Comparability of Contraceptive Prevalence Estimates for Women from the 2002 Behavioral Risk Factor Surveillance System

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SYNOPSIS

Objective. This article assesses the comparability of contraceptive use estimates for adult women obtained from the 2002 Behavioral Risk Factor Surveillance System (BRFSS), using the 2002 National Survey of Family Growth (NSFG) as a benchmark. The 2002 BRFSS uses data collection methods that are considerably different from the NSFG.

Method. We compared demographic differences and national estimates of current contraceptive methods being used and reasons for nonuse. Variables were recoded in the BRFSS and NSFG systems to make the two samples comparable.

Results. Women in the NSFG and BRFSS were similar in age and race/ethnicity. Compared with the NSFG, the BRFSS sample was more educated and of higher income, less likely to be cohabiting, and more likely to be married. After adjusting for differences in the coding of hysterectomy, many BRFSS estimates for current contraceptive use were statistically similar to those from the NSFG. Small but statistically significant differences were found for vasectomy (7.7% and 6.3%), the pill (21.9% and 19.6%), rhythm (1.5% and 1.0%), the diaphragm (0.5% and 0.2%), and withdrawal (0.3% and 2.7%) for the BRFSS and NSFG, respectively. Major reasons for nonuse were similar: seeking pregnancy and currently pregnant. The percentage of women who were not currently sexually active was higher in the BRFSS (16.0%) compared with the NSFG (12.5%).

Conclusions. The BRFSS is a useful source of population-based data on contraceptive use for reproductive health program planning; however, planners should be cognizant that lower-income women are not fully represented in telephone surveys.

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State-level information on contraceptive use can be used to guide the development of tailored state programs and policies to prevent unintended pregnancy and the spread of sexually transmitted infections. Prior to 2002, comparable population-based estimates for contraceptive use have not been available for all 50 states in the U.S. In 2002 for the first time, the Behavioral Risk Factor Surveillance System (BRFSS) collected data from all states to provide population-based estimates of current contraceptive use.[1] The BRFSS uses data collection methods and a sampling design that are considerably different from that of the National Survey of Family Growth (NSFG), the standard source of national-level information on contraceptive use in the U.S. This article compares results from the most recent NSFG, fielded in the same year as the BRFSS, with national-level BRFSS estimates as a means of assessing the reliability of estimates of contraceptive use from the 2002 BRFSS.

BACKGROUND

The NSFG provides data on sexual behaviors, contraceptive use, and other measures of reproductive health from a nationally representative sample of the U.S. population.[2] The NSFG is used by the National Center for Health Statistics (NCHS) to shed light on trends and differences in national birth registration statistics; to track progress on Healthy People 2010 objectives; and to provide data for Department of Health and Human Services programs for basic and policy research on fertility, family formation and dissolution, and parenting. While the NSFG does provide considerable detail on contraceptive use, it does not provide state-level data.

The BRFSS is used to monitor preventive health practices and health behaviors linked to chronic disease, injuries, and preventable infectious disease among adults 18+ years of age. It is composed of separate samples from all 50 states, the District of Columbia (DC), Puerto Rico, Guam, and the U.S. Virgin Islands. For these analyses, we restricted the sample to the 50 states and DC, to be comparable with the NSFG. In the 2002 BRFSS and the 2002 NSFG, both females and males were interviewed, but we only examined the female data in this report because women are the primary users of contraceptives.

Although both the NSFG and BRFSS provide population-based data for 2002, the two surveys differ considerably in design, sampling, and data collection methods (Figure).[3–5] The BRFSS interviews are conducted via the telephone, using random-digit dialing. Data are collected annually from a probability sample of households with telephones by interviewers aided by computer-guided questionnaires. The NSFG collects data via face-to-face interviews conducted in respondents' homes, using a computer-guided questionnaire as well as a computer-assisted self-interview questionnaire. In both surveys, only one randomly selected eligible individual from each contacted household is interviewed. BRFSS excludes those without landline telephones or those who are institutionalized or homeless. The NSFG also excludes institutionalized populations and those who are homeless. Both use post-sampling weighting to provide population estimates. In both, interviews are conducted in English and Spanish, although the BRFSS may use other languages based on state preferences. No compensation is provided in BRFSS, in which the interview is designed to last approximately 20 minutes; participants in the NSFG were given $40 and the interviews were expected to last about 80 minutes. NSFG compensation is designed to improve response rates among hard-to-reach populations.

METHODS

The questions used to estimate current contraceptive use vary considerably in the two systems. The BRFSS uses six questions for female respondents: (*1*) "Are you or your husband/partner doing anything now to keep you from getting pregnant?" Responses to this question were yes, no, no partner/not sexually active, and having a same-sex partner; (*2*) If "yes" to question 1, "What are you or your husband/partner doing now to keep you from getting pregnant?" The responses to this question included specific contraceptive methods and no partner/not sexually active; (*3*) If "yes" to question 2, "What other method are you also using to prevent pregnancy?" The responses to this question included specific contraceptive methods and "no other method"; (*4*) If "no" to question 1, female respondents were asked, "What is your main reason for not doing anything to keep you from getting pregnant?" Responses included no partner/not sexually active, post-hysterectomy, post-sterilization, postpartum, same-sex partner, partner is pregnant (males), and respondent or partner is too old to become pregnant; (*5*) "Did you have a hysterectomy?"; and (*6*) "Are you currently pregnant?"

The primary contraceptive use measure from the NSFG is constructed from a contraceptive calendar, which includes methods used in each month since January 1998 (until interview in 2002 or 2003). All respondents who had ever used a contraceptive method were told by the interviewer, "I need to find

Figure. Description of sampling and data collection for the 2002 Behavioral Risk Factor Surveillance System and 2002 National Survey of Family Growth

	Behavioral Risk Factor Surveillance System	*National Survey of Family Growth*
Description	State telephone survey, using random-digit dialing; collects extensive data on preventive health practices and risk behaviors that are linked to chronic diseases, injuries, and preventable infectious diseases in the adult population	Nationally representative household survey; collects detailed data on fertility and fertility-related events among women and men of reproductive age
Periodicity	Annual; data collected monthly throughout the year	Approximately every 6 or 7 years; 2002 data collected over 13 months; beginning in 2006, data collected on a continuous basis
Sample	Probability sample of households with telephones in 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands • In 51 of 54 areas, a disproportionate stratified sample (DSS) design is used • National sample is a merged sample of these 54 areas • Only one randomly selected adult per household	Multistage area probability sample for the U.S., drawn from 120 areas; no state samples; only one person interviewed in each household
Oversampling	High- and medium-density strata are oversampled; density is defined based on the proportion of telephone strata that represent households	Teenagers and black and Hispanic adults
Excluded from sample	Those without a landline telephone in their homes, institutionalized people, and homeless people	Institutionalized and homeless people
Age range	18 years and older	15–44 years
Languages	English, Spanish, other languages depending on the state	English and Spanish
Informed consent	Oral consent	Written informed consent
Compensation	None	$40
Data collection	Trained interviewers conducted telephone interviews using computer-assisted personal interviewing	Trained interviewers conducted face-to-face interviews using computer-assisted personal interviewing; sensitive data were collected using computer-assisted self-interviewing; contraceptive data were collected face-to-face
Weighting	Poststratification weighting to adjust for noncoverage and nonresponse; weighting provides population-representative data for each state and for the nation as a whole	Fully adjusted sampling weights based on four factors: • Inverse probability of being selected • Adjustment for nonresponse • Poststratification adjustment for age, gender, race, and Hispanic origin • Adjustment for trimming to reduce values of a few extremely large weights
Response rate	CASRO response rates ranged from 42.2% to 82.6%; cooperation rates ranged from 62.5% to 99.8%	80% for women and 78% for men
Sample size (*N*) for 2002 survey	148,702 women and 99,262 men, 18 years or older	7,643 women and 4,928 men
Sample size (*N*) for this study	62,026 women aged 18–44 years; 57,218 had complete information for contraceptive use	6,969 women, 18–44 years; <1% had missing data on contraceptive use and had data imputed

CASRO = Council of American Survey Research Organizations

out about the birth control methods you used each month between [date of first method use or January 1999] and [date of interview]. Remember to include methods men use—such as condoms, vasectomy, and withdrawal—in your answer." Respondents were asked to report all the methods used in each month. The measure of current use was based on any use in the three months preceding the interview. Information was also obtained through separate sets of questions on other reproductive health behaviors and conditions, including pregnancy, infertility, and hysterectomy.

For both surveys, a current contraceptive use variable was created, with each respondent categorized according to the most effective method currently being used (for those who reported simultaneous use of two or more methods).[6] For those who are not using contraception, the BRFFS categorizes respondents according to the reason why a contraceptive method was not being used, such as currently pregnant or trying to get pregnant, postpartum, noncontraceptively sterile, and not sexually active. The BRFSS does not ask about the time since last sexual activity; in the contraceptive analyses we did not include respondents who reported they were not "currently" sexually active. This nonuse measure for the NSFG uses other data from the interview such as being currently pregnant, trying to get pregnant, and being sterile. This recoded variable is *riskmeth_eff* in BRFSS and *constat1* for women in NSFG. Further details on the creation of these two variables are available.[1,6] Because hysterectomy was an exclusion criterion in creating *riskmeth_eff*, we recoded *constat1* to exclude women who had had a hysterectomy.

For this study, we compared national-level prevalence of current contraceptive use for women 18–44 years of age. We also examined the demographic composition of the two sample populations by comparing age, race/ethnicity, educational attainment, marital status, and household income. We used *proc freq* in SAS to calculate prevalence and standard errors for the BRFSS.[7] The *complex samples* procedure in SPSS was used to calculate prevalence and standard errors in the NSFG—and to account for the stratified, clustered, and poststratified weights of the NSFG survey design.[8] T-tests were used to test for statistically significant differences in the estimates for the NSFG and the BRFSS. Standard errors (SEs) for calculating any difference between BRFSS and NSFG estimates were computed as SE = SQRT ((SE1×SE1) + (SE2×SE2)). We used a p-value of <0.05 to determine statistical significance.

RESULTS

The mean time for the NSFG interview was 83 minutes. Informed consent was obtained in both survey systems: oral consent without signature in the BRFSS and written consent in the NSFG. Within the BRFSS, response rates varied considerably by state: in 2002, response rates (a proportion of completed interviews to the number of possible households) varied from 42% to 83% (state median = 58%).[9] The NSFG response rate for women was 80%. The BRFSS sample included 62,026 women aged 18–44 (57,218 had complete information for contraceptive use); the NSFG sample included 6,969 women aged 18–44. Further information about the methodology for the BRFSS and NSFG is available.[3–5,9]

Women in the NSFG and BRFSS were similar in age, except for a slightly lower percentage of 18- to 19-year-olds in the BRFSS (Table 1). Compared with the NSFG, the BRFSS sample included fewer women with less than a 12th-grade education (10.4% vs. 18.4%), more high school graduates, more women with education beyond a bachelor's degree, more married women (54.0% vs. 50.8%), and fewer unmarried but cohabiting women (5.6% vs. 9.8%). Women in the BRFSS generally had a higher household income, compared with women in the NSFG.

For women aged 18–44 years in the U.S., BRFSS estimates for current contraceptive use were similar to those from the NSFG, even when they were statistically different (Table 2). The percentage of women reporting use of any method of contraception was 61.8% in the BRFSS and 63.1% in the NSFG. Although a number of methods of contraception had significantly different percentages of women reporting use between the BRFSS and NSFG, these differences tended to be small: vasectomy (7.7% and 6.3%), the male condom (9.4% and 11.8%), the pill (21.9% and 19.6%), periodic abstinence or rhythm (1.5% and 1.0%), the diaphragm (0.5% and 0.2%), and withdrawal (0.3% and 2.7%). There were no statistically significant (ns) differences in the percentage of women reporting use of female sterilization (14.5% BRFSS and 15.4% NSFG), the injectable (3.2% and 3.4%), the intrauterine device (IUD) (1.4% and 1.4%), the implant (0.3% and 0.3%), and foam/jellies/creams/suppositories (0.2% and 0.2%).

Although some reasons for nonuse are not easily compared given question wording, major reasons for nonuse were similar in the two surveys: hysterectomy (6.1% and 4.6%, $p<0.001$), currently pregnant (5.1% and 4.6%, ns), and seeking pregnancy (4.0% and 4.5%)

Table 1. Percentage of analysis sample with selected demographic characteristics, 2002 BRFSS and 2002 NSFG

	BRFSS	*SE*	*NSFG*	*SE*	*Difference*	*SE difference*[a]	*T-test*	*Old T-value*	*Difference in T-value*	*P-value*
Age (in years)										
18–19	6.2	0.01	7.2	0.4	−1.0	0.4	−2.66	−2.54	−0.12	<0.01
20–24	18.7	0.16	17.7	0.8	1.0	0.8	1.16	1.20	−0.04	NS
25–29	16.4	0.15	16.6	0.7	−0.2	0.7	−0.36	−0.34	−0.02	NS
30–34	18.8	0.16	18.4	0.6	0.4	0.6	0.67	0.64	0.02	NS
35–39	19.3	0.16	19.5	0.7	−0.2	0.8	−0.28	−0.34	0.06	NS
40–44	20.7	0.16	20.7	0.9	0.0	0.9	0.01	−0.02	0.03	NS
Race/ethnicity										
White, non-Hispanic	64.4	0.19	65.9	1.1	−1.5	1.1	−1.33	−2.15	0.82	NS
Black, non-Hispanic	12.0	0.13	13.8	0.8	−1.8	0.8	−2.23	−2.42	0.19	<0.01
Multiracial	1.4	0.05	N/A							
Other	5.6	0.09	5.6	0.4	−0.0	0.4	−0.09	−0.18	0.01	NS
Hispanic	15.9	0.00	14.7	0.7	1.2	0.7	1.71	3.30	−1.59	NS
Don't know/not relevant/ refused	0.7	0.03	N/A							
Education										
<12th grade	10.4	0.12	18.4	0.7	−8.0	0.7	−11.22	−11.21	−0.02	<0.001
12th grade	28.5	0.18	25.6	0.7	2.9	0.7	3.89	3.82	0.07	<0.001
Some college	31.0	0.19	30.2	0.8	0.8	0.8	0.99	1.06	−0.07	NS
College graduate+	30.0	0.18	25.8	0.9	4.2	1.0	4.33	4.36	−0.03	<0.001
Missing	0.2	0.02	N/A							
Marital status										
Married	54.0	0.20	50.8	1.1	3.2	1.2	2.73	2.67	0.06	<0.01
Not married but cohabiting	5.6	0.09	9.8	0.4	−4.2	0.5	−9.09	−9.15	0.05	<0.001
Formerly married	12.0	0.13	10.9	0.5	1.1	0.5	2.06	2.09	-0.03	<0.05
Never married	28.2	0.18	28.5	0.9	−0.3	0.9	−0.36	−0.27	-0.09	NS
Missing	0.3	0.02	N/A						0.00	
Income										
<$10,000	5.3	0.09	8.7	0.5	−3.4	0.6	−6.15	−5.77	−0.39	<0.001
$10,000–$14,999	4.9	0.09	9.2	0.5	−4.3	0.5	−8.28	−8.17	−0.12	<0.001
$15,000–$19,999	7.1	0.10	6.1	0.4	1.1	0.4	2.60	2.88	−0.28	<0.01
$20,000–$24,999	8.5	0.11	6.6	0.4	1.9	0.4	4.30	4.51	−0.20	<0.001
$25,000–$34,999	13.0	0.13	13.8	0.5	−0.8	0.6	−1.46	−1.46	0.00	NS
$35,000–$49,999	15.9	0.15	14.2	0.6	1.7	0.7	2.60	2.44	0.17	<0.01
$50,000–$74,999	15.8	0.15	17.6	0.7	−1.8	0.7	−2.69	−2.94	0.25	<0.01
$75,000+	17.4	0.15	17.7	0.7	−0.3	0.8	−0.40	−0.69	0.28	NS
Missing	12.2	0.13	6.1	0.4	6.1	0.4	13.95	14.03	−0.07	<0.001

NOTE: The analysis sample included females 18–44 years of age.

BRFSS = Behavioral Risk Factor Surveillance System

NSFG = National Survey of Family Growth

NS = not statistically significant

SE = standard error

N/A = not applicable

for the BRFSS and NSFG, respectively. The percentage of women who were not currently sexually active/had no partner was higher in the BRFSS (15.7%) compared with the not sexually active in the past three months in the NSFG (12.5%). This information was elicited differently in the two surveillance systems: the BRFSS lists "no partner/not sexually active" without a specification about the time interval as a response option for the question, "Are you doing anything to keep from getting pregnant?", while the NSFG asks women, "When was the last time you had sexual intercourse with (PARTNER), that is, in what month and year?"

Table 2. Percentages of female contraceptive users and nonusers by reason for nonuse in 2002 BRFSS and 2002 NSFG

	BRFSS	*SE*	*NSFG*	*SE*	*Difference*	*SE difference*	*T-test*	*Old T-test*	*Difference in T-test*	*P-value*
Users, by specific methods										
Tubal ligation (female)[a]	14.5	0.1	15.4	0.6	−0.9	0.6	−1.42	−1.21	−0.21	NS
Vasectomy (male)	7.7	0.1	6.3	0.4	1.4	0.4	3.08	2.93	0.15	<0.01
Implant	0.3	0.0	0.3	0.1	0.1	0.1	0.61	0.57	0.05	NS
Injectables	3.2	0.1	3.4	0.3	−0.2	0.3	−0.67	−0.74	0.07	NS
Pill	21.9	0.2	19.6	0.7	2.3	0.7	3.08	2.84	0.24	<0.01
Intrauterine device	1.4	0.1	1.4	0.2	0.0	0.2	0.01	−0.05	0.06	NS
Diaphragm	0.5	0.0	0.2	0.1	0.3	0.1	3.78	3.76	0.02	<0.001
Male condoms	9.4	0.1	11.8	0.5	−2.4	0.5	−4.93	−5.04	0.11	<0.001
Foam/jelly/cream/suppository	0.2	0.0	0.2	0.1	−0.0	0.1	−0.20	−0.24	0.04	NS
Periodic abstinence (rhythm)[b]	1.5	0.1	1.0	0.2	0.5	0.2	2.70	2.98	−0.28	<0.01
Withdrawal	0.3	0.0	2.7	0.3	−2.4	0.3	−8.44	−8.39	−0.06	<0.001
Other methods	1.0	0.0	0.8	0.2	0.2	0.2	1.16	1.13	0.03	NS
Total users	61.8		63.1							
Nonusers, by reason for nonuse										
Hysterectomy	6.1	0.1	4.6	0.4	1.5	0.4	3.89	3.87	0.02	<0.001
Pregnant	5.1	0.1	4.6	0.4	0.5	0.4	1.11	1.09	0.03	NS
Seeking pregnancy	4.1	0.1	4.5	0.3	-0.5	0.3	−1.43	−1.49	0.06	NS
Postpartum	0.2	0.0	1.0	0.2	-0.8	0.2	−4.83	−4.82	−0.01	<0.001
Not sexually active/no partner	15.7	0.2								
Not sexually active			12.5	0.7						
Breast-feeding	0.1	0.0								
Same-sex partner	0.6	0.0								
Too old (respondent or partner)	0.1	0.0								
Don't think can get pregnant	1.0	0.0								
Do not care if get pregnant	1.5	0.1								
Didn't think would have sex, as have no regular partner	0.1	0.0								
Other reason for not contracepting	2.7	0.1								
Barriers to birth control use[c]	0.9	0.0								
Sterile—nonsurgical or unknown reason			1.7	0.2						
Sterile—surgical and noncontraceptive reason			0.2	0.1						
Other nonuse, sexually active			7.8	0.4						
Total nonusers	38.2		36.9							

[a]NSFG contraceptive users who are post-hysterectomy reassigned to hysterectomy

[b]"Periodic abstinence"—NSFG; "not having sex at certain times (rhythm)"—BRFSS

[c]Self or partner does not want to use, does not like/fears side effects, cannot pay for, or lapses in use of method

BRFSS = Behavioral Risk Factor Surveillance System

NSFG = National Survey of Family Growth

SE = standard error

NS = not statistically significant

DISCUSSION

The 2002 BRFSS provides the first comparable population-based estimates for current contraceptive use for all 50 states in the U.S. We found systematic differences in some demographic characteristics between the 2002 BRFSS and the 2002 NSFG, which is the standard national survey for documenting the nation's reproductive health behaviors. The composition of the BRFSS sample is systematically of higher socioeconomic status (i.e., higher educational attainment and higher income) than the NSFG sample. These differences may result from more women of lower socioeconomic status not having a currently operating landline telephone,[10]

the more intensive fieldwork done by the NSFG, and the fact that the BRFSS does not offer financial incentives. However, there are numerous other differences between the two surveys in sampling and data collection methods and other methodological aspects.

Despite the demographic differences and differences in data collection methods between the two surveys, national estimates for current contraceptive use for the U.S. were similar. Although some significant differences in reported levels of contraceptive use did exist, the actual magnitude of these differences was generally small.

This study combined with previous data[1] suggests that the BRFSS may be useful as a source of population-based data on this measure of current contraceptive use for reproductive health program planning at the state level. In a previous report, we found that patterns of contraceptive use by age and education within individual states in the BRFSS were similar to patterns in other states and to national patterns in the NSFG.[1] For example, in every state, as the age of the respondent increases, condom use declines and use of female surgical sterilization rises. Likewise, other studies have generally found good reliability and validity in estimates from the BRFSS in regard to other measures.[11]

Limitations

As a telephone survey, BRFSS has certain limitations. First, the survey is based on noninstitutionalized populations and excludes people residing elsewhere (e.g., nursing homes or long-term-care facilities). Second, the data are based on self-reports, which can be subject to recall bias. Third, those without a residential telephone are not included; therefore, BRFSS may exclude certain people of lower socioeconomic status or households with cellular phones only. Fourth, as a 20-minute telephone survey on a wide variety of health topics, the BRFSS contains one measure of contraceptive use—the primary method used at the date of interview (and if not using, the reason for nonuse). However, the BRFSS data are based on the largest telephone survey in the world. BRFSS is an ongoing, state-based survey that provides program planners with a unique opportunity to compare changes in risk behaviors at the local, state, and national levels. Furthermore, the substantial sample size allows for stratification to further examine the risk by selected variables of interest.

Likewise, NSFG excludes institutionalized populations and uses self-reported data. Homeless people are also excluded. As a survey that is focused on reproductive health and pregnancy, the NSFG includes measures of dual use (condom and pill, for example), ever-use, use at first intercourse, consistency of recent use, reasons for stopping use, effectiveness of contraceptive use, and use for teenagers aged 15–17 years.[2] Currently, state and local estimates are not available for the NSFG, although the latest round of NSFG is using continuous sampling and would allow for local and state samples from larger subdivisions by combining data across several years.

Implications

Efforts to increase the representation of poor women in the BRFSS sample would certainly improve the data available to programmers and policy makers. In addition, users of BRFSS data for particular states should assess the state's survey in terms of the representativeness of its sample, as there were substantial variations in response and cooperation rates by state. Our previous analyses found significant differences in use of contraceptive methods among men and women by state.[1] Among states, the prevalence of specific types of contraceptive use varied by three- to fourfold for the condom, the pill, and tubal ligation; by as much as sixfold for vasectomy; and by even greater ratios for less commonly used methods such as the IUD.

BRFSS data are particularly helpful in states with large proportions of groups that are not adequately represented in the NSFG. The NSFG estimates for Hispanic, white, and black people are sufficient, but estimates for other groups of people are hindered by small sample sizes. For example, in states such as Alaska, Hawaii, Montana, Idaho, New Mexico, and Arizona, with large populations of American Indians, Native Alaskans, and Pacific Islanders, national NSFG estimates of Asian, Hawaiian and other Pacific Islander, American Indian, and Alaskan Native women would be of questionable utility. As stated earlier, the BRFSS is the only source of population-based data for Puerto Rico, Guam, and the Virgin Islands. Furthermore, because the BRFSS is conducted more frequently than the NSFG, it can provide more accurate data for states that have undergone a rapid demographic transition, i.e., Mississippi or Louisiana in the aftermath of Hurricane Katrina.

CONCLUSION

In sum, BRFSS data can be valuable in guiding the development of state programs and policies to decrease unintended pregnancy and to prevent the spread of sexually transmitted infections. The 2002 BRFSS provides estimates on contraceptive use for specific states that are comparable to the estimates for other states. BRFSS data can be used to identify groups within a state that are experiencing a greater unmet need for

birth control and that may be experiencing increased barriers to birth control access. State comparison data also may identify gaps in the range of birth control methods offered by health-care providers within states. BRFSS data can be combined with data from other sources such as family planning programs and health insurers to provide a more complete picture of state efforts to prevent unintended pregnancy.[1]

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