Limitations and barriers in access to care for male factor infertility

Akanksha Mehta, M.D.,[a] Ajay K. Nangia, M.B.B.S.,[b] James M. Dupree, M.D., M.P.H.,[c,d] and James F. Smith, M.D., M.S.[e,f,g]

[a] Department of Urology, Emory University School of Medicine, Atlanta, Georgia; [b] Department of Urology, University of Kansas Medical Center, Kansas City, Kansas; [c] Department of Urology and [d] Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, Michigan; and [e] Department of Urology, [f] Philip R. Lee Institute for Health Policy Studies, and [g] Department of Obstetrics, Gynecology, and Reproductive Sciences, University of California San Francisco, San Francisco, California

The primary challenge to identifying and addressing barriers in access to care for male factor infertility is accurate measurement of the prevalence of male infertility. Current estimates are based on couples pursuing assisted reproduction, and likely underestimate the problem. These estimates also fail to account for the number of patients facing infertility due to cancer or cancer treatment. Lack of health insurance coverage for the diagnosis and treatment of infertility presents a major barrier for couples struggling with infertility. However, it is not the only barrier. Education level, household income, cultural norms, religious beliefs, geographic location, and the availability of specialty-trained reproductive urologists are all important factors in determining the ease with which patients access and obtain infertility care. Addressing each of these obstacles directly is imperative to improving reproductive care and outcomes for infertile couples in the United States. (Fertil Steril® 2016;105:1128–37. ©2016 by American Society for Reproductive Medicine.)

Key Words: Assisted reproductive technology, barriers to care, health services accessibility, male infertility, male reproductive health

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The World Health Organization maintains that "infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected intercourse" (1). This definition is echoed in statements from the American College of Obstetricians and Gynecologists and the American Society for Reproductive Medicine (ASRM) (2, 3). Despite these statements, insurance companies, political leadership, and many medical societies and practitioners hold the common misperception that access to infertility care is a lifestyle choice rather than an intrinsic healthcare right for men, women, and couples.

Infertility is present in 10% of all couples and is partly or completely attributable to a male factor in approximately 50% of cases. The etiology and severity of male factor infertility has been shown to independently affect reproductive outcomes, even in the setting of assisted reproductive technology (ART) (4, 5). A diagnosis of male factor infertility is associated with a lower personal quality of life (6), and undergoing ART for isolated male infertility can have a profound effect on the well-being of couples accessing infertility services (7). Despite this, the male partner is often overlooked in the evaluation and treatment of a couple's infertility (8). Male infertility is underrecognized scientifically, epidemiologically, socially, psychologically, financially, and politically. Overall, male infertility is underrepresented as a disease.

Data from the National Survey of Family Growth (NSFG) demonstrates that among couples actively seeking infertility care in the United States, as many as 18%–27% of men do not complete a male evaluation, which extrapolates to 370,000 to 860,000 men (9). This trend is worrisome because 1%–6% of men undergoing infertility evaluation can have a serious underlying medical condition (10, 11). Semen quality itself may be an important marker of overall male health—past, present, and future (12–15). Therefore, improved access to, and utilization of, male reproductive medicine services may have broader implications for public health.

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Reprint requests: Akanksha Mehta, M.D., Department of Urology, Emory University School of Medicine, 1365 Clifton Road, Suite 1400, Building B, Atlanta, Georgia 30305 (E-mail: akanksha.mehta@emory.edu).

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A growing body of literature suggests that access to care for male infertility is limited by a multitude of factors (Table 1). First and foremost is an imperfect understanding of the scope of the problem. Current estimates of the prevalence of male factor infertility in the United States are based on the number of men using ART, which is not necessarily representative of the larger population of men at risk for subfertility. Public and provider perception of infertility as a primarily gynecologic problem, combined with the misperception that the use of ART can circumvent a male factor problem, can unwittingly minimize the importance of the male evaluation. Finally, when consultation for male factor infertility is sought, geographic access to a male reproductive medicine specialist can be difficult, and the cost of undergoing treatment, prohibitive. Changes in health policy or other interventions will ultimately be required to remove these barriers and improve reproductive health and outcomes for men or couples struggling with male factor infertility.

EPIDEMIOLOGIC BARRIERS

The true prevalence of male factor infertility in the United States is unknown (Fig. 1). There is no national registry that systematically and specifically collects information about male reproductive health. According to the NSFG, approximately 7.5% of sexually active men seek medical help for conceiving a child at some time during their lifetime, which is equivalent to 3.3–4.7 million men (16). Approximately 18% of these men report a clinician-diagnosed male factor infertility problem (16). Although the NSFG is designed to include a nationally representative sample, the number of men included in the earlier cycles of the survey was small. Plans to increase the number of men surveyed by the NSFG will hopefully provide a better representation of male reproductive concerns in the future.

The National Survey for Ambulatory Surgery and the National Survey of Ambulatory Care have demonstrated that the highest utilization for male infertility services is for men aged 25–34 years (126 of 100,000); followed by men aged 35–44 years (83 of 100,000). According to these databases, healthcare utilization for male infertility was highest in the northeastern United States, in a Caucasian, college-educated population (17). In contrast, the VA Health System study showed healthcare utilization to be highest in the southern United States, within a minority population (17). The discrepancy in results is reflective of sample bias, likely secondary regional variations in insurance coverage and access to care for male infertility.

Nationwide, there are more than 440 ART clinics that provide services to couples seeking to overcome infertility (18). Data on the prevalence of male factor infertility among couples utilizing ART is collected by the Society for Assisted Reproductive Technologies Clinical Outcomes Reporting System (SART-CORS) from SART member clinics, and by the federally mandated National ART Surveillance System (NASS) maintained by the Centers for Disease Control and Prevention (CDC). As such, NASS is populated by data from SART-CORS, as well as non-SART member clinics, and is more comprehensive in terms of the number of clinics represented (97% vs. 85% of all US ART clinics).

Nevertheless, both NASS and SART-CORS are subject to the same limitations with respect to information specific to male factor infertility: demographic information for the male partner is extremely limited; there is no information about male reproductive history; and male factor infertility is simply defined by the federal registry as "abnormal semen parameters," irrespective of etiology or severity. The only

TABLE 1

Barriers in access to male reproductive care.

Barrier	Explanation
Epidemiologic	Lack of population-level databases that accurately define the burden of disease, and difficulties in access to care
Geographic	Disparity of services available for specialized male infertility and andrology care and ART centers
Knowledge	Limited patient and public awareness—due to gender, societal norms, education level Limited provider awareness—due to scientific biases, preset expectations, conflicts of interest, scientific knowledge
Financial	Lack of health insurance coverage (private and governmental) results in substantial out-of-pocket expenses in the private sector Limited funding for basic, clinical, and public health research for improving access to, and treatment of, male factor infertility
Socioeconomic	Cultural, religious and societal perception of the diagnosis of infertility, and its acceptance
Government and health policy	Need to recognize reproduction as a disease process and a public health issue

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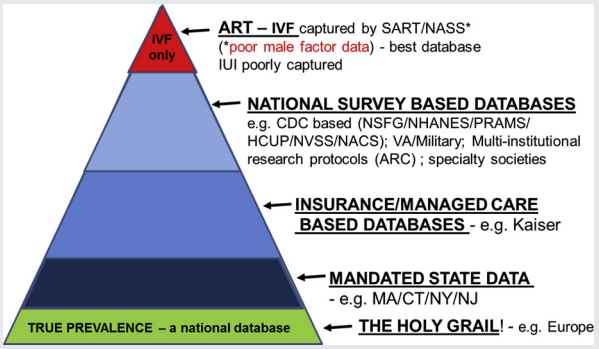
FIGURE 1



The "iceberg" of access and prevalence data collection in the United States. ARC = Andrology Research Consortium; CT = Connecticut; HCUP = Healthcare Cost and Utilization Project; MA = Massachusetts; NACS = National Ambulatory Care Survey; NHANES = National Health and Nutrition Examination Survey; NJ = New Jersey; NSFG = National Survey of Family Growth; NVSS = National Vital Statistics System; NY = New York; PRAMS = Pregnancy Risk Assessment Monitoring System.

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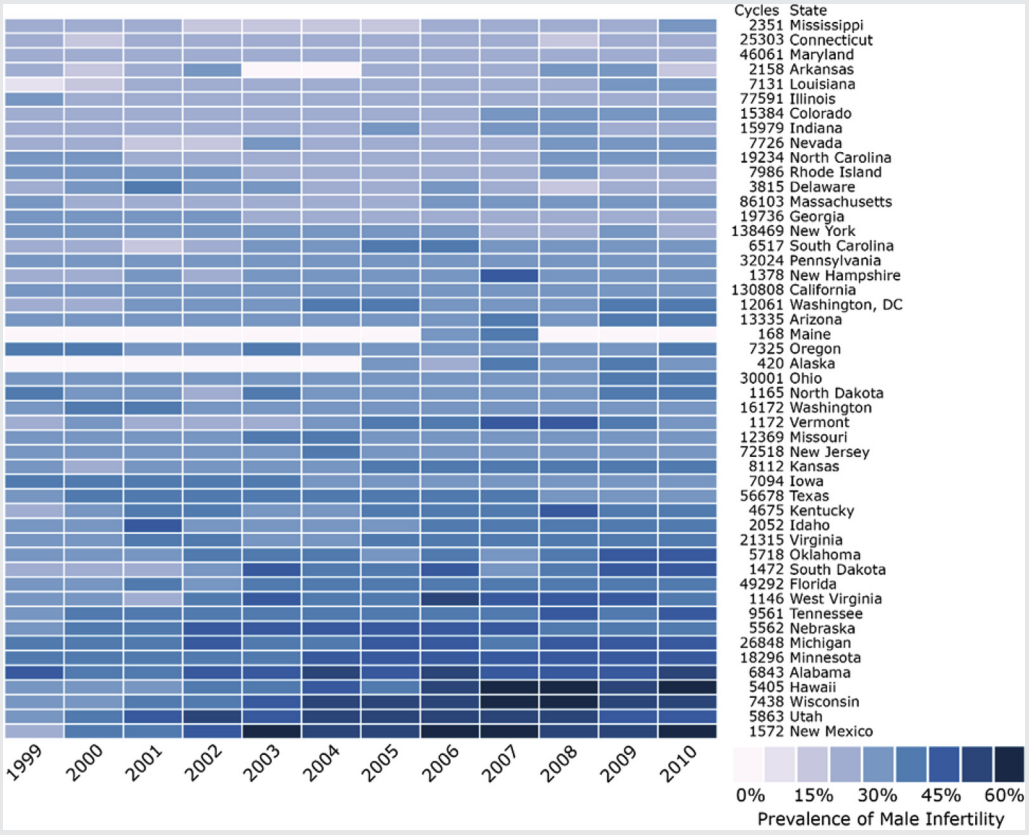
additional information included in these databases is the sperm source utilized for ART (ejaculated/testicular sperm extraction/aspiration/retrograde/electroejaculation). Because no etiologic male subfertility data have been collected within these databases, measuring the severity of each couple's male factor problem is extremely difficult, if not impossible, to appreciate. The available data also focuses exclusively on couples undergoing ART, and therefore only represents the "tip of the iceberg" of male subfertility (Fig. 1).

In 2011 the CDC implemented a key change with respect to the characterization of male factor infertility within NASS, by reporting the percentage of cycles that included a male factor diagnosis, irrespective of whether a female factor diagnosis was also reported. Before 2011, a "male factor" diagnosis was only reported in the absence of any identifiable female factor diagnoses. It is encouraging to note that further change is planned in 2016, with both NASS and SART-CORS to include more information on the etiology of male factor infertility. Instead of considering male factor infertility as a dichotomous variable, semen analysis parameters will be included. This change in data collection will help highlight the fact that infertility is a male factor problem as well as a female factor problem. The data will be available for analysis in 2018.

Despite their limitations, NASS and SART-CORS remain the most comprehensive databases pertaining to male factor infertility. Accordingly, Odisho et al. (19) investigated the prevalence of male factor infertility presenting for IVF using NASS data, and mapped its geographic and temporal distribution between 1999 and 2010 (Figs. 2 and 3). Although the overall prevalence of isolated and total male factor infertility remained stable around 17.1% and 34.6%, respectively, the prevalence varied by state and over time during the study interval; prevalence was highest in New Mexico (56.4%) and lowest in Mississippi (Fig. 3).

It is important to recognize the limitations in these estimates. Men seeking treatment for infertility may not be representative of the general population of subfertile men. Demographic and economic factors, for example, as well as availability of male reproductive specialists, may play a role in whether men seek infertility treatment services. These factors may certainly explain the geographic and temporal variability described by Odisho et al. More importantly, it is likely that current estimates of the prevalence of male factor infertility underestimate the true prevalence of this problem.

FIGURE 2



Annual prevalence of isolated male factor infertility diagnosed at ART clinics in the United States from 1999–2010. Adapted from Odisho et al. (19).

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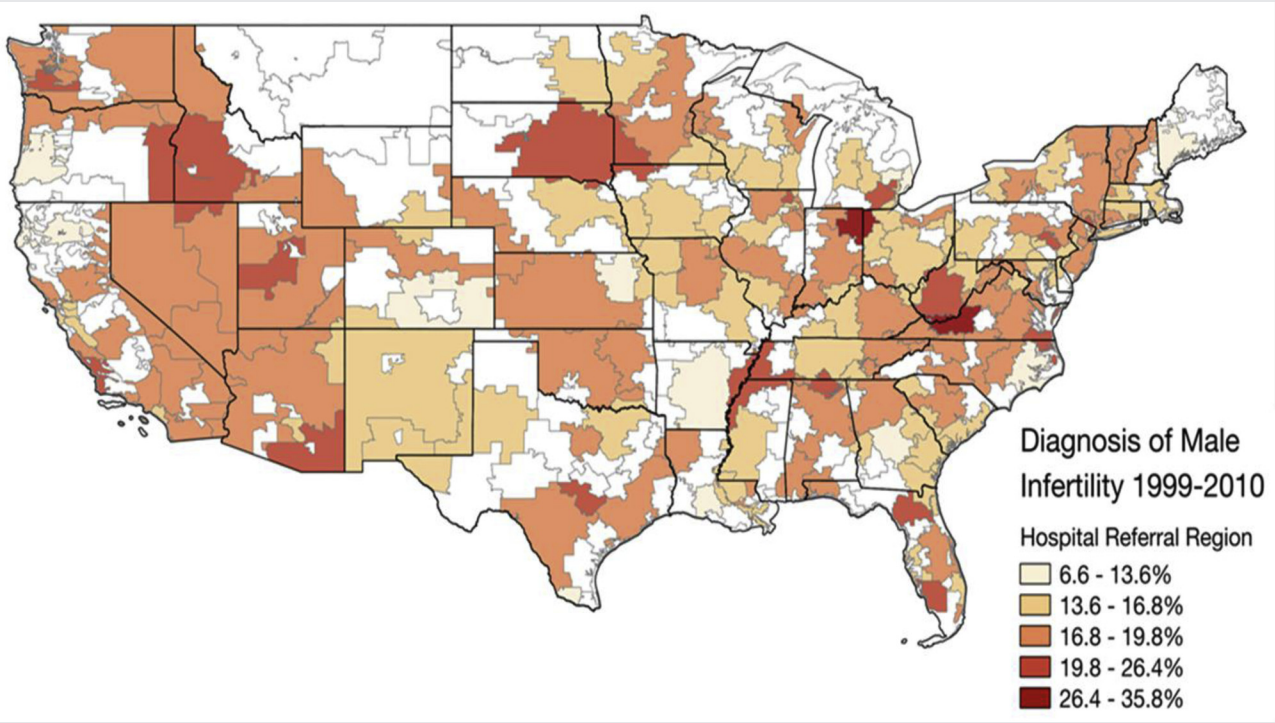
FIGURE 3



Prevalence of cumulative male factor infertility, weighted by number of IVF cycles performed 1999–2010. Adapted from Odisho et al. (19).

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GEOGRAPHIC BARRIERS

Access to care for infertility care relies on proximity to local and regional ART centers and, ideally, proximity to both male and female fertility specialists. Two studies have examined the geographic distribution and accessibility of infertility treatment centers and male infertility specialists, on the basis of 2000 US Census data. There is wide variability in the distribution of ART centers with respect to population density for men and women of reproductive age (women 20–44 years; men 20–49 years) (20). At the time of publication, more than 1.5 million men and women in Kentucky were served by the single in-state ART center, compared with 65,000 men and women served per ART center in the District of Columbia (20). Not surprisingly, states with some form of mandated health insurance coverage for infertility treatment were more likely to have a higher median number of ART centers, and these centers were more likely to be located in proximity to areas of highpopulation density (20).

The same group of authors then analyzed the distribution of male reproductive urologists in relation to the male population aged 20–49 years and found a disparity in the distribution of male reproductive specialists in the United States, with large areas of the country being under- or overserved (21) (Fig. 4). At the time of publication, 13 states had no male reproductive urologist whatsoever, and many more ART centers did not have a male fertility specialist within a 60-minute driving distance. In these scenarios there may be no option but to reply on general urologists who do not have expertize or interest in male reproduction, which, in turn, affects the interaction between male and female fertility specialists, and potentially impacts outcomes from ART care. Interestingly, the distribution of male population per male specialist was independent of a state's mandated health insurance coverage status (21).

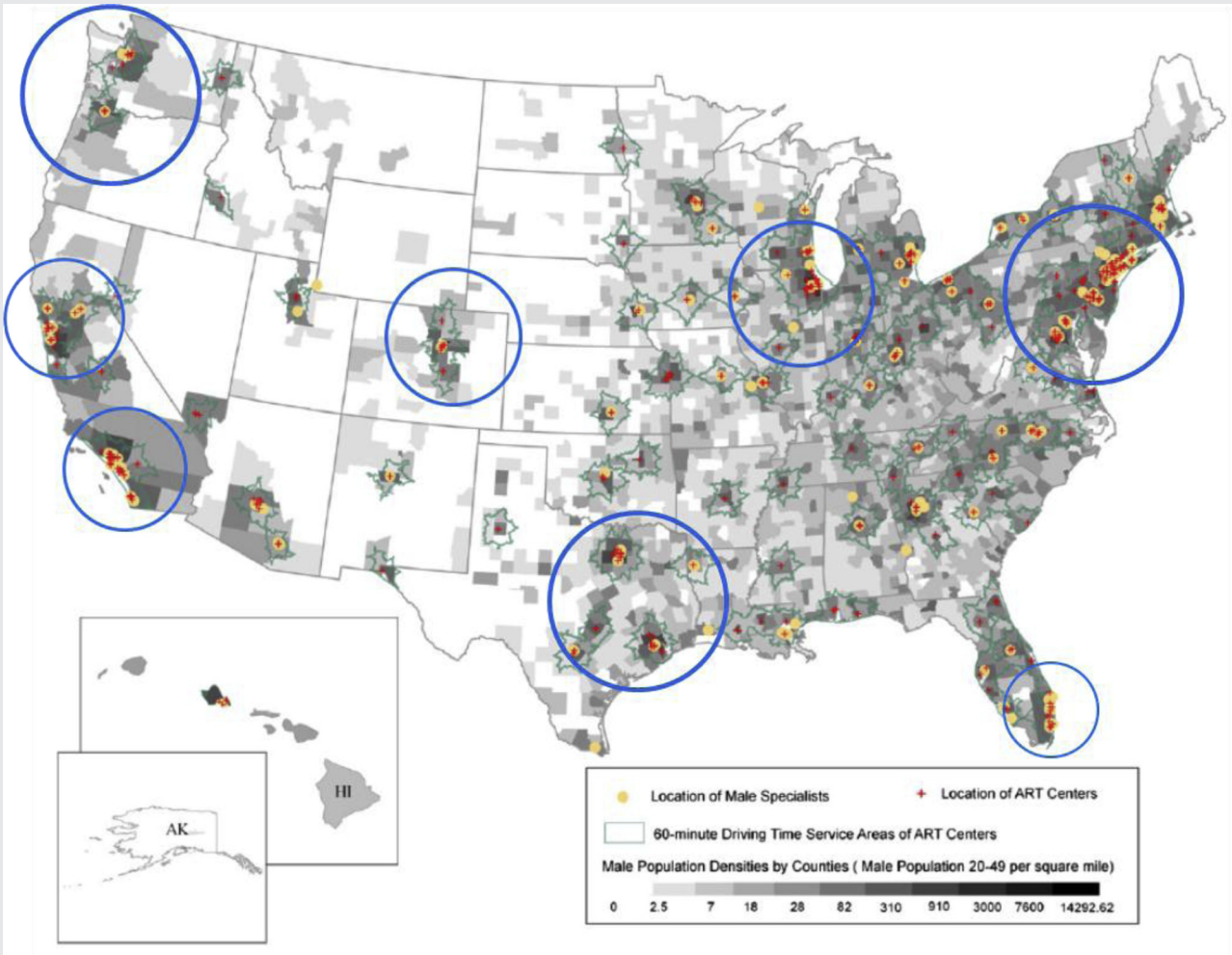
Together these results demonstrate clear geographic barriers in access to a male reproductive health evaluation. Not only do these barriers limit access to care for men with an established diagnosis of infertility, they also diminish the potential diagnosis of subfertility in men who are not actively seeking ART services.

KNOWLEDGE BARRIERS

There are widespread knowledge gaps among patients, physicians, and health policy makers about the importance of a male fertility evaluation, as well as the implications of a diagnosis of male factor infertility.

Men between the ages of 15 and 44 years of age are 2 to 2.5 times less likely than women to visit a doctor for a medical condition, and are therefore less likely to be educated about the male contribution to reproduction and less likely to undergo an evaluation for infertility (9, 22). This trend is compounded by the commonly held misperception that infertility is primarily a "woman's problem." Worse, men

FIGURE 4



Distribution of male population in the reproductive years, urology male infertility specialists, and ART centers with service areas within the United States. Adapted from Nangia et al. (21).

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may perceive male infertility as a lack of virility or masculinity or a threat to one's heterosexuality.

Given the geographic barriers in access to fertility services described above, the availability of internet-based information assumes even greater importance for couples seeking infertility-related information. The tremendous value of the internet as a tool for patients seeking healthcare information is well established: an estimated 80% of Americans report routinely using the internet to search for information relating to medical diagnoses and treatments (23). Similar trends have certainly been noted among infertile couples (24).

Leung et al. (18) recently performed a cross-sectional survey of patient-directed information pertaining to the contribution, etiology, workup, and treatment of male factor infertility on the websites of infertility treatment centers across the United States. Approximately 20% of websites completely failed to mention a male factor contribution to fertility, and referral for a urologic evaluation was specifically mentioned by less than 25% of the remaining websites (18). These findings suggest that couples undergoing infertility evaluation and treatment may not be well informed about the importance, or the benefit, of a male factor evaluation. In fact, in a prospective cohort of more than 400 couples seeking fertility care, having a college degree was the strongest predictor of fertility service utilization (25).

To a large extent, responsibility for patient education falls on healthcare providers, who may not have interest or training in andrology or male infertility. Additionally, providers may be subject to the pressures of managing patient expectations and maximizing clinical outcomes, as well as medical and scientific biases of their own. As a result, instead of evaluating and treating reversible conditions in the male partners, providers may direct infertile couples toward assisted reproduction.

The etiology of male infertility remains idiopathic or unknown in a large proportion of cases, resulting in the

perception that "the male factor has no cure." This perception, combined with advances in ART, and improved reproductive outcomes in the setting of male infertility, have unwittingly minimized the importance of the male evaluation and relegated the male partner to no more than a "sperm provider" in many cases. In actuality, of course, the male evaluation remains just as important in the era of ART. First, a thorough clinical evaluation can uncover other serious medical conditions, such as tumors, genetic disorders, and endocrinopathies (10, 11). Second, medical or surgical treatment can sufficiently enhance sperm production so as to downgrade the need for assisted reproduction (for instance, from IVF to IUI), or to obviate it entirely. As an example, among couples with male factor infertility attributed to a varicocele, surgical correction of varicoceles has been associated with improvement in semen parameters (26). Varicocelectomy is associated with improved reproductive outcomes in the setting of both IUI (27) and assisted reproduction (28). A recent meta-analysis also reports a benefit of varicocelectomy in men with nonobstructive azoospermia, in terms of return of sperm to the ejaculate as well as improved rates of surgical sperm retrieval (29).

Even though these conclusions are based on level-2 or -3 evidence, they reinforce the point that advances in ART should complement the evaluation and treatment of the male partner, not replace it.

FINANCIAL BARRIERS

Financial barriers to care for male infertility exist at many different levels and include not only the high out-of-pocket costs faced directly by patients but also the less visible limitations in research and public health funding faced by scientists and healthcare providers. Many of these issues are unique to the United States. In countries with universal healthcare that includes coverage for ART, such as the United Kingdom, Israel, France, and Canada, the debate centers on specific criteria for ART utilization and cost containment.

Out-of-pocket Costs/fee-for-service

The cost of undergoing IVF and intracytoplasmic sperm injection is highest in the United States, compared with other developed countries (30). The estimated cost for one cycle of IVF (approximately $12,500) represents 44% of annual disposable US income (30). The cost of undergoing intracytoplasmic sperm injection is usually $3,000 to $5,000 higher. The average cost per delivery using IVF is estimated to be more than $56,000 (31, 32).

These costs, combined with limited health insurance coverage, mean that out-of-pocket expenses for couples seeking infertility care are substantial. Wu et al. (33) analyzed cost diaries from 332 couples receiving care at eight different community and academic reproductive endocrinology clinics. Couples were treated with either medical therapy for ovulation induction medication, medical therapy for ovulation induction combined with IUI, or with IVF. Median out-of-pocket expenses ranged from $912 for couples using medication only to $19,234 for couples pursing IVF (33).

Men undergoing surgery for azoospermia may face costs in addition to the costs of ART. For those with nonobstructive azoospermia, outpatient testicular or epididymal biopsies alone, whether diagnostic or therapeutic, cost more than $500, with microsurgical epididymal or testicular sperm extraction costing upward of $5,000. Vasal reconstructive surgery or vasectomy reversal, for those with obstructive azoospermia, can cost up to $10,000. Out-of-pocket expenses are likely to be an important factor in the willingness and ability of couples to pursue evaluation and treatment for male factor infertility. These costs place significant financial strain on a family, even for couples with higher income and better insurance coverage, compared with the national average (Elliot et al. unpublished data). In one study of men seeking care for infertility, 64% spent more than $15,000 in out-of-pocket infertility-related expenses, which represented 16%–20% of their annual income. Forty-seven percent experienced financial strain, and 46% had treatment options limited by cost (Elliot et al. unpublished data).

Fertility preservation is, in fact, as much of a challenge as fertility treatment. Every year in the United States, cancer is diagnosed in more than 9,000 males between 15 and 35 years of age and more than 4,000 boys younger than 15 years (34). Advances in diagnostic techniques and treatment modalities have markedly improved the chances of cure or long-term remission in these patients, with overall cure rates now approaching 90% (34). Infertility is a known complication of cancer treatment, and fertility preservation is one of the top concerns for most cancer survivors. In a recent survey, 51% of men with cancer desired children in the future, including 77% of men who were childless when their cancer was diagnosed (35, 36). Guidelines from the American Society of Clinical Oncology, American Academy of Pediatrics, and ASRM (37–39) all recommend that fertility counseling and referral to fertility specialists be offered to all patients with a risk of sterility. However, these recommendations are followed sporadically, even in centers with dedicated, well-established fertility preservation programs (40).

Furthermore, insurance coverage for a consultation with a reproductive urologist, standard of care laboratory evaluations, sperm cryopreservation, and for the treatment of subfertility or infertility after cancer treatment, or surgical sperm retrieval, is usually poor or nonexistent. Patients with a history of cancer therapy are, therefore, doubly disadvantaged with respect to reproductive concerns. Advocacy groups like LIVESTRONG, the Alliance for Fertility Preservation, and RESOLVE; research and clinical organizations like the Oncofertility Consortium; and the health policy arm of ASRM advocate for patients at the state and federal levels to make fertility preservation a standard of care for all patients facing sterilizing cancer treatment.

Not surprisingly, infertility care is often perceived to be the province of the wealthy and well-to-do. Although infertility affects men equally across all socioeconomic strata, patients without significant family support or high household incomes are often unable to consult with a reproductive urologist, let alone pursue care that is recommended for them. Because all men are not able to access reproductive services,

infertility clinics are disproportionately composed of wealthy, college-educated white men and couples. This insurance gap further encourages the stereotype that infertility care is only for wealthier, well-educated couples.

In addition to financial costs, couples often spend a great deal of time seeking and using fertility treatments, which translates into lost productivity and wages and adds to the emotional and financial burdens faced by infertile couple. Assuming an 8-hour workday, the average time spent on fertility care is 125 hours, or 15.6 workdays, over an 18-month period (40). Possession of a college degree and intensity of fertility treatment are independently associated with increased time spent pursuing fertility care (41). Not surprisingly, couples that spend more time seeking and utilizing fertility care are more likely to experience fertility-related stress (41).

Insurance Coverage Limitations

One of the biggest challenges in access to care for male infertility in the United States remains the perception of infertility-related care being an elective option rather than a medical necessity. Although infertility was recognized as a disease by the ASRM in 2008 (2), federal and third-party insurers have failed to follow suit and characterize reproduction as a lifestyle choice instead (42). Health insurance coverage for the diagnosis and treatment of male factor infertility is, therefore, variable and often limited. The passage of the Affordable Care Act marks a major change in healthcare delivery in the United States. The fact that the ACA does not specify a federal mandate for infertility coverage means that decisions around insurance coverage for infertility services will remain a state-level decision.

Dupree et al. (43) comprehensively examined state-based laws related to insurance coverage for infertility and identified 15 states with laws mandating insurance coverage for infertility. In seven states the laws mandated insurance coverage for female infertility but did not address care for males with infertility. Two states (Montana and West Virginia) mandated coverage for undefined infertility services in Health Maintenance Organization plans. Only six states (California, Connecticut, Massachusetts, New Jersey, New York, and Ohio) clearly mandated male infertility evaluation or treatment (43). Of these, Massachusetts, New Jersey, and New York specifically exempt coverage for vasectomy reversal. Sperm cryopreservation is only mandated in Massachusetts and is specifically excluded in New York and New Jersey state laws (Fig. 5).

The federal government, in addition to private insurers, has failed to prioritize healthcare coverage for infertile couples. Its different programs, ranging from Medicaid to the Veterans Affairs Healthcare System, generally cover family planning (specifically, vasectomies), sexually transmitted disease and human immunodefiency virus testing and treatment, as well as infertility evaluation and diagnosis, but rarely cover infertility treatment. Electroejaculation is covered under Medicare. The Veterans Affairs Healthcare System covers vasectomy reversals at regional centers, but assisted reproduction is not covered either for active military employees or veterans.

For a number of years, the United States senate has debated legislation covering infertility services for military veterans, their spouses, and surrogates. However, although the adverse impact of active military duty on fertility seems to be well recognized, the Senate has been unable to agree on passing legislation confirming this (the Murray Bill). Currently, TriCare does not cover the costs of IUI or IVF, even in the setting of severe male factor infertility associated with the hazards of their military service, severely limiting treatment options for affected couples.

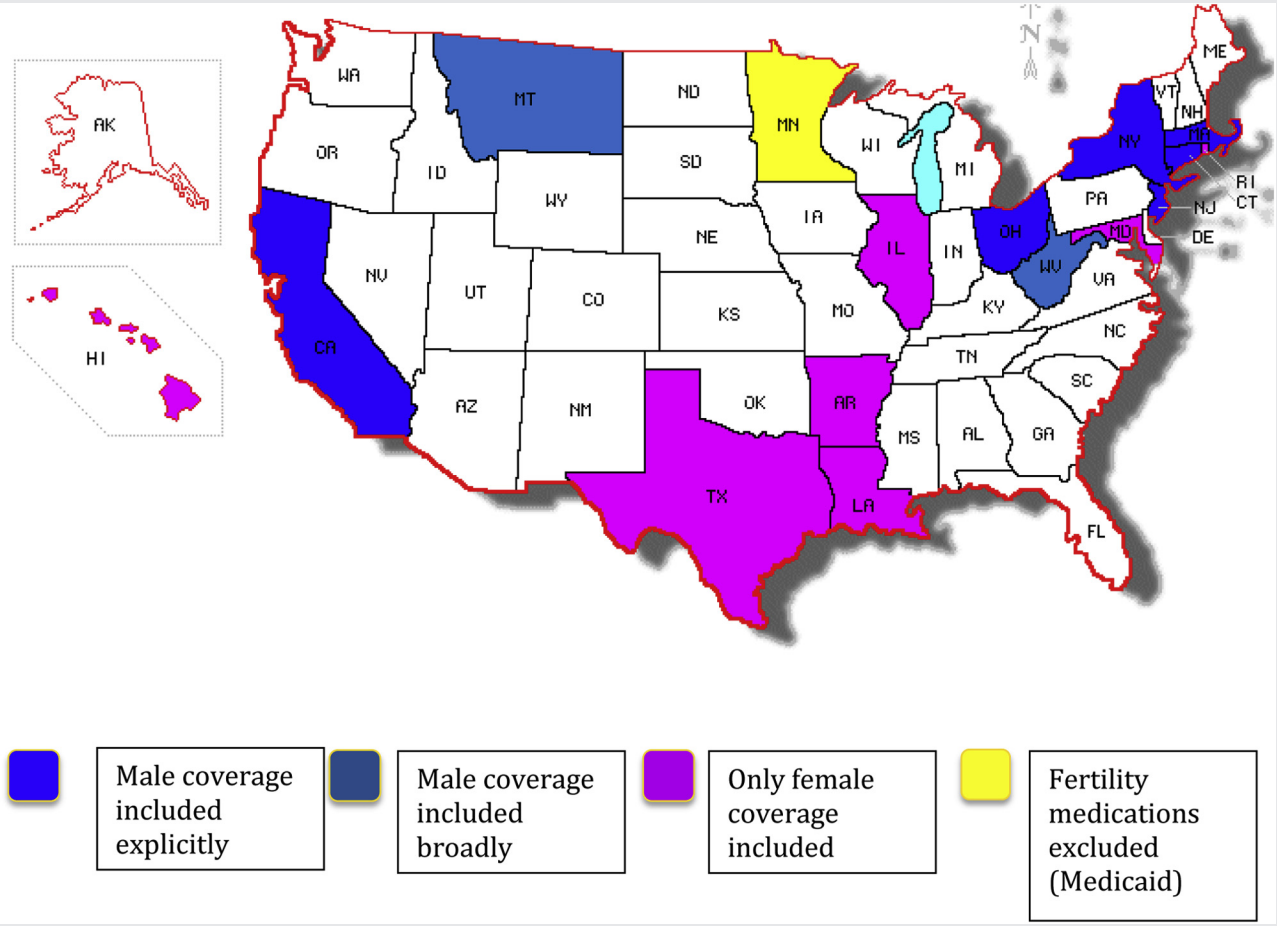
Whether infertility care should be covered by health insurance is an active and ongoing debate. Available evidence indicates that state insurance mandates impact access to care for couples with female factor infertility and influence the medical and surgical care patients receive for infertility before attempting ART (44, 45). Not surprisingly, mandated insurance coverage is to be associated with increased use of ART (46, 47), but this does not necessarily imply an inappropriate utilization of healthcare resources. In fact, Griffin and Panak (46) found no evidence of overutilization of ART by patients with a low chance of reproductive success, whereas Henne and Bundorf (47) found that increased use of ART was accompanied by a decrease in multiple births. Given the very high costs of multiple births (32), even modest reductions could generate significant cost savings to healthcare systems and offset the increased cost of providing ART services. Comparable analyses have not been specifically performed for the diagnosis of male factor infertility, but it is not unreasonable to expect similar conclusions.

Health economic analyses pertaining to infertility present a number of methodologic challenges (48). Studies of cost-effectiveness are difficult to perform, because there is a lack of consensus in terms of key outcomes, such as pregnancy, live birth, or a healthy baby. The use of quality-adjusted life-years as an outcome measure is also not straightforward: quality-adjusted life-years for an individual may be different from those for a couple or for a child, and identifying the most appropriate metric may be difficult (48). Besides the financial cost of undergoing fertility treatment, there may be intangible physical, psychological, and emotional costs that are harder to define. Last, if the management of infertility is to be covered by a publicly or privately funded healthcare system, consideration of societal views in addition to an individual's views may be important.

SOCIOECONOMIC BARRIERS

Given the geographic limitations, disparities in public perception of male factor infertility, and the costs associated with infertility treatment, it is not surprising that socioeconomic status impacts the utilization of infertility care, as well as treatment-related outcomes. College-educated and higher-income couples spend significantly more money on fertility treatments and are more likely to use higher intensity fertility treatments than their non–college-educated, lower-income counterparts (25). Having a college degree is independently associated with improved odds of pregnancy (25). Although the reason for improved outcomes is not known, a college education may imply better health status and health literacy, as

FIGURE 5



Mandated health insurance coverage spectrum for male factor infertility.

Mehta. Barriers in access to male reproductive care. Fertil Steril 2016.

well as higher household income, leading to optimal utilization of the available treatment options.

There can be substantial social barriers associated with access to infertility care, including race and ethnicity. Infertility has traditionally been considered a female problem. As a result, in certain cultures, the stigma associated with a diagnosis of male infertility may be so strong as to prevent the male partner from seeking medical care for diagnosis and treatment, even when a male factor problem is suspected.

Religion, in addition to culture, can influence the attitudes toward a diagnosis of infertility and toward medical care for infertility. Religious traditions, on one hand, may place tremendous emphasis on a couple's ability to conceive, and on the other, discourage the use of ART (49). The command to be fruitful and multiply, for example, is shared by the Catholic, Islamic, and Judaic traditions alike, but attitudes toward the treatment of infertility vary. The Catholic Church maintains that reproductive technologies are not a "morally legitimate" means of addressing infertility, because they separate the unitive and procreative aspects of married love (50). Islamic law is more accepting of ART but specifies that children have the right to be born through a valid union and know their parentage fully. Therefore, IUI and IVF are only considered licit if using sperm from a woman's spouse (51). Jewish perspectives with respect to infertility evaluation and treatment are much more specific, with strict limits placed on semen collection, surgical sperm extraction, cryopreservation, timing of IUI, and the potential use of donor sperm (52).

Social perspectives on infertility and infertility care may also vary with respect to the marital status of a couple; societies may be more willing to promote access to infertility care for married couples rather than unmarried or LGBTQ (lesbian, gay, bisexual, transgender, queer) couples. This distinction becomes increasingly relevant in light of the US Supreme Court decision legalizing same-sex marriage, and with it the ability of a same-sex couple to establish parenthood. The impact of this decision on the number of same-sex or LGBTQ couples seeking access to fertility care is not well understood at this time. Issues of insurance coverage, particularly in states with insurance mandates, also need to be defined.

GOVERNMENT/HEALTH POLICY BARRIERS

There is a general lack of knowledge among federal and state policy makers about infertility in general, let alone male infertility. Government at all levels (state and federal) also has its biases, owing to political or moral influences based on constituents, advocacy groups, lobbyists, and popular opinions. There is a need for political "champions" in the US House of Representatives and/or the US Senate to bring men's health and male factor infertility to the attention of policy makers, both as a problem of access to reproductive care and as a matter of public health. This task requires overcoming a big barrier—lack of knowledge—and therefore critically depends on better advocacy and lobbying efforts to recognize reproductive health as a right rather than a privilege, and to allocate greater research funding for understanding and treating male infertility.

FUTURE DIRECTIONS

The most important challenge in breaking down barriers in access to care for male factor infertility lies in acknowledging infertility as a disease and recognizing infertility-related treatment to be a healthcare necessity rather than a lifestyle choice. Fortunately there seems to be increasing awareness of infertility as a public health problem. The ASRM's Strategic Action Plan and the CDC's National Public Health Action Plan for the Detection, Prevention, and Management of Infertility were both released in 2014, with the common goal of increasing public consciousness of the impact of infertility and promoting healthcare efforts in the management of infertility. The National Public Health Action Plan recommended that both partners be evaluated for infertility and emphasized the need for more comprehensive population-level data. The addition of male factor-specific data points to NASS and SART-CORS, beginning in 2016, and potential future addition of data points to the CDC's NSFG, National Health and Nutrition Examination Survey, and potentially Pregnancy Risk Assessment Monitoring System databases, as well as an increase the number of men surveyed, will help improve the determination of the "denominator" as opposed to the "tip of the iceberg" that ART selects out.

While these efforts on the part of ASRM and the CDC are a tremendous start for improving our current appreciation of the scope of male factor infertility, they are by no means sufficient. Advocacy efforts by professional organizations such as the American Society of Andrology, the Society for the Study of Male Reproduction, and the Society for Male Reproduction and Urology will be important in recognizing infertility as a disease and establishing better health insurance coverage for couples seeking infertility-related care. Likewise, support from the American Cancer Society, the American Academy of Pediatrics, and the American Society of Clinical Oncology; patient advocacy groups like the Alliance for Fertility Preservation, LIVESTRONG, and RESOLVE; and clinical and research organizations like the Oncofertility Consortium play a very big role in promotion and facilitation of fertility preservation among oncology patients. Ultimately, these efforts will significantly reduce the burden of infertility related to cancer therapy.

To this end, as part of their Strategic Action Plan, ASRM hosted the first Access to Care Summit in September 2015, to address disparities in access to infertility-related services. Although the summit focused primarily on the female partner, it specifically included programming about the male partner as well and served to initiate a dialogue about the challenges faced by the couple as a couple. The ASRM has since published an Ethics Committee Opinion on this topic (53).

Epidemiologic and translational research and funding is needed to identify the true prevalence and etiology of male infertility and to better understand socioeconomic and medical barriers associated with access to care. This goal to strive for is efficiently delivered, better quality care. Multi-institutional collaboration for male factor is ongoing. A prime example of this is the Andrology Research Consortium's initiative to standardize male infertility electronic health records. Multi-institutional translational and clinical trial research grants through the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) and other branches of the National Institutes of Health, as well as foundations, are also available, albeit grossly underfunded at present. However, the recently announced NICHD request for information on fertility status being a marker of overall health is a promising step for advancing the current scientific and epidemiologic knowledge related to male factor infertility.

Public outreach and education are key to addressing knowledge gaps. Given the large scope of the deficiencies identified here, a public discussion and acknowledgment of the problems are important first steps.

Some increase in male education, and awareness of the men's health disease spectrum, has occurred over the last decade, but continued advocacy efforts, ideally unified across specialty societies, community organizations, and the media, are necessary to alleviate cost barriers and correct health policy inequities.

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