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Abstract bodies, concrete risks: clinical devices and the health of ova donors in Argentine reproductive medicine

Cuerpos abstractos, riesgos concretos: dispositivos clínicos y la salud de las donantes de óvulos en la medicina reproductiva argentina

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ABSTRACT Using a methodological perspective grounded in science and technology studies, this article analyzes two sociotechnical devices used in Argentine reproductive medicine (biostatistical measures and donation registries) with the aim of controlling both the so-called "genetic risk" arising from the use of donated ova as well as the health risks to female donors. By examining how the deployment of monitoring criteria disregards the specificity of ova donation, the article suggests that it is not the absence of control measures and clinical criteria that produces an inadequate monitoring of such risks, but rather the *concrete ways* in which such measures are implemented that results in potential harms to the health of female donors.

KEY WORDS Fertilization In Vitro; Oocyte Donation; Women's Health; Argentina.

RESUMEN Desde una perspectiva metodológica inspirada por los estudios en ciencia y tecnología, este trabajo analiza dos dispositivos clínicos (estándares bioestadísticos y registros de donación) que se utilizan en la medicina reproductiva argentina con el objetivo de controlar el denominado "riesgo genético" que se originan en el uso de óvulos donados, así como los riesgos para la salud de las mujeres donantes. Al examinar cómo la implementación de criterios de control desatiende la especificidad de la donación de óvulos, el artículo propone que no es la ausencia de criterios y controles clínicos en fertilidad lo que produce el inadecuado control de esos riesgos, sino que es la forma concreta en la cual se implementan tales controles lo que resulta en un potencial perjuicio para la salud de las mujeres donantes.

PALABRAS CLAVES Fertilización In Vitro; Donación de Óvulo; Salud de la Mujer; Argentina.

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INTRODUCTION

As part of a larger project that examined ova exchange in Argentina,[a] this article reflects on the care of women's health, particularly of those women who "donate"[b] eggs to others for use in reproductive treatments. The article aims to analyze the use of sociotechnical devices – the so-called "biostatistical measures" and "ova donation records" – through which reproductive medicine seeks to control the number of times a woman donates eggs. These devices aim to prevent two different risks: an increase in the probability of consanguinity, and the harm to women's health. The article states, however, that the use of these devices is more focused on preventing the risks of endogamy rather than on reducing the health risks posed to female donors, a situation that impacts upon the chances of adequately monitoring the potential harm to the latter. Paradoxically, the ways in which these devices are implemented imply new risks for the health of women.

Although assisted reproduction has been provided in Argentina for over thirty years, the field was regulated nationwide only recently in June 2013, under the Medically Assisted Reproduction Act 26862. This legislation ensures "full access" to reproductive treatments through both the public and private health systems regardless of sexual orientation, age, or marital status. Despite its democratic spirit and the fact that it was supported by a large sector of society, led by patient organizations and lesbian, gay, transvestite, transsexual, transgender, bisexual, intersex, and queer (LGTTTBIQ) activist groups, the act defined only broadly, or avoided to define altogether, important aspects of the implementation of reproductive technologies. Among these aspects, the most important were the creation of gamete banks and a central donor record, whose lack of treatment in the Act ultimately affects the authentic fulfillment of the democratic momentum of this act, in fact, undermining the right to benefit from reproductive technologies guaranteed by the legislation. As of June 2016, the effective implementation of this Act is far from meeting the expectations, since people who do not have health insurance, that is to say *obra social* (employment-based health insurance), or those without a pre-paid medical plan, will not have free access to the treatments provided in several locations, such as in the Autonomous City of Buenos Aires. Additionally, there have been delays and refusals from some health care providers regarding full coverage of the treatment, specifically diagnostic tests, drug coverage, etc.[3] Furthermore, national agencies have not taken the responsibilities that were vested in them by the Act so that they can fulfill the legislation (for example, the previously mentioned central donor registry). It is also important to mention that although the Act stipulates that "donation shall not be lucrative or commercial in nature," donation is almost exclusively carried out by means of monetary exchange in all the private centers, while there is no free of charge gamete donation scheme in the public field, as indicated by the law.

In the context of a strong institutionalization, specialization, and professionalization that is taking place in Argentina and other countries of the region, the development of the reproductive medicine field is closely related to a rhetoric of the care of female fertility and women's health in general.[4] Thus, on one hand, several Argentine clinics are extending their fertility services towards a larger range of interventions that seek to look after both reproductive and women's health in general, addressing climacteric, cervical and breast pathologies, pelvic floor dysfunction, reproduction immunology, and the preservation of fertility. Sometimes, the services provided include nutrition, yoga, psychology, dermatology, beauty, plastic surgery, etc. These contribute to presenting fertility treatment as a space where health is tackled as a whole, avoiding the fragmentation of the body which was a central concern of early feminist critiques of assisted reproduction.[5,6,7]

On the other hand, in the specific case of oocyte donation, fertility clinics often

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emphasize that both the mental and physical health of women donating ova[8] are continuously checked. This persistent rhetoric regarding the medical screening of the donor aims however to ensure that those who will receive donated ova will receive it from a "checked" woman, that is to say, from a woman whose reproductive history is already known, where the potential for genetic disorders, infections, or other type of diseases that could be transmitted to the descendant has been discarded to a certain extent, and for whom, as per the follicle count, an ovarian "good response" is predicted. The frequent reference to "having the patient checked" cannot be separated from the commercial conditions in which assisted reproduction is offered in Argentina. Most treatments are offered only in private clinics and patients must pay large amounts of money for them. Within this context, the medical examination of the donor, even when formulated through a rhetoric of care or of compensatory schemes – where the donor is partially compensated for donating her ova through the provision of medical services, such as checking her reproductive health[9] – is, inevitably, an aspect of the medical intervention taken as a "service" and, therefore, a component of the treatment's cost. Its market value cannot be understated.

The fact that the health of both patients and donors is taken care of does not mean that the health of women, especially female donors, is not at risk. In fact, being a donor in a reproductive treatment implies being exposed to several health (and not only reproductive) risks. Such risks arise not only from having ova removed as an isolated event (a surgical procedure with risks specific to this form of medical intervention, such as infections, anesthesia complications, bleeding, etc.), but also from the extraction of ova as a repeated event. The latter include the risk of developing different types of cancer, of a lessening of fertility, and of ovarian hyper stimulation syndrome.[c] These risks originate when the donor is involved as a supplier of *clinical labor*,[11] a type of bodily work in which the patient's biology is involved.[d]

In light of these considerations, this article is concerned not only with the medical provisions regarding the (reproductive or other) health of female ova donors before, during, and after their participation in any fertility treatment. What is also examined is the way in which these estimates, regulations, protocols, biostatistical measures or corporate assertions concerning the relevance of monitoring potential risks to women's health related to their status as ova donors, are actually performed in the clinical treatment of infertility. This is to say, it aims to contribute an understanding of the practical functioning of medical devices in concrete everyday situations, in this case related to the monitoring of the health of ova donors. Thus, this article explores the medical mechanisms through which harmful effects on the health condition of women who not only participate, but actually make possible, the very existence of egg donation schemes, are prevented.

Studies of reproductive medicine in Iberoamerican countries

Unlike what happened in the English-speaking context, reproductive medicine has not been the subject of academic interest for the social and human sciences in the Spanish-speaking world. This may be so because, at least in Latin America, certain issues (such as the persistent illegality of abortion, maternal mortality or teenage pregnancy) mark more urgently the agenda of the social studies of reproductive health in most of the countries of the region. Below are presented a series of studies that do not intend to enumerate exhaustively the production in this specific area, but rather to point out the main issues tackled in regard to reproductive medicine, as well as the likely vacant areas still available for research.

Regarding Argentina, the country where this study was conducted, research on reproductive technologies within the human and social sciences was significantly limited until the beginning of the 2000s. However, in the past few years, several studies have

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contributed specific knowledge to the field. Sommer[12,13] and Luna's[14] pioneering research shed light on gender asymmetry, the invasive nature of treatment, the experimental conditions of many of the techniques, and the bioethical dilemmas represented by said techniques. Luna's[15,16] research has especially emphasized the particularities of Latin America with respect to the implementation of reproductive techniques and the vulnerability context involved. Garay[17] has contributed with a feminist reflection on the role of gender in assisted reproduction. Raspberry[18] developed an ethnographic analysis of the ethical issues surrounding reproductive technologies, and Kemelmajer de Carlucci *et al*.[19] have contributed to the legal debate with a discussion of filiation as a result of the use of human reproduction techniques. Other legal aspects were studied by Calise,[20] who addressed the condition of excess embryos, and by Lloveras and Sapena[21] who paid attention to the potential regulation of preimplantation genetic diagnosis. Cuberli *et al*.[22] examined the tensions between reproductive technologies and other practices that involve reproductive decisions such as abortion and HIV testing; Straw and Petracci[23] carried out a comparative analysis of the use of reproductive technologies among middle and working class people in the City of Buenos Aires; Gemetro and Bacin[24] and Ariza and Libson[25] contributed to a comparison of the use of reproductive medicine in heterosexual and lesbian women. Ariza[26] studied the reasons argued by women for undergoing reproductive treatment or not, the medical practices and the construction of ideas of the natural during gamete donation,[27] and provided a discussion of the activism that led to the inclusion of assisted reproduction in the Obligatory Medical Plan.[28]

As for the rest of the countries, in Spain there is need to mention the contribution made to an understanding of the legal aspects of ARTs by Puerto[29]; Bestard's[30] research on the co-production of the social and the biological in reproductive technologies and its consequences for kinship; Jarufe Contreras'[31] study of non-biological filiation; Farnós Amorós'[32] contribution on reproductive tourism; the work by Rosset *et al*.[33] on the psychology of reproduction; and the tensions between subversive re-appropriation and the repetition of traditional gender patterns in the use of reproductive techniques in Spain analyzed by Fernández Jimeno.[34] Regarding Latin American countries, there is the need to mention the research conducted by Herrera *et al*.[35] on assisted reproduction and public opinion in Chile; the study of the (bio)ethics of assisted reproduction and its legal aspects conducted by several authors[36,37,38,39,40,41,42]; the bioethical and legal contributions on the right to personal identity and filiation among people born through gamete donation in reproductive technologies[43,44,45,46]; the analysis of the meanings of consent in reproductive medicine carried out by Albertoni Vazzaco *et al*.[47]; Roberts'[48] ethnography of the status of the embryo in Ecuador; and the contributions from within psychology to an understanding of reproductive search by Escalante Barboza[49] and Lanius and Souza.[50] There is also an empirical Venezuelan study carried out by Romero Márquez[51] on the social representations of assisted reproduction within a group of people that would potentially have access to it.

In sum, what has been previously mentioned reveals that studies of assisted reproduction in Iberoamerican countries have been, in general, of a theoretical and normative nature, with very few examples of empirical case studies and the formulation of local research agendas. In this field, the production has tended to focus on bioethical and legal problems, leaving aside, generally, the analysis of the experiences of those who use the techniques, as well as of the medical practices. Sociology, the Anthropology of Medicine and Health, and Social Studies of Science and Technology have in general not gone into a detailed analysis of medical work, nor have they paid attention to the interaction between human and non-human agents. Additionally, there is a considerable lack of research focused on gamete donation,

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which includes the lack of studies on the potential health risks to those women entailed in oocyte donation through reproductive technologies, like the ones that are being dealt with in this article. Lastly, it is worth noting that when non-biological filiation has been addressed in studies of assisted reproduction, the perspective has been exclusively centered on the legal aspects and ethical principles involved rather than on the use of sociotechnical devices for managing risks.

METHODOLOGY

The research study from which this paper derives adopted a methodological perspective based on Science and Technology Studies. To put it simply, these studies seek to explore the contemporary ways of doing science and technology[52] and of providing "inclusive knowledge of the origins, dynamics, and consequences" of them.[53 p.1] Even though at present it consists of a vast and multifaceted approach, the interest of Science and Technology Studies can be synthetized as getting to know the practices that generate scientific knowledge, the connections produced among science, technology, the State, economy, industry or laws, as well as the different ways in which different people participate in the formation of scientific goals and evaluate their results.[53] Science and technology studies are known for a certain aversion to generalizations regarding how knowledge or science behave and operate, mainly because they seek to study the concrete, specific, and local ways in which science is produced and knowledge is created.

Regarding the historical background of the studies on science and technology, their origins can be located in the philosophy and sociology of scientific knowledge. In this regard, the work carried out by Karl Popper, Robert Merton, Ludwik Fleck, Thomas Kuhn and others has been key. In general terms, on the one hand these authors were seeking to explore the viability and operations of scientific knowledge (Popper, Fleck, and Kuhn). On the other hand, they sought to become familiar with the social conditions of knowledge, for example, the political determinations of scientific research programs or the norms and ferocious competitions internal to the scientific field (Merton). Merton's agenda would largely deal with the search for "external" explanations for the progress of science, while Popper, Fleck, and Kuhn's research would anticipate the involvement of philosophy and sociology in science itself. With these influences, back in the 1970s, a new field of study started to develop: the "Sociology of Scientific Knowledge." This kind of sociology did not seek to understand the *social conditions* of the production of scientific knowledge, but to analyze the *content* of science properly: how a set of theories that explain the phenomena are progressively creating knowledge about them through the construction of scientific facts in a non-teleological way. A new field thus began to open in the human and social sciences interested in studying science from an "internist" perspective, that is, interested in the study of the production of *scientific facts*.

Bruno Latour's[55] "Laboratory Life: The Construction of scientific facts" stands as a landmark in this new perspective. This book inaugurated one of the most important traditions in the field of Science and Technology Studies, that of laboratory studies. The book is also one of the founding works of Actor-Network theory. Both Science and Technology Studies and Actor-Network Theory share essential aspects that differentiate them from other branches of work in the human and social sciences. Some of those aspects are: a) ideas regarding the *relativity* of scientific *truths* (insofar as every scientific advancement is the result of a complex system of specific interactions between elements contingently located within the same discipline, research problem or work place, any scientific fact can only be contextual and located *but*, as such, a *true* fact); b) the idea that scientific knowledge

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is *real*; and c) that scientific knowledge is *constructed*.

During the 1990s and as a result of a series of events among which the "Sokal *affair*"[e] stands out, such conception regarding the relative, constructed, and real character of scientific knowledge (a touchstone of Science and Technology Studies and Actor-Network Theory) was radicalized. Such radicalization came about through a strong contrast with postmodern visions regarding the lack of objectivity, reality, and materiality of the world and the science project that aims to know it, as well as the latter's irredeemable determination by the "social conditions" of its production.

As already mentioned, Actor-Network Theory is one important school of thought in Science and Technology Studies, within which this article is inscribed. This school is originally identified with the work of three authors: Bruno Latour, Michel Callon, and John Law. The theory was developed through case studies, particularly those involving laboratory practice, or economic activities such as Callon's research in the French city of St. Brieuc Bay, among others.[56] Although the difficulty of describing in a general way the main aspects of the theory is often conceded, a key element is its approach to the study of science and technology study "in the making," that is, the study of the actors that make science and the place where it is *made*.[57] Other important elements are the Latourian imperative to "follow the actors" (that for Actor-Network Theory are not only *human* actors) who slowly build the "network" through which science and technology are made; and to "open the black box," this is, to observe the micro-processes through which scientific and technologic facts are produced. In this exploration, Law[56] suggests that Actor-Network Theory must be understood as a "material-semiotics." Taking the idea from semiotics that entities are defined only in relation with one another, he suggests applying this principle to all materials, not just those of a linguistic nature. Actor-Network Theory assumes that no entity (actor) stands for itself, but rather that it is performatized (acted, repeated, constructed) through a network, while any network is for sure the result of the agency of the actors involved. Law has summarized the actor-network theory as follows:

> Actor-network theory is a disparate family of material-semiotic tools, sensibilities and methods of analysis that treats everything in the social and natural worlds as a continuously generated effect of the webs of relations within which they are located. It assumes that nothing has reality or form outside the enactment of those relations. Its studies explore and characterize the webs and the practices that carry them. Like other material-semiotic approaches, the actor-network approach thus describes the enactment of materially and discursively heterogeneous relations that produce and reshuffle all kinds of actors including objects, subjects, human beings, machines, animals, "nature," ideas, organizations, inequalities, scale and sizes, and geographical arrangements.(56 p.2)[f]

Taking into account the contributions coming from Science and Technology Studies and from Actor-Network Theory, this study neither took for granted nor epistemologically privileged human action in the clinical ontologies that were studied. It focused on the fact that medical facilities are inhabited by human and non-human entities (medical apparatuses, administrative mechanisms, facilities, legal contracts, advertising material, medical statistics and protocols, oocyte and sperm, etc.), as well as entities whose human status is still under dispute or put on hold in Latin American societies, like embryos. Bruno Latour has stated that:

> No social science can be initiated unless who and what participates in the action is explored first, although this means allowing elements that are called, in other words, non-humans [...] as soon as [objects] are released from the spell, they start to shake, stretch, murmur; they

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> start to wander everywhere, shaking the human actors and waking them from their dogmatic dream.(58 p.107-109)

In accordance with the above, Science and Technology Studies and Actor-Network Theory have been characterized for their emphasis on the analysis of the material and concrete aspects of the empirical realities studied, avoiding all-embracing syntheses regarding "the technique" or the expectation that a given technology would work the same way in the different places where it is implemented. As mentioned above, Science and Technology Studies and Actor-Network Theory have held a profound debate with post-structuralist streams that favor the idea that any object, entity, problem, identity, political project, scientific fact, etc., is the result of linguistic practices that construct *meaning* for human practices. Based on Foucault's thought,(59) Science and Technology Studies and Actor-Network Theory believe that *social construction* can never be split from the *physical devices* through which it is enacted, and can never be reduced to written words. Therefore, before perpetuating the most linguistic-oriented currents of social constructivism and of the qualitative approach, which are often centered on the *saying* (rather than the doing) of the people examined, Science and Technology Studies have highlighted that an approach based only on ideas, cosmovisions, or ideologies are at risk of leaving aside the central aspects of the problems addressed. Annemarie Mol has stated that:

> Instead of studying these topics by teasing out what doctors know or what happens to patient's self-knowledge, I have analyzed the knowledge incorporated in practices [...] does not reside in subjects alone, but also in buildings, knives, dyes, desks [...] the material organization of medical practice shapes the reality of disease.(60 p.48) [g]

During 2008 and 2009, before the passing of the Medically Assisted Reproduction Act (*Ley de Reproducción Médicamente Asistida*), 32 interviews were carried out with practitioners of different medical specialties at fertility clinics. Because the field sites were restricted and, in some cases, difficult to access, most of the people involved were recruited through the sampling technique known as "snowball." However, some of the respondents were contacted directly by the researcher through institutional or personal email or telephone. The interviews focused on practitioners' daily work, usually through a series of general questions regarding how the fertility center works and other aspects on the medical specialty of the interviewee. Practitioners were from the following specialties: gynecology, biology, biochemistry, genetics, psychology and psychoanalysis, endoscopy, endocrinology, and clinical medicine. To select the different specialties, the extent of involvement of such specialties with the different medical areas of the clinic was evaluated. To select potential interviewees, it was made sure that they were working or had previously worked at a fertility center; therefore, self-employed practitioners were not considered. Given the difficulties in accessing this field, the only inclusion criteria for the selection of fertility clinics was that they had been established for over a year and that they had made successful treatments during the same period of time.

During this research, scientists working on basic research in the area of fertility were also consulted. All interviewees signed an informed consent form where they accepted to participate after having received information about the use and purpose of the information gathered. The data gathered and the identity of the people involved were kept confidential. People working at seven different fertility clinics in the Autonomous City of Buenos Aires were interviewed. This research was approved by the Ethics Committee of Goldsmith's Department of Sociology in the University of London.

Throughout this research, different materials were gathered (informed consent forms, informative sheets, flyers, legislation proposals, diagrams, evaluation forms, etc.), and their circulation and agency was analyzed

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along that of human beings as part of the formation of networks and of the material performatization of ideas related to nature and procreation.[2,27,61,62]

Regarding the purpose of the interview, which is mainly a *linguistic* device, as a method to access the clinical ontologies studied, Mol's[60] experience in applying this data collection instrument was taken into account. Mol suggests that only from a perspective that reifies the difference between body and mind, disease and feelings over disease, can the interview be conceived as a device that allows the access only to the *meanings* of what happens to the body (leaving aside the understanding of the body *per se*). On the contrary, Mol proposes that the interview must be applied to ask physicians and patients "about what they do and the events that happen to them, rather than about their thinking,"[60 p.16] [h] getting away from the frequent reluctance of the social scientists to study the body, focusing only on studying the *meanings and interpretations* that people *give* to the body. This approach to the interview allows instead to unravel medical knowledge in a better way, something which "requires an investigation into clinical procedures and apparatuses rather than into the minds and cognitive operations of physicians."[60 p.16][i] The purpose of these interviews was, therefore, to establish the activities carried out by the practitioners interviewed. The interviews sought also to understand the ways in which these professionals interacted with the medical apparatuses and other daily life "practicalities"[60] of reproductive medicine, rather than looking only into the "deep meanings," the "thinking systems," and the "interpretations" and "meanings" that the people interviewed would assign to their daily work.

Once the interviews were finished, an analysis was carried out in order to answer the research question regarding the presence of ideas and practices about nature during gamete exchange in Argentina. Special attention was given to find, analyze, and understand the ways in which the humans involved entwine their actions with medical apparatuses, seeking to know how the medical realities studied are necessarily composed of semiotic and material elements, human and non-human nature. Partial results of these analyses[2,27,62] discuss the production of racial coherence and biological diversity as part of the instantiation of ideas and practices regarding what is nature in assisted reproduction.

As a correlate of this research, a number of articles have presented analyses of themes emerging from the data collection, such as the one discussed in this article. In this regard, although the main purpose of this research was not to understand how women's health was addressed in medical fertility practices, the information collected allowed to establish an area of problematization regarding women's health care, particularly donors. To analyze this dimension, the analysis proceeded in a way similar to the previous cases that is, paying special attention to how it can be considered that taking care (or not) of women's health is, at least partly, the result of the interaction between human agents and biomedical apparatuses, insofar as such result cannot be attributed only to ideas, ideologies, or forms of thought on the matter. Indeed, the research below shows that although there is discursive support for the importance of preserving women's health through reproductive medical practices, the consideration of the *concrete practices* through which such support should be enacted, as well as of the interactions between subjects and objects of medical practices, shows a different panorama than what was expected, that is, a certain disregard for the health of female donors.

Based on Science and Technology Studies, Actor-Network Theory, and the interviews performed, the following paragraphs analyze the role of two specific medical devices, biostatical measures and clinical donation records. These are examined as mechanisms that monitor female donors' health during fertility treatment. Insofar as they presuppose human action without being irrevocably reduced to it, the monitoring mechanisms analyzed are considered socio-technical (that is, they show a certain

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autonomy in the way they operate, yet this does not mean that human agency does not intervene at all). These apparatuses materially contribute to the organization of the clinical-scientific reality that, consequently, must be understood as produced by material, corporal, and socio-technical practices, among others. The purpose is to show the considerable margin of action that they acquire, as non-human entities, during fertility treatment, and to exemplify a perspective attentive to the materiality and the "practicalities"[60] of medical procedures.

BIOSTATISTICAL MEASURES

The "genetic risk"

Modern biology is based on a series of principles, among which is the law of variability. The theory of "natural selection" formulated by Charles Darwin,[63] which explains the prevalence or relative absence of certain biological features in a population, has as one of its main prerequisites the differences in the genetic constitution between individuals of a given population. This variation enables "environmental adaptation," insofar as acquiring new features (due to mutation or crossbreed with another influx population, among other mechanisms) ensures the genetic renovation that make organisms and populations able to face changes in life conditions and, thus, overcome the danger of extinction. Genetic diversity is thus an exalted principle in the great narrative of modern biology. According to this narrative, those organisms whose features better predispose them to survive in certain historical environmental conditions will be able to reproduce more offspring, their genes being widespread in a given population. The evolution of a population is the result of the relation between features that enable more and that enable less the relationship with the environment, a relation that is in itself made possible by variability among individuals.

Reproductive medicine is no stranger to these ideas; on the contrary, these are central to the organization of medical services provided to people who cannot conceive with their own gametes. Guided by the imposition of not contradicting the intrinsic ways in which life works, medical fertility services are not only not separated from this notion but they also explicitly propose to reproduce what is taken as the natural normativity.[1] Thus, references made to the need of ensuring genetic variability when using donated gametes, and the concomitant resistance to violate the ways in which natural selection is thought to work, are extremely frequent in the semiotic-material practices of fertility practice.

But what are the grounds for such insistence? They stem from the medical concern that using gametes coming from the same donors increases the probability that two people that share ancestors "*get to know each other and get married*" (Gynecologist 4), causing the genetic pool to decrease. That is to say, if in fertility treatments both ova and sperm donors come from a limited pool with a low replacement rate which makes it that "it is always the same donors who donate," there exists the probability that people conceived through these gametes reproduce together in the future, reducing the diversity of the population. If these risks are confirmed, they would weaken the institutional orientation of fertility medicine as a service that imitates, rather than contradicting, the natural norm of variability. These risks are managed by using two socio-technical devices (biostatistical measures and donation clinical records), oriented to reducing such risks. This section explores, firstly, how in fact the first of these mechanisms (biostatistical measures) works and, secondly, the risks posed to women's health.

Many professionals frequently refer to the "consanguinity risk" or the "genetic risk" when explaining the rationale for using a limited number of times a donor can donate. These limits, that some professionals call "biostatical measures," are used in order to reduce the probability of encounter between people with the same ancestors. The measures used are generally expressed in the form of ratios that estipulate a certain number

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of donations (or pregnancies or, to a lesser extent, births) for a specific population. For example, "25 pregnancies every 700,000 inhabitants," "1 birth every one million inhabitants," etc. These ratios[j] are mathematically calculated. Their definition follows a calculation regarding the probability of "encounter" of two "half siblings," as the quote below reflects:

> *We calculate as follows, how was it? It was 20 every million, this was the agreed upon number, 20 every million is the same as 1 every 100,000, in other words 1 every 50,000. What is it that matters? I mean, why can't there be more births? If there are 20 births within a population of one million, this would mean* [...] [that] *in the future the probability of encounter between 2 half siblings is 1 in 50,000 by 1 in 50,000. That is to say, 5 by 5 is 25 and 4 zeroes on each side. What is the result of this calculation? Look at that, 2,500,000,000. 1 in 2.5 billion. I mean if I consider this figure, the probability is very low. If I raise the number of pregnancies, this number will decrease, making the encounter between two half siblings more likely*. (Geneticist 1)

As this quote shows, the calculation that serves to regulate the risk of encounter between people with the same ancestors has an abstract character. Its use is not derived from studies (geographical, demographic, historical or sanitary) that serve to establish an appropriate consanguinity risk taking into account the relevant facts of a given real population (i.e. population density or degrees of consanguinity within its inhabitants) However, as described below, this abstract measure is used to regulate the risks held by the concrete bodies of women in ways that raise a few questions regarding its effectiveness.

The abstract nature of biostatistical measures can also be observed in the use of medical guidelines with recommendations for setting a limit to the number of donations that will be accepted from one donor. The most quoted guidelines are, in fact, the "2008 Guidelines for gamete and embryo donation: A practice committee report," published by the American Society for Reproductive Medicine (ASRM) and the Society for Assisted Reproductive Technology (SART), two US organizations that include professionals working in reproductive medicine. As said above, these guidelines, published in 2008, are constantly taken as a model by the practitioners working in the field in Buenos Aires. These guidelines, *which are only for the case of sperm donation*, recommend what is thought to be an appropriate number of times that a donor can donate reproductive material:

> It is difficult to provide a precise number of times that a given donor can be used because one must take into consideration the population base from which the donor is selected and the geographic area that may be served by a given donor. It has been suggested that in a population of 800,000, limiting a single donor to no more than 25 births would avoid any significant increased risk of inadvertent consanguineous conception. This suggestion may require modification if the population using donor insemination represents an isolated subgroup or if the specimens are distributed over a wide geographic area. (64)[k]

This recommendation aims to regulate the number of times gamete donation is allowed within a given population, that is, the population of the country where these recommendations were made (in this case, the US). However, and despite these precautions, given the fact that there is no measure that, considering aspects of the local context such as geographical distribution and density, demographic history, sanitary reality, or relationship degree within the inhabitants, etc., works appropriately in this context, Argentine professionals make use, in a decontextualized way, of the measure suggested by the northern country. The omission of the specific conditions that allow for the implementation of this measure in the USA

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(for example, of the epidemiological studies that would prove that the given measure is appropriate to prevent the risk of endogamy) undermines the *concrete* nature in which this measure is used in the USA, that is to say, the fact that the recommendation considers local information. Thus, Argentine fertility clinics implement in an unspecific way the measure, based on specific population criteria applied in the northern country, insofar as its implementation does not follow from a calculation that takes into account the specific characteristics of Argentina's population. This not only indicates the less concrete or less specific character of the application of this measure in Argentina when taken to the local context without any mediation from its original formulation in the USA. It also shows the extent of the irrelevance of the question regarding the significance of the context in the translation or clinical application of measures formulated in other contexts.

Apart from this process of abstraction or elimination of the empirical bases that support the use of a specific measure, it can also be added that the American recommendations here commented on apply only to sperm donation. In this regard, using this measure for ova donation, as it is done in Argentina, entails a new process of abstraction, that is, an abstraction of the sex for which they ought to work. This transforms it into a measure used with independence of sex, a generic measure (applicable in a way which disassociates it from its context) which is also de-sexualized. In this way, the risks specific to ova donation (its surgical nature, its dependency on hormonal stimulation, among others) are equally separated from the body, eliminating the question regarding the effect of a given number of donations (for example, 25) in the bodies of women who donate.

Risks to the female donor

When asking about the use of measures that limit the number of donations for the sake of genetic risk, a different set of explanations (to the one above) were brought up among some of the people interviewed.. In effect, especially the women interviewed argued that besides the possible consanguinity risk, the limitation to the number of donations was based on the need to preserve the health of those women who donate ova. One of the women who participated indicated that, for example, the number that limits the amount of times a donor can donate:

> *is related to the risk of ovarian cancer and to the risk of a potential diminishing of the ovarian reserve for that patient that, in future, is young and wants to have more kids. Generally, it is said that there is no relation with the alteration of the fertility nor with cancer* [...] *but six is like a maximum number because just imagine, this is a poliovulation that occurs every three months and for the ovaries and the body it is a lot to cope with*. (Gynecologist 2)

This testimony, taken from a female professional, indicates some of the concerns held by the reproductive field, and which are presented by some of its practitioners as an argument to justify the ways in which the services are organized. In this case, the female professional talks about the possibility that the hormonal ovarian stimulation performed in ova donors may affect their health, especially in relation to the risk of cancer or of a diminishing of fertility. The professional explains that even though there is no actual medical risk,[I] there is a suggestion to limit the donation number as a precautionary measure since undergoing *"poliovulation"* – obtaining more than one mature egg as a consequence of ovarian hormone administration – every three months (minimum time frame between one stimulation and the next one) *"is a lot to cope with* [...] *for the ovaries* [...] *and for the body."*

A second professional made her comments along the same lines, although she emphasized the lack of appropriate local studies that monitor the health of female donors. In Argentina, female donors tend to donate more times than the advised amount,

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by attending several clinics to donate the maximum number of times in each of them:

> *All of the studies made were conducted 20, 10 years ago. Whatever happens to the females who are donating now we know nothing about. Nowadays, female donors do not donate as the females in the past used to. They donate more; everything is much more widespread.* (Gynecologist 1)

However, testimonies about the potential risk to the health of those women who donate ova through their "clinical labor"[11] are fewer if compared to those arguments that, as quoted before, discuss the need of limiting the number of donations of the same donor due to the probability of consanguinity or the "genetic risk." When discussing the risks involved, the following dialogue gives examples of the endogamy risk that predominates in the discourse of professionals (especially male professionals):

> *The Argentine Society for Reproductive Medicine* [SAMER - Sociedad Argentina de Medicina Reproductiva] *made a few recommendations that consider the epidemiology and make it so that when in the same population nucleus, a woman has already given one pregnancy per million inhabitants she must be discarded* [sic] *(the same thing happens with sperm donors) to avoid endogamy, because the chances of endogamy increase* [...] [when the same donor goes to different clinics] *endogamy starts to increase and endogamy is not good for the species. It is bad for the species. Endogamy perpetuates many of the features, including those which are not useful or good to perpetuate, am I clear?* (Gynecologist 4)

> *Can a donor donate forever? No* [emphatic]*, because according to the WHO* [World Health Organization] *in a given population, only an x number of children can be produced through gamete donation. This formula, that I believe is in a book, I believe it is in the Manual of Semen of the WHO, a formula where a female or male gamete donor can have up to x number of pregnancies. Why? Because if you exceed this number of pregnancies, the risk of consanguinity may appear.* (Gynecologist 3)

In this regard, the wider clinical resonance of the "consanguinity risk" (as opposed to the risk for female donors) shows an ambivalence regarding the potential risks for the health of women who donate ova in fertility clinics. While some (two in particular) female professionals manifest the potential risks that female donors may experience, especially if they donate frequently, the main issue here is to prevent endogamy risk. This type of risk does not take into account the specificity of ova donation, its surgical nature, or the potential risk of suffering a type of cancer related to fertility, a diminishing of fertility, or ovarian hyper stimulation syndrome (OHSS). This issue is also observed in the fact that the "Manual of Semen" serves as the origin of this measure. In this regard, as suggested by Cooper and Waldby[11] clinical labor in ova donors in the clinical fertility treatment causes specific risks that are not properly monitored despite the measures provided to control them.

"Whatever happens first:" a random risk control

According to the previous paragraphs, two different risks are being controlled during fertility treatments. On the one hand, the idea is to regulate the loss of biological variability while on the other hand, although to a lesser degree, the aim is to control the risks to the donor. Indeed, on the one hand there are measures that – expressed in terms of number of donations, pregnancies, or births *per number of inhabitants* – are used to control the consanguinity risk; and on the other hand there are measures – expressed in terms of donations, pregnancies or births

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per donor (such as "8 donations per donor," "8 pregnancies per donor," etc.) – that aim to monitor women's health risk.

However, *in practice* it is difficult to monitor these two risks *simultaneously*. How are, therefore, the different measures *actually* applied? When and under which criteria is the decision taken to apply a given measure to regulate the number of times a donor donates in a fertility clinic? The testimonies of the interviewed professionals show that there is no single answer to these questions. In fact, rather than an objective, agreed and universally applied criterion that succeeds in harmonizing the monitoring of the two types of risks (the consanguinity risk at the population level and the individual risk of women's health), the biostatistical measures that control both risks are used interchangeably in reproductive medical practice. Some professionals mention that they use the population measure while others mention they use the individual measure. It may also happen that the same person uses both measures depending on the case. Thus, as it will be shown later in this article, which control measure will be used is left to chance,. This implies that, despite the impartiality and the apparently irrefutable character that numbers have, and their capacity to control risks in both a rational and exhaustive way, their use in reproductive treatment tends to preclude, rather than to allow, the appropriate control of the risks that surface, for both the population and the people involved in these procedures, from the use of donated gametes.

Thus, the control of the risks involved in the use of gamete donation is inappropriate since, in the absence of a single measure that can compress the simultaneous monitoring of both risks (at the population and individual level), two combined measures which serve two different purposes are used in practice. As one of the interviewees states:

> *Globally, there is a pre-set limit, a limit per donation that is based, on the one hand, on the consanguinity risk and, on the other hand, on the potential risk to the donor. This limit has been set in six donations, six punctures* [...] *Consanguinity is given by a formula, I don't know how to calculate it, which is 25 live births every 800,000 inhabitants of the same area* [...] *Thus, whatever happens first, whether it is more than 25 born alive every 800,000 inhabitants or that the donor donates more than six times, this would be our limit. Usually, it is when they donate more than six times* (Gynecologist 1)

What the previous quote shows is that since it is very difficult to *simultaneously* apply two measures that aim to control different types of risks, *in practice* measures are selected based on "whatever happens first." This method has the effect of producing the organizational perception that "the risks" have been controlled, the established protocols have been followed, and that there is compliance with the scheduled process; a perception that does not address satisfactorily, however, the question about the effectiveness of the controls applied.

Indeed, what do the more or less random use of the two measures that limit, for different reasons, the number of times a female donor can donate produce in terms of the protection given to the health of female donors? The risk to women's health resulting from their role as donors is not properly controlled when the measure applied is the population criteria for a certain number of donations, pregnancies, or births for a given population. In this case, and since this biostatistical measure was mathematically obtained considering the probability of encounter between two "half-siblings," its application raises questions regarding the effectiveness with which it can control the risk to women's health involved in this clinical labor. The few studies that took place (in other countries) show that up to six donations per donor (or a number similar to this) do not affect the health of women (but they do not show how the latter is affected when the measure that is used is that consisting of 25 pregnancies every 700,000 inhabitants).

The analysis below presents other arguments showing how the actual way in which

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measures to control risks are utilized do not only fail to prevent the occurrence of certain risks, but actually multiply the chances of them occurring.

CLINICAL DONATION REGISTRIES

This section discusses how clinical donation registries are used to monitor the number of times a donor donates her ova in a reproductive treatment. Like biostatistical measures, these registries are used to regulate the amount of times a donor donates her ova; this aims to decrease the probability of both genetic risk and risks to women's health. Unlike biostatistical measures, the way these registries work is by "memorizing" the clinical activities stating what has been done (the number of times a woman has donated) to establish, in future cases, whether a woman can continue donating or not.

Generally, professionals have shown a strong interest in how these registries are created and used, praising their effectiveness regarding the control of risks. However, since to date it has not been possible to create a collective registry that can gather the information collected from all the clinics[m] in Argentina, only intra-clinical donation registries are used. This is important given the "circulation" of donors among different clinics, which allows the exceeding of the stipulated amount of donations suggested by the biostatistical measures. Even though, as previously shown, clinics tend to control the number of times a donor donates, clinics do not have a way to verify whether that same donor donated or will donate to other fertility clinics. This situation shows the heterogeneous rationalities (mainly ethical and economic) that are involved in the organization of gamete donation services, insofar as it is precisely the economic factor and the clinical need to count on a semi-stable pool of donors which collisions with the "ethical" impetus to protect the health of female donors. For example, a professional expressed the following:

> *Just imagine, I went to this meeting at the Association* [Argentine Reproductive Association] *with two friends. On the way to the meeting they told me, they are both part of SAMER, they told me that two or three centers gathered and said "let's see, get me ten donors, the records of ten donors, let's do it." And at one of these clinics, there was a woman who had donated fifteen times, fifteen! Imagine the number of pregnancies she has given to this clinic plus those she has given to other clinics! And I cannot be calling "Hey* [doctor's name] *do you have a donor* [by the name of X]*?" It would be a mess because I would have to call thirty clinics...* (Gynecologist 3)

As shown in the quote above, even though creating a collective registry of clinics is considered to be very important, until this is achieved fertility clinics are unable to control the compliance of women with the number of times they donate *beyond the controls that the clinics have established*. In this way, even though there is a sociotechnical mechanism – a clinical registry – that serves to control (up to a certain extent, as indicated in the paragraph below) the number of times a female donor donates in a clinic, the fact that there is no collective registry that centralizes information from all the clinics working in a specific geographic area, renders these control procedures less efficient. For this reason, the absence of either a state or private initiative to effectively create a collective registry entails a lack of mechanisms that appropriately regulate the potential risk to women's health. Meanwhile, the limit to the number of times a woman can donate her ova established within each clinic does not imply that said woman will not donate her ova to another fertility clinic(s) an equal number of times. Thus, this situation increases her exposure to the risks of donation (maybe unknowingly, if she has not been provided with adequate information[n]):

> *A donor will donate here an "x" number of times and then she will go to another*

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> *fertility center* [...] *We have exclusive donation, that is, all of the ova which are recovered from a donor are for the recipient, but I cannot make sure that the same donor will [not] go to another clinic and donate. We do not go chasing after donors*. (Gynecologist 7)

> *We have established a limit of up to six times for a donor to donate, but the patient that donated six times in this clinic, also donated six times in* [name of the fertility clinic]*, six times in* [name of the fertility clinic]. (Gynecologist 2)

Furthermore, the concrete way in which records are used in the fertility clinic implies that the regulation they propose or exemplify is not always effective. That is, although the interviewed professionals working at fertility clinics stated that, in most cases, they had the appropriate record, some testimonies show that these records are not always used as planned. A professional stated the following:

> Interviewee: *Anyway, a donor should not donate many times*.
> Interviewer: *But is that rule always followed?*
> Interviewee: [Silence] ... *I don't know... we try to* [...]
> Interviewer: *Do fertility clinics have registries such as "this is the last time that this donor donates" for example?*
> Interviewee: *Yes, we do. "This donor cannot donate anymore..." The truth is that there are donors who are preferred over other donors, "what's-her-name is coming," because you know she has good ova, with a good probability of pregnancy, ova donation has a very good success rate*. (Embryologist 1)

This testimony indicates that even though there is a clinical registry that stipulates whether a donor can donate again or not, "the truth" about the fertility clinics is that "there are donors who are preferred over others," specifically those whose ova are "good" and have a good pregnancy probability. This alternative rationality, according to which is sought the maximum productivity of ova over the prevention of the potential risks for the donor's health, entails that those donors whose ova are "nice" are more likely to be exposed to an increase in the probability of risk, since their ova are in higher demand and, as an exception, they can donate more than usual.

CONCLUSION

This article discussed the use of two socio-technical devices (biostatistical measures and donation records) employed to regulate two risks that, according to the medical view, emerge from the use of donated gametes (ova). These risks are the probability that two people procreated from the same donor "meet and marry" in the future; together with the probability that the health of those women who donate is affected by the mere act of donating. In relation to biostatistical measures, this article showed that despite the pervasiveness of a rhetoric regarding the importance of biological variation, that promotes the general understanding that it is important to prevent the risk of encounter between two "half-siblings," there are also other, less clear concerns, that also exist among professionals of the field. These concerns are in effect the fact that the health of female donors can be harmed, especially in relation to the probability of having cancer and future fertility problems. The presence of these two risks encourages the use of two different types of control measures: a population measure, mathematically calculated and abstract, that regulates the probability of encounter between people with the same ancestors; and an individual measure, empirically derived from a few studies in specific women that indicates a donation limit which has been proven to reduce major risks to women. However, insofar as it is very difficult to use these measures together in the clinic, the measures are randomly used ("whatever happens first"). Since each measure seeks to

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control only one type of risk, and since it is impossible to regulate two risks at the same time, the outcome is that on some occasions the population measure is used to control the risk to women's health, and in other occasions the individual measure is used to regulate the genetic (population) risk. Thus, the biostatistical and abstract population measures which are derived from a mathematical probability, split from the concrete local conditions that provide a context for their use (geographical spread, relationship degree among individuals of a population, population or sanitary history), together with their sexual specificity (insofar as they are used irrespectively for both sperm and ova donation), are utilized to prevent the risk to the health of those concrete women who donate via their clinical labor[11] to fertility clinics. Likewise, although empirically derived, individual measures that regulate the risk to women's health are turned into abstract and separate from the reality of the women who donate, since they are taken from studies that took place in other regional contexts different from Argentina.

Regarding the use of clinical donation registries, this article has shown that even though the majority of the clinics implement them as a control measure, the absence of synergies that ensure the construction of an inter-clinical registry that can centralize the information from all of the clinics implies that the risks to female health is not being appropriately regulated. While there are individual clinical registries that serve to establish whether a donor can donate again or not, the lack of a central registry encourages the circulation of donors among the different clinics, where they comply with their individual donation limits, as seen in the testimonies of the professionals interviewed. As it is evident, the failure to have a centralized coordination makes it difficult to appropriately control the risks for the health of women who donate; a risk that is increased by the particular way in which clinical registries are used, that is, by making exceptions that favor the donation by certain donors (with "good" ova), although this might exceed the number of times it is convenient to donate. Additionally, it is also important to take into consideration, the potential lack of information with which donors decide to donate to different fertility clinics, insofar as the lack of medical evidence of an association between ova donation and cancer or reduced fertility could be affecting the quality and type of information provided to donors in regard to this matter.

The discussions presented help to consider to what extent it is not about the absence of monitoring and prevention mechanisms regarding the health of donors, but about the way in which the actual implementation of such mechanisms jeopardizes the possibilities that these mechanisms have of performing their control tasks. At the same time, the deployment of control mechanisms creates the corporate fiction that, since those mechanisms have been implemented, the risks involved have been adequately monitored. These findings open broader ethical questions regarding the participation of persons in experimentation and donation in the contemporary bioeconomy, pointing out the presence of the specific risks that emerge from clinical labor, as well as to the need of controlling them adequately.

The results herein presented point in the same direction as the tendency signaled by analyses already offered in other regions regarding the importance of biological aspects for native ways of understanding kinship. Thus, as this article points out, it is the concern for the possible future union between "half-siblings," understood as those who share a genetic ancestor, that constitutes the focus of the activities of control at fertility clinics. This understanding, that suggest that in Argentina kinship is understood as strongly determined by the genetic component, at least among the practitioners interviewed, appears to be coextensive to a moral aspect: those who share genes shall not unite again. This confirms that suggested by Bestard[30]: in the fertility clinic, social and biological aspects are coproduced, insofar as controlling the genetic risk also implies establishing precaution against moral risks.

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ENDNOTES

[a] The final result of this project was reflected in the doctoral thesis named "The normativity of nature: Morality, variability and kinship in the gamete exchange" (Goldsmiths, University of London). A different analysis in the use of biostatistical

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measures, such as those examined in this article, was published under the title "Population-level management of kinship and normativity: the production of biological viability in assisted reproduction's gamete exchange"[1] ("Gestión poblacional del parentesco y normatividad: la producción de variabilidad biológica en el intercambio de gametas de la reproducción asistida").

[b] For practical purposes, this article talks about ova "donation." However, the term must be critically denaturalized, since in Argentina, ova exchange is paid and compensated with large amounts of money. For an analysis of the sociotechnical devices that produce the donation as such, refer to Ariza.[2]

[c] According to the American Society for Reproductive Medicine (ASRM) "ovarian hyper stimulation syndrome (OHSS) is an excessive response to the drugs that are used to enlarge ova (specially to the injectable gonadotropins)." OHSS produces large amounts of growing follicles, which leads to a liquid filtration to the abdomen, causing bloating, nausea, and swelling. In severe cases blood clots, shortness of breath, abdominal pain, dehydration, and vomiting can be found. In rare occasions, this syndrome can lead to death.[10]

[d] Cooper and Waldby[11] define "clinical labor" as a specific type of embodied work made by certain people (pregnancy surrogates, tissue and body parts providers, clinical studies participants) for the post-Fordism biomedical industry. According to these authors, the in vivo biology of certain human subjects is inscribed in contemporary work processes through the transfer of tissue or the experimental production of data experimental. These types of embodied work are increasingly central for the creation of value in the post-Fordism economy. In particular, expansion of markets linked to assisted reproduction demands ever more outsourced providers (as gamete sellers and pregnant surrogate) to satisfy the growing demand of reproductive services. This article considers that ova donors are included within the definition of "clinical labor."

[e] Physician and mathematician Alan Sokal submitted an article to the Social Text journal that was intentionally fraudulent and made use of a series of theories generically related to postmodernism, trying to show their lack of reasonableness. The article was indeed published in the journal, which generated a debate about the argument proposed by Sokal.

[f] Original in English.

[g] Original in English.

[h] Original in English.

[i] Original in English.

[j] In a previous text[1] I have analyzed the significant variation in the way in which ratios are quoted and used in the fertility centers.

[k] Original in English.

[l] Initially, the (limited) investigation carried out mostly in central countries allow us to conclude that there is no relation between the intake of sexual hormones and cancer. However, related studies are still ongoing and have given no conclusive results. Cancer Research UK quotes, for example, a series of Danish, Dutch, Australian, and British studies that have shown the lack of relation between ovarian and breasts cancer, and the intake of reproductive hormones.[65] A 2006-revision of the donation guidelines of the ASRM stablished that there is no relation between ovulation stimulus agents and ovarian cancer, although it is clarified that "a definite conclusion still requires more studies.[64 p.S216] A 2004-report of the National Institute for Clinical Excellence (National Health Service, UK) states, however, that "women that are offered ovulation induction must be informed that the probable association between ovulation induction therapies and ovarian cancer remains uncertain."[66 p.34] The fertility reduction of donors is, however, a different subject. The 2006 ASRM guidelines establish, for example, that "it is not presently known whether repetitive follicular aspirations could affect the donor's future fertility."[64 p.S216]

[m] It must be noted that, even though the creation of a central gamete and/or embryo bank has been considered a need of the reproductive field for many years, it is also indicated by the Medically Assisted Reproduction Act (Ley de Reproducción Médicamente Asistida) passed in June 2013. However, such record has not been created yet.

[n] This point should be investigated more thoroughly in upcoming studies. In effect, since there is medical consensus – based on a small group of studies made several years ago – that donating up to six or eight times does not harm the health of women, the message that is being given to the potential donors in the meetings is that "donating does not harm health." The way this information is received and reinterpreted, especially in the context of economic need that marks the decision of many women to donate, entails the possibility that the probable health risks are unknown or ignored by those women who decide to donate.

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