

Use of Infertility Services in the United States: 1995

By Elizabeth Hervey Stephen and Anjani Chandra

Context: Both the demand for and the availability of infertility services in the United States increased during the 1980s and early 1990s. Understanding the factors that are related to service-seeking among women with current fertility problems would aid efforts to better provide services.

Methodology: Data on U.S. women's use of infertility services were taken from the 1995 National Survey of Family Growth, a nationally representative survey of 10,847 women aged 15–44. For the 1,210 women who at the time of the interview reported having fertility problems, multivariate statistical modeling was used to identify the characteristics associated with their use of infertility services.

Results: Of the 6.7 million women with fertility problems in 1995, 42% had received some form of infertility services. The most common services ever received among these women were advice (60%) and diagnostic tests (50%), medical help to prevent miscarriage (44%) and drugs to induce ovulation (35%). The proportions of fertility-impaired women who had ever received infertility services were generally highest among those who were older, who had ever been married, who had graduated from college, who had a high income and who were non-Hispanic white. Multivariate analyses reveal that apparent differences by age and race or ethnicity in the unadjusted analysis disappear once the effects of women's marital status, income and private health insurance coverage are taken into account.

Conclusion: Women who have ever used infertility services continue to represent a select group from among those with impaired fertility. Moreover, the vast majority of women with fertility problems who seek services receive noninvasive treatments that could be considered "low technology" interventions.

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As of 1995, 9.3 million women aged 15–44 had ever received infertility services, representing roughly 15% of all women of reproductive age.¹ In comparison, in 1982, 6.6 million women of reproductive age had ever received infertility services—or about 12% of all women aged 15–44. This suggests that the demand for and availability of infertility services increased during the 1980s and early 1990s.

The number of treatment options increased during this time, as did the number of providers. For instance, the field of assisted reproductive technologies grew in the late 1980s and 1990s: In 1986, approximately 41 clinics offered in vitro fertilization and related techniques (these clinics also reported data to what was then known as the National IVF/ET Registry); by 1996, that number had increased to more than 300.²

Despite the increase in diagnostic and treatment options for infertility services, the percentage of women with a fertility problem who seek medical treatment has remained fairly constant since 1988. Data from the 1988 National Survey of Family Growth (NSFG) indicate that about 43%

of women with current fertility problems had obtained some type of medical help for these problems.³ By 1995, roughly the same fraction of women with impaired fecundity (44%) had ever received infertility services.⁴

Earlier analyses of NSFG data have documented that among all individuals with self-reported fertility problems, those who pursue medical help for fertility problems are a highly selected group.⁵ Given the high costs of infertility services (which mostly remain uncovered by private health insurance or publicly funded assistance), service-seeking has become more common among women of higher socioeconomic status. That is, service-seeking is more prevalent among married, older, more highly educated and more affluent women than in the general population of women with impaired fertility.

To the extent that these demographic characteristics are more common among non-Hispanic white women than among Hispanic women or non-Hispanic black women, infertility service-seeking has also been more likely among non-Hispanic white women. In 1982 and 1988, socioeconomic factors distinguished not only

those women who pursued medical help at all, but also those who sought specialized infertility services (for example, medical help that goes beyond advice about how to time intercourse). Specialized services were more prevalent among women aged 30 or older, nulliparous women, married women, white women, more educated women and higher-income women.⁶

In this article, we examine the prevalence of receipt of infertility services and the characteristics associated with it among two primary groups of women: those in the general U.S. population who were aged 15–44, and those who reported during 1995 that they had fertility problems. We are particularly interested in examining the correlates of service-seeking for women with current fertility problems, because these may be the women most likely to pursue further medical help in the future.

Methods

Data

The NSFG is the only source of national estimates of infertility and of medical help for infertility in the United States. Five cycles of the NSFG have been conducted by the National Center for Health Statistics, in 1973, 1976, 1982, 1988 and 1995. The 1982 cycle was the first NSFG to include never-married women and to obtain information on infertility services.

All cycles of the NSFG were designed to represent the civilian, noninstitutionalized population of U.S. women 15–44 years of age. Black women were oversampled in all cycles of the survey, and Hispanic women were oversampled in 1995. The 1995 NSFG included 10,847 women; 1,210 of these women reported at the time of the interview that they were

Elizabeth Hervey Stephen is associate professor and chair of the Department of Demography, Georgetown University, Washington, DC. Anjani Chandra is a demographer in the Reproductive Statistics Branch, Division of Vital Statistics, National Center for Health Statistics (NCHS), Hyattsville, MD. The authors thank Mark Vogel for his research assistance in preparing tables for an earlier draft of this paper. The 1995 National Survey of Family Growth was jointly planned and funded primarily by the NCHS, the National Institute of Child Health and Human Development and the Office of Population Affairs, with additional support from the Administration for Children and Families.

experiencing some form of fertility problems. (Further details on the survey design and content can be found elsewhere.⁷)

Measures

The NSFG has traditionally defined two measures of fertility problems—infertility and impaired fecundity. To ensure that we can compare our results with those of earlier studies, we included women in this analysis if they fulfilled the definitions for either infertility or impaired fecundity. We refer to them here as women with fertility problems, or as “fertility impaired” women.

Impaired fecundity, which was defined for all women regardless of marital or cohabitation status, includes any of the following conditions:

- A woman reports that it is physically impossible for her to conceive or deliver a baby, or for her husband or cohabiting partner to father a baby. This group is referred to as “nonsurgically sterile.”
- A woman reports that it is physically difficult for her to conceive or deliver a baby or for her husband or partner to father a baby, or that she has been told by her doctor that a pregnancy would be harmful to her, to the baby or to both. This group is referred to as “subfecund.”
- A married or cohabiting woman reports that she and her husband or partner have had unprotected intercourse for at least 36 consecutive months preceding the interview but she has not become pregnant during that time. This group is referred to as having a “long interval without conception.”

In addition, we include in these analyses women who are “infertile.” This is based on the standard medical and demographic definition—that is, if a woman and her husband or cohabiting partner had had unprotected intercourse for at least 12 consecutive months before the interview and the woman did not become pregnant during that time.

Although some women may fulfill the definitions for both impaired fecundity and infertility, these two measures of fertility problems are not necessarily overlapping. The key differences are that infertility is limited to married or cohabiting women and to problems with conceiving a pregnancy, while impaired fecundity includes women of all marital or cohabitation statuses and includes difficulties with carrying pregnancies to term. Also, among those with impaired fecundity, the “long interval to conception” group may appear to be the same as the “infertility” group, but the former is based on a period of 36 months, while the latter is based on a span of only 12 months.

For this analysis, we include women

with either of the NSFG-defined measures of fertility problems—that is, either impaired fecundity or 12-month infertility—because our purpose is to understand as wide a spectrum as possible of infertility service use in the United States.

All women surveyed in the NSFG were asked if they (or their husband or partner) had ever sought medical help to become pregnant or to prevent miscarriage (beyond routine prenatal care); if they had, they were asked what types of services they had obtained. These services included medical advice (e.g., on timing of intercourse), diagnostic tests, drug treatments, surgery and assisted reproductive technologies. There are minute differences in the wording of questions across the three survey years, but these do not limit comparability over time.

As in previous analyses of the NSFG, we cannot identify the date of onset of certain conditions; this is one of several challenges in assessing the prevalence of infertility.⁸ Furthermore, there are social bases to infertility: It is typically experienced by a couple rather than by an individual, and a woman must generally have the desire to become pregnant in order to test her fertility. In addition, defining infertility as a health condition representing a lack of ability to do something poses unique challenges for conducting epidemiologic or other analyses. (For example, length of follow-up observation is critical.)

Because we cannot identify the onset of infertility or the relative timing of diagnosis of infertility-related conditions, the results of our analyses must be interpreted with extreme caution. For instance,

Table 1. Percentage distribution (and standard error) of all U.S. women aged 15–44, of women aged 15–44 with current fertility problems and of women aged 15–44 who have ever used infertility services, all by selected characteristics, 1995

Characteristic	% of all women (N=10,847)	% with current fertility problem (N=1,120)	% with problem who ever used infertility services (N=506)
No. of women (in millions)	60.2	6.7	2.8
Age at interview			
15–24	29.9 (0.5)	17.8 (1.2)	9.8 (1.8)
25–34	34.5 (0.4)	39.0 (1.6)	39.4 (2.3)
35–44	35.6 (0.5)	43.2 (1.5)	50.7 (2.4)
Parity			
0	41.9 (0.7)	44.6 (1.7)	39.9 (2.5)
1	58.1 (0.7)	55.4 (1.7)	60.1 (2.5)
Parity and age at interview			
0 births, 15–24	55.9 (0.9)	27.5 (2.0)	10.3 (2.4)
0 births, 25–34	28.3 (0.8)	37.0 (2.5)	40.3 (3.9)
0 births, 35–44	15.8 (0.6)	35.6 (2.0)	49.4 (3.9)
1 births, 15–24	11.1 (0.4)	10.0 (1.4)	9.5 (2.3)
1 births, 25–34	39.0 (0.6)	40.7 (2.0)	38.8 (2.8)
1 births, 35–44	49.9 (0.6)	49.3 (2.0)	51.7 (2.9)
Marital status at interview			
Never married	37.7 (0.6)	23.4 (1.3)	8.8 (1.3)
Currently married	49.3 (0.6)	64.3 (1.5)	78.9 (2.0)
Formerly married	13.0 (0.4)	12.3 (0.9)	12.3 (1.6)
Years of education at interview†			
<12	15.9 (0.5)	17.9 (1.4)	13.5 (2.0)
12	33.6 (0.6)	35.5 (1.7)	33.2 (2.7)
13–15	24.9 (0.5)	22.4 (1.3)	23.8 (2.0)
16	25.7 (0.6)	24.2 (1.7)	29.6 (2.4)
Income at interview (as % of poverty)‡			
<149%	21.1 (0.6)	19.6 (1.3)	13.5 (1.8)
150–299%	31.3 (0.6)	29.1 (1.7)	25.6 (2.5)
300%	47.6 (0.7)	51.3 (2.0)	60.9 (2.7)
Race/Hispanic origin			
Hispanic	11.1 (0.6)	11.6 (1.1)	9.3 (1.4)
Non-Hispanic white	70.6 (0.8)	69.0 (1.5)	75.8 (2.0)
Non-Hispanic black	13.6 (0.6)	13.1 (0.9)	9.5 (1.3)
Non-Hispanic other	4.6 (0.4)	6.3 (1.0)	5.4 (1.3)
Health insurance in last 12 months‡			
Private	75.9 (0.6)	73.8 (1.5)	82.5 (2.0)
Other	24.1 (0.6)	26.2 (1.5)	17.5 (2.0)
Private health insurance covered infertility services			
Yes	na	na	59.1 (2.4)
No	na	na	40.9 (2.4)
No. of infertility visits in past year§			
0	na	na	72.0 (2.2)
1	na	na	12.6 (1.4)
2	na	na	3.1 (1.0)
3	na	na	12.4 (1.6)
Total	100.0	100.0	100.0

†Limited to women aged 22–44 at interview. ‡Includes insurance coverage based on military service. §Infertility visits includes visits for medical help either to become pregnant or to prevent miscarriage. Note: These are weighted estimates, based on the 1995 National Survey of Family Growth.

some women might have been diagnosed with endometriosis before seeking infertility treatment, while others may have learned of their problem as an outcome of diagnostic testing for infertility.⁹ Thus, we show medical conditions such as uterine fibroids or endometriosis in our bivariate analysis only to illustrate their correlation

Table 2. Among women aged 15–44 who have a current fertility problem and who have ever used infertility services, percentage (and standard error) who used a service or who ever experienced a fertility-related condition, by type of service or condition

Service or condition	%
Service received	
Advice	59.8 (2.4)
Tests on woman or man	50.1 (2.6)
Ovulation drugs	34.7 (2.3)
Surgery or treatment for blocked tubes	16.0 (1.6)
Artificial insemination†	12.7 (1.6)
Assisted reproductive technology‡	1.6 (0.6)
Treatment for uterine fibroids	1.5 (0.6)
Treatment for endometriosis	8.8 (1.3)
Medical help to prevent miscarriage	44.3 (2.5)
Condition	
Problems with ovulation/menstruation	26.4 (2.0)
Blocked tubes	17.1 (2.0)
Other tubal/pelvic problems	13.6 (1.6)
Endometriosis	18.0 (1.8)
Semen/sperm problems§	21.8 (2.0)
Pelvic inflammatory disease	13.0 (1.5)
Sexually transmitted diseases††	12.4 (1.6)
Fibroid tumors/myomas in uterus	11.7 (1.6)
Ovarian cysts	26.0 (2.3)

†Artificial insemination with semen either from husband/partner or from a donor. ‡Includes in vitro fertilization, gamete intrafallopian transfer and other techniques not shown separately. §Includes women who reported it was physically impossible or difficult for their husband/partner to father a baby. ††Includes gonorrhea, chlamydia, syphilis and genital herpes. *Note:* These are weighted estimates based on the 1995 National Survey of Family Growth.

with fertility problems, and do not include them in our multivariate analyses of service-seeking.

Furthermore, because we are using social and demographic characteristics as of the time of interview, findings related to factors such as age, marital status, education and income should be interpreted cautiously as well. In using these current characteristics as correlates of past behavior, we acknowledge that a woman's attributes may have been different at the time she received infertility services. This may be particularly true for such characteristics as marital status, age and parity.

Our analysis includes two variables describing health insurance coverage: whether the respondent had private health insurance coverage in the past 12 months, and whether she had private health insurance coverage in the past 12 months that would have covered some of the costs of infertility treatment. The latter question was asked only of women who reported

*Respondents were asked about some of these conditions (blocked tubes, other tubal or pelvic problems, and semen or sperm problems) only within the context of infertility services. The questionnaire asked about some conditions (pelvic inflammatory disease, sexually transmitted diseases and ovarian cysts) only outside of the series on infertility services. The remaining conditions (problems with ovulation or menstruation, endometriosis and uterine fibroids) could have been reported either in the series on infertility services or elsewhere in the interview.

having received any infertility services, so we show this variable only in our bivariate analyses of service-seeking. Again, because we do not know the timing of any infertility diagnosis or service, and since the respondent may or may not have had health insurance coverage at that time, we use this information on health insurance in the past 12 months cautiously.

Analytic Approach

All of the percentages and odds ratios reported in this article are weighted national estimates, using a poststratified weight adjusted for nonresponse and sample design. We used SUDAAN software to estimate standard errors for all point estimates.

We first examine the characteristics of fertility-impaired women, in comparison to the general population of women aged 15–44 and to fertility-impaired women who have ever sought services. For fertility-impaired women who have ever used infertility services, we present the specific services they received and any fertility-related diagnoses they were given. We then summarize the prevalence of overall service-seeking and of specific infertility services, according to selected characteristics of fertility-impaired women.

The specific services that we examine include advice or diagnostic infertility tests on the woman or the man; drugs to stimulate ovulation; artificial insemination; assisted reproductive technology (including in vitro fertilization, gamete intrafallopian transfer and embryo donation, among others); and medical help to prevent miscarriage.

To determine the strongest net correlates of receipt of infertility services among women with fertility problems in 1995, we use multivariate logistic regression models to estimate the adjusted odds ratios associated with key demographic, socioeconomic and health factors. This allows us to determine the odds that a woman with certain characteristics ever sought services, holding all other variables constant. (We are not predicting the likelihood of future service receipt, but rather the odds of having received services at some time in the past.)

We present three separate regression models for the receipt of infertility services. For each of these, analyses are limited to women aged 22–44, for several reasons. Infertility and infertility service-seeking are relatively rare among women younger than 22. Given that many women younger than 22 have not completed their schooling, particularly their college degrees, excluding such women means that

most women in the study sample would not be precluded by their age from being in the “higher education” category. Also, younger women may not yet be financially independent of their parents, and might not be able to report accurately on their household income.

Results

Overall, 6.7 million women aged 15–44 had a current fertility problem in 1995 (Table 1, page 133). When these women are compared with all women, we see that the population of fertility-impaired women is very similar to the general population of women in terms of socioeconomic characteristics (education and income) and in race or ethnicity. However, fertility-impaired women are older: Forty-three percent are aged 35–44, compared with 36% of women in the general population. This differential is particularly large among nulliparous women (36% vs. 16%).

Among women with current fertility problems, 42% have ever used infertility services. On comparing these women with those who had fertility problems in 1995, we find that service-seekers were more likely to be currently married (79% vs. 64%), to have an income 300% or more of the federally designated poverty level (61% vs. 51%) and to have had private health insurance coverage in the past 12 months (83% vs. 74%). Slightly more than one-quarter of service-seekers had made an infertility-related visit in the previous year, and almost 60% had insurance that would have covered at least some of the costs of this medical care.

Among women with current fertility problems who had ever sought services, advice (60%), diagnostic tests (50%), medical help to prevent miscarriage (44%) and ovulation drugs (35%) were the most commonly reported services received (Table 2). (The percentages add to more than 100% because women could report receiving more than one type of infertility service.) Nearly 13% of the women had had artificial insemination, while fewer than 2% had used assisted reproductive technologies or had received medical treatment for uterine fibroids.

The most commonly reported conditions potentially related to fertility were problems with ovulation or menstruation (26%), ovarian cysts (26%) and semen or sperm problems (22%).* Fewer than 20% of these women reported being diagnosed with conditions such as endometriosis, blocked tubes and sexually transmitted diseases.

Among women with current fertility

problems, the two most prevalent services were advice or tests and medical help to prevent miscarriage (Table 3). (Since women could report having received more than one service, the percentages across specific services do not necessarily add to the total.) Tests could be for the male, for the female or for both; advice was generally advice on the optimal time to conceive.

Although receipt of any infertility service increased with age, artificial insemination and assisted reproductive technology were the only specific treatments that increased with age. As we might expect, ever-married women were more likely than never-married women to have received each type of service. College graduates were generally more likely to have received most types of services than were women with less than a college education. For some treatments, however, such as assisted reproductive technology, there was no difference by education. (This may be due to the small sample sizes reporting assisted reproductive technology.) The pattern by income is as might be expected, with higher-income women receiving each type of service much more frequently than lower-income women.

The most commonly reported services among women of all three racial and ethnic groups were advice or testing and miscarriage prevention, but non-Hispanic white women were twice as likely as Hispanic and non-Hispanic black women to have received ovulation drugs.

Women with private health insurance coverage in the last 12 months were more likely to have received most types of service than were women without private insurance coverage. (As was the case with women of differing educational levels, the number of recipients of assisted reproductive technology was probably too small to detect a difference between women who had private health insurance in the last 12 months and those who did not.)

Table 4 (page 136) shows the results of one bivariate and three multivariate logistic regression models. We first present the bivariate results, to determine the unadjusted odds ratio for each variable in relation to the use of infertility services. The first multivariate model is based on all women aged 22–44 with current fertility problems (n=1,092). The second is restricted to ever-married women with current fertility problems (n=889). The final model is limited to non-Hispanic white women with current fertility problems (n=652).

A bivariate analysis among women aged 22–44 (Table 4) reveals that patterns in the unadjusted odds ratios generally reflect the findings in Tables 1 and 3. Age is

Table 3. Among women aged 15–44 with current fertility problems, percentage (and standard error) who ever received specified infertility services, by selected characteristics

Characteristic	Any service†	Advice/ tests	Ovulation drugs	Artificial insemination‡	Assisted repro. tech.§	Medical help to prevent miscarriage	Weighted N (in millions)
Total	41.8 (1.6)	25.0 (1.4)	14.5 (1.1)	5.3 (0.7)	0.7 (0.2)	18.5 (1.3)	6.7
Age							
15–29	30.2 (2.5)	15.2 (2.0)	7.6 (1.3)	1.6 (0.7)	0.0 (0.0)	16.2 (2.0)	2.3
30–34	45.4 (3.5)	31.0 (3.3)	16.4 (3.0)	3.7 (1.5)	0.9 (0.5)	22.4 (2.8)	1.5
35–39	48.3 (3.0)	39.3 (2.9)	22.3 (2.8)	8.9 (1.7)	0.9 (0.5)	17.2 (2.4)	1.5
40–44	50.1 (3.4)	35.4 (3.3)	15.2 (2.6)	9.5 (2.1)	1.4 (0.8)	19.7 (2.7)	1.3
Parity							
0	37.5 (2.4)	31.8 (2.3)	15.1 (1.7)	7.5 (1.3)	1.2 (0.5)	7.2 (1.4)	3.0
1	45.3 (2.0)	25.6 (1.6)	14.1 (1.3)	3.5 (0.6)	0.3 (0.2)	27.7 (1.8)	3.7
Marital status							
Never-married	15.7 (2.3)	6.8 (1.6)	3.3 (1.3)	1.3 (0.8)	0.0 (0.0)	9.9 (1.7)	1.6
Ever-married	49.8 (1.8)	35.0 (1.7)	17.9 (1.4)	6.5 (0.9)	0.7 (0.3)	21.2 (1.5)	5.1
Education††							
<college graduate	41.3 (2.0)	27.4 (1.7)	13.6 (1.3)	3.8 (0.7)	0.6 (0.3)	17.7 (1.4)	4.7
College graduate	56.0 (3.9)	44.2 (3.7)	24.7 (3.4)	13.0 (2.0)	0.3 (0.8)	24.8 (2.9)	1.4
Income at interview (as % of poverty level)†††							
<300%	35.8 (2.7)	21.8 (1.9)	10.5 (1.6)	1.2 (0.4)	0.3 (0.2)	17.4 (2.0)	2.9
300%	53.0 (2.3)	40.1 (2.3)	21.4 (2.0)	10.4 (1.4)	1.2 (0.5)	21.2 (1.9)	3.1
Race/ethnicity							
Hispanic	33.5 (4.4)	18.9 (3.4)	8.4 (2.0)	3.6 (1.4)	0.5 (0.5)	22.7 (4.0)	0.8
Non-Hispanic white/other	45.1 (1.8)	31.2 (1.6)	16.5 (1.4)	6.4 (0.9)	0.7 (0.3)	19.2 (1.5)	5.0
Non-Hispanic black	30.4 (3.8)	20.7 (3.2)	8.3 (2.0)	0.6 (0.6)	0.8 (0.6)	10.9 (2.2)	0.9
Private health insurance in last 12 months††††							
Yes	46.7 (1.9)	32.8 (1.8)	18.1 (1.5)	6.5 (0.9)	0.6 (0.3)	19.8 (1.5)	4.9
No	27.9 (2.8)	15.9 (2.4)	4.3 (1.2)	2.1 (0.9)	0.8 (0.6)	15.1 (1.9)	1.7

†Includes medical help to become pregnant, as well as medical help to prevent miscarriage; also includes other forms of infertility services not shown separately in table. ‡Includes insemination with donor sperm or with husband's or partner's sperm, as well as other insemination techniques, such as intrauterine insemination. §Includes in vitro fertilization, gamete intrafallopian transfer and other assisted reproduction techniques not shown separately. ††Limited to women aged 22–44 at time of interview. †††Includes insurance coverage based on military service. Notes: Fertility problems include infertility and impaired fecundity. All percentages are weighted estimates based on the 1995 National Survey of Family Growth. Percentages may not add to total who ever received "any service" because women could report more than one type of service.

a highly significant correlate, with the odds of ever having used infertility services increasing in older age-groups. Having ever been married is the strongest single variable associated with ever-use of infertility services. Higher levels of education and income are significantly correlated with receipt of infertility services among fertility-impaired women. Also, women with private health insurance in the past 12 months are more than twice as likely to have used services as are women who did not have private health insurance in the recent period. Non-Hispanic blacks are significantly less likely than non-Hispanic whites to have used services, and Hispanic women are marginally less likely to have done so.

After we used multivariate logistic regression to adjust for the effects of the other variables among all women (Table 4), the factor most strongly associated with the receipt of any medical help to become pregnant or prevent miscarriage among all fertility-impaired women aged 22–44 was having ever been married: Ever-mar-

ried women were nearly five times as likely to have used services as were never-married women. Parity showed no net association with service receipt.

Although the bivariate results showed a pattern of service use increasing with age, the multivariate analysis revealed no net effect of age on service receipt. Thus, when the effects of education, marital status and other variables are controlled, a woman's age has no independent effect on receipt of infertility services. Similarly, controlling for the effects of other variables eliminates the effect of race or ethnicity on service receipt.

In contrast, private health insurance coverage and income remain significantly associated with greater odds of service use: Women with private health insurance in the last 12 months and those with an income 300% or more of poverty level were 50% more likely than those with no private health insurance or lower incomes to have received services. Additionally, being a college graduate was marginally associated with receipt of infertility services ($p<.10$).

Table 4. Adjusted odds ratios (and 95% confidence intervals) from bivariate analysis and from multivariate logistic regression models predicting ever-use of infertility services among women aged 22–44 with current fertility problems, for all women and for selected subgroups, by characteristic

Characteristic	Bivariate	Multivariate		
	All (N=1,092)	All (N=1,092)	Ever-married (N=889)	Non-Hispanic white (N=652)
Age at interview				
22–29 (ref)	1.0	1.0	1.0	1.0
30–34	1.5* (1.0–2.2)	1.1 (0.7–1.5)	1.2 (0.8–1.8)	1.0 (0.6–1.6)
35–39	1.7* (1.2–2.3)	1.1 (0.8–1.7)	1.2 (0.8–1.8)	1.2 (0.7–2.0)
40–44	1.8* (1.2–2.6)	1.1 (0.7–1.7)	1.2 (0.7–1.9)	1.2 (0.7–2.1)
Parity				
0	0.9 (0.7–1.2)	1.1 (0.8–1.4)	1.3 (0.9–1.8)	0.9 (0.6–1.4)
1 (ref)	1.0	1.0	1.0	1.0
Marital status				
Ever-married	5.2* (3.4–8.1)	4.7* (2.9–7.6)	na	8.0* (3.2–19.8)
Never-married (ref)	1.0	1.0	na	1.0
Education				
<college graduate (ref)	1.0	1.0	1.0	1.0
College graduate	1.8* (1.3–2.6)	1.4† (1.0–2.1)	1.5* (1.0–2.3)	1.5† (0.9–2.3)
Income at interview (as % of poverty level)				
<300% (ref)	1.0	1.0	1.0	1.0
300%	2.0* (1.5–2.7)	1.5* (1.0–2.1)	1.6* (1.1–2.3)	1.4† (0.9–2.2)
Private health insurance in last 12 months				
Yes	2.3* (1.6–3.1)	1.5* (1.0–2.2)	1.6* (1.0–2.3)	1.6* (1.0–2.7)
No (ref)	1.0	1.0	1.0	1.0
Race/ethnicity				
Hispanic	0.7† (0.4–1.0)	0.9 (0.6–1.5)	0.8 (0.5–1.4)	na
Non-Hispanic white/other (ref)	1.0	1.0	1.0	na
Non-Hispanic black	0.6* (0.4–0.8)	0.9 (0.6–1.4)	0.6 (0.4–1.0)	na

*p<.05. †p<.10. Notes: na=not applicable. ref=reference group.

For the subgroup of ever-married women with fertility problems, the multivariate analysis indicates that older age, nulliparity and race or ethnicity again show no net effect on receipt of infertility services (Table 4). Ever-married women with an income at 300% or more of poverty level, with private insurance in the last 12 months or with a college education were 50–60% more likely to have received services than were women with a lower income, with no private insurance or with less than a college education.

Among non-Hispanic white women with fertility problems, the multivariate analysis shows that two factors were significantly associated with greater use of infertility services: Ever-married women were eight times as likely as never-married women to have obtained infertility services, and those with private insurance were 60% more likely than other women to have done so. College graduates and women with higher income were somewhat more likely to have received medical help than were non-Hispanic white women with less education and income. Once again, when we control for the effects of such variables as marital status, income and education, the impact of age is muted.

Discussion

In 1995, about two out of five women aged 15–44 with a current fertility problem had ever sought medical services for the problem, about the same percentage as was seen in 1988. However, because so many women in 1995 were in their older, less-fecund reproductive years (as a result of the aging of the baby boom cohorts), the absolute number of women with fertility problems increased from 5.5 million in 1988 to 6.7 million in 1995. Parallel to this increase in the number of women with fertility problems has been an increase in the range of available infertility treatments and in the number of providers of assisted reproductive technologies.

The socioeconomic characteristics of service users have remained relatively uniform since 1988, and have changed in only minor ways since 1982.¹⁰ Our bivariate results indicate that service-seeking is more prevalent among fertility-impaired women who are older, who have more education and who have a higher income, and who are non-Hispanic white or other. This selectivity at the bivariate level suggests that there may still be an unmet need for infertility services, particularly among fertility-impaired women who are

less-educated and have less income.

Levels of service-seeking for medical help to prevent miscarriage are relatively high, close to the proportion of women who reported in 1996 that a pregnancy had ended in a miscarriage.¹¹ Nonetheless, service use in this category may be inflated in the NSFG if respondents reported any discussion they had had with their obstetrician-gynecologist during a prenatal visit regarding behavior they should avoid to prevent a miscarriage. Likewise, while there may be some social stigma associated with seeking infertility treatment, this is less likely to be the case with seeking treatment for miscarriage.¹² Therefore, women may be more likely to report treatment for miscarriage than specialized treatment for infertility.

Another key finding of our analysis was that when we control in a multivariate model for confounding factors such as education and income, the effects of race or ethnicity and age on the odds of having ever received infertility services diminish. This indicates that the correlates of service-seeking are complex. In multivariate analyses, the characteristics most strongly associated with ever-use of infertility services among women with fertility problems are being ever-married, having higher levels of income and education, and having been covered by private health insurance in the last 12 months. No net effect of race on the receipt of “any services” was detected, but we hypothesize that race and ethnicity, to the extent that they serve as a proxy for socioeconomic status, may now distinguish those who can afford “higher end” or specialized services. Further analyses with the 1995 data may bolster this hypothesis, as supported by work with earlier NSFG rounds.¹³ Marital status, which is strongly correlated with having private insurance and higher income, is likely a proxy for an entire set of behaviors that are associated with infertility service-seeking.

This cycle of the NSFG was the first to contain information on health insurance for infertility. We are particularly interested in analyzing the role of health insurance as a factor in the ability to pay for services, and whether there is a changing socioeconomic threshold in the receipt of lower-level versus higher-level infertility services.

Although the popular media focus on high-end fertility treatments and the most sensational cases, we find throughout these analyses that the preponderance of fertility treatment is at a lower level of technology and cost—e.g., advice to help

get pregnant or help prevent miscarriage, diagnostic testing and fertility drugs. This service mix is likely to be retained even as new forms of assisted reproduction are developed, so it is important to understand the factors associated with use of these more common infertility services, as well as barriers to their use.

The proportion of fertility-impaired women who have ever received assisted reproductive technology (less than 1%) may seem low, given that nearly 46,000 cycles of assisted reproductive technology were done in the United States in 1995 alone.¹⁴ However, the percentage who have ever received assisted reproductive technology is a prevalence measure, while the annual number of cycles is an incidence measure. Two additional aspects of the Assisted Reproductive Technology Registry may help to illuminate this issue: First, many women who undergo assisted reproductive technology have multiple cycles in a given year, and the increase in cycles reported over time in the registry may suggest that the same numbers of women are undergoing more cycles.¹⁵ Second, and perhaps less critically, the registry includes cycles performed at U.S. facilities for women from countries other than the United States; these women would not be covered in the NSFG, as it surveys only women living in the United States.

The prevalence of infertility-related diagnoses seen in this analysis matches closely with the levels reported for developed countries in a multicenter study of infertility evaluation and treatment that was conducted in the 1980s by the World Health Organization.¹⁶ This consistency in diagnostic prevalence between clinic-based data and self-reported data from the NSFG is reassuring for further analyses involving the NSFG data.

The importance of this research is that we are able to expand our knowledge about infertility service-seekers because of the inclusion of more variables of interest in the 1995 NSFG. For the most part, our multivariate findings mirror those of earlier studies,¹⁷ although each analysis has used slightly different variables and

definitions. For instance, a study based on the 1988 NSFG found in some multivariate models an age effect for receipt of "specialized infertility services"; however, age was dichotomized as younger than 30 versus 30 or older in that analysis.¹⁸ We expected to see a greater age effect on receipt of services using five-year age-groups, but this pattern was found only in our bivariate tabulations.

The lack of an effect in our multivariate models may have been because we were looking at the receipt of any services, rather than of specialized services. Another possibility is that once we controlled for the effects of age-related factors (such as marital experience, education and income), age loses its significance. We plan to pursue these questions in future analyses, particularly focusing on different definitions of specialized services and on the potential role of insurance coverage and a socioeconomic threshold on service receipt.

The 1995 data presented here allowed us to study the individual-level correlates of infertility service-seeking, and to help us assess service demand at an aggregate level. We will then be in a better position to address public health concerns regarding this aspect of reproductive health.

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