Le Monde. 2005. "L'échec du Modèle Français." 4 November. <www.lemonde.fr>.
Moore, Henrietta. 1988. *Feminism and Anthropology.* Minneapolis: University of Minnesota Press.
Musallam, Bassim F. 1983. *Sex and Society in Islam: Birth Control Before the Nineteenth Century.* Cambridge: Cambridge University Press.
Omran, Abdel R. 1992. *Family Planning in the Legacy of Islam.* London and New York: Routledge.
Ortner, Sherry. 2001. "Theory in Anthropology Since the Sixties." In *Readings for a History of Anthropological Theory.* Paul Erickson and Liam Murphy, eds. Orchard Park, NY: Broadview Press.
Quiminal, Catherine and Mahamet Timera. 2002. "Les Mutations de l'Immigration Ouest-Africaine." *Hommes & Migrations* 1239: 19–33.
Roseberry, William. 1988. "Political Economy." *Annual Review of Anthropology* 17: 161–86.
Sargent, Carolyn and Dennis Cordell. 2003. "Polygamy, Disrupted Reproduction, and the State." *Social Science and Medicine* 56: 1961–72.
Scheper-Hughes, Nancy. 1992. *Death Without Weeping: The Violence of Everyday Life in Brazil.* Berkeley: University of California Press.
Timera, Mahamet. 1996. *Les Soninke en France. D'une Histoire a l'Autre.* Paris: Karthala.
Turshen, Meredith, Helene Bretin and Annie Thebaud-Mony. 1993. "Migration, Public Policy, and Women's Experiences." In *Women's Lives and Public Policy: the International Experience.* Meredith Turshen, and Briavel Holcomb, eds. Westport, CT: Greenwood Press.

Chapter 7

Reproductive Disruptions and Assisted Reproductive Technologies in the Muslim World

Marcia C. Inhorn

Introduction

In their seminal volume, *Conceiving the New World Order: The Global Politics of Reproduction,* anthropologists Faye Ginsburg and Rayna Rapp (1995: 1) argue that reproduction, in both its biological and social interpretations, must be placed "at the center of social theory"—as the very "entry point to the study of social life." Furthermore, Ginsburg and Rapp insist that "reproduction also provides a terrain for imagining new cultural futures and transformations," often involving "transnational processes that link local and global interests" (2).

In this chapter, I want to draw on these important insights as they apply to infertility and assisted reproductive technologies (ARTs). By definition, ARTs include in vitro fertilization (IVF) and the many variants of IVF that have now spread around the globe. In a volume on reproductive disruptions, it is first important to ask why infertility is important on a global level. The first half of this chapter examines seven reasons why infertility is a profoundly important reproductive disruption, leading to a global industry of ARTs.

However, it is also important to note that local considerations—be they cultural, social, economic, religious, or political—shape and sometimes curtail the way in which ARTs are both offered to and received by non-Western infertile couples. To illustrate this point, the second half of this chapter focuses on the Muslim Middle East, where moral concerns surrounding the ARTs run deep and where major divergences regarding third-party gamete donation are occurring between the Sunni and Shi'a sects of Islam. In the second section, I focus on three Middle Eastern societies—Egypt, Lebanon, and Iran—to demonstrate the shifting moral landscape surrounding the spread of ARTs to the Muslim world.

Global Infertility and the Globalization of ARTs

Demography and Epidemiology

Infertility is a profoundly important global health issue affecting millions of people worldwide, between 8 and 14 percent of couples in most societies around the globe (Bentley and Mascie-Taylor 2000; Reproductive Health Outlook 1999). In some societies, however—particularly those in the so-called "infertility belt" of central and southern Africa—as many as one-third of couples are unable to conceive after a year or more of trying (Cates, Farley, and Rowe 1985; Collet, Reniers, Frost et al. 1988; Ericksen and Brunette 1996; Larsen 1994, 2000; World Health Organization 1987). Factors causing high rates of infertility in parts of the developing world are varied, but tubal infertility due to sexually transmitted, postpartum, postabortive, and iatrogenic infections is widely regarded as the primary form of preventable infertility (Reproductive Health Outlook 1999; Sciarra 1994, 1997). Although rarely socially acknowledged, male infertility contributes to at least half of all cases worldwide and is often the most difficult form of infertility to treat (Devroey, Vandervorst, Nagy, and Van Steirteghem 1998; Irvine 1998; Kamischke and Nieschlag 1998). Despite the high prevalence among males, infertility is paradoxically considered to be a "woman's problem" around the world, and thus the role of male infertility is vastly underestimated and even hidden in many societies (Inhorn 2002, 2003a, 2003b, 2004a).

The Fertility-Infertility Dialectic

The major paradox of infertility is that its prevalence is often greatest in those areas of the world where fertility is the highest—the phenomenon of so-called "barrenness amid plenty" (Sciarra 1994; Van Balen and Gerrits 2001). Problematic high fertility exists in a relationship of tension and contrast to problematic high infertility, a situation I have characterized in my own work as "the fertility-infertility dialectic" (1994).

In fact, investigating infertility in resource-poor, high-fertility countries may shed significant light on issues of *fertility*, for infertility provides a convenient lens through which many fertility-related behaviors and beliefs can be explored. These include, among other things, ideas about conception and contraception; beliefs about the importance of motherhood, fatherhood, and children themselves; and perceptions of risk regarding the body and its reproductive processes.

Despite the intimate connection between infertility and fertility, the control of infertility is rarely incorporated into programs of population and family planning in the purportedly "overpopulated" non-Western world. Although infertility is beginning to be recognized as part of the broadly defined global reproductive health agenda emerging from the 1994 United Nations International Conference on Population and Development in Cairo, no guidelines have yet emerged on how to translate "prevention and appropriate treatment of infertility" into concrete strategies, particularly in resource-poor countries (Van Balen and Gerrits 2001).

Health-Care Seeking

Yet, given the sheer numbers of infertile people worldwide, it should come as no surprise that infertility is a leading cause for those seeking health-care in many countries. Studies from around the world have shown that infertile women—and, increasingly, men—are massive users of biomedical health care services. Thus, many of them have long and tortured "body histories" of often unsuccessful infertility treatment (Inhorn 2003a). In addition, in many developing societies, the resort to both "traditional" and "modern" forms of infertility therapy, often simultaneously, is typical for many infertile people. Yet, studies from around the world demonstrate "how little formal health services have to offer them," as infertility is notoriously difficult to treat (Van Balen and Gerrits 2001).

Gendered Suffering

Given the very difficulty of overcoming infertility, this condition leads to profound human suffering on a global scale. Women worldwide appear to bear the major burden of infertility, in terms of blame for the reproductive failing; emotional responses of anxiety, frustration, grief, and fear; marital consequences, including duress, abuse, divorce,

polygamous remarriage, or abandonment; and social stigma and community ostracism (Van Balen and Inhorn 2002). Infertility can have lifelong consequences, "affect[ing] a woman for the remainder of her life, preventing subsequent marriage, and making her economically vulnerable" (Sciarra 1994: 155–6). In the era of HIV/AIDS, infertility can also lead to death, through unprotected intercourse in the effort to conceive.

Adoption Restrictions

Unfortunately, "alternatives" to biological parenthood such as adoption or so-called "child-free living" are unacceptable in many non-Western societies. Although Westerners often tout adoption as the "natural" solution to childlessness, adoption restrictions, both formal and informal, are found throughout many parts of the world. For example, in the Islamic world, the Qur'an explicitly prohibits legal adoption, although it encourages the kind treatment and upbringing of orphans (Inhorn 1996; Sonbol 1995). In other parts of the world, particularly parts of sub-Saharan Africa and Oceania, "adoption" in the form of informal fostering arrangements, usually of relatives' children, is quite common and viewed as a partial solution to infertility (Gerrits 2000; Ngwafor 1994; Savage 1992). However, in Africa, the number of AIDS orphans has now exceeded the supply of foster parents, including infertile ones, leading to a surfeit of literally unparented orphans in many central and southern African countries.

In other parts of the world, including parts of Latin America and Asia, "excess" babies—those born out of wedlock to teenaged mothers, born to poor families, exceeding state-mandated birth quotas, or undesired because they are female—are "marketed" at high costs to infertile Western couples (Jenkins 2002), who are sometimes accused of exploiting disadvantaged Third World women. Yet, Western couples who have suffered through infertility also have legitimate desires for children that may not be met by ARTs or local adoption agencies. Thus, as with the fertility-infertility dialectic, problems of global infertility are intricately related to problems of global adoption—including transnational movements of children—in ways that highlight the politics of disrupted reproduction in all their global complexity.

The Globalization of Assisted Reproductive Technologies

Taken together, these complex reproductive realities have fueled a global industry of ARTs. In short, IVF and other related reproductive

technologies have spread rapidly around the globe in response to the difficulties posed by both infertility and by adoption. However, ARTs are not transferred into cultural "voids" when they reach disparate societies. By examining how these globalizing reproductive technologies have been received in local, non-Western sites, we can begin to assess both the benefits *and* the costs of this globalization process on the local level—that is, for real people attempting to grapple with both their infertility and their desires to overcome it, by using the latest reproductive technologies. Examining "the arenas of constraint"—or the various structural, ideological, social relational, and practical obstacles and apprehensions facing users of these technologies wherever they spread (Inhorn 2003a)—clearly serves to deconstruct the modernist myth that ARTs are some sort of "miracle solution" for infertility, a myth that has been questioned by a generation of feminist scholars (Thompson 2002).

Furthermore, the global spread of ARTs provides a perfect case study of what Ginsburg and Rapp (1995: 3) have called "stratified reproduction," or "the arrangements by which some reproductive futures are valued while others are despised." While ARTs may assist global elites in reproducing socially esteemed children, these prohibitively expensive reproductive technologies, which range in cost from $2,000 per cycle in the developing world to $20,000 per cycle in the US, are rarely subsidized for those who may need them the most, namely, the poor, the indigenous, and, in the West, people of color who are at the greatest risk of infertility but who are, in fact, discouraged from reproducing under Western-sponsored regimes of population control (Inhorn and Fakih 2006).

Local Moral Worlds

In addition to the economic barriers to ART access, ARTs are received, accommodated, and resisted within local moral landscapes, some of them deeply inflected by religion. Medical anthropologist Arthur Kleinman (1992) has asked us to consider the "local moral worlds" accompanying the spread of biotechnologies into multifarious cultural and religious settings. In the world of ARTs, the importance of religiously based moral systems is striking, as shown, for example, in Susan Kahn's pathbreaking book, *Reproducing Jews: A Cultural Account of Assisted Conception in Israel* (2000), which details the large body of rabbinical rulings on the practices of ARTs among infertile Jewish patients. In the Muslim world, where I have conducted my own research over the past twenty years (2004b), moral concerns surrounding the ARTs also run deep, although in directions different from

neighboring Israel. This issue of religious morality in an ever-changing ART landscape in the Muslim Middle East is addressed in the remainder of this chapter.

Assisted Reproductive Technologies in the Muslim World

ARTs emerged in England, where Louise Brown, the world's first test-tube baby, was born in 1978. Only eight years after Louise Brown's birth, the first Middle Eastern IVF clinic opened in Cairo, Egypt. Eight years later, an even newer version of IVF, intracytoplasmic sperm injection (ICSI), to overcome male infertility, was introduced to the Middle East. By the mid-1990s, IVF clinics had sprung up throughout the twenty-two nations of the Middle East, reaching even the smallest Arab Gulf countries, such as Bahrain and Qatar. By 2003, Egypt, with its population of seventy million, had at least fifty IVF clinics, more than any other Muslim or non-Muslim country in the region. Neighboring Israel, considered to be on the cutting edge of assisted reproduction, had twenty-four IVF clinics for a population of only six million, one of the highest numbers per capita in the world (Kahn 2000). However, tiny, neighboring Lebanon, with a population of approximately four million, had nearly fifteen IVF centers in 2003.

Furthermore, by the turn of the new millennium, Lebanon and Egypt were again on the forefront of this "brave new world" of reproductive technologies. Egypt was one of the first Middle Eastern countries to introduce preimplantation genetic diagnosis (PGD), an IVF-related technology used to "weed out" embryos with genetic disorders as well as to "select" embryos by sex in a part of the world where son preference and daughter discrimination remain strong. Lebanon, meanwhile, was experimenting with third-party donor technologies, including sperm, egg, and embryo donation.

In short, the Muslim Middle East provides an excellent regional example of the "global metric" of ARTs: namely, their rapid expansion and considerable dynamism as the technologies themselves have evolved over time. Although these technologies have helped literally thousands of infertile Muslim Middle Eastern couples give birth to test-tube babies—whose very lives can be seen as the greatest fruits of ART globalization—the technologies also have brought considerable moral controversy and concern, suggesting that it is vitally important to interrogate the "local moral" in the global "technoscape" surrounding the ARTs.

In the Middle Eastern Muslim countries, Islamic religious proclamations called *fatwas* have profoundly affected the practice of ARTs in ways not commonly seen in the West. The influence of Islam on ARTs has become apparent during medical anthropological research that I carried out first in Egypt and then in Lebanon during three distinct periods: from 1988–1989, when IVF was new in the region; in 1996, which could be rightly called the IVF "boom period" in the Middle East; and then in 2003, when I carried out a study, "Middle Eastern Masculinities in the Age of New Reproductive Technologies," in Beirut, Lebanon. In each case, I conducted qualitative, ethnographic interviews with Muslim IVF patients, both husbands and wives, now totaling nearly five-hundred patient couples. The results of my research in Egypt have been published in my book *Local Babies, Global Science: Gender, Religion, and In Vitro Fertilization in Egypt* (Inhorn, 2003a). In subsequent publications, I have focused on Lebanon (2004b, 2006a, 2006b), where Shi'ite Muslim-serving IVF clinics are taking their lead from Iran. In 2006, I had the opportunity to travel to Iran, where religious authorities, physicians, lawyers, and social scientists are openly debating the acceptability of ARTs, gamete donation, and other new forms of "technoscience." I describe some of these developments in this chapter, highlighting Iranian innovations that are probably surprising to most Western audiences.

Sunni Islam and IVF

To begin in Egypt, the Grand Sheikh of Egypt's famed religious university, Al Azhar, issued the first fatwa on medically assisted reproduction, on 23 March 1980. Issued only two years after Louise Brown's birth in England but a full six years before the opening of Egypt's first IVF center, this initial fatwa has proved to be truly authoritative and enduring in all its main points. In fact, the basic tenets of the original Al-Azhar fatwa on IVF have been upheld by other fatwas issued since 1980, and have achieved wide acceptance throughout the Sunni Muslim world. Sunni Islam, I should emphasize, is the dominant form of Islam found in Egypt and throughout the Muslim world. Between 80-90 percent of the world's 1.3 billion Muslims are Sunni (Denny 2006).

The Sunni Islamic position on ARTs clearly permits in vitro fertilization using eggs from the wife with the sperm of her husband and the transfer of the fertilized embryos back to the uterus of the same wife. However, since marriage is a contract between a wife and husband during the span of their marriage, no third party should intrude into the marital functions of sex and procreation. This means

that a third party donor is *not* acceptable, whether he or she is providing sperm, eggs, embryos, or a uterus (as in surrogacy).

But to what degree are these fatwa declarations—particularly the explicit prohibition on any form of third-party donation of reproductive materials—actually followed by physicians in the Muslim world? A 1997 global survey of sperm donation among assisted reproductive technology centers in sixty-two countries provides some indication as to the degree of convergence between official discourse and actual practice (Meirow and Schenker 1997). In all of the Muslim countries surveyed—including the Middle Eastern countries of Egypt, Iran, Kuwait, Jordan, Lebanon, Morocco, Qatar, and Turkey, as well as a number of non-Middle Eastern Muslim countries, including Indonesia, Malaysia, and Pakistan—sperm donation in IVF and all other forms of gamete donation were strictly prohibited for three important reasons: the association with adultery, by virtue of introducing a third party into the sacred dyad of husband and wife; the potential for future half-sibling incest among the offspring of unknown donors; and the confusion of kinship, descent, and inheritance in the emphatically patrilineal societies of the Muslim Middle East.

Shi'a Islam and IVF

Having said this, it is very important to point out how things have changed for Shi'ite Muslims since this global survey was published. Shi'a is the minority branch of Islam in Iran and parts of Iraq, Lebanon, Bahrain, Saudi Arabia, Afghanistan, Pakistan, and India (Cole 2002). It has often been in the news lately because of the US-led war in Iraq, as well as the battle between Israel and the Southern Lebanese Shi'ite political party/militia known as Hizbullah.

Many Shi'ite religious authorities support the majority Sunni view, that third-party donation should be strictly prohibited. However, in the late 1990s, the Supreme Jurisprudent of the Shi'a branch of Islam, Ayatollah Ali Hussein Khamanei, the hand-picked successor to Iran's Ayatollah Khomeini, issued a fatwa effectively permitting donor technologies to be used. With regard to both egg and sperm donation, Ayatollah Khamanei stated that *both* the donor and the infertile parents must abide by the religious codes regarding parenting. However, the donor child can only inherit from the sperm or egg donor, as the infertile parents are considered to be like "adoptive" parents.

However, the situation for Shi'ite Muslims is actually much more complicated. Because Shi'ites practice a form of individual religious reasoning known as *ijtihad*, various Shi'ite religious authorities have

come to their own conclusions about sperm and egg donation. There are major disagreements about

(1) whether the child should follow the name of the infertile father or the sperm donor;
(2) whether donation is permissible at all if the donors are anonymous;
(3) whether the husband of an infertile woman needs to do a *mut'a* (temporary marriage) with the egg donor, then release her from the marriage immediately after the embryo transfer in order to avoid *zina*, or adultery. Such mut'a marriages are condoned in Shi'a but condemned in Sunni Islam (Haeri 1989); and
(4) whether a married Shi'ite Muslim woman can do a mut'a marriage with a sperm donor, which would constitute an illegal state of polyandry. In theory, only widowed or otherwise single women should be able to accept donor sperm in order to avoid the implications of zina. However, in Muslim countries, single motherhood of a donor child is likely to be socially unacceptable. Indeed, Iran recently made sperm donation illegal, although surrogacy has been permitted (Tremayne 2005).

Given these moral ambiguities, married infertile Shi'ite couples *truly* concerned about carrying out third-party donation according to religious guidelines find it difficult to meet these various requirements, particularly those regarding sperm donation. Yet, having said that, in the Shi'ite Muslim world, including in Iran and Lebanon, at least some Shi'ite couples *are* beginning to receive donor gametes, as well as donating their gametes to other infertile couples. For infertile Shi'ite couples who accept the idea of donation, the introduction of donor technologies has been described as a "marriage savior," helping to avoid the "marital and psychological disputes" that may arise if the couple's case is otherwise untreatable.

The Introduction of ICSI

Indeed, infertile Muslim women face considerable marital risks, particularly in the era of ICSI, a new solution for male infertility that ironically has increased the potential for divorce in the Muslim world. Since its introduction in Belgium in 1992, ICSI has heralded a revolution in the treatment of male infertility (Fishel, Dowell, and Thornton 2000; Hamberger and Janson 1997), as men with very poor semen profiles—even those without any mature sperm in the ejaculate—are now able to produce a "biological" child of their own. As long as a single viable spermatozoon can be retrieved from a man's body,

even through painful testicular aspirations and biopsies, this spermatozoon can be "injected" directly into an oocyte, thereby increasing the chances of fertilization (Fishel, Dowell, and Thornton 2000). Not surprisingly, the arrival of ICSI in the Middle East in the mid-1990s has led to the flooding of IVF clinics with male-infertility cases—for example, about 70 percent of all cases in the Egyptian and Lebanese clinics in which I worked.

For infertile men, it is fair to say that the arrival of ICSI in the Middle East has been nothing short of liberating. As a "new hope technology," ICSI has given men faith that their infertility can ultimately be overcome, and it has restored their masculinity, which is seriously impaired by male infertility. No longer a deficiency of manhood, male infertility is "a medical condition, like any other medical condition" and is seen as medically remediable in the IVF clinic. Additionally, ICSI's arrival across the Middle East has led to male infertility "coming out" from behind its veil of secrecy. Many Middle Eastern IVF clinics now openly advertise ICSI as the solution to male infertility, making the public generally aware of this condition and technology. Indeed, male infertility in the era of ICSI has proven to be a fascinating topic of research in the Middle East (Inhorn 2004a), one that needs to be replicated in other parts of the world.

But what about the wives of these infertile men, who have "stood by" their husbands for years, even decades in some cases? Many long-term, faithful wives of infertile men may have grown too old to produce viable ova for the ICSI procedure, for ICSI relies on healthy ova, even in the absence of healthy sperm. Without the options of either egg donation or adoption, infertile Muslim couples with a reproductively elderly wife face four difficult options: remaining together permanently without children; legally fostering an orphan, which is rarely viewed as an acceptable option; remaining together in a polygynous marriage, which is rarely viewed as an acceptable option by women themselves; or divorcing so that the husband can have children with another partner.

In my research in Egypt and Lebanon, the first option has proven to be the most common. Namely, infertile husbands and "forty-something" wives often love each other deeply and remain together in long-term marriages without children. Thus, divorce is not the immediate consequence of infertility, as is stereotypically portrayed. However, because of the Sunni Islamic restrictions on the use of donor eggs, at least some men are choosing to divorce or take a second wife, believing their own reproductive destinies lie with younger, more fertile women (Inhorn 2003a).

However, in Lebanon, with its Shi'ite majority, the recent Shi'ite fatwas allowing egg donation have been a great boon to marital relations. There, both fertile and infertile men with "old" wives are lining up at IVF clinics to accept the eggs of donor women. Some of these donors are other IVF patients, and some are friends or relatives. In at least one clinic, some egg donors are non-Muslim, unmarried American girls traveling to Lebanon for a fee in order to anonymously donate their eggs to conservative Shi'ite Muslim couples who, in Lebanon, may be members of Hizbullah, officially described by the US administration as a terrorist organization. Furthermore, quite interestingly, in multisectarian Lebanon, the recipients of these donor eggs are not necessarily only Shi'ite Muslim couples. Some Sunni Muslim patients from Lebanon and other Middle Eastern Muslim countries, such as Egypt and Syria, are quietly slipping across transnational borders to "save their marriages" through the use of donor gametes, thereby secretly "going against" the dictates of Sunni Muslim orthodoxy.

In short, the arrival of ICSI and donor technologies in the Muslim Middle East has led to a brave new world of reproductive possibility never imagined when these technologies were first introduced nearly twenty years ago. These technologies have engendered significant medical transnationalism and reproductive tourism; mixing of gametes across ethnic, racial, and religious lines; and the birth of thousands of ICSI and, now, donor babies to devout infertile Muslim couples. The frankly adventurous attitude of otherwise conservative, male Shi'ite religious leaders toward third-party gamete donation has led to a potential transformation in marital relations among infertile Shi'ite Muslim couples; a rethinking of traditional notions of biological kinship and parenthood; and the moral accommodation of previously perceived immoral reproductive acts. In my view, these multiple transformations are powerful indicators of the profound social effects that reproductive technologies may engender in the new world order.

Indeed, Iran is currently the country to watch, as it has been on the "cutting edge" of new reproductive technologies, largely as a result of novel fatwas being issued by otherwise conservative ayatollahs. In March 2006, I traveled to Iran, where I was invited as a keynote speaker in a conference devoted entirely to gamete donation. Ironically, I—a non-Muslim medical anthropology professor—was asked to represent the Sunni Muslim position on IVF and gamete donation to this completely Shi'ite Muslim, Farsi-speaking audience. The conference was totally fascinating. In my long coat and headscarf, I was

treated as an honored guest, in front of several hundred audience members, including lawyers, physicians, and Shi'ite ayatollahs.

It is important to reiterate that Iran is the only country in the world to be ruled by a Shi'ite clergy. Unlike the Sunni clergy, Shi'ite ayatollahs are free to take unique stances on matters of technological innovation, often disagreeing with one another on matters of religious permissibility. Because of the aforementioned practice of ijtihad in the Shi'ite world, there are divergent opinions about the religious morality of gamete donation. Whereas Ayatollah Khamanei has approved of gamete donation, other Iranian religious authorities do not support this decision, agreeing with the Sunni ban on gamete donation and especially the use of donor sperm for male infertility.

Indeed, the conference I attended was a fascinating example of ijtihad in action, with various ayatollahs, dressed in their stately robes and turbans (black for the *sayyids*, or descendants of the Prophet Muhammad), arguing on the stage about the moral permissibility of embryo and gamete donation. The disagreements generated in public were also debated in the more private recesses of the conference. For example, a Bahraini Shi'ite cleric staying at our guest residence took great pains to describe his opposition to all forms of gamete donation. To prove this point, he provided me with a copy of his book on Islamic personal status law, which has been translated into English and supports his position, based on evidence from the traditional Muslim scriptures. According to him, Iran is "innovating" in ways that are religiously unacceptable and at odds with the rest of the Muslim world.

For example, not only has the Iranian parliament passed a law permitting embryo donation, but future "pro-donation" legislation in Iran may legally permit egg donation, sperm donation, and gestational surrogacy. Once passed into law, gamete donation of all kinds will be difficult to stop. Meanwhile, in the absence of formal legislation, some IVF physicians in Tehran (as well as in Shi'ite-dominant Lebanon, which is closely following the Iranian lead) are using the legal vacuum to practice all forms of gamete donation among their desperate infertile patients. Not all of these patients are infertile Iranian Muslims; one of the largest and busiest clinics in Tehran caters to hundreds of Arab patients from the Persian Gulf countries, the majority of whom are Sunni Muslims.

In short, Iran is currently a country to watch on many levels. It is the site of an award-winning population program, in which a comprehensive family planning program includes the encouragement of vasectomies. As a result, the country has experienced one of the

sharpest fertility declines ever recorded, a very low fertility level similar to that of many developed countries. The level of education, particularly that of girls, has increased significantly. About 62 percent of university students are female.

In addition, both organ transplantation and sex-change operations have been approved by the Iranian clergy. The Ministry of Health is coping openly with its drug-related HIV/AIDS epidemic through innovative needle-exchange and rehabilitation programs. Stem-cell science has emerged as a byproduct of the active IVF programs in the country, and infertility has been placed on Iran's reproductive health and family planning agenda, one of the few examples in the world where IVF is partially state-subsidized.

All in all, these developments convince me of the need to recognize the "high-modern" nature of Iran, which is currently on the cutting edge of developments in reproductive science and technology (Adelkhah 2000; Keddie 2003). It also bespeaks of the need to de-vilify—indeed, de-demonize—the Shi'ite Muslim clergy, who are condoning these various innovations but are generally represented as backward and fanatical in the Western media.

Conclusion

Despite this veritable ART revolution in Iran, it is important to end on a more sobering note. Namely, most infertile Muslim couples, in Iran and elsewhere, will never know the joy of producing a Muslim IVF baby, due to the overwhelming arenas of constraint facing them. ARTs will probably never be a viable solution for the world's infertile poor, given the low rates of ART efficacy and lack of government investment for these services in the midst of structural adjustment programs and other economic constraints. In some ways, the governmental neglect of infertility and its treatment through ARTs seems justifiable given that many societies face other pressing health problems, including epidemic diseases such as AIDS, perceived overpopulation, shortages of health care resources, and deteriorating public health infrastructures (Bennett, McPake and Mills 1997; World Health Organization 2000). Thus, ignoring infertility may seem to be a reasonable response if it is argued that infertility is not a life-threatening "disease" and having children is not necessarily a basic human right.

But for the millions of infertile citizens around the globe, their childlessness is no trivial matter. Infertility may ruin their reputations, their marriages, their livelihoods, their physical health, and their

long-term security in ways that are truly disastrous. Indeed, infertility is a particularly pernicious form of reproductive disruption, one that engulfs whole lives in endless circles of treatment-seeking and human suffering.

So, what can be done? In my view, the most salient and clear-cut need is for prevention of the many *preventable* causes of infertility, particularly early and effective treatment of the reproductive tract infections that lead to tubal infertility (Sciarra 1997). Nonetheless, because not all infertility *can* be prevented—and this is particularly true of male infertility—there will always be a desire for the latest, most modern reproductive technologies to overcome this problem, even in resource-poor locations of the developing world.

It is our responsibility as reproductive scholars to follow these global technologies into the future, anticipating the ways in which even newer technologies, including ooplasmic transfer, PGD, human cloning, embryonic stem cells, and the like, will make their way into the diverse moral and social imaginaries of numerous local societies around the globe. As long as the global infertility problem continues unabated, the globalization of ARTs will continue well into the new millennium, reaching places like Egypt, Lebanon, Iran, and beyond. Such is the complex new world order of reproductive disruption and reproductive interconnection in which we now live.

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References

Adelkhah, F. 2000. *Being Modern in Iran.* New York: Columbia University Press.

Bennett, S., B. McPake, and A. Mills, eds. 1997. *Private Health Providers in Developing Countries: Serving the Public Interest?* London: Zed Books.

Bentley, G. R. and C. G. N. Mascie-Taylor, eds. 2000. *Infertility in the Modern World: Present and Future Prospects.* Cambridge, United Kingdom: Cambridge University Press.

Cates, W., T. M. M. Farley, and P. J. Rowe. 1985. "Worldwide Patterns of Infertility: Is Africa Different?" *The Lancet* (14 September): 596–8.

Cole, Juan R. 2002. *Sacred Space and Holy War: The Politics, Culture and History of Shi'ite Islam.* New York: I. B. Tauris.

Collet, M., J. Reniers, E. Frost, R. Gass, F. Yvert, A. Leclerc, C. Roth-Meyer, B. Ivanoff, and A. Meheus. 1988. "Infertility in Central Africa: Infection is the Cause." *International Journal of Gynecology and Obstetrics* 26: 423–8.

Denny, F. M. 2006. *An Introduction to Islam.* 3rd ed. Upper Saddle River, NJ: Pearson/Prentice Hall.

Devroey, P., M. Vandervorst, P. Nagy, and A. Van Steirteghem. 1998. "Do We Treat the Male or His Gamete?" *Human Reproduction* 13 (Suppl 1): 178–85.

Ericksen, K. and T. Brunette. 1996. "Patterns and Predictors of Infertility among African Women: A Cross-sectional Survey of Twenty-seven Nations." *Social Science & Medicine* 42: 209–20.

Fishel, S., K. Dowell, and A. Thornton. 2000. "Reproductive Possibilities for Infertile Couples: Present and Future." In *Infertility in the Modern World: Present and Future Prospects.* G. R. Bentley and C. G. N. Mascie-Taylor eds. Cambridge, UK: Cambridge University Press.

Gerrits, T. 2000. "Studying Infertility and STD's among the Macua in Montepuez, Mozambique: A Multidisciplinary Challenge?" In *Social Science Research on Childlessness in a Global Perspective. Proceedings of the Conference 8–11 November 1999, Amsterdam, The Netherlands.* F. Van Balen, T. Gerrits, and M. C. Inhorn, eds. Amsterdam: SCO-Kohnstamm Instituut, University of Amsterdam.

Ginsburg, F. and R. Rapp. 1995. *Conceiving the New World Order: The Global Politics of Reproduction.* Berkeley: University of California Press.

Haeri, Shahla. 1989. *Law of Desire: Temporary Marriage in Shi'I Iran (Contemporary Issues in the Middle East).* Syracuse. NY: Syracuse University Press.

Hamberger, L. and P. O. Janson. 1997. "Global Importance of Infertility and its Treatment: Role of Fertility Technologies." *International Journal of Gynecology & Obstetrics* 58: 149–58.

Inhorn, M. C. 1994. *Quest for Conception: Gender, Infertility, and Egyptian Medical Traditions.* Philadelphia: University of Pennsylvania Press.

_____. 1996. *Infertility and Patriarchy: The Cultural Politics of Gender and Family Life in Egypt.* Philadelphia: University of Pennsylvania Press.

_____. 2002. "Sexuality, Masculinity, and Infertility in Egypt: Potent Troubles in the Marital and Medical Encounters." *The Journal of Men's Studies* 10: 343–59.

_____. 2003a. *Local Babies, Global Science: Gender, Religion, and In Vitro Fertilization in Egypt.* New York: Routledge.

_____. 2003b. "'The worms are weak': Male Infertility and Patriarchal Paradoxes in Egypt." *Men & Masculinities* 5: 236–56.

_____. 2004a "Middle Eastern Masculinities in the Age of New Reproductive Technologies: Male Infertility and Stigma in Egypt and Lebanon." *Medical Anthropology Quarterly* 18: 162–82.

_____. 2004b. "Privacy, Privatization, and the Politics of Patronage: Ethnographic Challenges to Penetrating the Secret World of Middle Eastern, Hospital-based In Vitro Fertilization." *Social Science & Medicine* 59: 2095–108.

_____. 2006a. "'He won't be my son': Middle Eastern Men's Discourses of Adoption and Gamete Donation." *Medical Anthropology Quarterly* 20: 94–120.

_____. 2006b. "Fatwas and ARTs: IVF and Gamete Donation in Sunni v. Shi'a Islam." *Journal of Gender, Race & Justice* 9: 291–317.

Inhorn, M. C. and M. H. Fakih. 2006. "Arab Americans, African Americans, and Infertility: Barriers to Reproduction and Medical Care." *Fertility and Sterility* 85: 844–52.

Irvine, D. S. 1998. "Epidemiology and Aetiology of Male Infertility." *Human Reproduction* 13(Suppl 1): 33–44.

Jenkins, G. 2002. "Childlessness, Adoption, and Milagros de Dios in Costa Rica." In *Infertility around the Globe: New Thinking on Childlessness, Gender, and Reproductive Technologies.* M. C. Inhorn and F. Van Balen, eds. Berkeley: University of California Press.

Kahn, S. M. 2000. *Reproducing Jews: A Cultural Account of Assisted Conception in Israel.* Durham, NC: Duke University Press.

Kamischke, A. and E. Nieschlag. 1998. "Conventional Treatments of Male Infertility in the Age of Evidence-based Andrology." *Human Reproduction* 13(Suppl 1): 62–75.

Keddie, N. R. 2003. *Modern Iran: Roots and Results of Revolution.* New Haven: Yale University Press.

Kleinman, A. M. 1992. "Local Worlds of Suffering: An Interpersonal Focus for Ethnographies of Illness Experience." *Qualitative Health Research* 2: 127–34.

Larsen, U. 1994. "Sterility in Sub-Saharan Africa." *Population Studies* 48: 459–74.

_____. 2000. "Primary and Secondary Infertility in Sub-Saharan Africa." *International Journal of Epidemiology* 29: 285–291.

Meirow, D. and J. G. Schenker. 1997. "The Current Status of Sperm Donation in Assisted Reproduction Technology: Ethical and Legal Considerations." *Journal of Assisted Reproduction and Genetics* 14: 133–8.

Ngwafor, E. N. 1994. "Childlessness in Cameroon: Artificially Assisted Fertility or the Customary Law Solution." *Medicine and Law* 13: 297–306.

Reproductive Health Outlook. 1999 "Infertility: Overview and Lessons Learned." <www.rho.org>.

Savage, O. M. N. 1992. "Artificial Donor Insemination in Yaounde: Some Socio-cultural Considerations." *Social Science & Medicine* 35: 907–13.

Sciarra, J. 1994. "Infertility: An International Health Problem." *International Journal of Gynecology & Obstetrics* 46: 155–63.

_____. 1997. "Sexually Transmitted Diseases: Global Importance." *International Journal of Gynecology & Obstetrics* 58: 107–19.

Sonbol, A. e. A. 1995. "Adoption in Islamic Society: A Historical Survey." In *Children in the Muslim Middle East.* E. W. Fernea, ed. Austin: University of Texas Press.

Thompson C. M. 2002. "Fertile Ground: Feminists Theorize Infertility." In *Infertility around the Globe: New Thinking on Childlessness, Gender, and Reproductive Technologies.* M.C. Inhorn and F. Van Balen, eds. Berkeley: University of California Press.

Tremayne, S. 2005. "The Moral, Ethical, and Legal Implications of Egg, Sperm, and Embryo Donation in Iran." Paper presented at the International Conference on Reproductive Disruptions: Childlessness, Adoption, and Other Reproductive Complexities, University of Michigan, Ann Arbor, 19 May.

Van Balen F., and T. Gerrits. 2001. "Quality of Infertility Care in Poor-resource Areas and the Introduction of New Reproductive Technologies." *Human Reproduction* 16: 215–9.

Van Balen F. and M. C. Inhorn. 2002. "Introduction: Interpreting Infertility—A View from the Social Sciences." In *Infertility around the Globe: New Thinking on Childlessness, Gender, and Reproductive Technologies.* M. C. Inhorn. and F. Van Balen, eds. Berkeley: University of California Press.

World Health Organization. 1987. "Infections, Pregnancies, and Infertility: Perspectives on Prevention." *Fertility and Sterility* 47: 964–8.

_____. 2000. *The World Health Report 2000—Health Systems: Improving Performance.* Geneva: World Health Organization.