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Description and comparison of postpartum use of effective contraception among women with and without diabetes

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Abstract

Objective: As diabetes is increasing among women of reproductive age in the United States, access to effective contraception is important to allow time for optimal glycemic control which may mitigate complications in future pregnancies. This study sought to describe contraceptive use and compare the effectiveness of contraceptive methods among postpartum women with and without diabetes.

Study design: This study used data from the Pregnancy Risk Assessment Monitoring System and included women with recent live births during 2012–2015 ($N = 93,574$). Women were asked about pre-gestational or recent gestational diabetes and their postpartum contraceptive method. Chi-square and multivariate logistic regression analyses were used to compare contraceptive methods between women with and without diabetes.

Results: Contraceptive prevalence was similar between women with (82%) and without (83%) diabetes; women with diabetes were more likely to use the most effective methods. This was driven by higher use of female sterilization among women with diabetes (15%) compared to women without diabetes (9%) ($p < 0.001$). In multivariate analysis, odds of use of female sterilization versus reversible prescription methods was higher among women with diabetes than women without diabetes (adjusted odds ratio 1.29, 95% confidence interval 1.19–1.39).

Conclusions: Although overall postpartum contraceptive use was high, only 1/3 of women with or without diabetes were using the most effective methods. Furthermore, women with diabetes were more likely to use female sterilization than women without diabetes. It is important all postpartum women, particularly those with high risk pregnancies such as women with diabetes, receive counseling about and access to all contraceptive methods.

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Implications: It is important for clinicians to counsel women with pregnancies affected by diabetes that reversible contraceptives such as implants and IUDs are as effective as female permanent contraception.

Keywords

Gestational diabetes; Long acting reversible contraception; Postpartum contraception; PRAMS; Pre-gestational diabetes; Sterilization

1. Introduction

The prevalence of diabetes, both pregestational and gestational, is increasing among women of reproductive age in the United States [1,2]. In 2016, pregestational diabetes was present in 0.9% and gestational diabetes in 6% of women with a live birth [2]. Women with pregestational diabetes, including both type 1 and type 2 diabetes, are at risk for serious maternal and obstetric complications such as preeclampsia, preterm birth, congenital anomalies and stillbirth [3]. Women with gestational diabetes are also at higher risk for complications such as preeclampsia, birth trauma, and stillbirth and up to 70% will develop diabetes after pregnancy [4].

Fewer than one third of women with pregestational diabetes seek preconception counseling which is the optimal time to discuss the importance of euglycemia before pregnancy [3]. A short inter-pregnancy interval is a significant predictor of recurrence of gestational diabetes [5]. These factors underscore the importance of avoiding unintended pregnancies and short inter-pregnancy intervals (<18 months between pregnancies) among women with diabetes. Nonetheless, less than half of women of reproductive age with chronic diabetes are using a prescription method of contraception [6]. Among postpartum women in one state, women with pregestational diabetes were less likely to report using postpartum contraception compared to those without diabetes [7]. This study aimed to evaluate prevalence and types of postpartum contraception among a large multi-state sample of women with diabetes compared to women without diabetes. This study also aimed to assess characteristics associated with use of more effective contraception among women with diabetes compared to women without diabetes.

2. Materials and methods

We used cross-sectional population-based data from the Pregnancy Risk Assessment Monitoring System (PRAMS). In brief, PRAMS is a surveillance project conducted by the Centers for Disease Control and Prevention (CDC) in conjunction with state health departments. Women who had a recent live birth are sampled from birth certificates to receive a questionnaire. The questionnaire is mailed between two and four months after birth and non-responders are then contacted by mail or phone. The questionnaire addresses maternal attitudes, behaviors, and experiences before, during, and shortly after pregnancy. Responses are linked to birth certificate data. The survey data were weighted to account for sampling, nonresponse, and noncoverage. This analysis utilized Phase 7 PRAMS data from 2012 through 2015 from 36 states and 1 city with ≥60% response rate (29 sites in 2012, 31 sites in 2013, and 28 sites in 2014) or ≥55% response rate (34 sites in 2015). The PRAMS

project was approved by CDC's and each site's Institutional Review Board; participating sites approved the analysis plan.

The PRAMS survey includes 2 questions on diabetes before or during pregnancy: 1) have they been told by a health care worker that they had type 1 or type 2 diabetes before pregnancy, and 2) have they been told by a health care worker that they had gestational diabetes during the most recent pregnancy. Women were classified as having diabetes if they answered "yes" to either question. Women were classified as not having diabetes if they answered "no" to both questions. Women were excluded if responses were missing to both questions. Because women with pregestational diabetes may receive different counseling and may make different contraceptive choices, we conducted a sensitivity analysis to examine women with pregestational diabetes alone compared to women without diabetes. Women were classified as having pregestational diabetes if they answered "yes" to the first question or to both questions.

Use of contraception at the time of survey administration was assessed by examining the question "Are you or your husband or partner doing anything now to keep from getting pregnant?". Women who answered "yes" were then classified by what method they reported currently using: tubes tied or blocked (female sterilization), vasectomy (male sterilization), birth control pill, condoms, injection (Depo-Provera®), contraceptive implant (Implanon®), contraceptive patch (OrthoEvra®) or vaginal ring (NuvaRing®), intrauterine device (IUD) (including Mirena® or Paragard®), natural family planning (including rhythm method), withdrawal (pulling out), not having sex (abstinence) or other. Women who reported using "other" methods of contraception were excluded. If respondents reported more than one method of contraception, they were classified based on the most effective method chosen. For the purpose of further analyses, current method use was categorized by typical use effectiveness (most effective [female sterilization, male sterilization, IUD or implant], moderately effective [injectables, pills, patch, or ring], and less effective [condoms, natural family planning, or withdrawal]) [8]. Respondents reporting abstinence were classified as nonusers. Women who answered "no" to the question about current contraceptive use were also classified as nonusers. Women who reported non-use of contraception because they were currently pregnant were excluded.

Certain characteristics were selected as covariates, based on their potential association with both any diabetes status and contraceptive use. These included: maternal age (≤19, 20–34, ≥35), maternal race/ethnicity (Hispanic, non-Hispanic white, non-Hispanic black, and other), maternal education (<12 years, 12 years, >12 years), previous live birth (0, 1, 2 or more), recent pregnancy intended (yes, no [unwanted or mistimed], unsure), chronic hypertension (yes, no), current health insurance at time of survey completion (private insurance, Medicaid or other government insurance, none), mode of delivery (cesarean section, vaginal), and recent birth preterm (yes <37 weeks, no ≥37 weeks). Most information was obtained from the PRAMS survey, however certain information was obtained from linked birth certificates (i.e. race/ethnicity, maternal education, parity, mode of delivery, and preterm birth).

Percentages and 95% confidence intervals (CI) were calculated to describe characteristics, stratified by diabetes status. Chi-square analyses were performed to compare contraceptive use between women who reported diabetes compared to those who did not. Multivariate logistic regression was performed to calculate adjusted odds ratios (aOR) and 95% confidence intervals (CI) for use of different contraceptives among women with versus without diabetes. We assessed odds of use of female sterilization versus use of reversible prescription methods (IUDs, implants, and moderately effective methods). We also assessed, among women using reversible methods, odds of use of most effective (i.e. long acting reversible contraception [LARC] including IUDs and implants) versus moderately effective methods. Models were adjusted for variables significant in bivariate analyses. Analyses were performed using the Statistical Analysis Software (SAS®) version 9.4.

3. Results

After exclusions, we identified 93,574 women who met inclusion criteria for analyses (Fig. 1). Among all respondents, the overall prevalence of any diabetes was 12% (N = 11,370), and the overall prevalence of pregestational diabetes was 3% (N = 2,731). Table 1 shows characteristics of the study population by diabetes status. Compared to women without diabetes, women with any diabetes were more likely to be ages ≥35, Hispanic or other race/ethnicity, have <12 years of education, have chronic hypertension, and have Medicaid or other government insurance. Women with any diabetes were also more likely to have 2 or more previous live births, to have the most recent pregnancy delivered by cesarean section, and to have the most recent pregnancy delivered preterm. Recent pregnancy intention was similar between women with and without diabetes. Comparisons were similar when comparing women with pregestational diabetes to women without diabetes (data not shown).

Approximately 82% of women with diabetes and 83% of women without diabetes reported currently using a contraceptive method. The percent of women using most effective methods was higher among women with any diabetes (34%) than women without diabetes (29%) (p < 0.001) (Table 2). The percent using female sterilization was significantly higher among women with diabetes (15%) compared to women without diabetes (9%) (p < 0.001). The percent of women using moderately effective methods was lower among women with diabetes (26%) than women without diabetes (30%) (p < 0.0001). The percentages of women with and without diabetes using LARC, less effective, or no contraception were statistically significantly different but the absolute difference was within 2 percentage points. The contraceptive distribution was similar when examining only women with pregestational diabetes (data not shown).

Adjusted odds of female sterilization versus reversible prescription methods (IUDs, implants and moderately effective methods) were higher among women with diabetes than without diabetes (aOR 1.29, 95% CI 1.19–1.39) (Table 3). Certain characteristics were associated with higher odds of female sterilization versus reversible prescription methods including ages ≥35 years (vs ages 20–34), 12 years or less of education (vs >12 years), at least 1 previous live birth (vs no previous live births), recent pregnancy unintended or unsure (vs recent pregnancy intended), government or no insurance (vs private insurance), and cesarean

delivery (vs vaginal delivery). Results were similar in the sensitivity analysis comparing women with pregestational diabetes to women without diabetes (data not shown).

Among women using reversible methods, odds of use of LARC versus moderately effective methods were marginally significantly higher among women with diabetes than without diabetes (aOR 1.07, 95% CI 1.00–1.15) (Table 4). Characteristics associated with higher odds of LARC versus moderately effective methods included ages ≤19 years (vs ages 20–34), Hispanic or other race/ethnicity (vs non-Hispanic white), at least 1 previous live birth (vs no previous live births), recent pregnancy unintended or unsure (vs recent pregnancy intended), government or no insurance (vs private insurance), and cesarean delivery (vs vaginal delivery). Women with less education had lower odds of using LARC than moderately effective methods. In the sensitivity analysis comparing women with pregestational diabetes to women without diabetes, women with pregestational diabetes were not significantly more likely to use LARC (aOR 1.03, 95% CI 0.90–1.19) (data not shown).

4. Discussion

This analysis found that women with diabetes were more likely than women without diabetes to use the most effective methods of contraception, however the proportion was still low (approximately 1/3). This is despite recommendations that effective contraception be recommended for women with diabetes who wish to avoid or delay pregnancy, particularly those with complicated diabetes [3,9,10]. Among women using prescription methods, our analysis found that women with diabetes were more likely to choose female sterilization versus reversible prescription methods than women without diabetes. This is similar to a study of women in one state, in which women with pregestational or gestational diabetes were more likely to undergo postpartum sterilization than women without diabetes (aOR 1.39, 95% CI 1.31–1.47 and aOR 1.20, 95% CI 1.14–1.27, respectively) [11]. Another study also found that the percent using female sterilization was higher among women with diabetes than women without chronic medical conditions [6]. A study reporting on PRAMS data from two states found that, among postpartum women, those with gestational diabetes were more likely to choose sterilization than women without gestational diabetes (crude OR 4.99, 95% CI 1.13–22.17); this study did not report on women with pregestational diabetes [12].

Pregnancy intention was also associated with contraceptive use in this analysis. Women who reported the most recent pregnancy was unintended or reported being unsure about pregnancy intention were more likely to choose female sterilization versus reversible prescription methods. Among reversible contraceptive users, these groups were also more likely to choose LARC versus moderately effective methods. These women may be more motivated to avoid a future pregnancy and thus select a more highly effective method.

Our analysis highlights the potential importance of education on contraceptive choices, although we were unable to assess health literacy. We found that women with less education were more likely to choose female sterilization versus reversible prescription methods. Women with less education were less likely to choose LARC versus moderately effective reversible methods. One study using PRAMS data from 12 states found that higher

education was associated with lower likelihood of female sterilization postpartum [13]. Another study found that higher levels of education were associated with higher likelihood of use of LARC compared with female sterilization [14]. Another study found that higher levels of education were associated with lower percent female sterilization and lower percent desiring sterilization reversal [15]. None of these studies, including ours, were able to examine the quality and comprehensiveness of contraceptive counseling, which may be particularly important for women with lower levels of health literacy.

Choice of contraceptive method may also have been driven by what methods were available. Challenges remain in access to postpartum contraceptive methods, particularly LARC, and it is possible some women who desired effective contraception chose sterilization because of a lack of access to LARC [16]. A study of high-risk pregnancies (including among women with diabetes) found that about half of these women intended to use a highly effective method but only 25% actually used one [17]. The factors contributing to contraceptive choice and particularly choice of permanent or reversible contraception are complex. Nonetheless, it is important that women receive counseling about and access to all contraceptive methods and that choices are able to be made without financial, access, knowledge or other barriers.

The American College of Obstetricians and Gynecologists and the American Diabetes Association recommend preconception counseling for all women of reproductive age with diabetes, which includes use of contraception until the woman has good disease control and wishes to conceive [3,9]. This counseling is an important part of preconception care, which also includes components such as glycemic control, smoking cessation, screening and treatment of diabetes complications, and discontinuation of teratogenic medications [18]. These measures have been found to reduce congenital malformations, preterm birth, and perinatal mortality [18]. However, one study found that women with diabetes were less likely to receive contraceptive counseling than women without chronic conditions [11]. Although we were unable to assess frequency and completeness of contraceptive counseling in this study, it is possible that provider recommendations and patient preferences toward sterilization differ based on concerns about future pregnancy risks. We were also unable to assess women’s contraceptive wishes, and it is possible that women with diabetes had a greater desire for permanent contraception because they were more concerned about future pregnancies. LARC methods are safe for use by women with diabetes and ACOG suggests that they should be recommended for women with diabetes who do not choose permanent contraception [3,10]. In addition, certain reversible contraceptives, such as combined hormonal methods and progestin-only injectables, are generally unsafe for women with complicated diabetes, including women with vascular disease [10].

Strengths of this study include the large multi-state sample, availability of maternal and infant demographics unique to birth certificate records, and PRAMS process of adjustment for certain high risk groups and non-responders to create a more generalizable sample. However, there are certain limitations that should be considered when interpreting results. Information on the survey is self-reported and may be subject to recall bias, although it is not likely that this would occur differentially among women by their diabetes status or different contraceptive methods. The survey only captures known diagnoses and it is

possible some women were not diagnosed if they did not undergo screening. We were unable to assess whether contraceptive counseling occurred or the quality of counseling received or access and barriers to the full range of contraceptive methods. Combining women with pregestational and gestational diabetes may have masked differences between the 2 groups, however results were generally similar when examining only women with pregestational diabetes. The PRAMS survey does not include the lactational amenorrhea method (LAM) as a response option; therefore we may have underestimated the proportion of women using contraception, if women using LAM reported that they were using "other" or "no" contraception. Finally, timing of contraceptive initiation is not available and insurance status at survey completion may not reflect insurance status at the time of contraceptive initiation, which may influence contraceptive choice.

In conclusion, postpartum contraception is an important component of comprehensive care, especially among women who have had a recent high-risk pregnancy, such as those with diabetes. Among women with diabetes, effective contraception can prevent unintended pregnancies or allow adequate pregnancy spacing and time for optimal glycemic control before future pregnancies. Comprehensive counseling includes discussing all contraceptive methods, including their safety, effectiveness and reversibility, and understanding a woman's values and preferences regarding her contraceptive choice. Future studies can further elucidate factors affecting choice of and access to contraception especially within this population.

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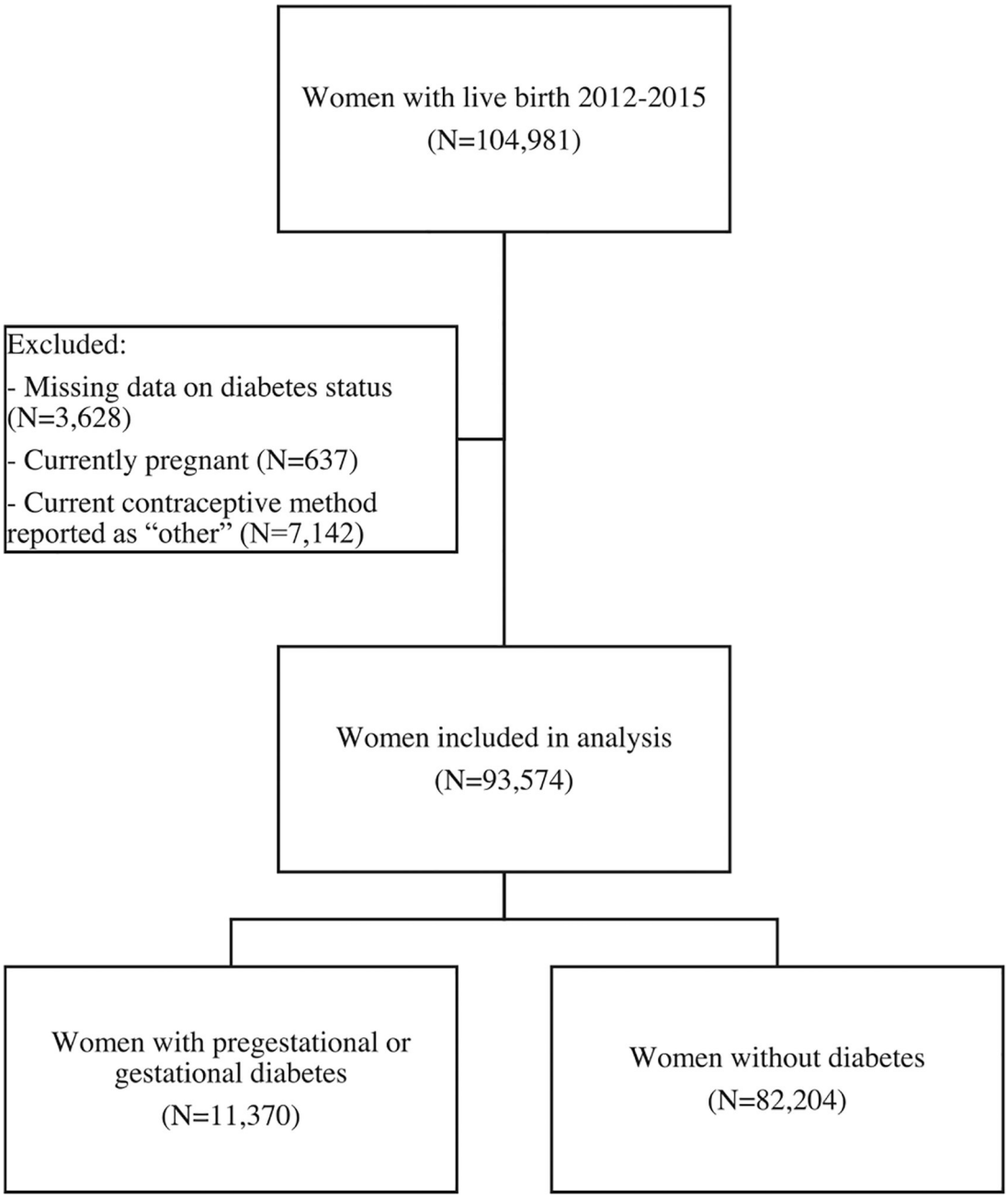

Fig. 1.
Flowchart of inclusion and exclusion in analytic sample, Pregnancy Risk Assessment Monitoring System, 2012–2015.

Table 1

Characteristics of women with a recent live birth, stratified by diabetes status, Pregnancy Risk Assessment Monitoring System, 2012–2015.[a]

Characteristic	Total N = 93,574 %[c]	Women with diabetes[b] N = 11,370 %[c] (95% CI)	Women without diabetes N = 82,204 %[c] (95% CI)
Total	100	12.2	87.8
Maternal age			
≤19	7.1	4.3 (3.9–4.7)	7.5 (7.4–7.7)
20–34	77.7	72.1 (71.3–72.9)	78.5 (78.2–78.8)
≥35	15.1	23.6 (22.8–24.4)	14.0 (13.7–14.2)
Maternal race/ethnicity			
Non-Hispanic White	51.3	41.3 (40.4–42.2)	52.7 (52.3–53.0)
Non-Hispanic Black	16.0	15.9 (15.2–16.6)	16.1 (15.8–16.3)
Hispanic	17.1	21.0 (20.2–21.7)	16.6 (16.3–16.9)
Other	15.5	21.9 (21.1–22.6)	14.7 (14.4–14.9)
Maternal education			
<12 years	14.2	17.2 (16.5–17.8)	13.8 (13.6–14.1)
12 years	25.2	26.4 (25.6–27.3)	25.1 (24.8–25.4)
>12 years	60.6	56.4 (55.9–57.3)	61.1 (60.8–61.5)
Previous live birth			
0	41.4	36.7 (35.9–37.6)	42.0 (41.7–42.4)
1	31.2	30.4 (29.5–31.2)	31.3 (31.0–31.6)
2+	27.5	32.9 (32.0–33.8)	26.7 (26.4–27.0)
Recent pregnancy intended			
Yes	54.4	55.4 (54.5–56.3)	54.3 (53.9–54.6)
No	30.3	28.5 (27.7–29.4)	30.5 (30.2–30.8)
Unsure	15.3	16.1 (15.4–16.8)	15.2 (15.0–15.5)
Chronic hypertension			
Yes	5.4	18.9 (18.2–19.7)	3.5 (3.4–3.6)
No	94.6	81.1 (80.3–81.8)	96.5 (96.4–96.6)
Current health insurance			

Characteristic	Total	Women with diabetes[b]	Women without diabetes
	N = 93,574	N = 11,370	N = 82,204
	%[c]	%[c] (95% CI)	%[c] (95% CI)
Private	45.6	39.8 (38.9–40.7)	46.4 (46.1–46.8)
Medicaid or other government insurance	40.8	44.8 (43.8–45.7)	40.2 (39.9–40.6)
None	13.6	15.5 (14.8–16.1)	13.4 (13.1–13.6)
Mode of delivery			
Cesarean section	33.0	42.6 (41.7–43.5)	31.7 (31.4–32.0)
Vaginal	67.0	57.4 (56.5–58.4)	68.3 (68.0–68.6)
Preterm birth			
Yes	18.7	23.3 (22.5–24.1)	18.1 (17.8–18.3)
No	81.3	76.7 (75.9–77.5)	81.9 (81.7–82.2)

Abbreviations: CI, confidence interval.

[a]Includes the following sites: Alabama (2014, 2015), Alaska (2012–2015), Arkansas (2012, 2013, 2015), Colorado (2012, 2013, 2015), Connecticut (2014, 2015), Delaware (2012–2015), Georgia (2012, 2013), Hawaii (2012–2015), Illinois (2012–2015), Iowa (2013–2015), Louisiana (2015), Maine (2012–2015), Maryland (2012–2015), Massachusetts (2012–2015), Michigan (2012, 2013, 2015), Minnesota (2012, 2013), Missouri (2012–2015), Nebraska (2012–2015), New Hampshire (2013–2015), New Jersey (2012–2015), New Mexico (2012–2015), New York City (2012–2015), New York State (2013–2015), Ohio (2012, 2014, 2015), Oklahoma (2012–2015), Oregon (2012, 2013, 2015), Pennsylvania (2012–2015), Rhode Island (2012–2014), Tennessee (2012–2015), Texas (2015), Utah (2012–2015), Vermont (2012–2015), Virginia (2015), Washington (2012–2015), West Virginia (2012–2015), Wisconsin (2012–2015), Wyoming (2012–2015).

[b]Women who reported Type 1 or Type 2 diabetes before most recent pregnancy or gestational diabetes during most recent pregnancy.

[c]Weighted column percent; percents are among those with available data on the characteristic.

Table 2

Use of contraception among women with a recent live birth, stratified by diabetes, Pregnancy Risk Assessment Monitoring System, 2012–2015[a].

Contraceptive method	Total *N* = 91,832 %[c]	Women with diabetes[b] *N* = 11,123 %[c] (95% CI)	Women without diabetes *N* = 80,709 %[c] (95% CI)	Chi-square *p*-value
Most effective	29.8	33.7 (32.8–34.6)	29.3 (29.0–29.6)	<0.001
Female sterilization	9.9	15.2 (14.5–15.9)	9.2 (9.0–9.4)	<0.001
Male sterilization	2.5	2.4 (2.2–2.7)	2.5 (2.4–2.6)	0.56
IUD or implant	17.4	16.1 (15.4–16.7)	17.5 (17.3–17.8)	<0.001
Moderately effective [d]	29.5	26.1 (25.3–26.9)	30.0 (29.7–30.3)	<0.001
Less effective [e]	23.9	22.7 (22.0–23.5)	24.0 (23.7–24.3)	0.003
None [f]	16.8	17.5 (16.8–18.2)	16.7 (16.5–17.0)	0.035

Abbreviations: CI, confidence interval; IUD, intrauterine device.

[a]Includes the following sites: Alabama (2014, 2015), Alaska (2012–2015), Arkansas (2012, 2013, 2015), Colorado (2012, 2013, 2015), Connecticut (2014, 2015), Delaware (2012–2015), Georgia (2012, 2013), Hawaii (2012–2015), Illinois (2012–2015), Iowa (2013–2015), Louisiana (2015), Maine (2012–2015), Maryland (2012–2015), Massachusetts (2012–2015), Michigan (2012, 2013, 2015), Minnesota (2012, 2013), Missouri (2012–2015), Nebraska (2012–2015), New Hampshire (2013–2015), New Jersey (2012–2015), New Mexico (2012–2015), New York City (2012–2015), New York State (2013–2015), Ohio (2012, 2014, 2015), Oklahoma (2012–2015), Oregon (2012, 2013, 2015), Pennsylvania (2012–2015), Rhode Island (2012–2014), Tennessee (2012–2015), Texas (2015), Utah (2012–2015), Vermont (2012–2015), Virginia (2015), Washington (2012–2015), West Virginia (2012–2015), Wisconsin (2012–2015), Wyoming (2012–2015).

[b]Women who reported Type 1 or Type 2 diabetes before most recent pregnancy or gestational diabetes during most recent pregnancy.

[c]Weighted column percent.

[d]Includes injectables, pills, patch and ring.

[e]Includes condoms, natural family planning, and withdrawal.

[f]Includes abstinence.

Table 3

Odds of female sterilization compared to reversible prescription contraception, among women with a recent live birth, Pregnancy Risk Assessment Monitoring System, 2012–2015.[a]

Characteristic	Use of sterilization[b] aOR[c] (95% CI)
Diabetes status	
Pregestational or gestational diabetes	1.29 (1.19–1.39)
No diabetes	Reference
Age	
≤19	0.08 (0.05–0.12)
20–34	Reference
≥35	2.35 (2.20–2.52)
Race/ethnicity	
Non-Hispanic White	Reference
Non-Hispanic Black	0.68 (0.63–0.73)
Hispanic	0.74 (0.68–0.80)
Other	0.69 (0.63–0.75)
Maternal education	
<12 years	1.14 (1.05–1.24)
12 years	1.34 (1.25–1.43)
>12 years	Reference
Previous live birth	
0	Reference
1	9.73 (8.67–10.91)
2+	27.27 (24.34–30.55)
Recent pregnancy intended	
Yes	Reference
No	1.50 (1.41–1.59)
Unsure	1.56 (1.44–1.68)
Chronic hypertension	
Yes	0.71 (0.64–0.78)
No	Reference
Current health insurance	
Private	Reference
Medicaid or other government insurance	1.11 (1.04–1.19)
None	1.18 (1.07, 1.29)
Mode of delivery	
C-section	3.84 (3.63–4.06)
Vaginal	Reference
Preterm birth	
Yes	0.98 (0.92–1.05)
No	Reference

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; LARC, long acting reversible contraception.

[a] Includes the following sites: Alabama (2014, 2015), Alaska (2012–2015), Arkansas (2012, 2013, 2015), Colorado (2012, 2013, 2015), Connecticut (2014, 2015), Delaware (2012–2015), Georgia (2012, 2013), Hawaii (2012–2015), Illinois (2012–2015), Iowa (2013–2015), Louisiana (2015), Maine (2012–2015), Maryland (2012–2015), Massachusetts (2012–2015), Michigan (2012, 2013, 2015), Minnesota (2012, 2013), Missouri (2012–2015), Nebraska (2012–2015), New Hampshire (2013–2015), New Jersey (2012–2015), New Mexico (2012–2015), New York City (2012–2015), New York State (2013–2015), Ohio (2012, 2014, 2015), Oklahoma (2012–2015), Oregon (2012, 2013, 2015), Pennsylvania (2012–2015), Rhode Island (2012–2014), Tennessee (2012–2015), Texas (2015), Utah (2012–2015), Vermont (2012–2015), Virginia (2015), Washington (2012–2015), West Virginia (2012– 2015), Wisconsin (2012–2015), Wyoming (2012–2015).

[b] Compared with reversible prescription methods (LARC, injectables, pills, patch, or ring).

[c] Adjusted for all other variables in table.

Table 4

Odds of LARC compared to moderately effective contraception, among women with a recent live birth using reversible prescription contraception, Pregnancy Risk Assessment Monitoring System, 2012–2015.[a]

Characteristic	Use of LARC[b] aOR[c] (95% CI)
Diabetes status	
Pregestational or gestational diabetes	1.07 (1.00–1.15)
No diabetes	Reference
Age	
≤19	1.26 (1.17–1.36)
20–34	Reference
≥35	0.87 (0.81–0.93)
Race/ethnicity	
Non-Hispanic White	Reference
Non-Hispanic Black	0.80 (0.75–0.85)
Hispanic	1.33 (1.25–1.41)
Other	1.25 (1.17–1.33)
Maternal education	
<12 years	0.72 (0.67–0.77)
12 years	0.86 (0.82–0.90)
>12 years	Reference
Previous live birth	
0	Reference
1	1.43 (1.36–1.50)
2+	1.50 (1.42–1.59)
Recent pregnancy intended	
Yes	Reference
No	1.20 (1.14–1.25)
Unsure	1.07 (1.01–1.14)
Chronic hypertension	
Yes	1.02 (0.92–1.12)
No	Reference
Current health insurance	
Private	Reference
Medicaid or other government insurance	1.12 (1.07–1.18)
None	1.30 (1.22–1.39)
Mode of delivery	
Cesarean section	1.13 (1.08–1.19)
Vaginal	Reference
Preterm birth	
Yes	0.31 (0.86–0.96)
No	Reference

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; LARC, long acting reversible contraception.

[a] Includes the following sites: Alabama (2014, 2015), Alaska (2012–2015), Arkansas (2012, 2013, 2015), Colorado (2012, 2013, 2015), Connecticut (2014, 2015), Delaware (2012–2015), Georgia (2012, 2013), Hawaii (2012–2015), Illinois (2012–2015), Iowa (2013–2015), Louisiana (2015), Maine (2012–2015), Maryland (2012–2015), Massachusetts (2012–2015), Michigan (2012, 2013, 2015), Minnesota (2012, 2013), Missouri (2012–2015), Nebraska (2012–2015), New Hampshire (2013–2015), New Jersey (2012–2015), New Mexico (2012–2015), New York City (2012–2015), New York State (2013–2015), Ohio (2012, 2014, 2015), Oklahoma (2012–2015), Oregon (2012, 2013, 2015), Pennsylvania (2012–2015), Rhode Island (2012–2014), Tennessee (2012–2015), Texas (2015), Utah (2012–2015), Vermont (2012–2015), Virginia (2015), Washington (2012–2015), West Virginia (2012– 2015), Wisconsin (2012–2015), Wyoming (2012–2015).

[b] Among those using reversible methods, compared with use of moderately effective prescription methods (injectables, pills, patch, or ring).

[c] Adjusted for all other variables in table.