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Estimates of Lifetime Infertility from Three States: The Behavioral Risk Factor Surveillance System

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Abstract

Background—Knowledge of state-specific infertility is limited. The objectives of this study were to explore state-specific estimates of lifetime prevalence of having ever experienced infertility, sought treatment for infertility, types of treatments sought, and treatment outcomes.

Methods—Male and female adult residents aged 18–50 years from three states involved in the States Monitoring Assisted Reproductive Technology Collaborative (Florida, Massachusetts, and Michigan) were asked state-added infertility questions as part of the 2012 Behavioral Risk Factor Surveillance System, a state-based, health-related telephone survey. Analysis involved estimation of lifetime prevalence of infertility.

Results—The estimated lifetime prevalence of infertility among 1,285 adults in Florida, 1,302 in Massachusetts, and 3,360 in Michigan was 9.7%, 6.0%, and 4.2%, respectively. Among 736 adults in Florida, 1,246 in Massachusetts, and 2,742 in Michigan that have ever tried to get pregnant, the lifetime infertility prevalence was 25.3% in Florida, 9.9% in Massachusetts, and 5.8% in Michigan. Among those with a history of infertility, over half sought treatment (60.7% in Florida, 70.6% in Massachusetts, and 51.6% in Michigan), the most common being non-assisted reproductive technology fertility treatments (61.3% in Florida, 66.0% in Massachusetts, and 75.9% in Michigan).

Conclusion—State-specific estimates of lifetime infertility prevalence in Florida, Massachusetts, and Michigan varied. Variations across states are difficult to interpret, as they likely reflect both true differences in prevalence and differences in data collection questionnaires. State-specific

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estimates are needed for the prevention, detection, and management of infertility, but estimates should be based on a common set of questions appropriate for these goals.

Introduction

Infertility is an important public health issue,¹ is recognized as a disease,^{2,3} and affects millions of men and women around the world.⁴ Individuals and couples experiencing infertility may experience physical or psychological distress related to the infertility itself or to infertility treatment. Advances in infertility treatment have resulted in increased treatment options for patients, including intrauterine insemination, ovulation induction, and assisted reproductive technology (ART), most commonly performed as *in vitro* fertilization. However, treatments can be expensive and time consuming.⁵⁻⁸ In addition, they can have adverse effects on mother and baby. Some women experience medical complications such as ovarian hyperstimulation.⁹ Also, some infertility treatments are associated with an increase in multiple births, which can have adverse results including preterm births.¹⁰⁻¹² Multiple births also result in exponential costs of care through the first year of life.¹³

Understanding national and state-specific prevalence of infertility is important for the prevention, detection, and management of infertility, as well as for examining adverse events and outcomes of infertility treatments.^{14,15} However, state-specific data on infertility are not routinely collected, and therefore the ability of states to address this important public health issue is limited. The Behavioral Risk Factor Surveillance System (BRFSS) is a tool commonly used to conduct state-based surveillance of chronic health conditions. In this analysis, we will explore the BRFSS as a means of conducting state-based infertility surveillance based on the experience of three states, all members of the States Monitoring ART (SMART) Collaborative.¹⁶ We will explore state-specific estimates of the lifetime prevalence of having ever experienced infertility, seeking treatment for infertility, types of treatments sought, and treatment outcomes.

Materials and Methods

Data analyzed in this study were obtained from the 2012 BRFSS, a health-related telephone survey. The BRFSS collects state-specific data pertaining to health-related issues in all 50 states, Washington DC, and three territories. Data are collected on an annual basis from a randomly selected, representative sample of adults aged 18 years or older within each state.¹⁷ A landline sample and cell phone sample are selected via stratified random selection of telephone numbers. The landline sample includes only calls made to a landline. The cell phone sample makes up roughly 20% of the total sample and includes respondents that use a cell phone for 90% or more of their calls.¹⁸ In addition to the core set of questions asked of all respondents,¹⁹ there is an option for state-constructed questions.²⁰ These state-constructed questions can be asked of the entire sample, only the landline sample, or some subset of the landline and/or cell phone sample, a split. Different sets of state-added questions can be asked of different splits, or different subsets of respondents, in order to increase the number of questions asked overall without adding to the survey length for individual respondents. The BRFSS is considered public health surveillance and is exempt

from review by an institutional review board under 45 Code of Federal Regulations 46.101(b)(2).

The questions used in this analysis relate to infertility and were constructed and added by three SMART Collaborative states in order to facilitate a multistate analysis of infertility prevalence. The SMART Collaborative is a partnership between the Division of Reproductive Health within the Centers for Disease Control and Prevention and the Massachusetts, Michigan, and Connecticut State Departments of Health, and formerly the Florida State Department of Health.¹⁶ It conducts surveillance of ART-related maternal and infant health outcomes, strengthens capacity for evaluating outcomes, and provides information and assistance to improve maternal and perinatal outcomes and programs. Connecticut was only recently added as a member of the collaborative and did not include state-added questions on infertility for the 2012 BRFSS; therefore, Connecticut data are not included.

Because the states constructed their own questions for infertility-related measures, the question structure and wording used in each state's survey was different. However, all of the states generally captured whether the respondent and/or a spouse or partner ever tried to get pregnant for a year or longer but were unable to do so, whether the respondent or spouse/partner ever sought medical consultation or treatment for infertility or problems becoming pregnant, which treatments the respondent or spouse/partner sought, and the result of the most recent treatment (not assessed in Massachusetts). Florida and Massachusetts assessed whether the respondent and a spouse or partner had ever tried to get pregnant for a year or longer but were unable to do so; Michigan assessed whether a coupled respondent or a spouse or partner and whether a single respondent had ever tried unsuccessfully for at least a year to get pregnant. Note that respondents were asked if they had ever experienced infertility, versus experienced infertility in the last 12 months, thus assessing lifetime infertility prevalence. The state-specific questions used to assess having ever tried to get pregnant and having ever experienced infertility are delineated in Table 1. The full questionnaires for each state can be found on the state-specific department of health websites.^{21–23}

Other personal characteristics about the respondents captured through the core questions and included in the analyses were sex, age, race/ethnicity, marital status, education, household income, having health care coverage, and having a personal doctor or health care provider. Only respondents 18–50 years of age were included in the analysis, as this was the common age range for the infertility questions across the three states, regardless of marital status. For marital status, respondents were categorized as coupled if they self-identified as a member of an unmarried couple.

The weighted response rate for the core BRFSS survey (i.e., the proportion of the total number of estimated eligible and likely eligible persons who partially or fully completed the survey²⁴) was 36.4% in Florida, 42.0% in Massachusetts, and 47.3% in Michigan. The weighted cooperation rate (i.e., the proportion of contacted and eligible persons that partially or fully completed the survey²⁴) was 60.0% in Florida, 62.7% in Massachusetts, and 65.6% in Michigan. These rates are comparable to those of other states.²⁵ The unweighted number

of adults (male and female) aged 18–50 years who were eligible for the analysis on infertility in Florida, Massachusetts, and Michigan, was 1,442, 1,966, and 3,655, respectively. For Michigan, those eligible were all respondents 18–50 years that completed or partially completed the core questionnaire. For Florida and Massachusetts, those eligible were landline respondents 18–50 years of age that completed or partially completed the core questionnaire, as cell phone respondents were not asked about infertility. In addition, only a subset of respondents (the first split) were eligible in Massachusetts. Of the unweighted number of eligible respondents, 1,285 (89.1%), 1,302 (66.2%), and 3,360 (91.9%) actively participated in the infertility module in Florida, Massachusetts, and Michigan, respectively. The majority of those that did not participate had missing values for all infertility questions [Florida 127 (80.9%), Massachusetts 659 (99.2%), Michigan 295 (100%)], while the remainder answered “don’t know” or “refused” to the first question only. Among the unweighted number that participated in the infertility analysis, 736 (57.3%), 1,246 (95.7%), and 2,742 (81.6%) adults had ever tried to get pregnant, while 549 (42.7%), 56 (4.3%), and 618 (18.4%) had never tried to get pregnant in Florida, Massachusetts, and Michigan, respectively.

State-specific estimates of population characteristics, including prevalence of infertility, were calculated among all eligible respondents, and separately among those respondents that had ever tried to get pregnant. The prevalence of infertility by respondent characteristic was estimated among those having ever tried to get pregnant; the prevalence of having ever sought infertility treatment was estimated among those having experienced infertility; types of treatment sought and treatment outcomes were estimated among those that had ever sought infertility treatment. All estimates were generated using a weighted analysis to account for the complex sample design. Analyses were not stratified by gender, as the questions did not distinguish between male and female factor infertility. Because Florida and Massachusetts asked the infertility questions of only landline respondents, while Michigan asked these questions of both landline and cell phone respondents, landline-only weights were used in Florida and Massachusetts and combined landline and cell phone weights were used in Michigan. Estimated percentages were suppressed if the denominator was smaller than 50 or the relative standard error was at or above 30. Age-adjusted prevalence estimates for having ever experienced infertility were also computed, but results are not shown, as these estimates were similar to the crude estimates.

Bivariate associations between respondent characteristics and infertility were assessed for significance with chi-squared tests using a significance level of 0.05; multivariable modeling was not conducted due to limited sample size. In addition, some response-option categories for the respondent characteristics were combined or not included in this analysis due to limited sample size. Analyses were conducted within Massachusetts and Michigan using SAS-Callable SUDAAN version 11.0.0 and within Florida using SAS Enterprise Guide 4.3, all of which accommodate weighted analysis (SAS Institute Inc., Cary, NC).

Results

Females accounted for approximately half of the eligible population in Florida, Massachusetts, and Michigan (Table 2). The age distribution was similar in all three states,

with about half of eligible respondents younger than 35. Florida's population was only 49.0% non-Hispanic white, compared with 70.8% and 79.2% in Massachusetts and Michigan, but 28.9% Hispanic, compared with 12.0% and 5.5% in Massachusetts and Michigan. Almost half were married or otherwise coupled in all three states. The distribution of education in the eligible population also was similar across all three states, with 56.6%, 65.0%, and 60.6% having at least some college in Florida, Massachusetts, and Michigan, respectively. In Massachusetts, 44.8% of the eligible population earned \$75,000 or more, compared with 29.5% in Michigan and 24.9% in Florida. A higher percentage of eligible respondents in Massachusetts reported having health care coverage (93.5%) and a personal care provider (86.5%) compared with Florida (72.0%, 69.2%) and Michigan (82.5%, 78.8%). The most drastic difference across the three states was the percentage indicating they had ever tried to get pregnant. Among all eligible 18- to 50-year-old respondents, 38.7%, 61.3%, and 75.0% had ever tried to get pregnant while 9.7%, 6.0%, and 4.2% had ever experienced infertility in Florida, Massachusetts, and Michigan, respectively, regardless of whether they had ever tried to get pregnant.

The comparison of population characteristics across the three states when the eligible population was restricted to those having ever tried to get pregnant differed for several variables (Table 3). Females comprised 57.0%, 51.7%, and 42.7% of this population in Florida, Massachusetts, and Michigan, respectively. The age distribution now was skewed toward the older age group in Florida, with over half of respondents between 40 and 50 years, as compared with the other two states in which ages were more equally distributed across all categories. The percentage that were married or otherwise coupled was now higher in Florida (72.2%) than in Massachusetts (52.6%) or Michigan (49.8%). In both Massachusetts and Michigan, non-Hispanic whites still made up approximately three-quarters of those having ever tried to get pregnant, compared with 57.3% in Florida. The majority of respondents having ever tried to get pregnant in all three states still had at least some college. The annual household income still was higher in Massachusetts than the other states, with almost half earning \$75,000 or more. The proportions with health care coverage and with a personal doctor or health care provider also still were higher among Massachusetts residents than among Michigan or Florida residents and similar to the eligible population estimates. The prevalence of having ever experienced infertility among adults that had ever tried to get pregnant was 25.3% in Florida, 9.9% in Massachusetts, and 5.8% in Michigan.

No consistent pattern was observed across the states with respect to associations between personal characteristics and infertility (Table 4). In Massachusetts and Michigan, but not Florida, the lifetime infertility prevalence was significantly higher for those married or coupled as compared with the other marital categories (14.2% vs. 5.1% in Massachusetts and 7.7% vs. 3.9% in Michigan; $p < 0.001$). In Massachusetts, but not Florida or Michigan, the prevalence of infertility was higher among those with an annual income over \$75,000 as compared with a lower income (14.5% vs. 7.2%, $p = 0.006$). In Michigan, the lifetime prevalence of infertility was significantly higher for those who did as compared with those who did not have a personal doctor or health care provider (6.6% versus 3.3%, $p = 0.004$). A similar pattern was observed for Florida residents, but the results were not statistically significant ($p = 0.058$).

Among 1–50 year olds having ever tried to get pregnant and with a history of infertility, the majority sought consultation or treatment: 60.7% of Florida residents, 70.6% of Massachusetts residents, and 51.6% of Michigan residents (Table 5). Of those that sought treatment, the majority in all states used non-ART fertility treatments, such as ovulation induction and ovarian stimulation. Of the other treatments, 33.4% of Massachusetts residents used artificial or intrauterine insemination and 24.5% used ART. In Michigan, 32.2% used artificial or intrauterine insemination and 20.1% used ART. Also of note, one-third of those who sought consultation or treatment indicated “other” with no further specification as to form of treatment in Florida, while 59.9% did the same in Michigan. The most commonly reported result of the most recent treatment among adults in Florida was “had a baby,” reported by 43.3%; the percent reporting this in Michigan was estimated to be 63.1%.

Discussion

This study provides state-specific estimates of lifetime infertility prevalence among adults 18–50 years and adults 18–50 years having ever tried to get pregnant. It also presents estimates of infertility treatment use and resultant outcomes among adults having ever tried to get pregnant and having experienced infertility in Florida, Massachusetts, and Michigan. The estimated lifetime prevalence of infertility among all eligible adults was 9.7% in Florida, 6.0% in Massachusetts, and 4.2% in Michigan; among adults having ever tried to get pregnant, the prevalence was 25.3%, 9.9%, and 5.8%, respectively. The majority of respondents with a history of infertility in all three states sought treatment, with non-ART fertility treatments being most common.

The lifetime prevalence of infertility showed some variation across the three states and also differed when calculated among all respondents eligible for the infertility module and all respondents that had ever tried to get pregnant. Differences in prevalence estimates across the three states could reflect true differences in infertility prevalence, which could be associated with differences in the state populations. For example, income, insurance, and access to a health care provider were higher in Massachusetts, which could be associated with increased awareness and diagnosis of infertility. Likewise, population differences also could have contributed to differences in estimates between the eligible and having ever tried to get pregnant groups. The most notable difference was the increase in prevalence in Florida when restricting to those that had ever tried to get pregnant. This population in Florida, when compared with the eligible population, was older and had more respondents reporting being married or otherwise coupled. Older people would have an increased risk of lifetime infertility due to increased exposure time, which could explain the increase in the prevalence estimate for Florida; the distribution of the age and marital status variables did not experience this same change for Massachusetts and Michigan when the population was restricted to those having ever tried to get pregnant.

The BRFSS produced state-specific estimates of lifetime infertility among eligible adults and adults that had ever tried to get pregnant. The authors are not aware of other state-specific estimates of lifetime prevalence of infertility or of current infertility. However, current infertility estimates for the United States are available through the National Survey of Family Growth (NSFG). In the NSFG, infertility is defined as the inability to achieve

pregnancy during the 12 months prior to the survey despite having unprotected intercourse in each of those months with the same husband or partner.^{26,27} The most recent data (2006–2010) from the NSFG estimates the prevalence of infertility among all married or cohabitating women 15–44 years of age to be 6.0% in the United States.^{26,27} Thoma et al.,²⁸ used an alternative approach for estimating prevalence using NSFG data and restricted the analysis to those women actively trying to become pregnant, producing a prevalence estimate of 15.5%.

Because the BRFSS looks at prevalence of infertility over a lifetime in adults through age 50, while the NSFG only looks at a 12-month window prior to the survey in women through age 44, we would expect the BRFSS estimates to be higher than the national estimates, with possible variations across states. Only the estimates for Florida were higher than the NSFG estimates. State characteristics, such as an older population, may have contributed to the lifetime prevalence in Florida being higher than in Massachusetts or Michigan, as well as higher than the national estimates. However, prevalence within each age group in Florida was also high, suggesting other sources, such as differences in the data collection questionnaires across states, may also have contributed to the higher estimate.

There were several differences in the state-added questionnaires that may have influenced the state-specific lifetime prevalence estimates. All three states defined infertility as the inability to get pregnant after a year or longer of trying, and all assessed lifetime infertility. However, Florida first asked respondents whether they had ever tried to get pregnant and then asked about infertility. Those that had never tried to get pregnant were not asked any infertility questions. Both Massachusetts and Michigan combined trying to get pregnant and infertility into a single question. In Florida, 49.6% of eligible respondents indicated they had never tried to get pregnant as compared with 4.6% in Massachusetts and 16.9% in Michigan (weighted estimates). In addition, population characteristics changed only in Florida when restricting to those having ever tried to get pregnant, yielding an older population more likely to be married or coupled. The higher percentage having never tried to get pregnant and the expected shift in the characteristics experienced only by Florida may suggest that Florida's questions were more successful in accurately capturing those that had ever tried to get pregnant. Michigan's questionnaire differed in two other ways. Information about infertility and difficulty carrying a pregnancy due to miscarriage or stillbirth were collected in a single question, and the question structure varied depending on gender and whether the respondent was in a couple. Couples were asked whether "you or your spouse/partner," while those not in a couple were asked whether "you" had ever experienced infertility; in other states, respondents were asked whether "you and a spouse/partner." For couples, this may have biased the Michigan estimate upward, as respondents might answer yes even if they had not experienced infertility themselves; for singles, this may have biased the estimate downward, as respondents not in a couple may have indicated no infertility history if the source of infertility was a spouse or partner. Finally, Massachusetts gave respondents the option to skip the entire infertility section, of which one-quarter did, possibly introducing nonresponse bias. Among those that did not skip the infertility module, 93.0% reported having ever tried to get pregnant. Given this high percentage, it seems likely that respondents that had never tried to get pregnant were more likely to have skipped the module.

There are several additional limitations that may have affected the estimates presented in this paper, and their interpretation. First, the BRFSS is a cross-sectional survey, resulting in an inability to determine temporal sequencing. Second, information on infertility was collected via self-report, and no attempt was made to validate whether a respondent had attempted pregnancy or had infertility. Third, defining infertility over a 12-month period does not take into account varying definitions, such as shorter time spans for women with known fertility issues or advancing age^{29,30} or information such as the frequency or timing of intercourse.^{28,30} Fourth, respondent level weighting was used even though responses might reflect the respondent or a spouse/partner. Fifth, only Michigan included cell phone respondents, which may further limit the comparability across states. Finally, the sample size was small among those having ever tried to get pregnant and even smaller among those experiencing infertility. This may have limited the power to detect significant associations and also prohibited the use of any multivariable analyses.

In moving forward with infertility surveillance, the purpose of the surveillance should be determined prior to the questionnaire construction, as this will determine what questions should be asked and of what population. The BRFSS infertility module assesses lifetime prevalence of infertility, which allows states only to understand what proportion of the population has ever experienced infertility. These estimates may help states determine whether their burden for infertility is high compared with other states. However, it does not allow states to understand what proportion of the population is currently trying to get pregnant and actively dealing with infertility versus what proportion has experienced infertility in the past. Understanding current infertility may be more helpful to states in targeting resources for infertility education and treatment. The population for which infertility is estimated is also of importance, as estimates can vary widely depending on the population to which they are applied. Some national estimates have looked at all married or cohabitating women, while others have looked at all married or cohabitating women that have ever tried to get pregnant. In this BRFSS analysis, we explored all male and female respondents and all male and female respondents that have ever tried to get pregnant. Another relevant population might be adults of childbearing age that have ever tried to get pregnant and currently desire children.

It is important to understand the burden of infertility, both nationally and at the state level, in order to provide treatment and services. However, the questionnaire content and structure used to assess infertility prevalence should be consistent across states, and allow states to understand needs relevant to providing infertility services. Results in this study suggest that structural differences in questionnaires such as how trying to get pregnant and infertility are included, how spouses/partners are included, and whether patients are allowed to skip the section on infertility altogether may affect survey estimates. While the BRFSS is a natural tool to produce state-specific estimates of infertility prevalence, a good set of common questions that make sense for assessing the needs for the prevention, detection, and management of infertility is needed to help states formulate effective programs and policies.

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Table 1

State-Specific Behavioral Risk Factor Surveillance System Questions Assessing Infertility, 2012

Survey element for comparison	Florida	Massachusetts	Michigan
Landline or cell	Landline only	Landline only	Landline and cell
Other exclusions by respondent characteristic	Females >50 years Males >59 years	Females >50 years Males >59 years History of hysterectomy	Females >75 years Males >75 years
Option to skip module	No	Yes	No
Survey question(s) assessing having ever tried to get pregnant and infertility	The next questions are about infertility and problems becoming pregnant. They ask about your lifetime experiences with infertility. I realize that some people may be uncomfortable with these questions. Remember that your answers are strictly confidential and that you don't have to answer a question if you don't want to. Have you and a spouse or partner EVER tried to get pregnant? 1. Yes 2. No 7. Don't know/not sure 9. Refused As a couple, were you EVER unable to become pregnant after a year or longer of trying to do so? 1. Yes 2. No 7. Don't know/not sure 9. Refused	The next questions are about infertility and problems becoming pregnant. They ask about your lifetime experiences with infertility. I realize that some people may be uncomfortable with these questions. Remember that your answers are strictly confidential and that you don't have to answer a question if you don't want to. If you would like to skip this section please say so. 1. Respondent asks to skip section 2. Continue Have you and a spouse or partner EVER tried to get pregnant for a year or longer and were unable to do so? 1. Yes 2. No 3. Never tried to get pregnant Not read: 7. Don't know/not sure 9. Refused	The next questions are about infertility and pregnancies not ending in a live birth. This means that after a year of trying to do so, a couple is unable to become pregnant or carry a pregnancy due to miscarriage or stillbirth. <i>For respondents in a couple:</i> Have you or your spouse/partner ever experienced infertility or difficulty carrying a pregnancy due to miscarriage or stillbirth? <i>For female respondents not in a couple:</i> Have you ever experienced infertility or difficulty carrying a pregnancy due to miscarriage or stillbirth? <i>For male respondents not in a couple:</i> Have you ever experienced infertility? 1. Yes, I have 2. Yes, my partner has 3. Yes, we both have 4. Yes, but undetermined (Respondent, partner, both, undetermined status only assessed for a coupled respondent if answered yes) 5. No 6. Never tried to get pregnant (Never tried to get pregnant only offered as a response option if respondent answered no) 7. Don't know/not sure 9. Refused Was it infertility, difficulty carrying a pregnancy due to miscarriage or stillbirth, or both? 1. Infertility 2. Difficulty carrying a pregnancy due to miscarriage or stillbirth 3. Both 7. Don't know/not sure 9. Refused

Table 2

Population Characteristics of Eligible Respondents, 18–50 Years, by State, 2012

Characteristics	Florida		Massachusetts		Michigan	
	%	95% CI	%	95% CI	%	95% CI
Gender						
Male	50.5	46.5–54.4	50.5	46.9–54.1	49.9	47.8–52.1
Female	49.5	45.6–53.5	49.5	45.9–53.1	50.1	47.9–52.2
Age						
18–24	21.1	17.3–24.9	21.7	18.1–25.4	23.7	21.7–25.7
25–29	14.6	11.5–17.6	13.6	10.8–16.5	13.4	11.9–15.0
30–34	15.5	12.6–18.4	17.6	14.7–20.4	13.9	12.5–15.5
35–39	11.6	9.3–13.9	12.5	10.5–14.4	13.1	11.8–14.5
40–44	18.0	15.3–20.7	16.1	13.9–18.4	16.0	14.6–17.6
45–50	19.2	16.6–21.9	18.5	16.3–20.6	19.9	18.5–21.5
Race						
Non-Hispanic white	49.0	45.1–52.9	70.8	67.5–74.1	75.2	73.2–77.1
Non-Hispanic black	17.2	14.1–20.3	6.9	5.2–8.6	14.7	13.2–16.4
Hispanic	28.9	25.0–32.8	12.0	9.8–14.3	5.5	4.4–6.9
Other	4.9	3.2–6.6	10.4	7.9–12.8	4.6	3.9–5.4
Marital Status						
Married/coupled	48.2	44.3–52.0	49.4	45.8–53.1	48.3	46.2–50.5
Divorced/widowed/separated	12.8	10.3–15.2	8.8	7.0–10.6	11.2	10.0–12.6
Never married	39.1	35.0–43.1	41.8	38.0–45.5	40.4	38.3–42.6
Education						
Less than HS	12.4	9.4–15.4	10.1	7.6–12.6	11.5	9.8–13.6
High school grad	31.1	27.3–34.8	24.9	21.7–28.2	27.9	26.1–29.9
Some college	32.7	28.9–36.4	28.1	24.7–31.5	36.5	34.4–38.5
College grad or higher	23.9	20.9–26.8	36.9	33.6–40.2	24.1	22.6–25.6
Annual household income						
Less than \$25,000	34.6	30.5–38.8	19.4	16.2–22.6	29.6	27.5–31.8
\$25,000–\$34,999	10.8	8.0–13.5	10.4	7.8–13.0	10.8	9.4–12.4

Characteristics	Florida			Massachusetts			Michigan		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
\$35,000–\$49,999	12.3	10.0–15.0	10.6	8.1–13.1	13.9	12.4–15.6			
\$50,000–\$74,999	17.4	14.2–20.6	14.8	12.1–17.6	16.2	14.7–17.9			
\$75,000 or more	24.9	21.5–28.2	44.8	40.9–48.6	29.5	27.6–31.5			
Health care coverage									
Yes	72.0	68.2–75.6	93.5	91.7–95.3	82.5	80.8–84.2			
No	28.0	24.4–31.8	6.5	4.7–8.3	17.5	15.8–19.2			
Personal doctor or health care provider									
Yes	69.2	65.5–73.0	86.5	83.9–89.1	78.8	77.0–80.6			
No	30.8	27.0–34.5	13.5	10.9–16.1	21.2	19.4–23.0			
Ever tried to get pregnant ^a									
Yes	38.7	35.0–42.2	61.3	57.7–64.9	75.0	73.1–76.8			
No	49.6	45.6–53.6	4.6	2.8–6.4	16.9	15.3–18.5			
Missing	11.7	9.1–14.2	34.0	30.6–37.5	8.1	6.9–9.5			
Ever experienced infertility ^a									
Yes	9.7	7.6–11.8	6.0	4.6–7.5	4.2	3.5–5.0			
No	78.5	75.3–81.6	59.9	56.4–63.6	85.9	84.4–87.3			
Missing	11.8	9.2–14.3	34.0	30.4–37.4	9.9	8.6–11.2			

^aMissing values are shown because Massachusetts allowed for the option to skip the entire infertility section containing these questions, resulting in a large proportion of missing values. 95% CI, 95% confidence interval.

Table 3
Population Characteristics of Those Aged 18–50 Years That Have Ever Tried to Get Pregnant, by State, 2012

Characteristics	Florida		Massachusetts		Michigan	
	%	95% CI	%	95% CI	%	95% CI
Gender						
Male	43.0	37.2–48.7	48.3	43.8–52.8	57.3	55.0–59.6
Female	57.0	51.3–62.8	51.7	47.2–56.2	42.7	40.4–45.0
Age						
18–24	7.1	3.1–11.1	17.3	13.4–22.1	18.1	16.1–20.3
25–29	8.7	5.2–12.2	14.4	11.1–18.5	12.8	11.2–14.7
30–34	17.2	12.7–21.7	18.3	14.9–22.2	15.0	13.3–16.9
35–39	15.6	11.6–19.6	13.7	11.3–16.5	14.7	13.2–16.3
40–44	25.6	20.8–30.4	18.2	15.4–21.4	17.9	16.2–19.6
45–50	25.8	21.1–30.5	18.1	15.6–20.9	21.5	19.9–23.3
Race						
Non-Hispanic white	57.3	51.4–63.3	76.2	72.2–79.7	75.2	73.0–77.3
Non-Hispanic black	14.1	9.7–18.5	5.5	3.9–7.7	15.2	13.4–17.1
Hispanic	25.4	19.5–31.2	10.1	7.8–13.0	5.1	3.9–6.5
Other	3.2	1.7–4.6	8.2	6.0–11.3	4.5	3.7–5.5
Marital status						
Married/coupled	72.2	66.8–77.5	52.6	48.0–57.1	49.8	47.5–52.2
Divorced/widowed/separated	14.8	10.8–18.8	8.9	7.0–11.4	13.2	11.8–14.9
Never married	13.0	8.5–17.6	38.5	33.8–43.3	36.9	34.6–39.3
Education						
Less than HS	15.7	10.4–20.9	8.9	6.2–12.6	11.7	9.7–13.9
High school grad	26.1	20.9–31.3	24.9	21.0–29.2	28.3	26.2–30.4
Some college	29.5	24.4–34.7	27.2	23.2–31.5	36.1	33.9–38.4
College grad or higher	28.7	24.2–33.2	39.1	35.1–43.3	24.0	22.3–25.7
Annual household income						
Less than \$25,000	31.0	25.0–37.0	18.5	15.0–22.7	29.9	27.6–32.3
\$25,000–\$34,999	8.6	5.3–11.9	8.5	6.0–11.8	9.7	8.3–11.3

Characteristics	Florida		Massachusetts		Michigan	
	%	95% CI	%	95% CI	%	95% CI
\$35,000–\$49,999	9.7	6.1–13.3	9.6	7.2–12.7	13.8	12.2–15.7
\$50,000–\$74,999	19.0	14.4–23.6	15.7	12.5–19.6	16.9	15.1–18.8
\$75,000 or more	31.7	26.8–36.6	47.7	43.0–52.4	29.7	27.7–31.9
Health care coverage						
Yes	76.1	70.8–81.3	95.0	92.7–96.6	82.1	80.1–83.9
No	23.9	18.7–29.2	5.0	3.4–7.3	17.9	16.1–19.9
Personal doctor or health care provider						
Yes	76.5	71.4–81.6	87.1	83.5–90.0	78.4	76.3–80.4
No	23.5	18.4–28.6	12.9	10.0–16.5	21.6	19.6–23.7
Ever experienced infertility						
Yes	25.3	20.3–30.3	9.9	7.8–12.5	5.8	4.8–6.9
No	74.7	69.7–79.7	90.1	87.6–92.2	94.2	93.1–95.2

Data includes respondents who themselves with a spouse or partner ever tried to get pregnant in Florida and Massachusetts; single respondents who ever tried to get pregnant in Michigan; and coupled respondents who ever tried to get pregnant or their spouse ever tried to get pregnant in Michigan. Individuals who did not participate in the infertility module or never tried to get pregnant are excluded.

Table 4
Lifetime Prevalence of Infertility Among Adults Aged 18–50 Years Who Have Ever Tried to Get Pregnant, by State, 2012

Characteristics	Florida			Massachusetts			Michigan		
	%	95% CI	p-Value	%	95% CI	p-Value	%	95% CI	p-Value
Age									
18–39 years	29.8	21.6–38.0	0.067	8.7	6.0–12.5	0.153	5.0	3.9–6.5	0.079
40–50 years	21.0	15.6–26.4		11.9	9.2–15.4		6.9	5.5–8.8	
Race									
Non-Hispanic white	23.8	18.3–29.2	0.635	10.1	7.7–13.1	0.785	6.3	5.1–7.6	0.133
Other	26.3	17.1–35.5		9.4	5.5–15.5		4.5	2.9–6.9	
Marital status									
Married/coupled	24.4	18.9–30.0	0.567	14.2	11.0–18.0	< 0.001	7.7	6.3–9.3	< 0.001
Divorced/widowed/ Separated/never married	27.8	17.2–38.5		5.1	2.9–9.0		3.9	2.7–5.6	
Education									
Some college or less	25.1	18.6–31.5	0.880	8.1	5.6–11.7	0.064	5.5	4.3–6.9	0.202
College grad or higher	25.8	18.9–32.7		12.6	9.4–16.6		6.8	5.3–8.7	
Annual household income									
Less than \$75,000	25.5	18.8–32.2	0.785	7.2	4.8–10.5	0.006	5.9	4.7–7.5	0.513
\$75,000 or more	26.9	19.6–34.1		14.5	10.7–19.3		6.7	5.1–8.7	
Health care coverage									
Yes	27.8	21.9–33.6	0.055	9.9	7.7–12.5		6.1	5.0–7.4	0.252
No	17.3	9.3–25.3		— ^a	— ^a		4.6	2.8–7.5	
Personal doctor or health care provider									
Yes	27.7	21.8–33.6	0.058	10.4	8.2–13.3		6.6	5.5–7.9	0.004
No	17.6	9.7–25.5		— ^a	— ^a		3.3	1.8–5.7	

Infertility is defined as the inability to get pregnant after a year or longer of trying to conceive.

Data includes respondents who themselves with a spouse or partner ever tried to get pregnant in Florida and Massachusetts; single respondents who ever tried to get pregnant in Michigan; and coupled respondents who ever tried to get pregnant or their spouse ever tried to get pregnant in Michigan. Individuals who did not participate in the infertility module or never tried to get pregnant are excluded.

^aNumber suppressed due to insufficient data.

Table 5
 Fertility Treatments and Outcomes Among 18–50 Year Olds with a History of Infertility, by State, 2012

Characteristics	Florida		Massachusetts ^a		Michigan	
	%	95% CI	%	95% CI	%	95% CI
Sought consultation or treatment for infertility						
Yes	60.7	49.2–72.3	70.6	57.9–80.8	51.6	42.4–60.7
No	39.3	27.7–50.8	29.4	19.2–42.1	48.4	39.3–57.6
Type of treatment sought ^b						
Non-ART fertility treatment	61.3	45.6–76.9	66.0	53.6–76.5	75.9	63.8–84.9
Artificial or intrauterine insemination	— ^c	— ^c	33.4	22.9–46.0	32.2	23.1–42.8
Assisted reproductive technology	— ^c	— ^c	24.5	14.1–39.1	20.1	12.9–29.9
Other	33.7	18.0–49.4	— ^c	— ^c	59.9	48.4–70.5
Most recent treatment result ^b						
Had a baby	43.3	29.4–57.2			63.1	51.8–73.1
Currently pregnant	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c
Pregnancy loss	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c
No pregnancy but trying	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c
No pregnancy and no longer trying	33.2	19.3–47.1			13.9	8.5–21.9
Receiving treatment	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c

Infertility is defined as the inability to get pregnant after a year or longer of trying to conceive.

^aMassachusetts did not collect information on most recent treatment result.

^bAmong those having sought consultation or treatment for infertility.

^cNumber suppressed due to insufficient data.