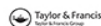


Included in the print edition  
number 5 May 2022ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/wwah20>

# Assisted reproductive technologies: when science helps dreams come true and pave the way to inclusion and diversity

Márcia Mendonça Carneiro

To cite this article: Márcia Mendonça Carneiro (2022) Assisted reproductive technologies: when science helps dreams come true and pave the way to inclusion and diversity, *Women & Health*, 62:5, 369-371, DOI: [10.1080/03630242.2022.2087269](https://doi.org/10.1080/03630242.2022.2087269)

To link to this article: <https://doi.org/10.1080/03630242.2022.2087269>



Published online: 13 Jun 2022.



Submit your article to this journal [↗](#)



Article views: 389



View related articles [↗](#)



View Crossmark data [↗](#)

## Assisted reproductive technologies: when science helps dreams come true and pave the way to inclusion and diversity

In 1978, the world learned about the birth of Louise Brown, the first baby born after *in vitro* fertilization (IVF) thanks to the groundbreaking work of Dr Robert Edwards, Dr Patrick Steptoe and Jane Purdue. The reaction to the extraordinary feat was a mixture of awe and concerns over the possibility of creating lives in test tubes and the consequences of such advancements for future generations (Fishel 2018). It goes without saying that though Edwards and Steptoe were the first to announce the birth of a healthy baby through IVF, they were not alone and a number of researchers around the globe soon reported the birth of more babies. Present estimates reveal that 8 million babies have been born after IVF all over the world and by the year 2100 about 3 percent of the global population will be born thanks to the assisted reproductive technologies (ART) that have been developed ever since (Fishel 2018).

IVF was initially developed for women with tubal factor infertility, but the incredible progress in the field over the last 40 years expanded ART use beyond infertility treatments. IVF is a labor intensive procedure that entails controlled ovarian stimulation (COS), ultrasound monitoring of follicle development, oocyte retrieval and *in vitro* insemination, embryo culture and embryo transfer to the uterus as well as embryo cryopreservation. Initially, success rates were limited to single digit numbers and complications such as ovarian hyperstimulation syndrome were dreaded. As understanding of the process coupled with the development of drugs for COS and new laboratory techniques and equipments for embryo culture lead to increased live-birth rates that may reach up to 40 percent depending on the woman's age. IVF birth rates have risen for patients under 43 in the last 30 years. Complications were also reduced due to better understanding of COS, drug and equipment development which rendered the procedure safer and more effective. Multiple births decreased while single embryo transfers increased (Centers for Disease Control and Prevention 2021).

Age in fact seems to be the most important factor limiting IVF success (Centers for Disease Control and Prevention 2021). This prompts the concept of female fertility preservation through oocyte cryopreservation, which was initially used for women undergoing gonadotoxic treatments for cancer. As survival rates improved and women began postponing pregnancy, the number of women who were either childless or desired more children increased. Thus the need for fertility preservation arose. The social and economic changes observed in the last 20 years also reflected in many women deciding to postpone motherhood and looking for fertility preservation through oocyte and embryo cryopreservation. In fact, findings of The European Thinking About Needs in Contraception (TANCO) study show that 72 percent of women with an average age of 32 were not planning to have any children in the next 3–5 years (Merki-Feld et al. 2018). As fertility starts reducing at age 35, so do IVF success rates. Therefore, women should be counseled regarding the age-limit even when IVF is used.

According to the Human Fertilization and Embryology Authority (HFEA) report between 2013 and 2018 the number of oocyte cryopreservation cycles increased 240 percent and embryo cryopreservation 707 percent (HFEA 2018). Numbers also show that single patients with no partners represent 55 percent of the oocyte cryopreservation cycles and 44 percent are heterosexual couples (HFEA 2018). The pandemic also caused an increase of about 39 percent in egg-freezing cycles. The number of oocytes that should be frozen has not been established yet, but is largely determined by the woman's age. Thus women have gained some empowerment over mother nature but this decision cannot be postponed for ever.

The technological progress in ART after the birth of Louise Brown have been enormous and include embryo and oocyte cryopreservation, intracytoplasmic sperm injection (ICSI), preimplantation genetic diagnosis, ovarian tissue cryopreservation and even ovarian and uterine transplantation. Such advancements took IVF to other areas of medicine including oncology and genetics to name a few. Moreover, ART opened up parenthood opportunities for same-sex couples as well as single people through donor insemination, oocyte donation and surrogacy. Data published by the HFEA in 2018 showed that although people in heterosexual relationships (90 percent) comprised the majority of ART users, followed by female same-sex relationships (6.4 percent) and single patients (3.2 percent). Oocyte cryopreservation was mostly used by females without partners reflecting a tendency over the past years (HFEA 2018) and that increased even more during the pandemic as many women decided to postpone pregnancy and birth rates declined.

In spite of the wonders achieved by ART, access to treatment remains a major issue. Unfortunately there are huge disparities in ART provision throughout the world. In addition to socio-cultural barriers, elevated costs limit the access to IVF to low-income populations. The situation needs to be discussed and the American Society of Reproductive Medicine (ASRM) compiled a special issue in an attempt to call attention to the health disparities as well as study the matter and search for much needed solutions. (Reimagining Reproductive Health: Eliminating Disparate Care, Disparate Access and Disparate Outcomes 2022). Moreover, lesbian, gay, bisexual, and transgender and nonbinary individuals who may have to resort to ART to build their families also find it hard to obtain adequate care. The ASRM Ethics Committee recently published a document analyzing medical, legal and ethical aspects on the reproductive and fertility care of transgender and nonbinary people and recommends these individuals should not be denied access to ART (Ethics Committee of the American Society for Reproductive Medicine 2021)

In June, we celebrate both the World Infertility Awareness Month and LGBTQ+ pride month. It may not be sheer coincidence. In the early days, procedures we now regard as standard such as IVF were met with disbelief and fear and even protests. IVF forefathers probably could not envision the amazing changes it would bring to our lives nor that it could potentially be a means of inclusion and diversity as it may pave the way to building of families for all. There remain scientific and ethical questions related to embryo development, ovarian reserve and, male infertility to name a few. The biggest challenges however may lie in making ART more accessible and affordable worldwide. Fertility care must be regarded both a medical and a social problem as well as a way to inclusion and diversity. Providing education and suitable means so that people may make free informed choices regarding their reproductive care is after all an essential human right. June may be not enough to parade so many vital issues.

## Disclosure statement

No potential conflict of interest was reported by the author(s).


## Funding

The author(s) reported there is no funding associated with the work featured in this article.

## References

- Centers for Disease Control and Prevention. 2021. 2019 assisted reproductive technology fertility clinic and national summary report, US Dept of Health and Human Services. <https://www.cdc.gov/art/artdata/index.html#reports>
- Ethics Committee of the American Society for Reproductive Medicine. 2021. Access to fertility services by transgender and nonbinary persons: An ethics committee opinion. *Fertility and Sterility* 115 (4):874–78. [10.1016/j.fertnstert.2021.01.049](https://doi.org/10.1016/j.fertnstert.2021.01.049).
- Fishel, S. 2018. First in vitro fertilization baby-this is how it happened. *Fertil Steril* 110 (1):5–11. doi: [10.1016/j.fertnstert.2018.03.008](https://doi.org/10.1016/j.fertnstert.2018.03.008)

- HFEA. 2018. Accessed May 30, 2022. <https://www.hfea.gov.uk/media/3234/family-formations-in-fertility-treatment-2018.pdf>
- Merki-Feld, G.S., C. Caetano, T.C. Porz, and J. Bitzer. 2018. Are there unmet needs in contraceptive counselling and choice? Findings of the European TANCO study. *The European Journal of Contraception & Reproductive Health Care* 23 (3):183–93. doi: [10.1080/13625187.2018.1465546](https://doi.org/10.1080/13625187.2018.1465546)
- Reimagining Reproductive Health: Eliminating Disparate Care, Disparate Access and Disparate Outcomes. 2022. Edited by Torie Plowden, Richard Paulson, vol. 3, 2, Supplement, 1–130. *Fertility & Sterility Reports*, May

Márcia Mendonça Carneiro, MD, PhD  
*Editor in Chief, Women & Health Department of Obstetrics and Gynecology,*  
*Universidade Federal de Minas Gerais, Brazil*  
*ORIGEN Centro de Medicina Reprodutiva, Belo Horizonte-MG, Brazil*  
 [marciamc.ufmg@gmail.com](mailto:marciamc.ufmg@gmail.com)