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Unintended pregnancy risk and contraceptive use among women 45–50 years old: Massachusetts, 2006, 2008, and 2010

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Abstract

BACKGROUND: Little is known about unintended pregnancy risk and current contraceptive use among women 45 years old in the United States.

OBJECTIVES: The purpose of this study was to describe the prevalence of women ages 45–50 years old at risk for unintended pregnancy and their current contraceptive use, and to compare these findings to those of women in younger age groups.

STUDY DESIGN: We analyzed 2006, 2008, and 2010 Massachusetts Behavioral Risk Factor Surveillance System data, the only state in the United States to collect contraceptive data routinely from women >44 years old. Women 18–50 years old ($n = 4930$) were considered to be at risk for unintended pregnancy unless they reported current pregnancy, hysterectomy, not being sexually active in the past year, having a same-sex partner, or wanting to become pregnant. Among women who were considered to be at risk ($n = 3605$), we estimated the prevalence of current contraceptive use by age group. Among women who were considered to be at risk and who were 45–50 years old ($n = 940$), we examined characteristics that were associated with current method use. Analyses were conducted on weighted data using SAS-callable SUDAAN (RTI International, Research Triangle Park, NC).

RESULTS: Among women who were 45–50 years old, 77.6% were at risk for unintended pregnancy, which was similar to other age groups. As age increased, hormonal contraceptive use (shots, pills, patch, or ring) decreased, and permanent contraception (tubal ligation or vasectomy) increased as did non-use of contraception. Of women who were 45–50 years old and at risk for unintended pregnancy, 66.9% reported using some contraceptive method; permanent contraception was the leading method reported by 44.0% and contraceptive non-use was reported by 16.8%.

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CONCLUSION: A substantial proportion of women who were 45–50 years old were considered to be at risk for unintended pregnancy. Permanent contraception was most commonly used by women in this age group. Compared with other age groups, more women who were 45–50 years old were not using any contraception. Population-based surveillance efforts are needed to follow trends among this age group and better meet their family planning needs. Although expanding surveillance systems to include women through 50 years old requires additional resources, fertility trends that show increasingly delayed childbearing, uncertain end of fecundity, and potential adverse consequences of unplanned pregnancy in older age may justify these expenditures.

Keywords

contraceptive use; older reproductive-aged women; Behavioral Risk Factor Surveillance System; unintended pregnancy

Little is known about unintended pregnancy (UIP) risk and current contraceptive use among women who are 45 years old in the United States. The primary US national surveillance tool that gathers information on family life, pregnancy, and use of contraception—the National Survey of Family Growth (NSFG)—has collected family planning and contraceptive use data only from women who were 15–44 years old since 1973¹; however, starting September 2015, NSFG expanded their age range to 15–49 years old (Anjani Chandra, PhD, personal communication, July 2015). Nonetheless, our ability to understand the fertility desires and contraceptive needs of older women in the United States is limited. Several countries do collect this information from older women,² and European data suggest that approximately 30% of women 45–49 years old are not using any contraception.³

Fecundity in women significantly declines after 44 years old; the median age at which women in the United States reach natural menopause is 51.4 years old.⁴ Nonetheless, conceptions in the later reproductive years do occur.⁵ In fact, live births among women in the United States who are 45–49 years old are increasing.⁶ In 2013, the US birth rate for women who were 45 years old was 0.8 births per 1000 women, which is a small increase from 0.7 births per 1000 women in 2012 and an even larger increase since the early 1990s when the birth rate for women who were 45 years old was 0.3 births per 1000 women.^{6,7} Presumably, much of this increase is due to planned births and the increasing use of assisted reproductive technologies; however, to our knowledge, no estimates of the UIP rate among women in the United States who are 45 years old have been reported. Among women who are 15–44 years old, proportions of UIP are highest among teenagers and women who are 20–24 years old (82% and 64%, respectively), although the third highest proportion is among women who are 40–44 years old (48%).⁸

According to current US contraception guidelines, contraceptive protection is recommended for women who are 45 years old who are at risk for UIP.⁹ The American College of Obstetricians and Gynecologists further specifies that women who want to avoid pregnancy should continue contraception until 50–55 years old.¹⁰ All methods of contraception are considered safe or generally safe for women who are 45 years old without other risk factors and should not be dismissed from consideration or discontinued based on age alone.¹¹ Although certain medical conditions that are more common as women age (such

as hypertension or diabetes mellitus) may preclude the use of some reversible contraceptive methods (eg, those containing estrogen), many methods such as progestin-only implants or intrauterine devices (IUDs) remain safe, even for women with underlying medical disorders and are among the most effective methods available.¹²

Given limited information on UIP risk and contraceptive use behaviors among women in the United States who are >44 years old, we sought to describe the prevalence of women who are 45–50 years old and who are at risk for UIP and their current contraceptive use habit and to compare these findings with those of women in younger age groups. Understanding UIP risk and contraceptive use among women who are 45–50 years old, compared with younger age groups, provides insight into UIP and contraceptive trends over the reproductive life span.

Materials and Methods

Overview

The Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing, state-based, random-digit-dialed telephone survey of noninstitutionalized US civilian adults who are 18 years old that is conducted annually by state health departments in collaboration with the Centers for Disease Control and Prevention. The BRFSS sampling method samples households rather than individuals; 1 adult in each household is selected randomly to participate, so the likelihood of the same individual participating in multiple BRFSS surveys is low. The BRFSS collects information on health-related risk behaviors, chronic health conditions, and the use of preventive services. The BRFSS questionnaire consists of core questions that are used by all states, optional modules that are supported by Centers for Disease Control and Prevention programs and are available for states to use, and state-added questions. The BRFSS data are weighted to produce estimates that are representative of the state population. More detail on the BRFSS, including methods, is available from the BRFSS website.¹³

We analyzed 2006, 2008, and 2010 Massachusetts BRFSS data; response rates during these years, based on the Council of American Survey and Research Organization guidelines, were 38.6%, 48.2%, and 47.5%, respectively.^{14–16} Although family planning questions were previously part of the 2002 and 2004 core BRFSS questionnaires and were offered as optional modules during other years, the questions were asked only among women who were 18–44 years old. We analyzed Massachusetts data because Massachusetts was the only state to include BRFSS family planning questions and to ask these questions among women who were 18–50 years old, beginning in 2006 and implemented during even-numbered years. We did not include data subsequent to 2010 because the BRFSS methods and weighting methods changed in 2011; therefore, subsequent survey data are not directly comparable to previous years. Analysis of 2012 and 2014 data, independent from previous years, was undesirable because of the low numbers of older women. Institutional review board approval was not needed because the analysis used publicly available data with de-identified participants.

Measures

Our outcome of interest was current contraceptive use and was measured with the use of several questions. Women were first asked, “Are you or your husband/partner doing anything now to keep you from getting pregnant?” Those who indicated “yes” were asked, “What are you or your husband/partner doing now to keep you from getting pregnant?” Response options for numerous contraceptive methods were included, and respondents who were using a method not listed could indicate “other” and specify the method being used. Women who reported the use of multiple methods were asked to report their primary contraceptive method; women who reported multiple partners were asked to consider their usual partner when answering the question. Women who indicated “no” to the first question were classified as using no method and were asked, “What is the main reason for not doing anything now to keep yourself from getting pregnant?” Those who reported “tubes tied” or “partner vasectomy” were recoded as contraceptive users.

Use of any contraceptive method was coded as “yes” or “no.” We also coded current contraceptive use by categories of methods. Use of permanent methods included tubal ligation or vasectomy. Use of long-acting, reversible contraception (LARC) included IUDs or implants. Use of hormonal methods included shots, pills, patch, or ring. Use of barrier methods included condoms, diaphragm, cervical cap, sponge, or shield. Use of some other method included withdrawal, rhythm, emergency contraception, or “other.” Please note that, in 2006 and 2008, ring use was included in the response option for barrier methods rather than its own response category. Although this may have led to underreporting of hormonal methods and overreporting of barrier methods, we do not expect noteworthy misclassification error because of the low rate (1.3%) of ring use reported among women in the United States who were 15–44 years old and an even lower rate (0.4%) among older women who were 40–44 years old.¹⁷

Data analysis

We combined 2006, 2008, and 2010 Massachusetts BRFSS data for women who were 18–50 years old and who participated in the version of the survey that included family planning questions ($n = 4930$). Women were considered to be at risk for UIP unless they reported current pregnancy, hysterectomy, or not being sexually active in the past 12 months, which was ascertained by 3 separate questions, or reporting a same-sex partner or wanting to become pregnant as reasons for not using contraception. We were unable to identify and subsequently exclude women who were no longer at risk of UIP because of menopause because the survey did not ask about menopausal status.

Missing data are typically a concern in secondary analysis of large surveys.¹⁸ We examined differences between women with and without missing data (or “don’t know” or refused responses) on at least 1 of the 3 main questions that were used to determine whether women were at risk for UIP. We found that older women who were 45–50 years old had significantly ($P < .05$) more missing data (28.3%) than women in other age groups (8.7%, 12.5%, 17.0%, and 13.3% for women who were 18–24, 25–34, 35–39, and 40–44 years old, respectively). A large proportion of older women with missing data had missing information on a current pregnancy; this was in part due to women who were 45 years old not being asked about

current pregnancy in the 2006 survey. Among the entire sample (n = 4930), we assumed at risk for UIP status for 900 women (16.2%) because of missing data. We conducted a sensitivity analysis excluding these 900 women to explore how findings may have differed.

We estimated the prevalence of at risk for UIP, overall, and by age group (18–24, 25–34, 35–39, 40–44, and 45–50 years old). Among women considered to be at risk for UIP, we estimated the prevalence of current contraceptive use overall and by age group. We reported use of any method and use of specific methods by category. Given the large percentage of women (16.2%) with “don’t know” responses or missing data on current contraceptive use, we included a category for “don’t know”/missing data in the analysis. We also compared characteristics of women with and without missing data on current contraceptive use.

Among the subset of women who were 45–50 years old who were considered to be at risk for UIP (n = 940), we examined characteristics that were associated with current contraceptive use using chi-square tests of independence and probability values <.05 to determine statistical significance. Characteristics of interest included marital status, education level, race/ethnicity, smoking status, and lifetime diagnosis of diabetes mellitus or a cardiovascular medical condition (ie, heart attack, angina, coronary heart disease, or stroke). All analyses were performed on weighted data with SAS-callable SUDAAN (RTI International, Research Triangle Park, NC) to account for the complex sampling design of the BRFSS.

Results

Among all women in the sample, 18.3% were 45–50 years old; the majority were married (64.3%) and had >12 years of education (75.0%; Table 1). Most women classified themselves as white and non-Hispanic (80.4%), and 16.7% reported being a smoker (ie, smoked at least 100 cigarettes in their lifetime and smoked regularly at the time of interview). Less than 5% of women reported ever being diagnosed with diabetes mellitus or a cardiovascular medical condition.

Overall, 76.6% of women who were 18–50 years old were considered to be at risk for UIP; prevalence estimates were similar across age groups (Table 2). Not being sexually active in the past 12 months or having a same-sex partner was the most common reason women who were 18–24 (21.7%), 35–39 (6.7%), 40–44 (11.6%), and 45–50 (12.6%) years old were considered not to be at risk for UIP. Older women (45–50 years old) more frequently reported hysterectomy (9.2%). Among women who were 25–34 years old, current pregnancy (8.8%), not being sexually active in the past 12 months or having a same-sex partner (8.7%), and wanting to become pregnant (7.6%) were common reasons for being considered not to be at risk for UIP.

Table 3 summarizes current contraceptive use among women who were 18–50 years old and considered to be at risk for UIP. Use of any contraceptive method was highest for women who were 18–24 years old (79.9%) and decreased as age increased with a low of 66.9% of women who were 45–50 years old using some method. Other trends by age group were observed. As age increased, so did the use of permanent contraception (tubal ligation or

vasectomy), from 4.7% among women who were 18–24 years old to 44.0% among those who were 45–50 years old. Non-use of contraception also generally increased as age group increased, from 9.3% among women who were 18–24 years old to 16.8% among those who were 45–50 years old. For hormonal contraceptives (shots, pills, patch, or ring), use decreased as age group increased from 46.9% among women who were 18–24 years old to 5.9% among women who were 45–50 year old. Although the use of LARCs (IUDs or implants) was low overall (6.6%), its use peaked among women who were 25–34 years old (9.0%) and was lowest (3.3%) among women who were 45–50 years old. Reported use of barrier methods essentially plateaued after age 34 years, with a prevalence of 11.7% among women who were 35–39 years old, 10.9% among women who were 40–44 years old, and 11.6% among women who were 45–50 years old. Similar percentages of women among age groups 25–34, 35–39, 40–44, and 45–50 years old reported “don’t know” or gave no response to the question regarding contraceptive use. Significant differences ($P < .05$) in characteristics of women with and without missing data on current contraceptive use were race/ethnicity and smoking status. Non-Hispanic, white women had a lower proportion of missing data (15.0%) compared with women of other racial/ethnic backgrounds (21.6%), and smokers had a lower proportion of missing data (10.5%) than nonsmokers (17.3%; data not shown).

Results of our sensitivity analysis, which excluded women in our sample assumed to be at risk for UIP because of missing data, showed fewer women to be at risk for UIP than detected in the main analysis (72.1% vs 76.6%); this difference was more substantial among women who were 45–50 years old (68.7% vs 77.6%). Patterns of reasons women were considered not to be at risk for UIP were similar (eg, not being sexually active or having a same-sex partner was the top reason for not being at risk among older women). Additionally, contraceptive use (any method and use of specific methods) was higher overall and by age group (data not shown). Patterns in contraceptive use by age group remained the same (eg, use of sterilization increased as age group increased; LARC use was highest among women who were 25–34 years old and lowest among women who were 45–50 years old).

In our sample, most women who were 45–50 years old and at risk for UIP ($n = 940$) were married (80.0%), had >12 years of education (76.8%), were white non-Hispanic (89.3%), were nonsmokers (84.9%), and had never been diagnosed with diabetes mellitus or a cardiovascular medical condition (94.8%; Table 4). None of these characteristics were significantly ($P < .05$) associated with current use of contraceptive method when categorized as “any method.” However, the use of permanent contraception was significantly ($P < .05$) associated with being married (46.7% vs unmarried (34.3%)), and the use of a LARC or hormonal method was associated significantly ($P < .05$) with having >12 (10.8%) vs <12 (4.0%) years of education, being a non-smoker (10.0%) vs smoker (3.2%), and never (9.4%) vs ever (2.6%) being diagnosed with diabetes mellitus or a cardiovascular medical condition. Contraceptive non-use was associated significantly ($P < .05$) with being a smoker (26.7%) vs non-smoker (15.3%) and being non-Hispanic white (18.0%) vs other race/ethnicity (8.2%). “Don’t know” or no response was associated significantly ($P < .05$) with being a non-smoker (18.3%) vs smoker (6.0%).

Comment

With the use of the Massachusetts BRFSS data for women who were 18–50 years old, this analysis extends reporting of UIP risk and contraceptive method use to include older women beyond that reported in current national surveys, although the NSFG was expected to include women up to 49 years old starting September 2015 (Anjani Chandra, PhD, personal communication, July 2015). Our findings suggest that a high proportion of women who were 45–50 years old were at risk for UIP, similar to other age groups. The use of permanent contraception increased as age increased; contraceptive non-use also increased as age increased. Our findings are similar to those reported by the NSFG, which demonstrated increased use of permanent contraception with increasing age, and by the European surveys, which include women who were 15–49 years old and which indicated sterilization as the most common contraceptive method used by older women.³ Our findings are also similar to other studies that have demonstrated that contraceptive nonuse increased with increasing age and that non-users are more likely to be women >40 years old.^{19,20}

We considered several limitations. First, we may have overestimated the percentage of women who were considered to be at risk for UIP because of missing data, especially among women who were 45–50 years old. Second, we did not have information on menopausal status other than a history of hysterectomy. Because the median age of menopause is 51 years old in the United States, some women in our analysis may have already been menopausal, which may have led to a further overestimation of the percentage of women who were considered to be at risk for UIP and underestimation of the percentage of older women using contraception. Third, a large proportion (16.2%) of women considered to be at risk for UIP had missing data or answered “don’t know” when asked about current contraceptive use; however, the proportion did not differ by age group. Fourth, even though we aggregated 3 years of survey data from a population-based sample of women, findings are generalizable only to Massachusetts; other states should consider including family planning questions on their BRFSS surveys and expanding the age range of women who complete the questions. Another limitation is that more recent data (2012 and 2014) were not incorporated into the analysis. Unfortunately, changes in the weighting methods of the BRFSS after 2010 prevent comparisons, and several years of data are needed for sufficient numbers of older women. As more data that include older women become available with the anticipated expansion of the NSFG to age 49 years, additional analyses would be warranted, especially because LARC methods have become more popular. Last, BRFSS response rates generally are lower than comparable national surveys; however, estimates between BRFSS and NSFG specifically have been shown to be similar.²¹ Despite these limitations, our analysis contributes to the literature by examining UIP risk and contraceptive use among older reproductive-aged women in the United States who use nationally validated measures of contraception.²¹ Further, our analysis highlights the need for surveillance systems to collect data that can address the risk of UIP in older women, which ultimately could be used to generate improved clinical guidelines to address contraceptive use for women nearing menopause.

Surveys that include women >44 years old allow the examination of trends in contraceptive use across the broad range of reproductive years and serve as a reminder to health care

providers and program planners that perimenopausal women may have unmet contraceptive needs and may benefit from contraceptive counseling and care. In the United States, surveys regarding UIP risk and contraceptive use generally do not include women >44 years old because of declining fertility and lower likelihood of UIP as women near natural menopause.⁴ Despite the lower probability of pregnancy in this age group, the age at which an individual woman will no longer conceive remains elusive. Demographic fertility trend studies have attempted to estimate when women are no longer fecund; however, these studies have inherent biases, and their conclusions may be misleading.²² Demographic fertility trend studies require populations in which fertility control is not practiced, which is not practical with today's wide-spread use of contraception, and often use historical populations for which only live births were recorded, not the number of conceptions.²³ Additionally, these studies cannot account for other factors that affect a woman's fertility, such as sexual behavior, cycle length, sexually transmitted infection history, smoking, or other medical conditions.²⁴ Hormonal testing promises a better glimpse into probable age at which an individual woman reaches menopause, but the technology has not been perfected. Clinicians can assess ovarian activity with serum testing of follicle-stimulating hormone levels, but follicle-stimulating hormone serum levels are considered unreliable because they change monthly and because periodic testing is costly. Levels of anti-Müllerian hormone have shown promise in distinguishing women who will reach menopause at younger vs older age²⁵; however, standardized assays are lacking.²⁶ Because there is no specific age at which all women are no longer fecund and because the median age of menopause occurs in the early 50s, surveillance systems should include women who are >44 years old to capture the broadest range of reproductive-aged women.

National contraceptive guidelines that recommend contraceptive protection for women who are ≥ 45 years old, if the woman wants to avoid pregnancy,^{9,10} are important not only because of the uncertainty of the age in which a woman will no longer conceive, but also because of potentially devastating consequences of an unplanned pregnancy in older age. In the United States, women >40 years old have a nearly 5 times greater pregnancy-related mortality ratio than that of women who are 25–29 years old (55 deaths vs 12 deaths per 100,000 live births annually, respectively).²⁷ Additionally, women who are >44 years old have a higher risk of pregnancy-induced hypertension, gestational diabetes mellitus, cesarean delivery, fetal chromosomal abnormalities, and pregnancy loss when compared with younger women.^{28,29} Despite the risks of pregnancy in older women, our analysis shows that approximately 1 in 6 women who were 45–50 years old and at risk of UIP reported not using contraception. In this present analysis, 1 factor associated with non-use was being a smoker, with more than 1 in 4 smokers reporting non-use. This finding is not surprising in light of contraindications to hormonal contraception among older women who smoke cigarettes, which may explain why use may be lower in this subgroup of women. Although smokers ≥ 35 years old generally should not use combined hormonal methods, women and their providers should be aware that there are several safe and highly effective contraceptive methods available to smokers, including progestin-only methods and IUDs. Given the potential severe consequences of an UIP among older women and the considerable proportion of women who were 45–50 years old who were at risk for UIP by not using contraception, efforts are needed to continue contraceptive use until menopause.

In contrast to the risks associated with pregnancy for women who were >44 years old, all contraceptive methods are considered safe or generally safe for women based on age alone according to the US Medical Eligibility Criteria for Contraceptive Use.¹¹ Among older women who are not interested in permanent contraception, LARCs may be an ideal method. In our sample, LARC use was lowest in women who were 45–50 years old (3.3%), although LARC use was low overall for all age groups. Our data from 2006, 2008, and 2010 preceded national efforts to promote LARC use and may not represent current estimates; however, the recent push for LARC use has been primarily among adolescent women.^{30,31} Similar to our findings, a non-BRFSS state-specific survey on women's health issues found older women (those who were 45–50 years old) to be less likely to use an IUD than women in younger age groups.³² In contrast, among IUD users from 14 European countries, older women (those who were 40–49 years old) made up the largest proportion (52%) of IUD users.³³ LARC methods are suited especially for older women who desire a highly effective, long-lasting, reversible contraceptive method, given that most of these women have completed childbearing. Additionally, their safety in the presence of existing medical conditions that include hypertension, diabetes mellitus, or hypercholesterolemia, which are common medical conditions that become more prevalent as women age, is important. Diabetes mellitus and cardiovascular conditions were reported by only 5% of women who were 45–50 years old in our analysis, which may not represent actual disease among women in this age group nationally.³⁴ Compared with tubal ligation, LARC methods are administered easily in the office setting, are reversible, and have demonstrated health care cost-savings, especially among women who were 40 years old.^{35,36} The progesterone-releasing IUD has particular benefits in perimenopause; it has been approved for treatment for heavy menstrual bleeding, provides endometrial protection from uterine cancer among those women who use parenteral estrogen therapy, and assists women with seamless transition into menopause.^{37–39} Additionally, evidence suggests this IUD prevents endometrial polyps in patients with breast cancer who undergo tamoxifen therapy.⁴⁰

In conclusion, few data exist about the reproductive health needs among women in the United States who are 45–50 years old. These data from Massachusetts suggest that women who are 45–50 years old face similar risks of UIP as other women in younger age groups; although many women who are 45–50 years old are protected from UIP because of permanent contraceptive use, approximately 17% reported nonuse of contraception. Without including older reproductive-aged women in population-based surveillance efforts, trends among this age group and whether their family planning needs are being met remain unknown. Routinely including women up to 50 years old in national surveys likely would improve missing data as well. Although expanding surveillance systems to include women through 50 years old requires additional resources, fertility trends that show increasingly delayed childbearing,⁴¹ uncertain end of fecundity, and potential devastating consequences of unplanned pregnancy in older women may justify these expenditures. ■

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TABLE 1

Sample characteristics, women 18–50 years old: Massachusetts, Behavioral Risk Factor Surveillance System, 2006, 2008, and 2010 (n = 4930)

Variable	N ^a	% ^a
Age, y		
18–24	374	10.2
24–34	1201	25.5
35–39	945	21.1
40–44	1034	24.8
45–50	1376	18.3
Married		
Yes	2595	64.3
No	2308	35.7
Education, y		
12	1526	25.0
>12	3386	75.0
Race/ethnicity		
White, non-Hispanic	3553	80.4
Other	1342	19.6
Smoker ^b		
Yes	1033	16.7
No	3877	83.3
Ever diagnosed with diabetes mellitus or cardiovascular medical condition ^c		
Yes	291	4.6
No	4621	95.4

^aNumbers based on unweighted sample. Percentages based on weighted sample. Percentages calculated excluding observations with missing values;

^bHas smoked at least 100 cigarettes in lifetime and is now smoking regularly;

^cIncludes heart attack, angina, coronary heart disease, or stroke.

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Prevalence to be at risk for unintended pregnancy^a among women 18–50 years old, overall and by age group: Massachusetts, Behavioral Risk Factor Surveillance System, 2006, 2008, and 2010 (n = 4930)

TABLE 2

Unintended pregnancy											
Not at risk											
At risk ^a		Currently pregnant		Hysterectomy		Not sexually active or same-sex partner		Want to become pregnant			
Variable	N ^b	% ^c	N ^b	% ^c	N ^b	% ^c	N ^b	% ^c	N ^b	% ^c	% ^c
Total	3605	76.6	153	3.7	276	4.3	746	11.0	150	4.3	
Age, y											
18–24	260	72.0	24	3.6	0	0	76	21.7	14	2.7	
25–34	896	74.1	88	8.8	15	0.8	135	8.7	67	7.6	
35–39	733	79.9	35	4.1	29	3.1	107	6.7	41	6.2	
40–44	776	77.6	5	0.8	73	7.2	161	11.6	19	2.8	
45–50	940	77.6	1	0.0	159	9.2	267	12.6	9	0.6	

^aWomen were considered to be at risk for unintended pregnancy, unless they reported current pregnancy, hysterectomy, not being sexually active in the past 12 months, having a same-sex partner, or wanting to become pregnant;

^bBased on the unweighted sample;

^cBased on the weighted sample.

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Prevalence of current contraceptive use among women 18–50 years old who were considered to be at risk for unintended pregnancy,^a overall and by age group: Massachusetts, Behavioral Risk Factor Surveillance System, 2006, 2008, and 2010 (n = 3605)

TABLE 3

Variable	Any method			Permanent method ^b			Long-acting reversible contraception method ^c			Hormonal method ^d			Barrier method ^e			Other method ^f			No method			Do not know/no response			
	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	NG	% ^h	
Total	2478	70.6	1046	27.4	217	6.6	612	20.6	473	13.2	130	2.8	489	13.1	638	16.2									
Age, Y																									
18–24	190	79.9	8	4.7	24	6.7	101	46.9	51	21.0	6	0.7	32	9.3	38	10.8									
25–34	648	72.2	119	12.9	84	9.0	273	32.4	135	15.1	37	2.9	92	11.7	156	16.0									
35–39	529	71.3	260	32.1	46	7.5	107	17.0	92	11.7	24	3.1	75	11.3	129	17.3									
40–44	511	67.9	281	34.0	36	6.0	77	13.2	85	10.9	32	3.8	115	14.7	150	17.3									
45–50	600	66.9	378	44.0	27	3.3	54	5.9	110	11.6	31	2.1	175	16.8	165	16.3									

^aWomen were considered to be at risk for unintended pregnancy unless they reported current pregnancy, hysterectomy, not being sexually active in the past 12 months, having a same-sex partner, or wanting to become pregnant;

^bTubal ligation or vasectomy;

^cIntrauterine devices or implants;

^dShots, pills, patch, or ring; ring was included in this group in 2010 only;

^eCondoms, diaphragm, cervical cap, sponge, or shield; this group also included vaginal ring in 2006 and 2008;

^fWithdrawal, rhythm, emergency contraception, or other;

^gBased on unweighted sample;

^hBased on weighted sample.

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TABLE 4

Prevalence of current contraceptive use among women 45–50 years old who were considered to be at risk for unintended pregnancy^a by select characteristics: Massachusetts, Behavioral Risk Factor Surveillance System, 2006, 2008, and 2010 (n = 940)

Variable	Women 45–50 years old, n ^b (% ^c)		Long-acting reversible contraception or hormonal method ^e						Do not know/no response					
	N ^b	% ^c	Any method	Permanent method ^d	Barrier or other method ^f	No method	Do not know/no response	N ^b	% ^c	N ^b	% ^c			
Married														
Yes	635 (80.0)		417	68.0	281	46.7	47	8.5	89	12.8	114	16.8	104	15.2
No	295 (20.0)		180	64.0	96	34.3 ^g	33	12.4	51	17.3	61	17.4	54	18.5
Education, y														
12	242 (23.2)		151	64.8	109	50.7	12	4.0	30	10.0	46	16.1	45	19.1
>12	693 (76.8)		448	67.7	269	42.1	69	10.8 ^g	110	14.8	129	17.1	116	15.2
Race/ethnicity														
White, non-Hispanic	780 (89.3)		503	66.9	313	44.5	66	8.5	124	13.9	153	18.0 ^g	124	15.1
Other	152 (10.7)		93	66.9	62	37.7	14	15.6	17	13.6	21	8.2	38	24.9
Smoker ^h														
Yes	176 (15.1)		105	67.3	73	53.6	5	3.2	27	10.5	44	26.7	27	6.0
No	756 (84.9)		488	66.4	300	42.2	75	10.0 ^g	113	14.3	131	15.3 ^g	137	18.3 ^g
Ever diagnosed with diabetes mellitus or cardiovascular medical condition ⁱ														
Yes	72 (5.2)		42	61.7	31	45.8	3	2.6	8	13.3	13	13.4	17	24.8
No	865 (94.8)		556	67.0	346	43.9	77	9.4 ^g	133	13.8	162	17.0	147	15.9

^aWomen were considered to be at risk for unintended pregnancy unless they reported current pregnancy, hysterectomy, not being sexually active in the past 12 months, having a same-sex partner, or wanting to become pregnant;

^bBased on unweighted sample;

^cBased on weighted sample; percentages were calculated excluding observations with missing values;

^dTubal ligation or vasectomy;

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- e Long-acting reversible contraception includes intrauterine devices and implants; hormonal method includes shots, pills, patch, or ring (ring was included in this group in 2010 only);
 - f Barrier method includes condoms, diaphragm, cervical cap, sponge, or shield; other method includes withdrawal, rhythm, emergency contraception, or other (this group also included vaginal ring in 2006 and 2008);
 - g Probability value of $<.05$ based on chi-square test, which compared the distribution of contraceptive use outcome (coded as "yes vs no") by characteristic;
 - h Has smoked at least 100 cigarettes in lifetime and is now smoking regularly;
 - i Includes heart attack, angina, coronary heart disease, or stroke.
- Godfrey et al. Contraceptive use among women 45 years old. *Am J Obstet Gynecol* 2016.