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Abstract

From their first use in the late 1970s until the mid-1990s, Assisted Reproductive Technologies (ART) gave rise to serious concerns by feminists internationally. Their questions ranged from asking about health risks to ethical and political problems inherent in these technologies. However, over the last 25 years, interest in women's health which used to be central to feminist theory and politics, progressively decreased and with it concerns about ART. Today, while the medical literature about health risks in ART is increasing, the topic of women's health in relation to reproductive technologies remains marginal in feminist discourse, social sciences, and the mainstream media. On the basis of recent medical studies, published in peer reviewed scientific journals, this article aims to begin filling this gap. The author discusses adverse effects of ART for three groups of people from a feminist perspective: egg providers; surrogate mothers; and children who are born through in vitro fertilization (IVF), heterologous embryo transfer (HET), and surrogacy. Among the numerous health problems are ovarian hyper-stimulation syndrome (OHSS), birth defects, tumours in children, chromosomal damage, and cardiac and metabolic diseases. Serious questions arise about the long-term health of women who undergo repeated hormonal stimulations, sell their egg cells, or "rent" their wombs as surrogate mothers—a process entailing the exploitation of economically vulnerable women. It also addresses some of the ethical issues arising, such as the importance of risk disclosure to potential IVF users, egg providers, surrogate mothers and intended parents; children's right to access all details regarding their genetic origins and their birth mother; and relevant psychosocial problems related to the use of ART. This paper calls for renewed critiques of women's experiences with reproductive technologies so that they can become, yet again, an important part of the feminist movement.

Keywords

assisted reproductive technologies, in vitro fertilization (IVF), egg donation, surrogacy, children born of surrogacy, short- and long-term health risks, ethical concerns, political implications for women's social status, ethics, psychosocial problems, infertility epidemics, environmental health, birth defects, women's health politics, divisions within feminism, common aims in feminism

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ASSISTED REPRODUCTIVE TECHNOLOGIES AND HEALTH-RELATED ISSUES AMONG WOMEN AND CHILDREN: A RESEARCH REVIEW

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ABSTRACT

From their first use in the late 1970s until the mid-1990s, Assisted Reproductive Technologies (ART) gave rise to serious concerns by feminists internationally. Their questions ranged from asking about health risks to ethical and political problems inherent in these technologies. However, over the last 25 years, interest in women's health which used to be central to feminist theory and politics, progressively decreased and with it concerns about ART. Today, while the medical literature about health risks in ART is increasing, the topic of women's health in relation to reproductive technologies remains marginal in feminist discourse, social sciences, and the mainstream media. On the basis of recent medical studies, published in peer reviewed scientific journals, this article aims to begin filling this gap. The author discusses adverse effects of ART for three groups of people from a feminist perspective: egg providers; surrogate mothers; and children who are born through in vitro fertilization (IVF), heterologous embryo transfer (HET), and surrogacy. Among the numerous health problems are ovarian hyper-stimulation syndrome (OHSS), birth defects, tumours in children, chromosomal damage, and cardiac and metabolic diseases. Serious questions arise about the long-term health of women who undergo repeated hormonal stimulations, sell their egg cells, or "rent" their wombs as surrogate mothers—a process entailing the exploitation of economically vulnerable women. It also addresses some of the ethical issues arising, such as the importance of risk disclosure to potential IVF users, egg providers, surrogate mothers and intended parents; children's right to access all details regarding their genetic origins and their birth mother; and relevant psychosocial problems related to the use of ART. This paper calls for renewed critiques of women's experiences with reproductive technologies so that they can become, yet again, an important part of the feminist movement.

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SCIENTIFIC LITERATURE REPORTING HEALTH RISKS in assisted reproductive technologies (ART) is increasing. In February 2013, a medical study was carried out at The Hospital for Sick Children, Toronto University in Canada, by three scientists: Daria

Grafodatskaya: Cheryl Cytrynbaum; and Rosanna Weksberg. The results were published in the EMBO Report, a journal that communicates major findings indexed by the National Center for Biotechnology Information (NCBI), and it appeared in the US National Library of Medicine (part of the National Institutes of Health). The authors warn:

> There are health risks attached for both mothers and children that need to be properly understood and managed. … The most commonly cited health problems pertain to multiple gestation pregnancies and multiple births. More recently, however, concerns about the risks of birth defects and genetic disorders have been raised. There are questions about whether the required manipulations and the artificial environments of gametes and embryos are potentially creating short and long-term health risks in mothers and children by interfering with epigenetic reprogramming (Grafodatskaya et al., 2013).

In September 2016, the Committee of the American Congress of Obstetricians and Gynecologists (ACOG-Women's Health Care Physicians) endorsed a document titled Perinatal Risks Associated with Assisted Reproductive Technologies. After a review of existing studies, based on available data and expert opinion, the Committee published the following list of risks associated with ART:

> multifetal gestations, prematurity, low birth weight, small for gestational age, perinatal mortality, caesarean delivery, placenta previa, abruptio placentae, preeclampsia, and birth defects. Although these risks are much higher in multifetal gestations, even singletons achieved with ART and ovulation induction may be at higher risk than singletons from naturally occurring pregnancies.

They also issued the following recommendations:

> Before initiating ART or ovulation induction procedures, obstetrician–gynecologists and other health care providers should complete a thorough medical evaluation to ensure that patients are in good health and should counsel these women about the risks associated with treatment. Any maternal health problems or inherited conditions should be addressed. Couples at risk of passing genetic conditions on to their offspring, including those due to infertility-associated conditions, should be counselled appropriately (The American College of Obstetricians and Gynecologists, 2016).

Yet, a widespread belief that ART are risk-free technologies dominates media discussions where the existence of serious health-related problems are rarely acknowledged. There are several reasons for this neglect, the first being the reluctance of the international fertility industry to offer complete information about risks when dealing with clients in search of a baby. As documented by Hillary B. Alberta and colleagues in relation to the recruitment of egg providers, ART clinics are not eager to comply with already vague ethical requirements such as enforcing basic standards of informed consent (Alberta et al., 2014). Moreover, laws differ considerably from country to country, and sometimes from state to state within the same country, as is the case in the United States.. Lack of clear regulations are exploited by fraudulent professionals (both legal and medical), a phenomenon whose extent and gravity are difficult to assess (Devine and Stickney, 2012). Such opacity profits from the desire of clients to have a child "at any cost," which leads to the under-reporting and downplaying of medical, legal, and ethical dangers.

From their first use in the late 1970s until the mid-1990s, ART were topics of serious concerns by feminists internationally. These concerns ranged from assessing health risks to ethical-political problems inherent in these technologies. Issues of *choice* were addressed as controversial by radical feminists: as a matter of fact, despite the rhetoric of choice surrounding ART, they have not increased women's reproductive freedom. Indeed, the medical, legal, and commercial developments of ART, and the change in the social perception of motherhood through the use of IVF and surrogacy have established new forms of control over female reproduction (Bernard and Neyer, 2013). Daphna Marcia Inhorn and Birenbaum-Carmeli also asked important questions about access to ART in relation to geo-political inequalities, writing that the silence surrounding infertility in resource-poor countries may reflect a tacit eugenic view that the infertile poor women are unworthy of treatments (Inhorn and Birenbaum-Carmeli, 2008).

A reason for the current silence of feminists about health-related topics in the contested arena of ART is the unwillingness to assume a position that has the potential to clash with three categories of people: gay men and trans persons having genetic parenting plans; women who are in the market to sell their egg cells and rent their wombs, often out of economic need; and the *infertile women* whose desire for a child is enabled by the possibility to buy *reproductive services* (Corradi, 2017). Such concerns play an important role especially among lesbians, whose frequent embarrassed silence on the subject matter has been pointed out (Bonnet, 2018; Lo Moro, 2017). So, it came that in feminist circles something strange happened: after much theorizing and putting into practice *the personal is political*, a highly relevant social phenomenon such as the commercialization of reproduction via surrogacy became relegated to *personal choice* – as if it were simply a matter of freedom: An agreement between two women, an equal exchange. The ART industry had already been legitimized by most of the medical profession, international lawyers, and the media as welcome saviours who were rescuing couples from the pain of infertility.

In the process of the institutionalization of a significant part of the feminist movement, the critique of medicine and science became less important than efforts to break through the glass ceiling and further individual women's careers; women's energies got hijacked toward achieving moderate goals through emancipatory politics, equal opportunities, and pink quotas, all of which resulted in a domestication of feminist discourse, activism, and politics. Even a positive phenomenon such as the quantitative growth of female professionals in several scientific sectors was partially obliterated by the decline of critical feminist attention towards scientific goals, research trends and methods, and how they affect women. Science—once blamed for being patriarchal, racist, heterosexist, and enslaved to the profit system—today seems to be accepted as secular dogma, a new religion with neo-liberal ethics.

In western countries, the initial alertness of the women's movement to reproductive health matters progressively decreased. It used to be central to feminist political discourse in the 1980s, giving birth (in the following three decades) to a richness of feminist books and journal articles critiquing reproductive technologies (among them Cockburn, 1981, 1985; Hanmer, 1982; Arditti, Duelli Klein & Minden 1984; Corea, 1985, Corea et al., 1987; Harding, 1986; Wikler, 1986; Spallone, 1987, 1989; Pateman, 1988; Woliver, 1989; Chokr, 1992; Anderson, 1993; Duden, 1993; Callahan, 1993, 1994; Denny, 1994; Spar, 2006; Corradi, 2008; Klein, 2008, Franklin, 2009; Qadeer and John, 2009).

According to Sara Ainsworth, Director of Legal Advocacy—an organization which developed a working group about reproductive technologies—among North-American feminists, critical attention seems to be missing in the field of ART. Legal Advocacy took a public stand in a column of the authoritative Washington Law Review:

> Compensated surrogacy—an arrangement in which a woman carries and gives birth to a child for someone else in exchange for money—intimately affects women. Yet, feminist law reformers have not led efforts to regulate this practice in the United States. Their absence is notable given the significant influence of feminist lawmaking in a host of other areas where women's interests are at stake. This lack of feminist law reform leadership can be understood, however, in light of the complex issues that surrogacy raises—complexity that has long divided feminists (Ainsworth, 2014).

Today, the development of a renewed feminist debate about proven adverse effects for egg providers, surrogate mothers, and children represents an opportunity to overcome the existing silence in feminist discourse about ART, by introducing fresh information and different forms of critical understanding. A common ground in the women's movement is much needed around the importance of women's and children's health in relation to ART; and to reframe the alliance between feminists of diverse standpoints and various positions within LGBT-Queer activism. In this article I focus on the first task—offering a contribution in terms of recent medical data and research results to open a discussion that should not be divisive and go beyond political and religious differences in the transnational feminist movement of today.

In the following three sections I will discuss health risks for different groups of women: egg providers; women recipients of HET (heterologous embryo transfer); surrogate mothers; and children born from ART. After that I will address psychosocial issues and in the last section draw conclusions about some bio-ethical issues that have emerged in this work, including advocating for alternative solutions to fertility crises.

Health Risks for Eggs Providers

The first type of risk concerns Ovarian Hyper-Stimulation Syndrome (OHSS). Women with infertility problems and those who want to sell or *donate* their eggs have to undergo hormonal therapies, which are proven to be harmful to many women (see Klein, 2017). Before IVF can commence, hormonal *bombardment* is necessary in order to get a woman's ovaries to mature 10 to 20 or more egg cells instead of the one or two monthly egg cells that are matured naturally. OHSS may happen and becomes manifest after egg retrieval. The hyper-stimulated ovaries are enlarged and can cause severe pain, abdominal distension, nausea, vomiting, diarrhoea, thromboembolism, fluid on lungs, and even death. Women who produce their gametes for the ART market often undergo fertility treatments to stimulate egg cell growth several times a year (Barry, 2019). For this reason, they may incur OHSS more frequently than infertility patients, a condition leading to serious short- and long-term illnesses, and the risk of losing their life.

Silence was reigning almost undisturbed about health issues for egg providers, when on 9 November 2007, a group of feminists organized a seminar titled *Trading on the Female Body* in Oakland, California. A campaign and a blog named handsoffourovaries.com were launched. A network of international activists started to work with a common mission: Jennifer Lahl (Director of The Center for Bioethics and Culture Network) in the United States; Josephine Quintavalle (Director of Comment on

Reproductive Ethics) in the United Kingdom; Melinda Tankard Reist and Katrina George from Australia's Women's Forum; and Renate Klein from the Feminist International Network of Resistance to Reproductive and Genetic Engineering (FINRRAGE). This campaign inspired many new (and old) women activists internationally, especially after scandals involving egg predation and severe health issues for egg providers associated with OHSS. The network "Hands Off Our Ovaries" called for a ban on the dangerous practices related to the commercialization of egg cells.

Initially, IVF was recommended only for women who had problems with their fallopian tubes which made it impossible for their egg cells to descend and be fertilized by sperm. Gradually, however, IVF became also used for cases of male low sperm motility and was prescribed for endometriosis and other pathologies. Increasingly, this technology is used without even considering other therapeutic options. Such a liberal use of IVF appears less and less justified, as studies documenting health issues for women using IVF as well as test-tube babies can now increasingly be found in prestigious international journals (Kamphuis et al., 2014).

The Journal of Law, Medicine & Ethics highlighted ethical issues in ART by publishing a study focused on the necessity of informing women donating/selling egg cells about potential serious health risks. Indeed, long-term problems may occur, such as various types of cancers of the ovaries, womb, colon, or breast, as Hillary B. Alberta, Roberta M. Berry, and Aaron D. Levine (2014) emphasized. These authors also analyzed more than 400 advertisements for the recruitment of egg suppliers, finding that the majority *did not provide information about these risks*.

Correct timing is also a factor in risk disclosure. Although potential health dangers should be communicated by the recruiting agencies to egg providers at the first appointment, many clinics are reluctant to do this and give information only after weeks, when the women have already invested time and energy on medical check-ups and meetings. The Ethics Committee of the American Society for Reproductive Medicine (ASRM) has produced guidelines stating the necessity to disclose risks when financial incentives are involved, but unfortunately these guidelines are not being enforced at present.

The money issue is closely connected to ethical problems. The selling of egg cells calls into question social inequalities and problems with *personal choice*. For egg providers, the payment is often meant to cover the costs, the time, and their efforts. In 2005, the European Parliament accepted a resolution[1] that prohibits the selling of egg cells in member states. But unfortunately, the law does allow *reimbursements*, thus leaving space for the exploitation of low-income women. In some countries such as Russia and Ukraine, as well as in several states in the USA, payment in exchange for the surgical removal of egg cells is legal and explicitly commercialized.

However appealing, the sum does not account for the health risks, especially long-term problems. Women from lower-socioeconomic classes undergo such dangerous procedures far too frequently, thus increasing the risk of OHSS and the occurrence of fatalities. In terms of medical ethics, the problem is that the egg provider undergoes procedures from which she will not benefit herself. She will make a small economic gain and possibly feel satisfaction for being useful to others. But she will be left alone

[1] A resolution was taken by the European Parliament against the traffic of human ova. Eggs were redefined as body parts and the ban on commercialization was approved (Doc B6-0199/2005) voted by 307 deputies, 199contrary, 25 abstained. https://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+MOTION+P6-RC-2005-0199+0+DOC+PDF+V0//EN&language=GA

with developing health problems, as well as a sense of alienation (see section 5 on psychosocial issues).

Health Risks of IVF and Heterologous Embryo Transfer for Surrogate Mothers

The use of IVF is expanding despite the increases of serious health risks for pregnant women: multiple pregnancies[2] are associated with maternal and perinatal complications such as gestational diabetes, fetal growth restriction, pre-eclampsia, premature births and even death (Riben 2015). Even singletons born through IVF have been shown to have worse outcomes than those conceived naturally. Although a few countries have mitigated the risk of multiple births by requiring single embryo transfer, multiple transfers are still common in many states of the world, including in the United States and Asia, where multiple birth rates are 20% to 30%. Furthermore, studies suggest that even a single embryo transfer (which involves an extended embryo culture before the implantation of a blastocyst in the woman's womb) is associated with a 50-70% additional risk of preterm birth and congenital malformations (Kamphuis et al., 2014).

Additional problems appear in case of Heterologous Embryo Transfer (HET), that is, the transfer of a genetically unrelated embryo into the womb of a woman. This technology is used to help women who cannot conceive with their own eggs (e.g., because of their age or undergoing cancer treatment), as well as in gestational surrogacy.[3] The women who are recipients of embryos created with another woman's eggs have experienced documented health issues. Pregnancies following egg donation are reported to more than triple the risk of high blood pressure (hypertension) (European Society of Human Reproduction and Embryology, in *ScienceDaily*, 1 July 2014) and lead to other problems that need to be further investigated, such as higher level of implantation failure and lower live birth rates.

In 2014, the *Journal of Perinatology* published a study about ART, including artificial insemination (AI),[4] which highlighted worrying results in California:

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[2] The implantation of several embryos is believed to increase the chances of a successful pregnancy, but the number of embryos that should be transferred is still controversial. The Practice Committee of the American Society for Reproductive Medicine, and the Practice Committee of the Society for Assisted Reproductive Technology produced a document called Guidance on the limits to the number of embryos to transfer a committee opinion (2017). https://www.asrm.org/globalassets/asrm/asrm-content/news-and-publications/practice-guidelines/for-non-members/guidance_on_the_limits_to_the_number_of_embryos_to_transfer.pdf

[3] HET can also be performed in the case of *adoption* of abandoned embryos, a practice that has been sponsored by Catholic medical services which attribute dignitate personae to the embryo. However, the role of women as simple *carriers* in surrogacy goes unquestioned by most Catholics. On related moral issues see Accad (2014).

[4] The difference between artificial insemination (AI) and in vitro fertilization (IVF) is that the first happens in the woman's body, the second in a petri dish (popularly called a test-tube). In AI, previously selected sperm is introduced into the woman's uterus after the uterine lining has been prepared by stimulating ovulation with hormonal drugs. IVF consists of retrieving ripe egg cells from a woman's ovary, fertilize them in the laboratory with sperm, and later insert the developing embryo(s) into the woman's uterus. The difference between IVF and ICSI (intra-cytoplasmic sperm injection) pertains to the method of achieving fertilization. After gametes (egg cells and sperm) are collected from each partner, in IVF, the egg cells and sperm are mixed together in a petri dish and the sperm fertilizes the egg cells *naturally*, whereas in ICSI, one *good sperm* is selected by embryologists and inserted into the egg cells with a syringe. ICSI is used for the increasing group of sub-fertile men who produce only few sperm cells.

> In 2009, births in California accounted for 12.8% of all US resident births. Women in California underwent 18,405 ART procedures in 2009, of which 15,953 embryos were transferred, resulting in 7155 pregnancies and 5710 live births, of which 30,1% were multiple births. … Among ART/AI pregnancies there was a 4-5 fold increase in stillbirth identified from 2009 to 2011 compared with women whose pregnancy occurred naturally … ART/AI conceived pregnancies also experienced increased rates of caesarean section with associated complications and co-morbidities (41% on average), which were increased four-fold compared with those among naturally conceived pregnancies (10% on average). … 2-3-fold increase in known or suspected foetal anomalies among ART or AI compared with naturally conceived infants (Merritt et al., 2014).

This study indicates how the additional costs for maternal care attributable to ART, and the substantially higher hospital charges for infants delivered after ART/AI are a growing medical economic concern for Californians and for health policymakers nationwide. In fact, ART considerably extends the hospitalization time for mothers and intensive care for children, which can become a heavy burden for public health systems as well as for private insurance (Nicolau et al., 2015). In addition there can be psychosocial problems for the women and their families who are impacted by such unexpected adversities (see section 5. below).

There are other health risks for recipients of HET and surrogate mothers, related to the drugs administered before the implantation of the embryos. Some research found an increase in gestational diabetes (which does also impact the foetus), and intracranial hypertension among surrogate mothers while they prepare for gestational surrogacy because of the use of medicines and hormones (Alexander and Levi, 2013). Besides the normal risks associated with serial pregnancies, it is highly likely that recipients of HET and surrogate mothers experience miscarriages and still births at higher frequency, with their known physical and psychological consequences for women.

Health Risks for Children

Even though medical studies on surrogacy advocate the follow-up of children born from ART (Corradi, 2017 and 2018), long-term consequences are not fully investigated. Few studies mention the risk of early forms of cancer. A Japanese study published in the *Journal of Human Genetics* found an association between the use of ART and several illnesses, including child tumours (Higashimoto & Soejima, 2013). One of the early studies pointing out health problems for newborns from reproductive technologies came from France. More than 15 years ago, ART babies already represented 1.3% of the total birth defects, according to the annual official data of the French Ministry of Health. Genetic alterations were found among those born with IVF and AI, and scientists asked for careful monitoring of these children (Gicquel et al., 2003).

In 2017, the *American Journal of Obstetrics and Gynecology* published a study about the long-term health effects on offspring conceived after fertility treatments. An association was found between the mode of conception (in vitro fertilization, ovulation induction, or spontaneous pregnancy) and tumour (neoplasm) risk, which includes benign and malignant types of tumours among the offspring. This was a longitudinal study in which the scientists observed large numbers of children for up to 18 years, finding that the rate of neoplasms was higher among children conceived through in vitro fertilization or ovulation induction treatments, as compared to naturally conceived children. The researchers' conclusion was unambiguous: "Children

conceived after fertility treatments are at an increased risk for paediatric neoplasms" (Wainstock et al., 2017).

An article by Philip Hunter (2017) on the long-term health risks from ART published in the *Journal of European Molecular Biology Organization* (*EMBO Press*) pointed out that based on both epidemiological data and research on animals, in vitro fertilization can create health problems later in life. There are conditions related to the genetic makeup of the parents. According to Hunter, subfertility "does not seem to be just an isolated condition, but is often associated with other deficiencies that seem to heighten the risk of various diseases for the child." He further comments that IVF procedures are also controversial for intrinsic reasons: "A factor affecting both pregnancy rates and possibly health risks for the child that has been fully recognized only recently is the oxygen concentration of the embryo culture conditions." Philip Hunter points out that 40 years after the birth of the first IVF baby in 1978, the significant body of studies produced is still considered "inconclusive" proof for what is glaringly obvious: "significantly increased levels of serious conditions, including cancer, cardiac, or metabolic diseases" (Hunter, 2017).

The *World Journal of Clinical Pediatrics* published the results of a medical research project confirming what emerged in several earlier studies—children conceived through IVF have a higher rate of brain damage (Bellieni et al., 2011), often associated with multiple gestation. But even for babies that were implanted as single embryos, the risk was found to be higher, which calls into question the techniques related to IVF including embryo cultures, and the low quality of egg cells usually obtained after the administration of fertility drugs and hormone therapies.

The sequence of procedures around cryopreservation (the use of very low temperatures to preserve structurally intact living cells and tissues) are also still debatable. A comparative study found some issues related to the stage in which embryos are implanted, in terms of determining the success of the operation: "Cryopreserving embryos at the zygote stage [the newly fertilised egg] was associated with lower survival rates and lower implantation rates compared with freezing at the blastocyst stage [approximately 200 cells on day 5 after fertilization]" (Pavone et al., 2011, p. 27, see also Hidenobu and Higashimoto, 2013). Yet the most sensitive phase is when embryos are defrosted. This question has come under scientific scrutiny because there could be implications in terms of epigenetic damage:

> The efficiency and safety of cryopreservation methods is usually assessed by measuring cell survival rates immediately after thawing, but this parameter does not measure the impact of more subtle effects on cellular processes, and in particular on epigenetic mechanisms. Such epigenetic marks control the expression of genes and reflect the influence of developmental and environmental factors. Moreover, epigenetic marks can be passed on to daughter cells through cell division. There is also increasing evidence that epigenetic markers can be passed on through sexual reproduction via gametes and can influence disease risk or even cause disease in the next generation (Chatterjee et al., 2016, p. 294).

A 2012 Chinese research project based on quantitative meta-analysis took into consideration a large number of scientific investigations regarding birth defects among children conceived via in vitro fertilization and more specifically intra-cytoplasmic sperm injection (ICSI, see Footnote 4). These explorations led the scientists to create a database of studies and the formulation of six main sites of birth defects:

nervous system; genitourinary system; digestive system; circulatory system; musculoskeletal system; and ear, face, and neck. Findings indicate significant relations between IVF/ICSI and the mentioned types of birth defects (Wen et al., 2012).

A 2016 study published in the *Journal of American Medical Association* (*JAMA Pediatrics*) shows evidence that the use of ART increases birth defects, in particular, of the gastro-intestinal and musculoskeletal systems (Boulet et al., 2016). The disturbing results of this 10-year long investigation motivated the scientists to recommend that risks be disclosed to patients looking for advice whether to begin IVF. A 2015 meta-study published in *Fertility and Sterility*, the journal of the American Society for Reproductive Medicine (ASRM), assessed whether children conceived by ART are at increased risk of childhood illnesses compared with spontaneously conceived children. Results indicated that children conceived with ART may be at increased risk of unspecified infectious and parasitic diseases, asthma, genitourinary diseases, epilepsy or convulsions, and longer hospitalizations (Kettner et al., 2015).

In July 2018, paediatric oncologist Maura Massimino participated in the International Symposium on Pediatric Neuro-Oncology (ISPNO) held in Denver, Colorado, where a world congress of scientists belonging to different medical fields gathered to discuss brain cancer in children. She reported):

> I am impressed about the data presented by the European Registry on the pathology regarding the correlation between Assisted Reproductive Technologies (ART) and the incidence of atypical teratoid/rhabdoid tumors. This is a very aggressive embryonal type of cancer, hitting very small children, often newborns; in a certain percentage of the cases such a pathology has to do with a genetic syndrome affecting multiple tumors at birth or during later life (pers.comm.).

Since then, an increasing number of research projects have focussed on cancers in children related to ART. On November 8, 2020, the on-line Journal *Bioedge* reported the results of a study carried out in Massachusetts, New York, Texas, and North Carolina: "Children conceived with IVF have a higher risk of developing cancer than those conceived naturally" (Cook, 2020). According to this study published in the journal *JAMA Network Open*, the increased risk was two-fold higher for children conceived via in vitro fertilization than for children conceived naturally, say the authors (Luke, Brown and Nichols 2020).

Psychosocial Issues

Studies suggest the occurrence of problems in families where babies have been created with "donation" of gametes or surrogacy. There is a negative impact on children's psychological well-being resulting from the lack of a "bio-social connection" with the surrogate mother.[5] An investigation by the Centre for Family Research of Cambridge University compared the difficulties found among children from surrogacy with those born through egg or sperm donation. Researchers conclude that the absence of a connection with the surrogate mother (who gives birth to them) is more problematic for children then the absence of a link with the genetic donors (Golombok et al., 2013). In other words, while "paternity" and "maternity" are socially constructed, nine months of a *generative relationship* (Corradi 2017, 2019) during the

[5] Similar issues are also found among children in adoptive families, having to do with previous traumas, abandonment, abuses, and multiple custodians (Corradi, 2017, 2019).

whole pregnancy cannot be ignored as a mere biological issue. The surrogate mother is not just a simple "carrier," but one of the two elements of a living dyad, having biological, emotional, and some genetic exchanges with the developing child. With donated gametes, an intended mother receiving a genetically unrelated HET embryo has the possibility to grow the child in her womb, thus forming an important physical tie with him/her during pregnancy, delivery, and nursing. In the case of gestational surrogacy, on the other hand, it is precisely such elements of connection that are completely missing (McGee et al., 2001). Negative outcomes after the separation of the newborn from the woman who just delivered him/her have been studied in the last decade (Morgan et al., 2011). After birth, the surrogate's breasts are full of milk and she must undergo hormonal treatments to stop the milk flow (lactogenesis). Psychologically, after delivery, the surrogate mother may feel attached to the child she generated during pregnancy and to whom she gave birth.

Some researchers appear to downplay these issues: a longitudinal research project by Jadva, Imrie and Golombok (2014) points out findings that are meant to be reassuring, such as the one that after 10 years, surrogate mothers do not view the delivered child as their son/daughter anymore. However, I believe that this should be interpreted at the very least as a problematic outcome: If for up to ten years the surrogate mother feels an emotional attachment to the baby, she gave birth to, this is a disturbing finding. And when surrogate mothers still feel some special tie with the child it would be *only* in cases of gestational surrogacy which seems to contradict common sense. In fact, a surrogate mother is more likely to feel more attachment to the newborn she conceived with her own egg, than with the egg of another woman. This is the reason why there was a shift from traditional to gestational surrogacy, which is the preferred method today, and was in Jadva et al.'s study. According to this study, 10 years after the birth of the child they were separated from, surrogate mothers would "score within a normal range for self-esteem." Furthermore, they would show no signs of depression. And the most surprising finding regarding relations with their partner was that surrogates declared the quality of their marriages remained positive over the 10 years, a result that is hard to achieve even for women who do not engage in surrogacy.

Surveys of surrogate mothers seem to emphasize their satisfaction, and amongst their personal motivations the focus is on altruistic purposes and philanthropic enthusiasm—a desire to help childless couples and a feeling of solidarity with other human beings. There are also reports of positive feelings such as the pleasure of pregnancy (Edelman, 2004; Imrie & Jadva, 2014). Yet, there is no acknowledgement in this research that surrogates are used to give testimonials for the IVF clinics; they must appear stress-free and convincingly happy.[6]

In reality, besides the known problems dealt with by expecting mothers, surrogates have additional problems, since they undergo more hormonal therapies than naturally pregnant women (pre- and post-implantation of the embryo) and constant medical check-ups and tests. Surrogates experience several forms of dispossession related to the loss of privacy, including being subjected to controls of their behaviours in their own house. They lose sovereignty over nutrition and lifestyle; even the presence of pets can be restricted in surrogacy contracts. Surrogates are more at risk of

[6] For information on surrogacy in India, Thailand and Nigeria see Bhadra, 2017; Makinde et al., 2017; *The Economist*, 13 May 2017; Saravanan, 2018.

pregnancy misadventure than other mothers because of the higher rate of miscarriages and stillbirths. If they are not able to hand over the final "product," they will miss out on most of the expected monetary compensation. Furthermore, surrogates may suffer from the separation with the child after delivery. After giving birth to the child, they may not perceive him or her as just an "outcome of their reproductive work." Becoming milk providers—an alternative mentioned in some contracts—would certainly be beneficial for the child. Yet such an option can aggravate the difficulties for surrogate mothers, because they must prolong the reproductive exploitation of their bodies, and the connection with a child with whom they will never have a sustained relationship. For these reasons, becoming a milk provider may increase their sense of alienation.

Even though fertility business advertisements show smiling pregnant surrogate mothers, seemingly to reassure customers they never have problems in generating children for others, a number of former surrogate mothers founded a National Coalition Against Surrogacy in the 1990s to oppose surrogacy.[7] Mainstream media continues to be pro-surrogacy and represents it as an expression of a woman's *choice*, or a fruitful mutual exchange between free consenting adults. The disparity in economic status, education, social power, race/caste and geopolitical privilege is rarely mentioned. What we need is an intersectional analysis of former surrogate mothers' experience: Looking at their vulnerabilities is by no means a way to disempower women. On the contrary, it is crucial to study the role of inequalities in terms of class, race, status, education, and geopolitical privileges. Surrogacy cannot be simplistically explained as a form of *solidarity* among women or *care work* as it was argued in a paper presented by L. M. Anabel Stoeckle at the International Sociological Association (ISA) held in Vienna (2016).

At times, journalists have documented relations between surrogacy and crime. On July 27, 2014, *The New York Times* published an article on "ghost clinics" in Mexico and the phenomenon of babies sold in the illegal market—stolen from both the intended parents and the women who had delivered the babies (Lewin, 2014). But these events are simply shown as unfortunate and rare episodes—like cases of a few rotten apples. The mainstream media tends to focus on success stories, such as the celebration of Carole Horlock, Britain's most prolific surrogate mother, who had 13 babies for couples and happily retired in 2016—while paying no attention to health issues related to ART, either her own or those of her children.

Psychosocial issues have also emerged among people who donate their gametes and who may have second thoughts even years after the separation from what was considered, at that time, simply *bio-materials*. A study published in the scientific journal *Human Reproduction* reports the experience of sperm and egg donors who eventually met their offspring. An online questionnaire was administered through an organization whose aim it is to put in contact "the two parts of a biological relation" (Jadva et al., 2014). The survey revealed a big difference between women and men: During their lifetimes, women had donated oocytes from one to five times, while men

[7] On September 1, 1987 several surrogate mothers, including Mary Beth Whitehead of the celebrated Baby M case and Elizabeth Kane, joined forces with a group of feminists (Phyllis Chesler, Gena Corea and Janice Raymond, among others) and biotechnology opponents (Jeremy Rifkin) to announce the formation of a National Coalition Against Surrogacy. The Coalition was very active until the mid-1990s and managed to criminalize surrogacy in a number of states in the U.S. See Janet Cawley https://www.chicagotribune.com/news/ct-xpm-1987-09-01-8703060344-story.html

provided sperm from one to 950 times. Also, more than 50% of men and more than a third of women mentioned thinking about the wellbeing of the children born from their gametes, and some regret about not being in touch with them.

The majority wanted to know how many children with their genes were born. Half of them asked for information to identify their offspring; all who succeeded in getting in touch with the children reported the experience as positive; and the majority of them established an ongoing relationship. They referred to their offspring as sons or daughters during the interviews (Jadva et al., 2014). These research findings should not be generalized, yet I believe such subjective perceptions merit serious consideration. Furthermore, access to information regarding biological relations should be disclosed. In the Netherlands, the U.K., Norway and Australia, legal obstacles have already been removed in favour of transparency ahead of privacy and anonymity.

In fact, secrecy can be unsettling for children. Bioethicists at the University of Pennsylvania in Philadelphia believe that giving information to offspring regarding their conception through donation and/or surrogacy should not be optional. Children may get to know the truth later in life anyway, and in addition to the specific stress of learning important details about their birth, they would have to cope with a feeling of betrayal toward those who concealed the truth (Brakman et al., 2001). Keeping a *family secret* implies the creation of an artificial psychological environment around the child. Everybody who knows the truth tries to keep it hidden. Sudden embarrassments, allusions, silences, broken phrases, enable children to understand that something is hidden from them, even if they don't know what it is (Corradi, 2017).

The fact that their parents are not open about an issue as important as their origin is a violation of children's autonomy. When they grow up, they may get to know the truth in different ways. Jennifer Lahl, one of the founders of the international advocacy group Stop Surrogacy Now[8] interviewed a young woman named Jessica Kerns who calls herself a *product of surrogacy* (Lahl, 2015). Born through commercial surrogacy, she was the first activist to give a voice to people brought into the world through a third-party reproduction contract. Talking about her experience, she gives people who are considering surrogacy the chance to understand issues that are usually concealed. Jessica Kerns also talks about "The Other Side of Surrogacy" in her blog, where she explains that surrogacy and human trafficking should not be regarded as different phenomena because the distinction is purely formal: "If you sign the document before the mother gets pregnant it is surrogacy; if you sign it when she is pregnant it is human trafficking" (Kerns, 2014). The difference between surrogacy and the illegal market of children would thus only depend on the time when the contract is signed. However, it is undisputable that when you are born, you are a human being and nobody should be able to sell you, buy you, or give you away as a gift. The implication of children being sold and bought, is one of the reasons for considering surrogacy "a human rights violation" as Renate Klein points out in her book *Surrogacy. A Human Rights Violation* (2017).

Swedish feminist Kajsa Ekis Ekman, author of the book *Being and Being Bought. Prostitution, Surrogacy, and the Split Self* (2013), analyses the different ways in which

[8] Stop Surrogacy Now was founded in 2015 as an international advocacy group with the aim to abolish all forms of surrogacy. It is housed by the Center for Bioethics and Culture in California (CBC) and spearheaded by its president Jennifer Lahl. At the time of writing (February 2021), more than 12000 individuals have signed its position paper. See https://www.stopsurrogacynow.com. The CBC has also produced a number of films relevant to ART, e.g., *Eggsploitation; Breeders: A Subclass of Women; Big Fertility: It's All about The Money*, and produces a regular Podcast (http://www.cbc-network.org/film/).

talking about surrogacy as a *service* is misleading. The surrogate mother is not *renting* her womb—she is giving up her whole body's sovereignty for the whole duration of her pregnancy. Given that she is paid upon delivery of the child and on the signature of required documents, she is de facto selling the product of her reproductive labour, in a way that is quite different from selling an organ. In the case of surrogacy, the object of the payment is a person. The commercial split between sex and reproduction produces other splits at the level of self and between the two women. There is a double transfer of pain where the woman *commissioning* the baby is suffering because she cannot have a child of her own. She may experience a feeling of alienation, for not having been able to be pregnant and give birth to a child herself, and for having taken advantage of another woman by virtue of her/her partner's economic privilege. While the surrogate mother is getting paid to make her *happy*, she may be left with a sense of loss and alienation for having given up the child she gave birth to, and with a sense of anguish for having no connections with him/her. In such a relationship, the burden of pain is not shared; actually, it may have multiplying effects.

In the 2019 book, *Broken Bonds. Surrogate Mothers Speak Out,* 16 stories by women who *rented* their wombs or provided their eggs to others demonstrate more convincingly than any medical study how these technologies are not creating happiness or freedom—they are sources of misery and alienation (Lahl, Tankard Reist & Klein, eds. 2019). The scientific mission of perfecting nature seems to be requesting a high price of sorrow and a burden of physical and psychological illness while producing huge profits for the ART industry, Big Pharma, and the omnipresent agents of biomarkets.

In her study carried out in India, Sheela Saravanan (2018) interviewed 13 surrogate mothers, four intended parents and two doctors with an intersectional methodology. Saravanan's work based on the concept of *reproductive justice* offers a useful perspective on bridging *feminist factions* divided by contextual and ideological grounds toward building global feminist solidarity beyond underlying race, class, caste, gender, sexuality, ability, age, and immigration oppressions (Saravanan 2018).

Conclusion: Assisted Reproductive Technologies in the Time of a Fertility Crisis and Renewed Feminist Resistance

In this paper I discussed different physical health problems and psychosocial issues impacting women using IVF, egg providers, surrogate mothers, commissioning parents, and children gestated with these technologies. Much more research is needed on all aspects of ART: we are facing the creation of a category of *breeders*: women in poor countries or migrants, women of colour, or from the white lower classes—often in need of paying their mortgages or sending their children to college—who are generating children for (economically better off) third parties (Smith, 1999; El Boudamoussi and Rainhorn, 2015). Such a social process cannot be seen as unproblematic or treated as a personal issue. The performative task of creating a baby should be re-considered, in feminist research and the social sciences, through the prism of an intersectional approach.

This is especially important because, as I have shown in this paper, there is a growing list of documented serious short- and long-term health risks in peer reviewed medical journals for women and children born from ART that should be discussed together with the social and ethical questions I mentioned. Other issues relate to the *right to know* of several subjects involved in ART and to *risk disclosure* about potential harms. Should women who consider selling their egg cells or serving as surrogate

mothers not be fully informed about the risks for their health through the medical research studies available today? Should intended parents (be they infertile couples, single women, lesbians, gay men, intersexual or transsexual people) not have the right to know about adverse health effects of ART on the babies they pay for? Should the children born via donation of gametes and/or surrogacy not know *all* the details about their genetic origins and who gave birth to them? Do these children not have the right to be born healthy? As feminists, we should strongly advocate for full disclosure of these issues and use intersectional approaches in finding solutions to ART, health, and social ethics, by making a clear distinction between reproductive rights and reproductive privileges (Corradi 2008) thus aiming for global reproductive justice as suggested by Sheela Saravanan (2018).

Several years before Thailand, Nepal, Cambodia and India decided to stop being rent-a-womb countries, in their article The business and Ethics of Surrogacy (2009), feminist social scientists Imrana Qadeer and Mary E. John from the Centre for Women's Development Studies in New Delhi proposed two relevant transformations that are still valuable today: the improvement of global laws to facilitate adoptions for infertile and gay couples; and a cultural change to overcome negative social attitudes about infertility itself. They were the first to point out the obligation of the (Indian) state to protect the rights of surrogate mothers, who by law should be assured they have the right to keep the child if they cannot part from him/her, and the right to have their name on the child's birth certificate. Intended parents should be required to guarantee the surrogate mother all rights in terms of autonomy, privacy, and *bodily integrity*—an important concept when we are dealing with situations of medical harm and economic inequality. A child should be universally considered as a result of women's generative capacity, not a commodity whose value is assessed by the market (Qadeer and John, 2009).

Technology is often presented as a panacea, able to solve social issues. So called *ethical sex selection* or *family balancing* refer to the process of implanting only male embryos—presented as an alternative to selective abortion of female foetuses. Such a *solution* is neither ethical nor socially useful because it doesn't solve the problem of discrimination against female children, and negatively impacts the birth rate of females. As a matter of fact, implanting only male embryos makes gender inequality worse. When boys outnumber girls, legitimizing the social preference for males and increasing the social stigma attached to having female babies, the result is a crystallization and strengthening of patriarchal problems (Corradi 2017).

In industrialized countries, fertility in both women and men is undoubtedly on the decline and resorting to ART may become an even more common phenomenon.[9] We know that environmental pollution and the widespread presence of physical and chemical carcinogens adversely affect our genetic makeup, reproductive potential and the future health of our offspring. Today, exposure to chemical and physical carcinogens translates into damages to the children of tomorrow and lowers their reproductive capabilities. But ART cannot be seen as the solution to social and environmental problems such as increasing infertility. Answers may be found in ecologically grounded prevention policies, in cultural changes around the idea of maternity and parenting, and laws that allow single women, LGBT members, and alternative families to adopt children in countries where this is still prohibited (Corradi 2019). Women's

[9] See the information on infertility by the U.S. Centers For Disease Control and Prevention on www.cdc.gov/reproductivehealth/infertility

health has historically been a common ground for feminist activism —it should re-gain the centre of the debate about ART as a political priority and a non-divisive goal.

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REFERENCES

Accad, Michel. (2014). Heterologous embryo transfer: Magisterial answers and metaphysical questions. *The Linacre Quarterly* 81(1), pp. 38-46. https://doi.org/10.1179%2F2050854913Y.0000000016

Ainsworth, Sara L. (2014). Bearing children, bearing risks: Feminist leadership for progressive regulation of compensated surrogacy in the United States. *Washington Law Review* 89(4), pp. 1077-1123.

Alberta, Hillary B., Berry Roberta M. & Levine, Aaron D. (2014). Risk disclosure and the recruitment of oocyte donors: Are advertisers telling the full story? *The Journal of Law, Medicine & Ethics* 42(2), pp. 232-43. https://doi.org/10.1111/jlme.12138

Alexander, Joshua & Levi, Leah. (2013). Intracranial hypertension in a patient preparing for gestational surrogacy with leuprolide acetate and estrogen. *Journal of Neuro-Ophthalmology* 33(3), pp. 310-311. https://doi.org/10.1097/WNO.0b013e3182906881

Anderson, Elizabeth. (1990). Is women's labour a commodity? *Philosophy & Public Affairs* 19(1), pp. 71-92.

Arditti, Rita, Duelli Klein, Renate & Minden, Shelley. (eds.) (1984). *Test-tube women. What future for motherhood?* Pandora Press, London.

Bellieni, Carlo Valerio, Bagnoli, Franco, Tei, Monica, De Filippo, Marcello, Perrone, Serafina, Buonocore, Giuseppe & Bender, L. (2003). Genes, parents and assisted reproductive technologies: Mistakes, race, Sex, and law. In: *College of Law Faculty Scholarship*. https://student.cc.uoc.gr/uploadFiles/1110-%CE%91%CE%9509%CE%9A/Bender%20genes_parents_arts.pdf

Bellieni, Carlo Valerio, Bagnoli, Franco, Tei, M., De Filippo Monica, Perrone, Serafina, & Buonocore, Guiseppe. (2011). Increased risk of brain injury in IVF babies. Minerva *Pediatrica* 63(3), pp. 445-48. https://www.minervamedica.it/en/journals/minerva-pediatrics/article.php?cod=R15Y2011N06A0445

Bernardi, Laura & Neyer, Gerda. (2013). Feminist perspectives on motherhood and assisted reproduction. In: *XXVII International IUSSP Conference*, Busan, Korea, 26-31, August 2013.

Bhadra, Bula. (2017). Surrogacy and surrogates in India through the lenses of intersectionality. Nagla. B.K. & Srivastava, V.K. (eds.) *Globalisation, leisure, and social change: Essays in honour of Professor Ishwar P. Modi*. Jaipur: Rawat Publications.

Bonnet, Marie-Jo. (2018). *Desiderio e libertà. Questioni di politica femminista e lesbica*. Giacobino, M. (ed.). Milano: Il dito e la luna.

Boulet, Sheree L., Russell S. Kirby, Jennita Reefhuis, Yujia Zhang, Saswati Sunderam, Bruce Cohen, Dana Bernson, Glenn Edward Copeland, Marie A. Bailey, Denise J. Jamieson & Dmitry M. Kissin. (2016). Assisted reproductive technology and birth defects among liveborn infants in Florida, Massachusetts, and Michigan, 2000-2010, *JAMA Pediatrics* 170(6). https://doi.org/10.1001/jamapediatrics.2015.4934

Cawley, Janet. (1987). Surrogate mums fight the 'slavery.' *Chicago Tribune* https://www.chicagotribune.com/news/ct-xpm-1987-09-01-8703060344-story.html

Callahan, Joan C. (1993). The contract motherhood debate: Surrogate Motherhood: Politics and Privacy. Gostin, L. (ed.). *The Journal of Clinical Ethics* 4(1), pp. 82-91.

Callahan, Joan C. (1994). Feminism and reproductive technologies. *The Journal of Clinical Ethics* 5(1), pp. 75-85. https://doi.org/10.4324/9781315598093-3

Center for Bioethics and Culture (CBC). (2021). Films and Podcasts. http://www.cbc-network.org/film/

Chatterjee, Anamika, Debapriya Saha, Glasmacher, Birgit, & Nicola Hofmann. (2016). Chilling without regrets. Deciphering the effects of cryopreservation on the epigenetic properties of frozen cells will benefit the applications of cryo-technology. Embo Report 17(3), pp. 292-295. https://doi.org/10.15252/embr.201642069

Chokr, Nader N. (1992). Feminist perspectives on reproductive technologies: the politics of motherhood. *Technology in Society* 14(3), pp. 317-33. https://doi.org/10.1016/0160-791x(92)90010-8

Cockburn, Cynthia. (1981). *The material of male power*. *Feminist Review* 9(1), pp. 41-58. https://doi.org/10.2307/1394914

Cockburn, Cynthia. (1985). *Machinery of dominance: Women, men, and technical know-how*. London: Pluto Press.

Cook, Michael. (2020). High cancer risk for IVF babies. *Bioedge*. https://www.bioedge.org/mobile/view/high-cancer-risk-for-ivf-babies/13598

Corea, Gena. (1985). *The mother machine: Reproductive technologies from artificial insemination to artificial wombs*. New York: Harper and Row.

Corea, Gena, Klein, Renate Duelli, Hanmer, Jalna, Holmes, Helen B., Hoskins, Betty, Kishwar, Madhu, Raymond, Janice, Rowland, Robyn & Steinbacher, Roberta. (1987). *Man-made women: How new reproductive technologies affect women.* Bloomington: Indiana University Press.

Corradi, Laura. (2008). Redefining reproductive rights. An eco-feminist perspective on in-vitro fertilization, egg markets and surrogate motherhood. *Advances in Gender Research* 12; pp. 245-273. https://doi.org/10.1016/S1529-2126(08)12013-6

Corradi, Laura. (2017). Nel ventre di un'altra. Critica femminista delle tecnologie riproduttive. Roma: Castelvecchi.

Corradi, Laura. (2019). En el vientre de otra. Critica feminista de las tecnologias reproductivas. Gorla: Buenos Aires.

Corradi, Laura. (2019). Odissea embrionale. Fecondazione in vitro, eterologa e surroga di gravidanza: problemi di salute, giuridici e sociali. Mimesis: Milano.

Denny, E. (1994). Liberation or oppression? Radical feminism and in vitro fertilization. *Sociology of Health & Illness* 16(1), pp. 62-80. https://doi.org/10.1111/1467-9566.ep11347010

Devine, Rory. & Stickney, R. (29 February 2012). Convicted surrogacy attorney: I'm tip of iceberg. *NBC San Diego*, www.nbcsandiego.com/news/local/Theresa-Erickson-Surrogacy-Abuse-Selling-Babies-140942313.html.

Duden, Barbara. (1993). *Disembodying women: Perspective on pregnancy and the unborn*. Cambridge: Harvard University Press.

Ekman, Ekis Kajsa. (2013). *Being and being bought: Prostitution, surrogacy, and the split self*. Melbourne. Spinifex Press.

Edelman, R. J. (2004). Surrogacy: the psychological issues. *Journal of Reproductive and Infant Psychology* 22(2), pp. 123-136. https://doi.org/10.1080/0264683042000205981

El Boudamoussi, Samira and Rainhorn, Jean-Daniel. (2015). *New cannibal markets: Globalization and commodification of the human body.* Paris: Les éditions de la Maison des sciences de l'homme.

European Parliament. (2005). Joint Motion for a Resolution. https://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+MOTION+P6-RC-2005-0199+0+DOC+PDF+V0//EN&language=GA; https://www.europarl.europa.eu/sides/getDoc.do?type=MOTION&reference=B6-2005-0205&language=EN

European Society of Human Reproduction and Embryology. (1 July 2014). Pregnancies following egg donation associated with more than 3-fold higher risk of hypertension. *ScienceDaily*. www.sciencedaily.com/releases/2014/07/140701091446.htm.

Franklin, Sarah. (2009). Postmodern procreation: Representing reproductive practice. *Science as Culture* 3(4), pp. 522-561. https://doi.org/10.1080/09505439309526365

Gicquel, Christine, Véronique Gaston, Jaqueline Mandelbaum, Jean-Pierre Siffroi, Antoine Flahault & Yves LeBouc. (2003). In vitro fertilization may increase the risk of Beckwith-Wiedemann Syndrome related to the abnormal imprinting of the KCNQ1OT ene. *American Journal of Human Genetics* 72(5), pp. 1338–1341. https://doi.org/10.1086/374824

Golombok, Susan, Lucy Blake, Polly Casey, Gabriela Roman & Vasanti Jadva. (2013). Children born through reproductive Ddnation: A longitudinal study of psychological adjustment. *The Journal of Child Psychology and Psychiatry* 54(6), pp. 653-60. https://doi.org/10.1111/jcpp.12015

Grafodatskaya, Daria, Cheryl Cytrynbaum, & Rosanna Weksberg. (2013). The health risks of ART. *Embo Reports* 14(2), pp. 129-135. https://doi.org/10.1038/embor.2012.222

Hanmer, Jalna & Allen, Pat. (1982). Reproductive engineering: The final solution? *Feminist Issues* 2(1), pp. 53-74. https://doi.org/10.1007/bf02933966

Harding, Sandra. (1986). *The science question in feminism*. Ithaca: Cornell University Press.

Hunter, Philip. (2017). The long-term health risks of ART. *Embo Reports* 18(7) https://doi.org/10.15252/embr.201744479

Imrie, Susan & Jadva, Vasanti. (2014). The long term experience of surrogates: relationships and contact with surrogacy families in genetic and gestational surrogacy arrangements. *Reproductive BioMedicine Online* 29, pp. 423-435.

Inhorn, Marcia Claire & Daphna Birenbaum-Carmeli. (2008). Assisted reproductive technologies and culture change. *Annual Review of Anthropology* 37, pp. 177-196. https://www.google.com/search?client=safari&rls=en&q=Inhorn,+Marcia+Claire+and+Daphna+Birenbaum-Carmeli.+2008.+Assisted+Reproductive+Technologies+and+Culture+Change.+Annual+Review+of+Anthropology+37:+177-196.+https://doi.org/10.1146/annurev.anthro.37.081407.085230&ie=UTF-8&oe=UTF-8

Jadva, Vasanti, Susan Imrie, & Susan Golombok. (2014). Surrogate mothers 10 years on: a longitudinal study of psychological well-being and relationship with the parents and child. *Human Reproduction* 30(2), pp. 373-379. https://doi.org/10.1093/humrep/deu339

Kamphuis, Esme I., Siladitya Bhattacharya, Fulco Van Der Veen, Ben W. J. Mol & Allan Templeton. (January 28 2014). Are we overusing IVF? *British Medical Journal* 348, p. g252. doi: https://doi.org/10.1136/bmj.g252

Kettner Laura-Ozer., Henriksen, Tine Brink. Bay, Bjørn, Ramlau-Hansen, Cecila Høst, Kesmodel, Ukrik Schiøler. (2015) Assisted reproductive technology and somatic morbidity in childhood: a systematic review. *Fertility and Sterility* 103(3), 707-719. https://10.1016/j.fertnstert.2014.12.095

Kerns, Jessica. (2014). *The other side of Surrogacy*. www.theothersideofsurrogacy.blogspot.com

Klein, Renate. (2008). From test-tube women to women without bodies. *Women's Studies International Forum* 31, pp. 157-175, https://doi.org/10.1016/j.wsif.2008.04.006

Klein, Renate. (2017). *Surrogacy. A human rights violation*. Spinifex Press: Melbourne, Australia.

Lahl, Jennifer. (2015). Jennifer Lahl interviews Jessica Kerns about the *Other side of surrogacy*. www.vimeo.com/125756487.

Lahl, Jennifer, Tankard Reist, Melinda & Klein, Renate. (eds.). (2019). *Broken bonds. Surrogate mothers speak out*, Spinifex Press: Mission Beach, Australia.

Lewin, Tamar. (27 July 2014). A Surrogacy agency that delivered heartache, *The New York Times*. http://nyti.ms/1rJWXM0

Lo Moro, Viola. (2017). L'afonia delle lesbiche. *mammaNoNmamma* supplement to *Leggendaria* 123, pp. 35-37.

Luke, Barbara, Brown Morton B. & Nichols H.B. (2020). Assessment of Birth Defects and Cancer Risk in Children Conceived via In Vitro Fertilization in the US. *JAMA Network Open.* 3(10), e2022927. https://10.1001/jamanetworkopen.2020.2292

Maggie. (2019). Anonymous no more: How I was groomed to be a multiple egg donor. *Broken Bonds. Surrogate Mothers Speak Out,* Lahl, Jennifer, Tankard Reist, Melinda, & Klein, Renate (eds.), pp. 27-36.

Makinde, Olusesan Ayodeji, Olaleye Olalekan, Olufunmbi Olukemi Makinde, Svetlana S. Huntley, & Brandon Brown. (2017). Baby factories in Nigeria: Starting the discussion toward a aational prevention policy. *Trauma Violence & Abuse* 18(1), pp. 98-105. https://doi.org/10.1177%2F1524838015591588

McGee, Glenn, Sarah-Vaughan Brakman & Andrea D. Gurmankin. (2001). Gamete donation and anonymity: Disclosure to children conceived with donor gametes should not be optional. *Human Reproduction* 16(10), pp. 2033-36. https://doi.org/10.1093/humrep/16.10.2033https://doi.org/10.1093/humrep/16.10.2033

Merritt, Thurman Allen, Mitchell Goldstein, Raylene Philips, Ricardo Peverini, Joy Iwakoshi, Aida Rodriguez & Bryan Oshiro. (2014). Impact of ART Pregnancies on California: Analysis of Maternity Outcomes and Insights into the Added Burden of Neonatal Intensive Care. *Journal of Perinatology* 34(5), pp. 345-50. https://doi.org/10.1038/jp.2014.183

Morgan, Barak E., Alan R. Horn & Nils J. Bergman. (2011). Should neonates sleep alone? *Journal of Biological Psychiatry* 70(9), pp. 817-25. https://doi.org/10.1016/j.biopsych.2011.06.018

Nicolau, Yona, Austin Purkeypile, Thurman Allen Merritt, Mitchell Goldstein & Bryan Oshiro. (2015). Outcomes of surrogate pregnancies in California and hospital economics of surrogate maternity and newborn care. *World Journal of Obstetrics and Gynecology* 4(4), pp. 102-107. https://doi.org/ 10.5317/wjog.v4.i4.102

Pateman, Carole. (1988). *The Sexual Contract*. Stanford: Stanford University Press.

Pavone, MaryEllen. (2011). Comparing thaw survival, implantation and live birth rates from cryopreserved zygotes, embryos, and blastocysts. *Journal of Human Reproductive Science* 4(1), pp. 23-28. https://10.4103/0974-1208.82356

Quadeer, Imrana & John, Mary E. (2009). The business and ethics of Surrogacy. *Economic and Political Weekly* 44(2), pp. 10-12.

Riben, Mirah. (2015). American surrogate death: Not the first. *The Huffington Post*. www.huffingtonpost.com/mirah-riben/american-surrogate-death- b 8298930.html.

Saravanan, Sheela. (2018). A *transnational feminist view of surrogacy biomarkets in India*. Singapore: Springer Nature.

Smith, Linda Tuhiwai. (1999). Decolonizing methodologies: Research and indigenous peoples. London: Zed Books.

Soejima, Hidenobu & Ken Higashimoto. (2013). Epigenetic and genetic alterations of the imprinting disorder Beckwith-Wiedemann Syndrome and related disorders. *Journal of Human Genetics* 58(7), pp. 402-9. https://doi.org/10.1038/jhg.2013.51

Spallone, Patricia. (1989). *Beyond conception: The new politics of reproduction*. Granby: Bergin & Garvey Publishers.

Spar, Debora L. (2006). The baby business: How money, science, and politics drive the commerce of conception. Cambridge: Harvard Business School Press.

Stoeckle, L.M. (2016). Surrogacy and the meaning of care work. 3rd International Sociological Association Forum Vienna, Austria, 10-14 July 2016.

Stop Surrogacy Now (2021). Petition and Resources. https://www.stopsurrogacynow.com

The American College of Obstetricians and Gynecologists. (2016). Committee opinion no. 671. Perinatal risks associated with assisted reproductive technology. *Obstetrics & Gynecology* 128(3). https://doi.org/10.1097/AOG.0000000000001643

The Practice Committee of the American Society for Reproductive Medicine & the Practice Committee of the Society for Assisted Reproductive Technology. (2017). Guidance on the limits to the number of embryos to transfer: a committee opinion. https://www.asrm.org/globalassets/asrm/asrm-content/news-and-publications/practice-guidelines/for-non-members/guidance_on_the_limits_to_the_number_of_embryos_to_transfer.pdf

The Economist. (2017). As demand for surrogacy soars, more countries are trying to ban it. Many feminists and religious leaders regard it as exploitation. www.economist.com/international/2017/05/13/as-demand-for-surrogacy-soars-more-countries-are-trying-to-ban-it

U.S. Centres for Disease Control and Prevention. (No date). Reproductive Health. Infertility. www.cdc.gov/reproductivehealth/infertility

Wainstock, Tamar, Asnat Walfisch, Ilana Shoham-Vardi, Idit Segal, Avi Harlev, Ruslan Sergienko, Daniella Landau & Eyal Sheiner. (2017). Fertility treatments and pediatric neoplasms of the offspring: research on a population based cohort with a median follow-up of 10 years. *American Journal of Obstertic and Gynecology* 216(3), 314.e1. https://doi.org/10.1016/j.ajog.2017.01.015

Wen, Juan, Jie Jiang, Chenyue Ding, Juncheng Dai, Yao Liu, Yankai Xia, Jiayin Liu & Zhibin Hu. (2012). Birth defects in children conceived by in vitro fertilization and intracytoplasmic sperm injection: A meta-analysis. *Fertility and Sterility* 97(6), pp. 1331-1337. https://doi.org/10.1016/j.fertnstert.2012.02.053

Wikler, Norma J. (1986). Society's response to the new reproductive technologies: the feminist perspectives. *Southern California Law Review* 59(5), pp. 1043-57.

Woliver, Laura R. (1989). The deflective power of reproductive technologies: the impact on women. *Women & Politics* 9(3), pp. 17-47. https://doi.org/10.1300/j014v09n03_02