

Cultural factors contributing to health care disparities among patients with infertility in Midwestern United States

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Objective: To identify cultural differences in access to infertility care.

Design: Cross-sectional, self-administered survey.

Setting: University hospital-based fertility center.

Patient(s): Thirteen hundred fifty consecutive women who were seen for infertility care.

Intervention(s): None.

Main Outcome Measure(s): Details about demographic characteristics, health care access, and treatment opinions based on patient race or ethnicity.

Result(s): The median age of participants was 35 years; 41% were white, 28% African American, 18% Hispanic, and 7% Asian. Compared with white women, African American and Hispanic women had been attempting to conceive for 1.5 years longer. They also found it more difficult to get an appointment, to take time off from work, and to pay for treatment. Forty-nine percent of respondents were concerned about the stigma of infertility, 46% about conceiving multiples, and 40% about financial costs. Disappointing one's spouse was of greater concern to African-American women, whereas avoiding the stigmatization of infertility was of greatest concern to Asian-American women.

Conclusion(s): While the demand for infertility treatment increases in the United States, attention to cultural barriers to care and cultural meanings attributed to infertility should be addressed. Enhanced cultural competencies of the health care system need to be employed if equal access is to be realized as equal utilization for women of color seeking infertility care. (Fertil Steril® 2011;95:1943–9. ©2011 by American Society for Reproductive Medicine.)

Key Words: Health care disparities, assisted reproductive technology, infertility, race/ethnicity, religion, cultural differences, mandate health insurance, equal access, equal utilization, IVF

Infertility is a major public health issue affecting more than 6 million women in the United States (1). The number of assisted reproductive technology (ART) clinics has been increasing steadily (from 300 clinics in 1995 to 361 clinics in 2008) as have the number of ART cycles being performed (from 59,142 cycles in 1995 to 140,795 cycles in 2008) (2, 3).

Data from the 1995 survey of 10,847 American women of reproductive age conducted by the National Center for Health Statistics suggest that infertility affects women of all race, ethnicities, and levels of education (1), noting that African-American (10.5%), Hispanic (7%), and other minority women (13.6%) reported infertility more often than white women (6.4%). Furthermore, women with less than or only a high school diploma reported a higher prevalence

of infertility than women with a bachelor's degree or higher (8.1%, 8.5%, and 5.6%, respectively). Unfortunately, there is evidence that this trend has increased with time as African-American women have experienced an increase in rates of infertility whereas there has been a concomitant decrease among white women (4).

However, the demographics of those receiving infertility treatment (5–7) and success rates of such treatment (8–10) are dramatically skewed from the characteristics of those who experience infertility in the general population. A survey of >500 women attending a fertility clinic in Massachusetts demonstrated that, even in a state with mandated insurance coverage for infertility services, those seeking services are predominantly white, highly educated, and wealthy (11).

These findings suggest that, if access to infertility services were in fact equal, a greater number of African-American and Hispanic women would be expected to seek care. Similarly, higher numbers of women with infertility but a lower level of education and income would be expected to seek care, particularly if a state mandates health care coverage for infertility treatment. At the very least, a large proportion of couples faced with infertility are not receiving medical treatment to achieve pregnancy. The lack of state-mandated insurance coverage for IVF has been proposed as a major obstacle for equal access to such care (12, 13). However, equal access does not necessarily guarantee equal use of such available care (11, 14, 15).

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To explore the possible reasons why those with the greatest need for infertility services do not seek them out even when available, we conducted a survey of women seen for infertility care in a mandated state to determine the possible role(s) that demographic, cultural, and socioeconomic characteristics may play in access to and opinions regarding fertility treatment.

MATERIALS AND METHODS

Data Collection

Institutional Review Board approval was obtained from the University of Illinois at Chicago before conducting the study. A questionnaire consisting of 24 questions was developed and mailed to 1,350 consecutive women who came to the University of Illinois at Chicago Fertility Center for infertility care, identified by their primary ICD-9 diagnosis code for infertility (628.x or 606.x), between March 2004 and April 2005. The survey instrument collected information on patient demographics, obstetric and infertility history, elements of obtaining infertility treatment, attributions for experiencing impaired fertility, and concerns regarding treatment.

The questionnaire was pilot tested for face validity with the assistance of three infertility physicians, three non-infertility physicians, four infertility patients, and a sociologist. On the basis of their feedback, the questionnaire was amended to ensure future subjects' understanding of the questions. The questionnaire (along with a cover letter and postage-paid return envelope) was mailed in June 2005, and responses were collected during the next 3 months. One month after the initial mailing, a second mailing was sent to nonrespondents to improve the response rate. Survey results were entered into a database (Microsoft Access 2000; Microsoft Inc., Redmond, WA) and reverified for accuracy.

Statistical Analysis

The distribution of demographic characteristics was compared by self-reported information regarding care seeking and access, as well as worries and concerns surrounding infertility and ART. Unconditional multivariable logistic and linear regression, mutually adjusted for race and ethnicity, religion, education, income, age, and nulliparity, was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs) that are presented as estimates of the relative risk (16). All multivariable Wald statistic *P* values are based on two-sided tests. The SAS statistical software (version 9.1; SAS Institute, Inc., Cary, NC) was used for all analyses.

RESULTS

Out of 1,350 mailed questionnaires, 129 were returned by the postal service because of lack of a correct mailing or forwarding address. From the remaining 1,221 mailings, 743 completed questionnaires were received (61% response rate). Respondent race or ethnicity was not significantly different from that of nonrespondents. Respondents ranged in age from 21 to 56 years (median 35 years) (Table 1), with 41% self-identifying as white, 28% African American, and 18% Hispanic. Most had at least a 4-year college education (59%) and a household income of over \$100,000 (51%). The most prevalent religious affiliation was Catholic (39%), followed by Protestant (35%) and agnostic (13%).

The age distribution across race or ethnicities and religions was similar (multivariable Wald, two-sided *P* values >.10; data not shown), although greater income was associated with older age (*P*=.03), and nulliparous women were more likely to be younger (*P*<.0001). Compared with whites, African-American and Hispanic women were more likely to be nulliparous when presenting at the fertility clinic as were Catholic women (*P*<.005; data not shown).

No significant differences by race or ethnicity, religion, or education were observed in having insurance coverage for fertility treatment (*P*>.12, data not shown). However, compared with those with a bachelor's degree, both women with a high-school diploma

TABLE 1

Characteristics of women seen with infertility at a Midwestern fertility center (n = 743).

Characteristic	Median	No. (%)
Age, y (range)	35 (21–56)	
Nulliparous, n (%)	380 (51.1)	
Parity (range)	1 (1–5) children	
Duration attempting to conceive, mo (range) ^a	36 (0–144)	
Distance traveled to clinic, miles (range)	10 (1–200)	
Race or ethnicity		
African American		208 (28.0)
Asian American		54 (7.3)
White		306 (41.2)
Hispanic or Latina		134 (18.0)
Other		41 (5.5)
Marital status		
Single		96 (12.9)
Married		634 (85.3)
Divorced		11 (1.5)
Same-sex couple		2 (0.3)
Religion		
Secular or agnostic		95 (12.8)
Buddhist		4 (0.5)
Catholic		288 (38.9)
Chinese		13 (1.8)
Traditional		
Hindu		27 (3.7)
Muslim		21 (2.8)
Jewish		32 (4.3)
Protestant		260 (35.1)
Education		
High school		303 (40.8)
4-year college		223 (30.0)
Graduate degree		217 (29.2)
Annual household income		
<\$50,000		180 (24.3)
\$50,000–\$100,000		182 (24.6)
\$100,001–\$150,000		143 (19.3)
\$150,001–\$200,000		144 (19.5)
>\$200,000		91 (12.3)
Current ART		
IUI		310 (41.7)
IVF		211 (28.4)
IVF + ICSI		124 (16.7)
Internet access		
No		156 (21.0)
Yes		586 (79.6)
Search for infertility information on the Internet		
No		312 (42.0)
Yes		431 (58.0)
Insurance coverage		
No		15 (2.0)
Yes		728 (98.0)
Fertility treatment coverage		
No		105 (14.0)
Yes		556 (74.9)
Partial		81 (10.9)

Note: ICSI = intracytoplasmic sperm injection.

^a Self-reported number of months attempting to conceive before being seen at this fertility center.

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and those with a graduate degree reported that it was difficult to get treatment because of their income level ($P=.02$, data not shown). In addition, women without a graduate degree found it to be more difficult to get time off from work to see the physician ($P=.0003$).

Compared with whites, African-American and Hispanic women had been attempting to conceive for 20 months longer ($P<.0001$) and had traveled on average 19 fewer miles to the clinic ($P<.001$) (Table 2). Overall, compared with whites, African-American and Hispanic women found it more difficult to find a physician with whom they felt comfortable, to get an appointment with a physician, to take time off from work for their appointment, and to pay for treatment ($P<.0001$). In addition, they reported that it was more difficult

to get treatment specifically because of their race or ethnicity ($P<.0001$) or income level ($P<.0001$) (Table 2).

Relative to whites, Hispanic women were four times as likely to have been referred to the clinic by a friend or family member ($P=.0006$), whereas African Americans were five times more likely to have self-referred ($P=.06$) (Table 2). Catholic women were five times more likely than Protestant women to have self-referred and nine times more likely to report that it was difficult to get treatment specifically because of their religion ($P=.02$ and $.02$, respectively; data not shown). Nulliparous women were also significantly more likely to have self-referred (OR = 2.3; $P=.04$; data not shown).

TABLE 2

Self-reported barriers to infertility care by race or ethnicity among women seen at a Midwestern fertility center (n = 743).

Barrier	Proportion overall, no. (%)	OR ^a (95% CI)			
		African American	Asian American	White	Hispanic
Duration attempting to conceive (mo) ^b		+15	+3	Referent	+14
Distance traveled to clinic (miles)		-14	-8	Referent	-16
Internet access	586 (79.6)	0.2 (0.1-0.5)	All	Referent	0.2 (0.1-0.5)
Fertility tx insurance coverage	637 (85.9)	0.8 (0.4-1.9)	1.7 (0.5-5.6)	1.00 (referent)	2.1 (0.9-5.3)
Current ART					
IUI	310 (41.7)	0.5 (0.3-0.9)	0.5 (0.2-1.3)	1.00 (referent)	0.4 (0.2-0.7)
IVF	211 (28.4)	0.2 (0.1-0.4)	1.0 (0.4-2.4)	1.00 (referent)	0.4 (0.2-0.7)
IVF + ICSI	124 (16.7)	0.2 (0.1-0.4)	0.6 (0.2-1.6)	1.00 (referent)	0.4 (0.1-0.9)
Referral source					
Self	38 (5.1)	4.6 (1.0-22.3)	5.2 (0.4-64)	1.00 (referent)	1.2 (0.3-5.0)
Internet	60 (8.1)	0.5 (0.2-1.8)	0.4 (0.1-2.1)	1.00 (referent)	0.2 (0.0-2.3)
Friend or family	126 (17.0)	0.9 (0.4-2.0)	1.6 (0.5-5.0)	1.00 (referent)	4.3 (1.9-9.9)
Physician	404 (54.5)	1.8 (1.0-3.3)	0.8 (0.3-1.9)	1.00 (referent)	0.6 (0.3-1.2)
Harder to get treatment because of					
Age	91 (12.3)	38 (11-129)	4.9 (1.0-25)	1.00 (referent)	4.4 (1.6-12)
Race or ethnicity	110 (14.8)	72 (14-378)	0	1.00 (referent)	36 (6.6-195)
Income	238 (32.0)	8.0 (3.6-18)	0.5 (0.1-4.6)	1.00 (referent)	6.4 (2.9-14)
Insurance coverage	302 (40.7)	6.2 (3.2-12)	0.5 (0.1-1.9)	1.00 (referent)	4.1 (2.1-8.1)
Career	62 (8.3)	36 (5.9-224)	0	1.00 (referent)	20 (1.8-111)
It was difficult to ^c					
Find a doctor with whom I'm comfortable	150 (20.2)	6.6 (2.8-15.4)	0.4 (0.05-3.3)	1.00 (referent)	3.4 (1.4-8.3)
Get an appointment	87 (11.7)	9.9 (3.3-29.8)	2.3 (0.4-12.7)	1.00 (referent)	7.2 (2.5-21.0)
Take time off for appointments	240 (32.3)	4.6 (2.4-9.0)	0.5 (0.1-1.5)	1.00 (referent)	6.8 (3.3-14.0)
Pay for the treatment	168 (22.6)	6.7 (2.9-15.3)	0.4 (0.1-1.9)	1.00 (referent)	9.4 (4.1-21.7)
Ability to bear children rests on ^d					
Timing	544 (73.3)	5.2 (2.5-10.7)	1.6 (0.5-5.1)	1.00 (referent)	3.2 (1.5-7.1)
Personal control	283 (38.1)	4.3 (2.3-8.1)	1.5 (0.6-3.6)	1.00 (referent)	2.4 (1.3-4.6)
God's will	483 (65.1)	3.1 (1.5-6.1)	0.3 (0.1-0.9)	1.00 (referent)	1.5 (0.8-3.0)
A couple's physiology	429 (57.8)	0.1 (0.1-0.3)	1.0 (0.1-8.6)	1.00 (referent)	0.1 (0.1-0.3)
Chance	245 (33.0)	4.2 (2.3-8.1)	0.6 (0.2-1.6)	1.00 (referent)	4.2 (2.2-8.4)
Religious faith	242 (32.6)	2.8 (1.5-5.4)	0.3 (0.1-1.7)	1.00 (referent)	1.8 (0.9-3.5)
Trusting a medical provider	435 (58.6)	0.1 (0.04-0.2)	5.7 (1.7-18.4)	1.00 (referent)	0.7 (0.3-1.4)

Note: ICSI = intracytoplasmic sperm injection; tx = treatment.

^a Adjusted for age, education, income, religion, race or ethnicity, and nulliparity.

^b Self-reported number of months attempting to conceive before coming to this fertility center.

^c Answered 4 or 5 on 5 point scale from 1 = Not difficult to 5 = Very difficult.

^d Answered 1 or 2 on 5 point scale from 1 = Agree to 5 = Disagree.

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TABLE 3

Points of worry and concern in seeking infertility treatment among women seen with infertility at a Midwestern fertility center (n = 743).

Significant worries or concerns	Proportion overall, no. (%) ^a	OR ^b (95% CI)
Violation of religious beliefs	60 (8.1)	
Annual household income		0.6 (0.4–0.9)
Age		1.1 (1.0–1.1)
Historic misuse of medical treatment in my community	49 (6.6)	
African American vs. white		33.2 (7.7–143)
Catholic vs. Protestant		3.2 (1.1–9.7)
Secular or agnostic vs. Protestant		6.4 (2.3–17.7)
Need to consider adoption as an alternative first	96 (12.9)	
African American vs. white		2.9 (1.2–7.2)
Hispanic vs. white		3.7 (1.4–10.0)
Age		1.1 (1.02–1.1)
Personal sense of “failing” to conceive	330 (44.4)	
African American vs. white		3.8 (2.0–7.1)
High school diploma vs. bachelor’s degree		2.0 (1.2–3.2)
Age		1.0 (0.94–0.99)
Nulliparous vs. parous		2.4 (1.7–3.4)
Social stigma of infertility	364 (49.0)	
African American vs. white		3.7 (1.8–6.0)
Asian American vs. white		7.3 (2.8–19.0)
Chinese vs. white		59 (6.0–579)
Age		0.95 (0.93–0.98)
Disappointing spouse	240 (32.3)	
African American vs. white		4.3 (2.2–8.4)
Muslim vs. Protestant		6.3 (1.5–26.0)
Secular or agnostic vs. Protestant		2.1 (1.1–4.1)
Hindu vs. Protestant		7.5 (2.0–29.0)
Chinese Traditionalist vs. Protestant		7.7 (1.6–36.7)
Friends or family finding out about treatment	198 (26.7)	
African American vs. white		6.6 (2.8–15.4)
Asian American vs. white		12.9 (4.7–35.5)
Chinese vs. white		18.4 (3.5–96.2)
Hispanic vs. white		7.0 (3.0–15.9)
Secular or agnostic vs. Protestant		2.3 (1.1–5.2)
Graduate degree vs. bachelor’s degree		2.5 (1.3–4.8)
Annual household income		0.6 (0.5–0.8)
Using science or technology to conceive	175 (23.6)	
African American vs. white		4.1 (1.8–9.2)
Hispanic vs. white		5.3 (2.2–12.9)
High school diploma vs. bachelor’s degree		2.0 (1.1–3.6)
Annual household income		0.6 (0.5–0.9)
High financial costs	301 (40.5)	
Catholic vs. Protestant		0.5 (0.3–0.8)
Graduate degree vs. bachelor’s degree		2.2 (1.3–3.6)
Annual household income		0.6 (0.5–0.7)
Short-term side effects	291 (39.2)	
African American vs. white		3.8 (2.1–7.1)
Hispanic vs. white		4.8 (2.4–9.7)
Catholic vs. Protestant		0.5 (0.3–0.9)
Annual household income		0.7 (0.6–0.9)
Long-term side effects	411 (55.3)	
African American vs. white		2.5 (1.3–4.5)
Hispanic vs. white		9.5 (4.4–20.6)
Annual household income		0.8 (0.6–1.0)
Age		1.2 (0.9–1.7)
Not conceiving	649 (87.4)	
All equally concerned		—
Having twins	90 (12.1)	
African American vs. white		4.0 (1.5–10.5)

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TABLE 3

Continued.

Significant worries or concerns	Proportion overall, no. (%) ^a	OR ^b (95% CI)
Annual household income		0.7 (0.5–0.9)
Having triplets or greater	338 (45.5)	
African American vs. white		5.2 (2.8–9.7)
Hispanic vs. white		11.0 (5.4–22.2)
Catholic vs. Protestant		0.5 (0.3–0.9)
Having a miscarriage	503 (67.7)	
African American vs. white		2.6 (1.3–5.1)
Asian American vs. white		0.3 (0.1–0.8)
Hispanic vs. white		12.7 (4.7–34.4)
Graduate degree vs. bachelor's degree		1.8 (1.1–2.8)
Annual household income		0.7 (0.6–0.9)
Having an ectopic pregnancy	352 (47.4)	
African American vs. white		5.6 (2.8–11.2)
Hispanic vs. white		11.3 (4.9–25.6)
Secular vs. Protestant		0.4 (0.2–0.8)
Annual household income		0.5 (0.4–0.6)
Risk of birth defects	480 (64.6)	
Hispanic vs. white		6.9 (3.1–15.4)
High school diploma vs. bachelor's degree		1.7 (1.0–2.9)
Nulliparous vs. parous		0.5 (0.3–0.7)

^a Answered 4 or 5 on 5 point scale from 1 = Not worried or concerned to 5 = Very worried or concerned.

^b Adjusted for age, education, income, religion, race or ethnicity, and nulliparity.

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African-American and Hispanic women were statistically significantly 80% less likely to have access to the Internet, although no difference in referral patterns via the Internet was observed by race or ethnicity (Table 2). Older women and those with only a high school education were less likely to be referred via the Internet ($P=.008$ and $.04$, respectively; data not shown).

Among the questions with answer options ranging from “1—not worried” to “5—very worried,” those with a median answer of 4 or 5 were “How worried are you about not getting pregnant?” = 5 (very worried); “How worried are you about having a miscarriage?” = 4 (worried); “How worried are you about the potential risk of birth defects?” = 4 (worried); “How worried are you about potential long-term medication side effects?” = 4 (worried). The social stigma of infertility was very concerning to 49% of respondents, 46% were very concerned about conceiving higher-order multiples, and 40% were very concerned about high financial costs of treatment (Table 3).

Significant racial, religious, and cultural meanings and socioeconomic differences were evident in self-reported points of concern in seeking infertility treatment (Table 3). Compared with white women, African-American women were three to four times more likely to be concerned about having “failed” to conceive, using science to conceive, the social stigma of infertility, and disappointing their spouse. The social stigmatization of infertility was of greatest concern to Asian-American women, particularly of Chinese descent (OR = 59 compared with white women). Indeed, all other races and ethnicities were seven to 18 times more likely to be concerned about friends and family finding out about their infertility treatment compared with white women. Although all races and ethnicities were equally concerned about the high financial cost of treatment, those with greater annual household income were significantly less concerned about costs (OR = 0.60 per \$50,000 increase). In addition, those with greater household income were significantly less concerned about using science to conceive, friends and family finding

out about treatment, and the potential short- and long-term health side effects of treatment.

Although only 12% of respondents were concerned about having twins, 46% were concerned about triplets or higher-order multiples (Table 3). African Americans were consistently significantly more concerned than whites about the potential for poor pregnancy outcomes (multiples, spontaneous abortions, ectopic pregnancies, and birth defects). Although Hispanic women were not significantly more concerned about having twins, they were more than 10 times more likely to be concerned about high-order multiples, miscarriages, or ectopic pregnancies than were white women. Nulliparous women were 50% less likely to be concerned about the risk of birth defects than were parous women (95% CI = 0.3–0.7).

DISCUSSION

A growing body of literature suggests that the incidence of infertility (1, 4) and its treatment varies by race and ethnicity (8–10) and that such differences may only be increasing over time (4, 9). As the disparity in infertility rates continues to increase in the United States, it is concerning that there are concomitant disparities in ART outcomes between women of color and white women (8–10, 17). Attention to barriers to care and possible social stigma surrounding infertility need to be better identified and eventually addressed if equal access for diagnosis and treatment are ultimate goals. Without thoughtful attention to the cultural barriers and stigma that potentially complicate utilization, it may be that mandated insurance benefits will be necessary but not sufficient to realize equal access for all women.

Sharara and McClamrock (18) were the first to report that, among patients with infertility at an inner-city ART clinic, those who were African American had a significantly longer duration of infertility than did white women. Our study expands on these observations

and suggests that, even among those women who have successfully initiated care at a fertility clinic, barriers to access differ by race or ethnicity, education levels, and income and these barriers may account for the observed greater duration of infertility before treatment among racial minorities and those with lower education levels and household income.

Although financial status is often regarded as the key barrier to treatment access, our observations, which were adjusted for annual household income and education levels, support those of our previous study that documented the continued racial and socioeconomic disparities in patient population characteristics that persisted in states with mandated insurance coverage (4, 11, 14, 15). Indeed, Feinberg et al. (19) evaluated the demographic distribution of patients accessing infertility treatment within the military system, where improved access to care would be expected given the full access to diagnostic modalities and greatly reduced cost of IVF regardless of economic status or military rank. They observed that although the proportion of African-American women receiving ART was representative of the general military population (fourfold higher than the proportion receiving ART in the general U.S. population) (20), the proportion of Hispanics was significantly lower: Hispanics comprised 9% of the military population but only 4% of patients in the ART program. As mentioned above, this is similar to the general U.S. population where Hispanics comprise 12.5% but only 5.4% of U.S. ART patients, despite the military's minimization of cost and specialist referral barriers.

The proportion of our study participants who ranked that they were "very concerned" about stigma (49%) did not differ statistically significantly from the proportion who were "very concerned" about financial costs of treatment (40%), although this may be influenced by sample size. The lower level of concern for costs may be a temporal artifact of study enrollment and data collection methods because the participants already had accessed treatment and started out payment before questionnaire completion. Still, little is known about how the stigma of infertility or fertility treatment varies across race and ethnicity or income and education levels. This warrants further investigation, given that the few studies exploring stigma and infertility suggest that stigma may shape how women and couples respond to impaired fertility, ART, and treatment outcomes (21, 22). Moreover, although racial or ethnic and socioeconomic

biases may play a role in ART referral patterns, social stigma may also be a factor. Some populations of women may be less likely to share their fertility concerns with friends and family, thus constricting their access to informal referral sources and increasing reliance on clinical support.

Having grappled with accessing ART, at least the short-term payment of their fertility care, and dealing with stigma concerns, these women are now contending with the possibility of a multiple birth outcome. Forty-six percent of women reported conceiving higher-order multiples as a major concern, and this concern did not differ by demographic characteristics. Yet, only African-American women reported significant concern about conceiving twins. This suggests that patients seeking fertility treatment may need more information and counseling about the health risks and both the economic and social costs associated with twins (23). The professional controversies surrounding the definition of a "successful" treatment as a single live birth may decrease awareness among patients and the general public of the risks associated with all multiple births (24, 25).

Data from this survey suggest that there are cultural factors in addition to known pelvic pathology (i.e., tubal and/or uterine factor) that most likely contribute to lower and/or delayed use by nonwhite women of infertility care. We argue that the disparities observed likely would be even greater if a comparison were carried out between infertile women receiving treatment and those who have not yet sought or gained access to treatment. It is suggested that to mitigate the underlying hesitation and reluctance to seek treatment reported by those of different races and ethnicities, education levels, and socioeconomic standing will take development of enhanced culture competencies throughout the health system.

We suspect that geographic and cultural variation will be observed between clinical populations and encourage practitioners within and outside the United States to replicate this data collection and analysis. As mentioned above, future studies also will need to focus not only on clinical populations but on those who experience infertility and are not able to, or perhaps choose not to, access the health care system.

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