



International Bioethics Committee (IBC)

Topic B: Measures to address the ethical concerns of assisted reproductive technologies and parenthood

Introduction:

Assisted reproductive technologies (ART) provide specialized medical procedures to aid with fertilization and implantation, increasing the chances of pregnancy for those facing challenges. According to the 1992 Fertility Clinic Success Rate and Certification Act, any fertility related treatments in which eggs or embryos are manipulated are considered ART; whereas procedures where only sperm is manipulated are not considered under this definition, such is the case for ovarian stimulation performed without egg retrieval plans. When a natural pregnancy is impossible and cannot be treated, medical intervention can assist the steps for fertilization and early embryo development. Since the first reproductive medical intervention in the 18th century, further development of procedures have emerged. In the second half of the 20th century, medical assisted procreation experienced two technological advances: gamete freezing and in vitro fertilization (IVF).

In vitro fertilization is the most common and available procedure used for ART. It involves a series of precise steps. First, a mature egg is retrieved from the ovary using ultrasound guidance. Afterwards, the egg is fertilized in a laboratory with sperm. Finally, the resulting embryo is transferred back into the woman's uterus, where it can be implanted and grow into a healthy baby (Meaghan, 2023).

Gamete freezing, also known as egg freezing, is one of many ways to preserve a woman's fertility, so she can try to have children in the future. In addition, gamete freezing is a process that usually substitutes an IVF step. Instead of mixing the eggs with sperm, as it is done in IVF, cryoprotectant (freezing solution) is added to protect the eggs. After this, eggs get frozen either by slowly cooling them or by vitrification (fast freezing), so they can later be stored in nitrogen liquid tanks (HFEA, n.d.).

With the convergence of reproductive biology and genetics, a revolutionary opportunity has opened: this breakthrough allows the screening of embryos for chromosome and gene defects before implantation, offering families a chance to make informed decisions about their future and increasing the chances of having a healthy child.

While infertility can feel like an obstacle, ART allows individuals and couples with a range of tools to overcome it. With IVF, bypassing blocked tubes is simply one way to open parenthood possibilities. From helping manage male fertility and low egg reserves to





navigating ovarian issues and unexplained challenges, IVF offers options. And for those who pregnancy poses difficulties, IVF can collaborate with a gestational carrier to turn hope into reality.¹

Concepts and definitions:

- **Chromosome:** “a threadlike structures of nucleic acids and protein found in the nucleus of most living cells, carrying genetic information in the form of genes” (Oxford, n.d.).
- **Cryoprotectant:** “a substance that will prevent or reduce the formation of ice crystals during freezing” (Oxford, n.d.).
- **Gene defects:** “the deviation of a certain genetic information that leads to a defective gene product” (Generatio, n.d.).
- **Genetic material donation:** also known as sperm, oocyte, and pre-embryo donation. They are medical and technical procedures to assist and increase the possibilities of conceiving a child.
- **Gestational carry:** "it involves a couple who undergoes IVF with their genetic gametes and then places the resultant embryo in another woman's uterus, the gestational carrier, who will carry the pregnancy and relinquish the child to this couple upon delivery" (Brezina & Zhao, 2012).
- **Surrogacy:** "a woman who agrees to carry a pregnancy using her own oocytes but the sperm of another couple and relinquish the child to this couple upon delivery" (Brezina & Zhao, 2012).
- **Vitrification:** “the process of changing, or changing something, into glass, or into a substance like glass” (Cambridge Dictionary, n.d.).

Current issue:

Although assisted reproductive technologies (ART) can help overcome infertility concerns, they cause challenges to public health. There are several ethical, legal, and social aspects that derive from procedures related to ART.

There are concerns regarding the morality of these processes. Many believe that genetic manipulation, the intervention of a third party in the reproductive process by genetic material donation, the experimentation on pre-embryos and surrogacy are not ethical practices, for example.





ART can prevent the birth of a severely incapacitated child. It can increase the odds for single women and same-gender couples of having children. ART directly challenges society to reevaluate their beliefs in when human life is created, and these issues will force legal systems to modify existing laws to adapt with ART. It is important to acknowledge that the ethical and legal frameworks surrounding ART need constant updating due to the field's rapid advancements, requiring ongoing examination from medical professionals, policymakers, and the general population (citizens). As a result, society is responsible for ensuring that technology is implemented in a responsible manner. Practices like ART contribute to developing a new perspective in human reproduction while also providing opportunity to face new challenges in our society.

According to PMC PubMed Central, "worldwide, more than 70 million couples are afflicted with infertility" (Brezina & Zhao, 2012). It is estimated that the probability of experiencing infertility will increase in the next 260 years due to women delaying childbearing. Since the first successful IVF procedure in 1978, the use of these technologies has expanded around the globe. Over the past decade, the use of ART has increased at an annual rate between 5-10%. These ART procedures are only accepted in a limited number of countries (Austria, Cyprus, Czech Republic, France, Hungary, Ireland, Italy, Lithuania, Malta, Poland, Slovakia, and Slovenia) due to social, cultural, and religious factors limiting the legality for its usage in most countries.

Economic implications are another key factor that contribute to the limited global access to ART. Even though ART has existed for over four decades, limited access and inequality are still an issue. ART procedures are usually expensive; therefore, they create financial barriers for many individuals and families, particularly those from marginalized communities. In several regions, such as sub-Saharan Africa, infertility treatments are not accessible due to the lack of health coverage to most public health challenges (HIV/AIDS, tuberculosis, and malaria). Government-funded infertility treatments are either limited or non-existent in low- and middle-income countries (Njagi, 2023).

The direct medical costs of one cycle in each five regions studied were \$ 11,804,385 in Africa, \$ 1,000-3,500 in Eastern Mediterranean, \$ 2,000-6,300 in the Americas, \$1,000-5,596 in Asia, and \$1,398-3,000 in the Pacific region (ESHRE, n.d.). Low- and middle-income countries lack accessibility in ART procedures, and accessibility to specialists and facilities varies according to the geographical regions and socioeconomic backgrounds. This results in "inequitable distribution of access to care" (Brezina & Zhao, 2012).

The common practice of transferring multiple embryos in a single cycle in an IVF procedure, while increasing the probability of success, also increases the rate of multiple births. This raises ethical concerns because of the social costs and health risks it implies.





Consequently, many countries have introduced legislation or guidelines to restrict the number of embryos that can be transferred per IVF cycle (Brezina & Zhao, 2012).

There are medical risks associated with IVF, which include ovarian hyperstimulation syndrome and surgical risks. Women that donate eggs must undergo this procedure. For this reason, adequate informed consent is a central concern and should always be an ethical prerequisite. Other ethical concerns surrounding the donation of gametes are whether the donor should remain anonymous and if it should imply a financial compensation (and the amount of said compensation) (Brezina & Zhao, 2012).

There are ARTs that offer the ability to characterize genetic composition of an embryo before it is transferred through IVF. This can result in sex selection practices, which can "skew the gender proportions in certain nations where one gender is culturally preferred" (Brezina & Zhao, 2012).

Regarding the donation of embryos, there are ethical issues related to their possible fate because of the surplus that are currently cryopreserved. Whether they should be discarded, donated to research, stored indefinitely, or donated to another couple (Brezina & Zhao, 2012).

Some people consider the use of surrogates and gestational carriers as a "sale of parental rights" and even as a form of "child selling". International surrogacy has emerged as an important industry, especially in developing nations. This raises the concern surrounding the possibility that financial pressures can lead to exploitation, as well as loopholes in legislation regarding the rights of the surrogate mother and the citizenship of the offspring (Brezina & Zhao, 2012).

International initiatives:

Several national and international organizations and committees have played a crucial role in addressing the ethical concerns related to assisted reproductive technologies (ART) by developing policies that oversight and regulate these technologies. Some of the most important will be covered in the next paragraphs.

The European Society for Human Reproduction and Embryology (ESHRE) has established a Special Task Force on Developing Countries regarding infertility. Its purpose is to document problems and explore ART innovations that can be useful in the developing world. ESHRE has an Ethics Committee that releases guidelines, recommendations, and statements that focus on ethical issues regarding reproductive medicine and embryology. The ESHRE journal "Human Reproduction" published a list of articles after being approved





by the Executive Committee, also focusing on ethical statements regarding the practice of ART (Science Moving People, n.d.).

The Reproductive Endocrinology and Infertility (REI) Program is a specialized medical program that conducts research, diagnosis, and treatments to identify different approaches to improve ART and help both men and women with their reproductive and hormonal disorders. It deals with issues related to fertility, hormonal irregularities, and conditions that can affect the reproductive system. There is an Assisted Reproductive Team group constituted by active members who discuss related topics (Columbia University Irving Medical Center, n.d.).

The International Federation of Fertility Societies (IFFS) promotes Ethical Guidelines on the Global Use of ART, as international organization representing reproductive medicine societies, it is committed to provide global access to all women and men to quality fertility and reproductive health care” (International Federation of Fertility Societies, n.d.). Guidelines are provided to address global ethical concerns related to ART, focusing on the importance of respecting the autonomy and well-being of all those involved in assisted reproduction.

On a national level, the Human Fertilization and Embryology Authority (HFEA) in the United Kingdom is a regulatory body of the Department of Health (independent from the Government) responsible for licensing, monitoring, and inspecting fertility clinics ensuring patients and those born through fertility treatment receives high quality care” (UK Health Data Research Alliance, n.d.). It provides information and guidance to patients and the public on issues regarding the ethics on assisted reproduction, such as gamete and embryo donation, surrogacy, and the storage of reproductive materials.

The Japan Society of Obstetrics and Gynecology (JSOG) is a professional organization in Japan that focuses on obstetrics and gynecology, also addressing ethical issues in these two areas and ART. Their Ethics Committee releases guidelines and recommendations for gestational surrogacy, reproductive counseling, and oocyte donation. This organization also arranges conferences, seminars, and academic activities promoting knowledge sharing, and the improvement of medical attention provided.

Guiding questions:

- How can we ensure vulnerable individuals (for example, surrogates and egg/sperm donors) are not exploited or pressured into participating in ART procedures?





- In cases where there are potential societal consequences of widespread ART use, like increased gender inequalities or resource strain, at what point should individual freedom to pursue it be limited?
- Do you know of any government that has proposed effective public participation regarding ethical issues in assisted reproductive technologies and parenthood?
- What regulatory strategies that currently exist can help address the ethical issues of assisted reproductive technologies and parenthood?
- What type of repercussions has the lack of regulation of assisted reproductive technologies had?

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