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## FERTILITY REGULATION

## Right to assisted reproductive technology: Overcoming infertility in low-resource countries

Marcia C. Inhorn\*

Department of Anthropology, Yale University, New Haven, CT, USA

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## ABSTRACT

This article examines the high prevalence of primary and secondary infertility in low-resource countries. Provision of assisted reproductive technology (ART) to overcome both female and male infertility is in line with the reproductive rights agenda developed at the International Conference on Population and Development (ICPD) in Cairo 15 years ago. In addition to the right to control fertility, reproductive rights must encompass the right to facilitate fertility when fertility is threatened. Facilitation of fertility may require resort to ART, among both men and women. Egypt is highlighted as a positive example of progress in this regard.

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## 1. Introduction

In 1978, the world's first "test-tube baby"—the UK's Louise Brown—was born via in vitro fertilization (IVF), a technique whereby sperm and eggs are retrieved from bodies, allowed to fertilize in a petri dish, and then transferred as fertilized embryos back to the woman's uterus. This reproductive technology, initially developed to overcome the problem of a woman's blocked or otherwise damaged fallopian tubes, is now 30 years old. However, after 30 years of IVF successes, the birth of nearly 5 million IVF babies, and the rapid evolution of many other assisted reproductive technologies (ARTs), including some that bridge the fields of assisted reproduction and human genomics, IVF remains inaccessible to many infertile couples in low-resource countries. If there is a reproductive "right" to ART—under a rights-based approach to family planning—then this right has yet to be achieved by millions of infertile couples living worldwide.

This article argues for the right to ART, by demonstrating the reasons why IVF and related technologies are so desperately needed by women and men in low-resource regions of the world. Firstly, the high prevalence of infertility in these regions is explored. Secondly, infertility is assessed as a human rights issue, especially for women, but also for men. Finally, the provision of ARTs to infertile couples in low-resource countries is examined as a reproductive rights issue in line with the agenda developed at the International Conference on Population and Development (ICPD) held in Cairo 15 years ago.

## 2. Infertility and childlessness in low-resource countries

Infertility is a highly prevalent global reproductive health problem, affecting at least 15% of reproductive-aged couples worldwide [1].

Recent evidence suggests that the percentage of infertile women may be much higher. A global study utilizing data from 47 Demographic and Health Surveys (DHS) in low-resource countries estimated that, in 2002, more than 186 million ever-married women of reproductive age (15–49 years) in such countries (except China) were infertile. This number includes both primary infertility (i.e., infertility in the absence of a prior history of pregnancy) and secondary infertility (i.e., infertility following a prior pregnancy). According to the global DHS study, this number represents more than one-fourth of the ever-married women of reproductive age in these countries [2].

The scope and gravity of the infertility problem is much more severe in some regions of the world, especially Sub-Saharan Africa, owing largely to the problem of untreated reproductive tract infections (RTIs) [3–5]. In Central and Southern Africa, the presence of an "Infertility Belt" has been repeatedly reaffirmed in cross-national studies [6]. Almost half of men in these countries have a medical history of sexually transmitted disease, and two-thirds of infertile women have diagnoses of tubal blockage attributable to sterilizing RTIs, a rate that is 2 to 4 times higher than in the rest of the world [1,3]. Not all of these infections are sexually transmitted; in Sub-Saharan Africa, the percentage of women with secondary infertility from postpartum, postabortive, and iatrogenic infections exceeds 30% in some countries. Tubal infertility of this nature could be prevented through early detection and treatment of RTIs, not only in Africa, but in parts of Latin America and South Asia where secondary infertility is also highly prevalent [3,7].

However, not all infertility is preventable. Male infertility is a neglected reproductive health problem, yet it contributes to at least half of all cases of subfertility worldwide [8]. Male infertility is often "idiopathic," or of unknown cause; hence, it is recalcitrant to prevention, and is among the most difficult forms of infertility to treat [9]. Because of advances in the field of genetics, it is now realized that a significant percentage of male infertility cases, particularly those that are severe, are due to genetic abnormalities [10]. As with

\* Department of Anthropology, Yale University, 10 Schem Street, P.O. Box 208277, New Haven, CT 06520, USA. Tel.: +1 203 432 4510; fax: +1 203 432 3669.  
E-mail address: [marcia.inhorn@yale.edu](mailto:marcia.inhorn@yale.edu).

tubal infertility in women, most cases of male infertility are incurable, and can only be overcome through resort to ARTs. The need for ARTs to overcome male infertility is especially dire in parts of the world where alternatives to fatherhood (especially adoption and donor insemination) are religiously or otherwise culturally prohibited, for example, in the Muslim countries [11,12].

### 3. Gendered suffering and human rights

Infertility leads to profound human suffering, particularly on the part of women [13,14]. Strong pronatalist norms in many low-resource countries mean that children are highly desired and parenthood is culturally mandatory. As a result, infertility may be an especially pernicious form of “reproductive disruption” [15]. Women’s lack of pregnancy is both physically and socially visible, especially in high-fertility societies where women are typically blamed for reproductive failures, even in cases of male infertility.

For women, the marital effects of infertility may be devastating [13–16]. According to the 47-country DHS survey, women who have never had a child are much more likely to be divorced or separated—at a rate of 14% overall for women with primary infertility. These effects are most pronounced in Latin America, where 21%, or more than one-fifth of women with primary infertility are likely to be divorced or separated. In 3 countries, Nicaragua, Dominican Republic, and Eritrea, more than 40% of primarily infertile women are divorced or separated. Overall, childless women who are divorced are 13% more likely to have married more than once than women with children. Furthermore, in societies where polygyny is allowed, men may prefer to take a second wife instead of divorcing or separating. For example, in Kenya, Jordan, Nepal, and Yemen, men whose first wives are childless are 20%, 19%, 19%, and 15% more likely to have a second wife, respectively.

Within childless marriages, marital duress may be severe. Childless women are more likely to be the victims of domestic violence [3], and may also endure various forms of verbal and emotional abuse perpetrated by their husband and husband’s family members. Additionally, emerging evidence suggests that infertile women, especially in Sub-Saharan Africa, are more likely than fertile women to be exposed to the HIV virus as a result of extramarital attempts to conceive [2]. Furthermore, infertile women who are abandoned by their husbands may be forced to turn to prostitution as a form of economic survival. In this context, infertility may be life threatening, as it leads to higher rates of HIV and related mortality.

Infertility also leads to a variety of untoward social and economic effects. In many low-resource countries, especially in parts of Africa, the Middle East, and Asia, infertile women face various forms of community ridicule and social ostracism. They may be taunted about their barrenness and lack of femininity; they may be turned away from life-cycle rituals involving other women and their children; and they may be accused of casting the evil eye on other women’s children through their uncontrollable envy [17,18]. In parts of the world where adults depend upon their children for family labor, infertility can lead to economic impoverishment, especially when childless couples devote their meager earnings to ineffective traditional and biomedical infertility treatments [16–20]. Although infertile couples in Sub-Saharan African countries are 15% more likely than fertile couples to take in adopted children [2], adoption is not an option for most infertile couples in South Asia and the Middle East [21,22], where strong cultural and religious norms prohibit this practice. Without children in the household, life-long childlessness implies severe difficulties in achieving old age security, especially for elderly women [14].

Although the gender burden of infertility is particularly pronounced for women, men, too, suffer from their infertility. Male infertility remains deeply hidden in most societies because male infertility is among the most stigmatizing of all male health conditions [20]. Such stigmatization is clearly related to issues of sexuality. Male infertility is popularly, although usually mistakenly, conflated with

impotency, as both disrupt a man’s ability to impregnate a woman and to prove one’s virility, paternity, and manhood. Although little is known about the experience of male infertility worldwide, scattered reports from Africa and the Middle East show that male infertility, like female infertility, has profound effects on personhood, marriage, and community relations, particularly in high-fertility societies where all men are expected to father offspring [21,22]. Furthermore, men in these societies may be subjected to ineffective, even iatrogenic, medications and genital surgeries [20].

To summarize, infertility is a condition that can lead to marital demise, physical violence, emotional abuse, social exclusion, community exile, ineffective and iatrogenic therapies, poverty, old age insecurity, increased risk of HIV/AIDS, and death. Given these adverse marital, social, economic and physical effects, a compelling argument can be made that infertility affects the basic human rights of the individual. It is an “engulfing” health and social condition, which diminishes individual dignity, reproductive agency, perceived personhood, and happiness. As such, it is a condition that should be overcome.

### 4. Provision of ART as a reproductive right

Unfortunately, effective infertility treatments and ARTs are generally inaccessible in the resource-poor and mostly rural nations of the low-income world, leading to a grim scenario of untreated and intractable infertility across large portions of the globe [14,16]. The nonexistence of IVF and other ARTs in these countries is often rationalized in terms of population control, scarcity of healthcare resources and infrastructure, and the heavy burden of other life-threatening diseases such as HIV/AIDS and maternal mortality [19,23]. While these concerns raise major questions about prioritizing infertility as a global reproductive health problem [7], the silence surrounding infertility in low-resource countries may also reflect a tacit eugenic view that the infertile poor are unworthy of treatment; thus, overcoming their infertility problems, including through provision of ARTs, contradicts Western interests in global population control.

The disparities between high- and low-resource countries in terms of provision of ART are quite stark. Such disparities were addressed at a recent meeting on “Developing Countries and Infertility,” convened by the European Society of Human Reproduction and Embryology (ESHRE) in Arusha, Tanzania, from 15–17 December 2007 [24].

For example, of the 191 member states of the World Health Organization, only 48 have medical facilities that offer IVF [3]. Most of the countries with the world’s largest populations (i.e., China, India, Pakistan, Indonesia, Egypt) offer less than 1% of the projected need for IVF. Latin America—which is one of the few regions of the world to provide a collaborative registry of clinics and ART cycles—is characterized by limited access to ART and a high number of multiple births (nearly 50%) because of the high number of embryos transferred [25]. Even in the Western world, access to ARTs reflects pronounced class- and race-based inequalities [26]. The United States, for example, provides less than 15% of the suggested utilization of ARTs. Relatively few American states mandate full or even partial insurance coverage for ARTs, meaning that infertile American couples must pay for ARTs out of pocket, at the average cost of \$12 400 per IVF cycle as of 2003 [26]. As a result, only 36% of infertile women in the United States seek any form of medical assistance, and only 1% resort to any form of ART. Poor ethnic minority populations in the USA are generally unable to access these technologies [3]. All Western healthcare systems—both public and private—set restrictive eligibility criteria that limit consumers’ access, despite some state subsidization in most of the countries of Western Europe [26].

The financial burden of ARTs is even heavier in low-resource countries, where state-subsidization rarely exists [3,16]. The mean cost of a single IVF cycle in an international survey of 25 countries ranged from \$1300 in Iran to \$6400 in Hong Kong [27]. In all of these countries, the cost of a single cycle was more than half of an average

individual's annual income. Indeed, ARTs provide an example *par excellence* of “stratified reproduction” [28]; namely, technologically assisted reproduction is largely restricted to global elites, whereas the infertile poor, who are at highest risk of infertility, are devalued as reproducers. Numerous “arenas of constraint”—economic, cultural, and practical—serve to limit access to these technologies for most couples [7]. As noted by Nachtigall [3], “relatively few of the world's infertile men and women can be said to have complete and equitable access to the complete range of infertility treatments at affordable levels.”

Nonetheless, ART services are gradually reaching larger populations in some low-resource countries. For example, anthropologists have documented the globalization of ARTs to countries ranging from Ecuador to Vietnam [29]. Egypt is case in point. Over the past 23 years, Egypt has supported a thriving IVF sector, with approximately 50 IVF clinics serving an infertile population estimated at 15% of all married couples (among a total population of more than 70 million) [7,30]. Five of these clinics are located in government hospitals and receive some state funding to offset expenses for the infertile poor. The busiest clinic is located in Al-Azhar University, Egypt's oldest and most famous institute of religious learning, under the auspices of the Al-Azhar International Islamic Center for Population Studies and Research. The clinic was started by Professor Gamal Serour, director of Al-Azhar's Islamic Center and President Elect of FIGO (2006–2009). Designed to serve the needs of Egypt's infertile poor, the clinic provides generously subsidized IVF cycles to hundreds of lower-income couples each year.

The Egypt example is instructive. Egypt is a resource-poor country, which has generally been regarded as seriously overpopulated. Nonetheless, Egypt has managed to bring down its population growth rates while, at the same time, experimenting with state subsidization of infertility care, including the provision of ARTs [30]. Why has Egypt moved in this direction? A combination of cultural and political factors may provide the answer. Culturally, Egypt is a pronatalist Muslim country, where both marriage and parenting are religiously extolled virtues [12,17,18,30]. Politically, the country hosted the famous “Cairo conference” (ICPD 1994), where “prevention and appropriate treatment of infertility, where feasible” was mentioned as an issue for future action [16]. Furthermore, Egypt has produced a remarkable cadre of highly trained IVF physicians [12], as well as two FIGO presidents. One of these former presidents, Mahmoud Fathalla, has argued, through the prism of reproductive rights, that “family planning must also mean planning for families” [31].

Indeed, 15 years post Cairo, it is time to rethink the meaning of reproductive “rights” through a framework that includes infertility and the ARTs. In addition to the right to *control* fertility, reproductive rights must encompass the right to *facilitate* fertility when fertility is threatened. For millions of couples in low-resource countries, particularly those facing tubal or male infertility, facilitation of fertility may require resort to ARTs. In short, achieving full reproductive rights around the globe means achieving access to IVF and related technologies.

Although the barriers to provision of ART in low-resource countries are continually cited [3,5,7,12,14,16,19,23–26], it is time to move beyond repeated justifications for inaction. Egypt provides a positive example of political will and real progress in ART service provision over the past 15 years. As we enter the second decade of the new millennium, it is time for other low-resource countries to follow suit, thereby helping their infertile citizens to achieve their reproductive rights through becoming loving parents.

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