6 (57.9-61.3)	558 (0.6)	14.5 (13.3-15.7)	1,001 (0.8)	26.0 (24.4-27.5)
35 and older	676 (1.6)	60.7 (57.5-63.8)	176 (1.2)	15.6 (13.3-18.0)	262 (1.4)	23.7 (21.0-26.5)
Race and ethnicity						
White, non-Hispanic	2,093 (0.9)	60.4 (58.7-62.2)	481 (0.6)	13.4 (12.2-14.7)	910 (0.8)	26.1 (24.5-27.7)
Black, non-Hispanic	561 (1.3)	34.5 (31.9-37.1)	387 (1.2)	24.1 (21.8-26.5)	656 (1.4)	41.3 (38.6-44.1)
Hispanic	470 (1.8)	51.5 (48.0-54.9)	123 (1.2)	12.7 (10.4-15.0)	328 (1.7)	35.8 (32.5-39.1)
Other race and ethnicities	126 (3.3)	46.7 (40.2-53.2)	47 (2.6)	18.2 (13.1-23.3)	95 (3.2)	35.2 (28.9-41.4)
Education						
< 12 years of school	418 (1.7)	40.8 (37.5-44.0)	214 (1.3)	19.3 (16.7-21.9)	407 (1.7)	39.9 (36.7-43.2)
High school graduate	617 (1.3)	37.8 (35.2-40.4)	394 (1.2)	23.4 (21.1-25.7)	635 (1.3)	38.8 (36.2-41.4)
> 12 years of school	2,371 (0.8)	62.3 (60.7-64.0)	446 (0.6)	11.9 (10.8-13.1)	977 (0.8)	25.7 (24.2-27.2)
Medicaid						
Yes	1,035 (1.0)	35.2 (33.3-37.1)	669 (0.8)	22.0 (20.3-23.6)	1,266 (1.0)	42.8 (40.8-44.7)
No	2,346 (0.9)	68.1 (66.4-69.8)	367 (0.6)	10.7 (9.6-11.8)	722 (0.8)	21.2 (19.7-22.7)
County						
Kent	695 (1.5)	49.4 (46.5-52.2)	234 (1.1)	16.7 (14.5-18.8)	467 (1.4)	33.9 (31.2-36.7)
New Castle	2,061 (0.9)	54.2 (52.5-56.0)	590 (0.7)	15.5 (14.3-16.8)	1,130 (0.8)	30.2 (28.6-31.8)
Sussex	660 (1.5)	50.5 (47.6-53.4)	235 (1.1)	17.0 (14.8-19.1)	435 (1.4)	32.5 (29.8-35.3)

Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

**Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" with response choices: 1) I wanted to be pregnant later; 2) I wanted to be pregnant sooner; 3) I wanted to be pregnant then; 4) I didn't want to be pregnant then or at any time in the future; 5) I wasn't sure what I wanted*

† "Wanted then or sooner" (items 2 and 3)

‡ "Unsure" (item 5)

¶ "Wanted later or unwanted" (items 1 and 4)

Notes: n is unweighted counts with standard error (SE). Percent are weighted with 95% confidence intervals (95%CI) estimated using recreated weights for combined years of data accounting complex survey design. Use caution in interpreting wide confidence intervals (i.e. relative standard errors >30%). Relative standard error (RSE) is calculated dividing the standard error (SE) by estimate and multiplying by 100.

Age, race and ethnicity, education, Medicaid status, and county of residence were all associated with pregnancy responses. To assess if there was a difference in pre (2012-2015) and post-intervention (2016-2018) and pregnancy responses, adjusted odds ratios (aOR) were estimated. It was hypothesized that post-intervention (2016-2018) pregnancy response for "wanted then or sooner" would be higher and pregnancy response for "wanted later or unwanted" would be lower compared to pre-intervention (2012-2015). Table 3 presents adjusted odds ratios for pregnancy response "wanted then or sooner" and "wanted later or unwanted".

Table 3. Pre (2012-2015) and post (2016-2018) intervention adjusted odds ratio for pregnancy responses* prevalence among Delaware women who had a live birth, 2012-2018

Characteristics	Wanted then or sooner†		Wanted later or unwanted‡	
	b (SE)	Odds Ratio (95% CI)	b (SE)	Odds Ratio (95% CI)
Intervention				
2016-2018	0.28 (0.06)***	1.3 (1.2-1.5)	-0.32 (0.07)***	0.7 (0.6-0.8)
2012-2015	Ref	Ref	Ref	Ref
Age (in years)				
< 20	-1.29 (0.19)***	0.3 (0.2-0.4)	1.18 (0.17)***	3.3 (2.4-4.5)
20 to 24	-0.56 (0.10)***	0.6 (0.5-0.7)	0.65 (0.11)***	1.9 (1.6-2.4)
25 to 34	0.06 (0.08)	1.1 (0.9-1.2)	0.05 (0.09)	1.0 (0.9-1.3)
35 and older	Ref	Ref	Ref	Ref
Race and ethnicity				
White, non-Hispanic	Ref	Ref	Ref	Ref
Black, non-Hispanic	-0.7 (0.08)***	0.5 (0.4-0.6)	0.41 (0.08)***	1.5 (1.3-1.8)
Hispanic	0 (0.10)	1.0 (0.8-1.2)	0.27 (0.1)**	1.3 (1.1-1.6)
Other race and ethnicities	-0.35 (0.15)*	0.7 (0.5-0.9)	0.25 (0.16)	1.3 (0.9-1.7)
Education				
< 12 years of school	-0.23 (0.10)*	0.8 (0.6-1.0)	-0.03 (0.11)	1.0 (0.8-1.2)
High school graduate	-0.4 (0.08)***	0.7 (0.6-0.8)	0.07 (0.08)	1.1 (0.9-1.3)
> 12 years of school	Ref	Ref	Ref	Ref
Medicaid				
Yes	-0.91 (0.07)***	0.4 (0.4-0.5)	0.7 (0.08)***	2.0 (1.7-2.3)
No	Ref	Ref	Ref	Ref
County				
Kent	-0.09 (0.08)	0.9 (0.8-1.1)	0.09 (0.08)	1.1 (0.9-1.3)
New Castle	Ref	Ref	Ref	Ref
Sussex	-0.03 (0.08)	1.0 (0.8-1.1)	-0.01 (0.08)	1.0 (0.8-1.2)

Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

***p < .0001 **p < .01 *p < .05

Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" with response choices: 1) I wanted to be pregnant later; 2) I wanted to be pregnant sooner; 3) I wanted to be pregnant then; 4) I didn't want to be pregnant then or at any time in the future; 5) I wasn't sure what I wanted

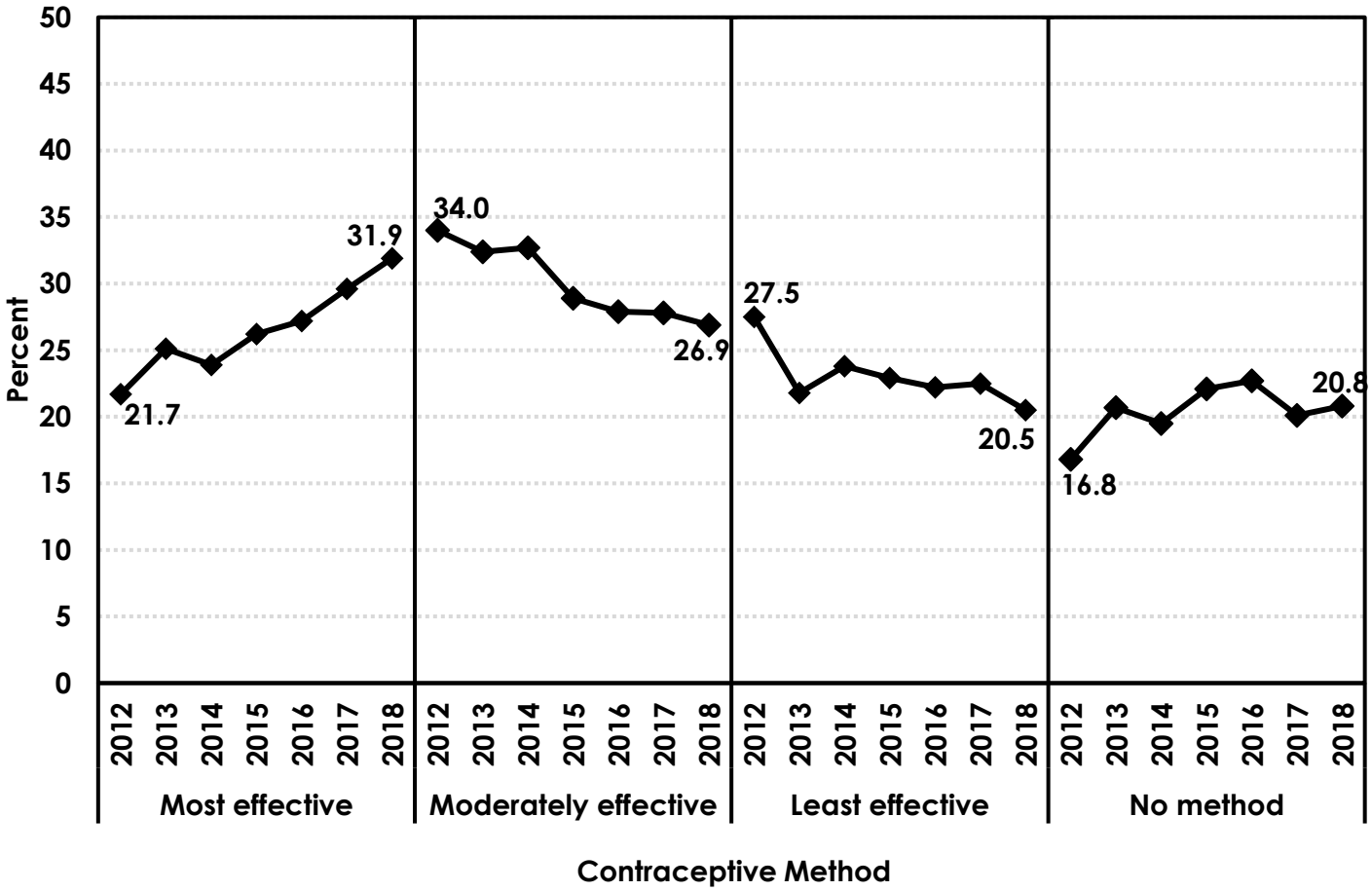
† "Wanted then or sooner" (items 2 and 3)

‡ "Wanted later or unwanted" (items 1 and 4)

Notes: Log odds (b) with standard error (SE). Odds ratios with 95% confidence intervals (95%CI) estimated using recreated weights for combined years of data accounting complex survey design.

As expected, pregnancy response "wanted then or sooner" was higher and pregnancy response "wanted later or unwanted" was lower during post-intervention (2016-2018), after adjusting for demographic covariates. As part of sensitivity analysis, 2017-2018 was used as post-intervention timeframe. The hypothesized direction of effects, estimates, and the results did not change. The results suggest that Delaware's reproductive health activities as outlined earlier, have had some impact on the pregnancy responses of Delaware women. The next set of results provide an overview of postpartum contraceptive use among Delaware women. Figure 7 displays postpartum contraceptive results for women who had a recent live birth.

Figure 7. Percentage of postpartum contraceptive use among Delaware women who had a live birth, 2012-2018

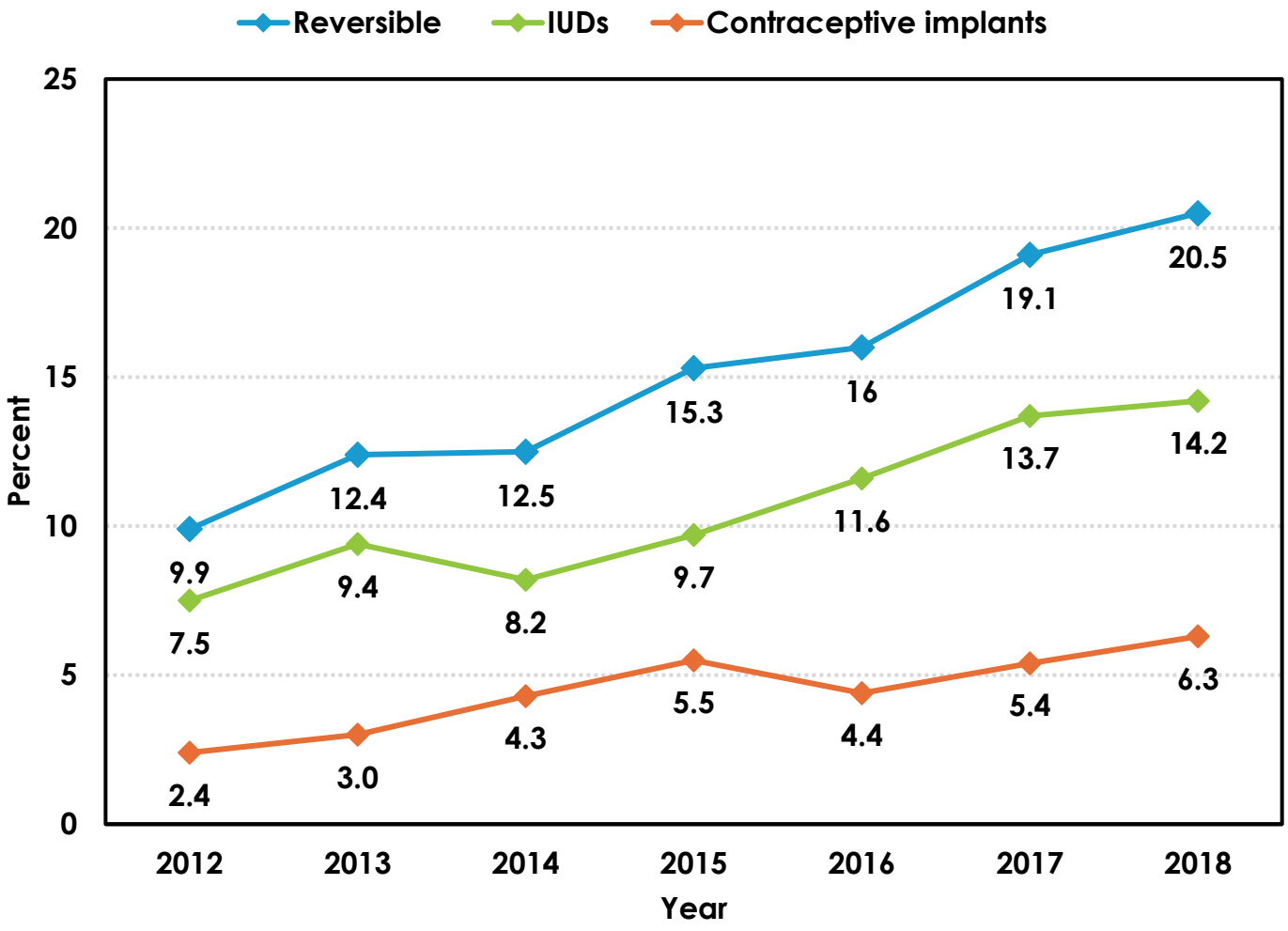


Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

Notes: Most effective methods include permanent methods include male/female sterilization, long acting reversible contraception include Nexplanon, Implanon (hormonal implants), and intrauterine devices (IUDs). Moderately effective methods include DepoProvera, patch/rings, pills. Least effective methods include male/female condoms, diaphragm, withdrawal, rhythm or natural family planning and other methods. Percent are weighted with 95% confidence intervals (95% CI not shown) using recreated weights for combined years of data accounting complex survey design.

Between 2012-2018 there was a 47% increase in most effective contraceptive use methods; 21% decrease in moderately effective methods; 25% decrease in least effective methods; and, a 23% increase no method among Delaware women who had a live birth. Figure 8 displays contraceptive use method choice by reversible methods (i.e., IUDs, contraceptive implants). As evident from figure 8, there was a 107% increase in reversible methods among Delaware women between 2012-2018. There was an 89% increase in IUDs and 162.5% increase in contraceptive implants between 2012-2018.

Figure 8. Percentage of postpartum contraceptive use, reversible overall, and by type among Delaware women who had a live birth, 2012-2018



Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

Notes: Reversible methods (percent IUD and percent LARC). Percent are weighted with 95% confidence intervals (95% CI not shown).

Table 4 provides an overview of the reversible methods (LARCs and IUDs) and no method by age, race and ethnicity, education, Medicaid status, and county of residence during 2012-2018. Age, race and ethnicity, education, Medicaid status, and county of residence was associated with LARC use.

Table 4. Postpartum contraceptive use of contraceptive implants, IUDs, and no method and characteristics of Delaware women who had a live birth, 2012-2018

Characteristics	Contraceptive implants†		IUDs‡		No method¶	
	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)	n (SE)	Percent (95% CI)
Age (in years)						
< 20	27 (1.7)	8.3 (5.0-11.6)	33 (2.0)	11.7 (7.8-15.7)	57 (2.3)	17.4 (13.0-21.9)
20 to 24	93 (0.9)	8.1 (6.4-9.8)	141 (1.0)	12.4 (10.3-14.4)	263 (1.3)	21.6 (19.1-24.1)
25 to 34	130 (0.3)	3.6 (2.9-4.2)	384 (0.5)	10.3 (9.2-11.3)	748 (0.7)	19.6 (18.3-21.0)
35 and older	16 (0.5)	1.8 (0.9-2.7)	102 (0.9)	8.9 (7.1-10.7)	257 (1.4)	22.6 (19.9-25.2)
Race and ethnicity						
White, non-Hispanic	82 (0.3)	2.4 (1.9-3.0)	380 (0.6)	11.2 (10.0-12.3)	661 (0.7)	19.3 (17.9-20.7)
Black, non-Hispanic	79 (0.6)	5.4 (4.1-6.7)	153 (0.9)	10.3 (8.6-12.0)	350 (1.2)	21.7 (19.4-24.0)
Hispanic	90 (1.1)	10.8 (8.6-13.0)	87 (1.1)	9.9 (7.8-12.0)	147 (1.3)	15.7 (13.2-18.2)
Other race and ethnicities	13 (1.4)	4.6 (1.8-7.4)	23 (2.0)	9.6 (5.7-13.6)	81 (3.1)	30.5 (24.5-36.5)
Education						
< 12 years of school	82 (1.0)	8.4 (6.5-10.3)	66 (0.9)	7.3 (5.5-9.1)	215 (1.4)	20.1 (17.5-22.8)
High school graduate	86 (0.6)	5.7 (4.4-7.0)	175 (0.8)	10.7 (9.1-12.4)	320 (1.1)	20.1 (17.9-22.3)
> 12 years of school	95 (0.3)	2.8 (2.2-3.3)	417 (0.6)	11.4 (10.3-12.5)	785 (0.7)	20.5 (19.2-21.9)
Medicaid						
Yes	177 (0.5)	6.4 (5.4-7.4)	311 (0.6)	11.2 (9.9-12.4)	574 (0.8)	19.3 (17.7-20.9)
No	82 (0.3)	2.6 (2.0-3.2)	343 (0.6)	10.2 (9.1-11.3)	729 (0.8)	21.4 (19.9-22.9)
County						
Kent	57 (0.6)	4.2 (3.0-5.3)	136 (0.9)	9.6 (7.9-11.3)	303 (1.2)	22.9 (20.5-25.3)
New Castle	106 (0.3)	3.0 (2.4-3.7)	431 (0.6)	12.0 (10.9-13.2)	764 (0.7)	19.6 (18.2-21.0)
Sussex	103 (0.9)	8.8 (7.1-10.5)	93 (0.8)	7.4 (5.9-9.0)	258 (1.2)	19.9 (17.6-22.3)

Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

† Contraceptive implants include Nexplanon and Implanon.

‡ Intrauterine devices (IUDs).

¶ No method specified.

Notes: n is unweighted counts with standard error (SE). Percent are weighted with 95% confidence intervals (95%CI) estimated using recreated weights for combined years of data accounting complex survey design. Use caution in interpreting wide confidence intervals (i.e. relative standard errors >30%). Relative standard error (RSE) is calculated dividing the standard error (SE) by estimate and multiplying by 100.

For instance, prevalence of contraceptive implants was higher in women who were less than 20 years of age (8.3%; 95% CI: 5.0-11.6); higher in women 20-24 years of age (8.1%; 95% CI: 6.4-9.8) and lowest in women 35 and older (1.8%; 95% CI: 0.9-2.7). Similarly, prevalence of IUDs was highest in women 20-24 years of age (12.4%; 95% CI: 10.3-14.4), followed by women less than 20 years of age (11.7%; 95% CI: 7.8-15.7), and 25 to 34 years of age (10.3%; 95% CI: 9.2-11.3). No method was

highest among 35 and older (22.6%; 95% CI: 19.9-25.2), followed by 20-24 years of age (21.6; 95% CI:19.1-24.1).

When stratified by race, contraceptive implant use was highest among Hispanics (10.8%; 95% CI: 8.6-13.0), IUD was highest among white (non-Hispanic) (11%; 95% CI: 10.0-12.3), and no method was highest in other race and ethnic groups (30.5%; 95% CI: 24.5-36.5).

Contraceptive implant use was also higher in women with less than 12 years of school (8.4%; 95% CI: 6.5-10.3), followed by women who were high school graduates (5.7%; 95% CI: 4.4-7.0). IUD use was highest among women with more than 12 years of education (11.4%; 95% CI: 10.3-12.5).

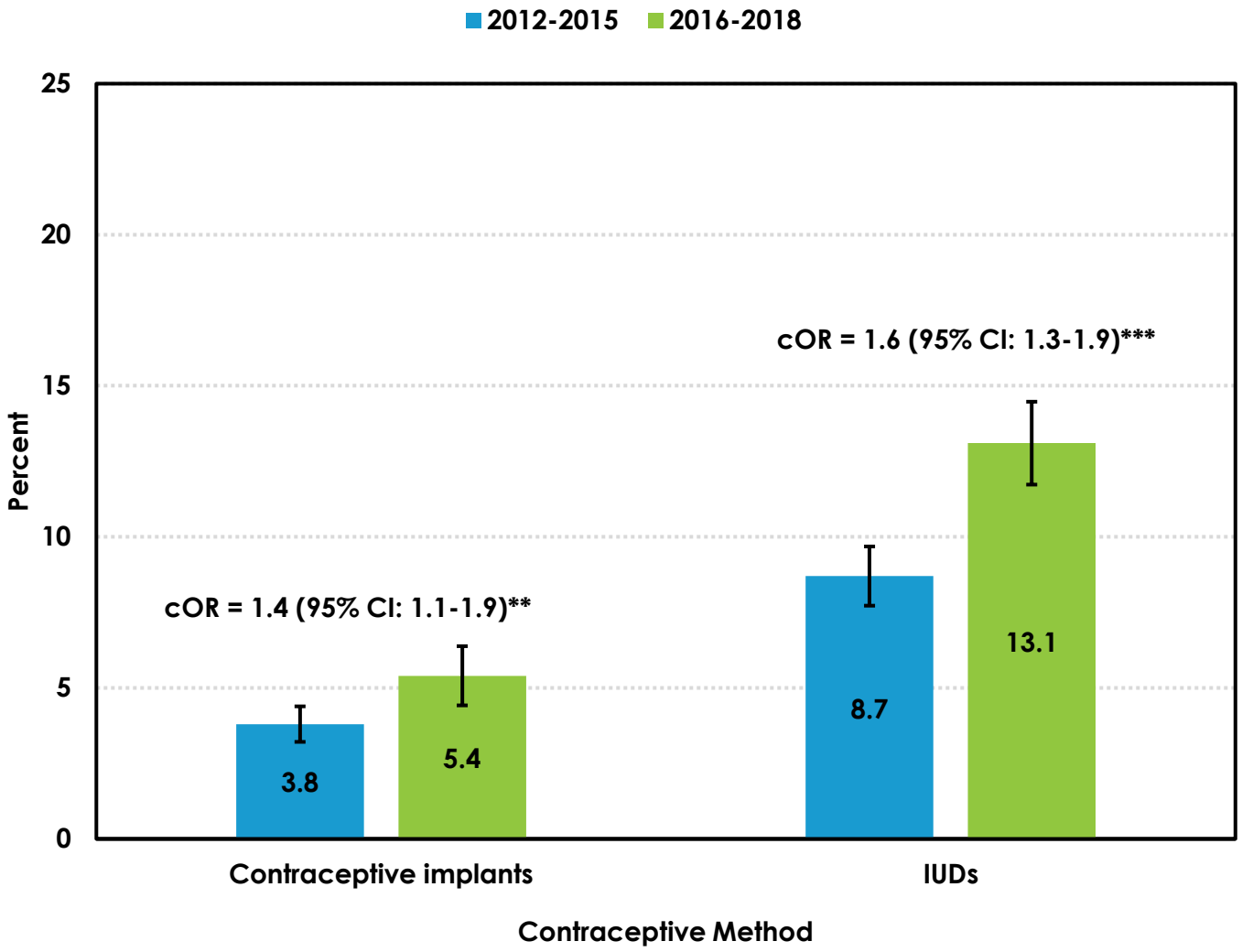
Contraceptive implant use was also higher among women who indicated that their payer of delivery was Medicaid (6.4%; 95% CI: 5.4-7.4) as compared with non-Medicaid (2.6%; 95% CI: 2.0-3.7). The difference was statistically significant – Rao-Scott Chi-square 42.77(1) $p < .0001$.

With regards to county, contraceptive implant use was highest in Sussex county (8.8%; 95% CI: 7.1-10.5) as compared with New Castle (3.0%; 95% CI: 2.4-3.7) and Kent county (4.2%; 95% CI: 3.0-5.3). To assess if there was a difference in pre (2012-2015) versus post-intervention (2016-2018) and postpartum contraceptive use (i.e., contraceptive implants, IUDs), crude and adjusted odds ratios (aOR) were estimated.

Figure 9 displays the prevalence rates and crude odds ratios for contraceptive implants and IUDs for pre and post-intervention period. In the 2012-2015 "pre-intervention" phase, the percent of women who indicated using contraceptive implants was 3.8 percent and during 2016-2018 "post-intervention phase" the prevalence was 5.4 percent. There was approximately a two percentage points increase in contraceptive implants during 2012-2015 and 2016-2018, and the percent change between during the 2012-2015 (i.e., "pre-intervention") and 2016-2018 (i.e., "post-intervention") was about 42 percent.

Similarly, during 2012-2015 "pre-intervention" phase the percent of women who indicated using IUD was 8.7 percent and during 2016-2018 "post-intervention" phase it was 13.1 percent. There was an approximately five percentage points increase during 2012-2015 (i.e., "pre-intervention") and 2016-2018 (i.e., "post-intervention") and the percent change was 50 percent. The difference in the prevalence of contraceptive implant and IUD use during 2012-2015 (i.e., "pre-intervention") and 2016-2018 (i.e., "post-intervention") was statistically significant. The estimated crude odds ratio (cOR) for contraceptive implant was 1.4 (95% CI: 1.1-1.9) and 1.6 (95% CI: 1.3-1.9) for IUD use.

Figure 9. Pre (2012-2015) and post (2016-2018) intervention prevalence rates and crude odds ratio for contraceptive implants and IUDs among Delaware women who had a live birth, 2012-2018



Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018
***p < .0001 **p < .01
Notes: Long acting reversible contraceptives (LARCs) contraceptive implants (i.e., Nexplanon, Implanon, and intra-uterine devices (IUDs)). Percent are weighted with 95% confidence intervals (95% CI) shown using recreated weights for combined years of data accounting complex survey design. Crude odds ratio (cOR).

It was hypothesized that post-intervention (2016-2018) postpartum use of contraceptive implants and IUDs would be higher compared to pre-intervention (2012-2015) after adjusting for demographic covariates described earlier. As evident from table 5, the "post-intervention" (i.e., 2016-2018) time-period was associated with increased contraceptive implant and IUD use after adjusting for demographic covariates. For instance, relative to 2012-2015, women in 2016-2018 had 40 percent higher odds of contraceptive implant use; similarly, relative to 2012-2015, women in

2016-2018 had 60 percent higher odds of IUD use after accounting for age, race and ethnicity, education, Medicaid status, and county of residence.

Table 5. Adjusted odds ratio for postpartum contraceptive use for contraceptive implants and IUDs among Delaware women who had a live birth, 2012-2018

Characteristics	Contraceptive implants†		IUDs¶	
	b (SE)	Odds Ratio (95% CI)	b (SE)	Odds Ratio (95% CI)
Intervention				
2016-2018	0.31 (0.14)*	1.4 (1.0-1.8)	0.49 (0.09)***	1.6 (1.4-2.0)
2012-2015	Ref	Ref	Ref	Ref
Age (in years)				
< 20	1.09 (0.37)**	3.0 (1.4-6.1)	0.66 (0.24)**	1.9 (1.2-3.1)
20 to 24	1.30 (0.30)***	3.7 (2.0-6.7)	0.48 (0.16)**	1.6 (1.2-2.2)
25 to 34	0.64 (0.29)	1.9 (1.1-3.3)	0.20 (0.13)	1.2 (0.9-1.6)
35 and older	Ref	Ref	Ref	Ref
Race and ethnicity				
White, non-Hispanic	Ref	Ref	Ref	Ref
Black, non-Hispanic	0.73 (0.19)**	2.1 (1.4-3.0)	-0.22 (0.12)	0.8 (0.6-1.0)
Hispanic	1.27 (0.18)***	3.5 (2.5-5.0)	-0.03 (0.14)	1.0 (0.7-1.3)
Other race and ethnicities	0.36 (0.37)	1.4 (0.7-2.9)	-0.24 (0.24)	0.8 (0.5-1.3)
Education				
< 12 years of school	0.26 (0.20)	1.3 (0.9-1.9)	-0.64 (0.16)***	0.5 (0.4-0.7)
High school graduate	0.15 (0.18)	1.2 (0.8-1.7)	-0.24 (0.12)*	0.8 (0.6-1.0)
> 12 years of school	Ref	Ref	Ref	Ref
Medicaid				
Yes	0.37 (0.18)*	1.5 (1.0-2.1)	0.22 (0.11)*	1.2 (1.0-1.5)
No	Ref	Ref	Ref	Ref
County				
Kent	0.36 (0.19)	1.4 (1.0-2.1)	-0.34 (0.12)**	0.7 (0.6-0.9)
New Castle	Ref	Ref	Ref	Ref
Sussex	0.95 (0.16)***	2.6 (1.9-3.6)	-0.60 (0.13)***	0.5 (0.4-0.7)

Source: Delaware Department of Health and Social Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System, 2012-2018

***p < .0001 **p < .01 *p < .05

†Contraceptive implants include Nexplanon and Implanon.

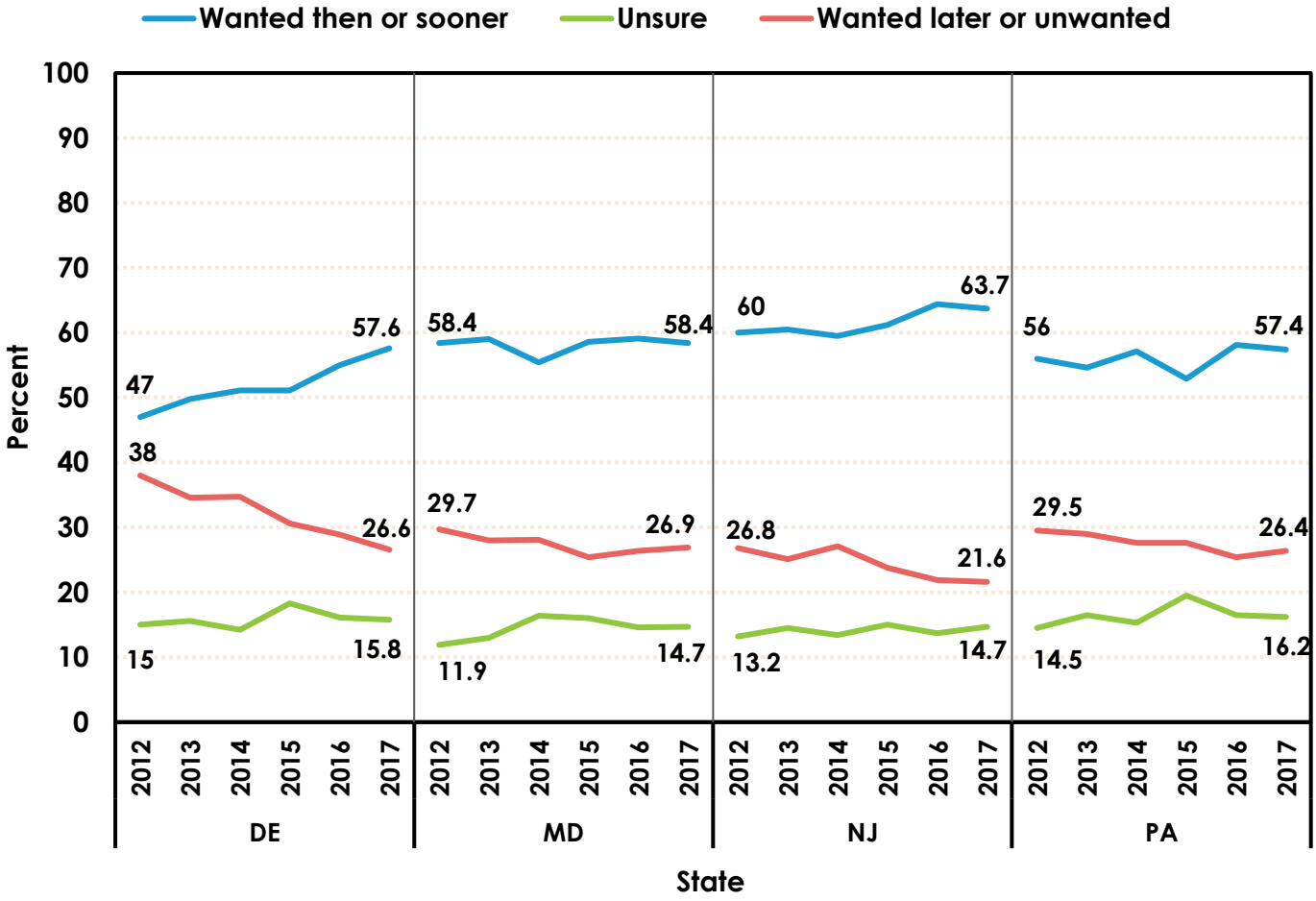
‡Intrauterine devices (IUDs).

Notes: Log odds (b) with standard error (SE). Odds ratios with 95% confidence intervals (95%CI) estimated using recreated weights for combined years of data accounting complex survey design.

As part of sensitivity analysis, 2017-2018 was used as an alternate post-intervention timeframe. The hypothesized direction of effects, estimates, and the results did not change. The results suggest that Delaware's reproductive health activities as outlined earlier, have had some impact on LARC (i.e., contraceptive implants and IUDs) use among Delaware women.

To better contextualize the results, prevalence estimates for pregnancy responses and LARCs were also estimated for Delaware's neighboring states – Maryland, New Jersey, and Pennsylvania. Because not all states had data available for 2018, results are presented for 2012-2017.

Figure 10. Percentage of pregnancy responses* among Delaware women and women in neighboring states who had a live birth, 2012-2017

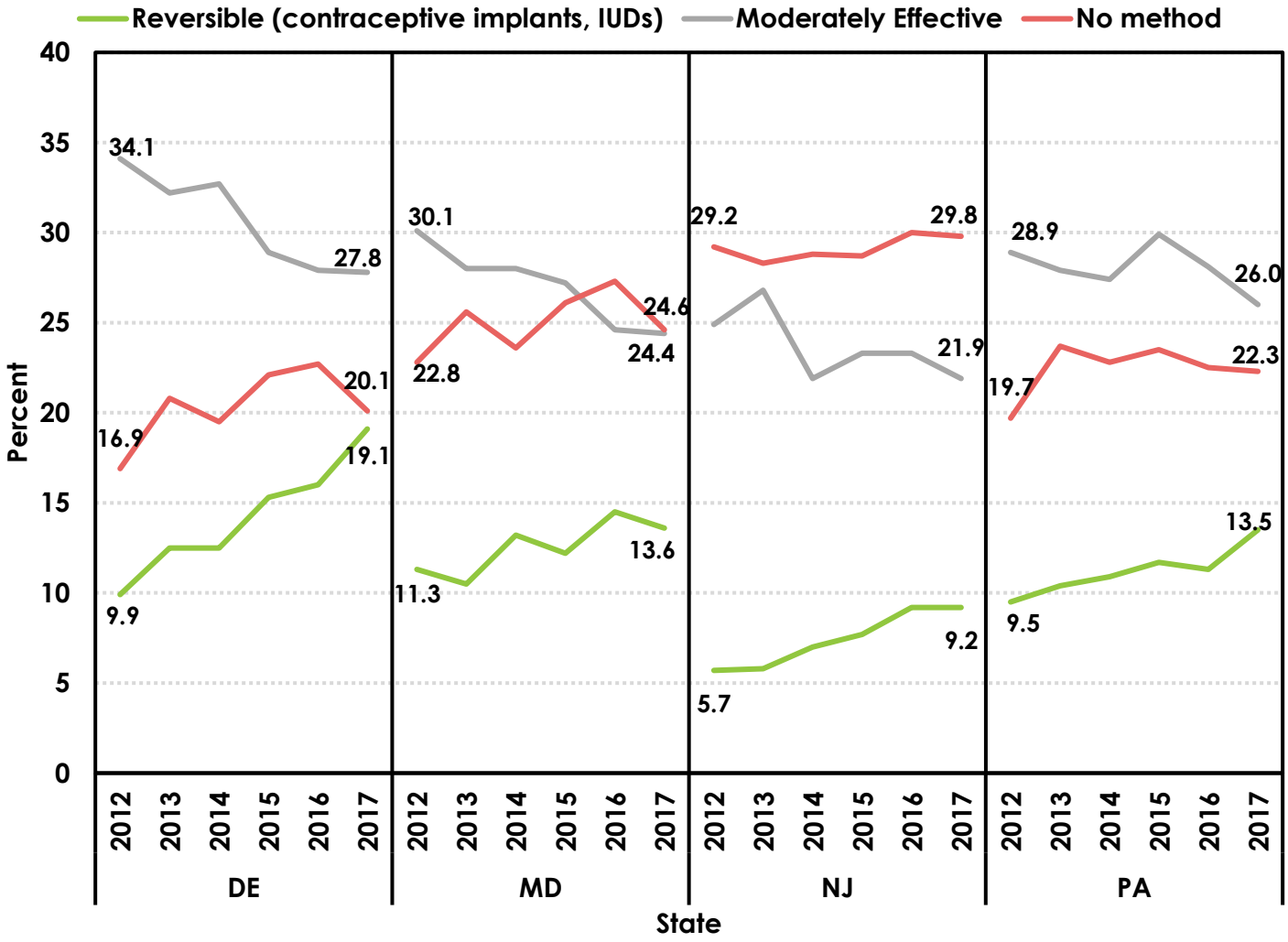


Source: Centers for Disease Control and Prevention, Pregnancy Risk Assessment Monitoring System, 2012-2017
**Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?" with response choices: 1) I wanted to be pregnant later; 2) I wanted to be pregnant sooner; 3) I wanted to be pregnant then; 4) I didn't want to be pregnant then or at any time in the future; 5) I wasn't sure what I wanted*
Notes: Items 2 and 3 indicate "wanted then or sooner"; items 1 and 4 indicate "wanted later or unwanted" and item 5 is "unsure." Percent are weighted with 95% confidence intervals (95% CI not shown.

It is evident from figure 10 that Delaware saw the largest decrease (~12 percentage points) in pregnancy responses of "wanted later or unwanted" and largest increase (~10 percentage points) for "wanted then or sooner" between 2012-2017 as compared with other states. Figure 11 displays reversible methods of contraception (contraceptive implants, IUDs), moderately effective methods, and no method for the same timeframe. It is evident from figure 11 that Delaware saw

the largest increase (~10 percentage points) for "reversible methods" between 2012-2017 as compared with neighboring states.

Figure 11. Percentage of postpartum contraceptive use among Delaware women and women in neighboring states who had a live birth, 2012-2017



Source: Centers for Disease Control and Prevention, Pregnancy Risk Assessment Monitoring System, 2012-2017
Notes: Reversible methods or LARCs (include contraceptive implants such as Nexplanon, Implanon, IUDs such as Paragard). Moderately effective methods include DepoProvera, patch/rings, pills. Percent are weighted with 95% confidence intervals (95% CI not shown).

Results from this data brief suggests that Delaware's reproductive health activities and strategies have led to increased use of most effective methods of contraceptives particularly with regards to long acting reversible contraceptives (i.e., contraceptive implants and IUDs). In addition, there seems to be some evidence in changes with regards pregnancy responses among women who had a recent live birth. However, there are noticeable differences with regards to age, race and ethnicity, education, Medicaid status, and county of residence and it is critical to minimize these differences in order to sustain larger gains at the population level.

Suggested citation: Hussaini, SK. Reproductive Health, Delaware Profile 2010-2018. Data Brief No.4. Delaware Department of Health and Social Services, Division of Public Health. Published June 2020.

Endnotes

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Mission — Protect and Promote the Health of all People in Delaware

Vision — Healthy People in Healthy Communities

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