



# Singapore needs to update regulation of frozen egg donation after permitting social egg freezing

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## Abstract

With social egg freezing being permitted in Singapore, there is expected to be an accumulated surplus of unused frozen eggs (vitrified oocytes) available for donation in coming years. A comprehensive update of current healthcare regulations pertaining to frozen egg donation is needed to resolve various pertinent ethical issues. In particular, the issue of egg donor anonymity should be addressed, together with the lack of sharing of medical and family information about the donor to prospective recipient patients and donor-conceived offspring. Rigorous and comprehensive genetic testing of prospective egg donors must be mandated to protect the welfare of recipient patients. Older women above 35 years of age should be required to have at least one child, before being allowed to donate their unused frozen eggs, to prevent any future regret and psychological problems of remaining childless, while being unsure of whether they have an unknown genetic offspring out there. New regulations drafted to address these ethical issues must also prevent potential conflicts of interests. For example, fertility doctors soliciting and encouraging former patients to donate their unused frozen eggs face an obvious conflict of interest, because additional medical fees will be earned by performing the egg donation procedure on other patients. A centralized donor registry should be established by the Singapore government to oversee the distribution and allocation of donated unused frozen eggs to infertile IVF patients. Such a registry could also facilitate sharing of vital health information about the donor to recipient patients and donor-conceived offspring.

**Keywords** Cryopreservation · Donor · Ethics · Freezing · Oocyte · Vitrification

## Introduction

After an intensive and lengthy debate, the Singapore government recently announced that elective egg freezing for fertility preservation of women without medical problems, commonly referred to as social egg freezing, will be permitted from 2023 onwards [1]. Although all women aged between 21 and 35 years of age, regardless of marital status, can undergo the procedure, they have to be married before being allowed to utilize their frozen eggs to conceive a child, in keeping with the Singapore government's policy of encouraging motherhood within the context of heterosexual marriage and traditional family structure [1]. While this certainly represents a welcome move towards greater reproductive autonomy for Singaporean women, what has

largely been overlooked is the anticipated increase in the availability of unused frozen eggs for donation to infertile IVF patients unable to conceive with their own eggs.

Indeed, studies conducted in Australia [2, 3] and Israel [4] have confirmed that the overwhelming majority of patients who freeze their eggs do not utilize them. It was estimated that at best, only around 20% of women who freeze their eggs will eventually return to use them [3, 4]. Hence, an accumulated surplus of unused frozen eggs available for donation is to be expected in coming years within Singapore. Because there have been relatively few local egg donation cases in Singapore to date [5], relevant legislation in this area has largely been overlooked and neglected. Indeed, current laws and regulations are outdated and poorly equipped to deal with the anticipated rise in frozen egg donation cases [5–7], following lifting of the ban on social egg freezing from 2023 onwards.

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## Donor anonymity and lack of sharing of vital health information

The most pressing issue relates to donor anonymity and lack of sharing of medical and family information about the egg donor to prospective recipient patients and donor-conceived offspring [8, 9]. Although the risk of accidental incest is minimized by limiting the number of donor offspring to three within Singapore [7], this could be further mitigated by releasing non-identifying information on donor-conceived siblings (such as the total number, sex, and year of birth) to donors, donor-conceived offspring, and their legal parents, as in the case of the Human Fertilization and Embryology Authority (HFEA) of Britain [10]. Because predisposition to many human diseases such as breast cancer [11],  $\alpha$ , $\beta$ -thalassemia [12], and spinal muscular atrophy [13] have a genetic and hereditary basis, it is only right for donor-conceived offspring to have access to such potentially health and life-saving medical information [8]. No doubt, prospective egg donors may be healthy at the time when they froze or donated their eggs, but they or their family members could develop such genetically predisposed health problems later in life [8]. Hence, there must be an avenue to relay such vital health information to donor-conceived offspring, for example through a centralized sperm and egg donor registry, which is glaringly absent from current laws and regulations on assisted reproduction in Singapore [8, 9].

More importantly, the concept of sperm and egg donor anonymity is gradually falling out of favor, and has already been abolished in several countries [14–17]. Indeed, there has been increasing recognition worldwide that donor-conceived offspring have an inherent legal right to know the identity of their egg donor, and even possibly connect with her, as part of forming their own personal identity and acknowledging their family heritage, hence the concept of “open-identity” egg donation [15]. Numerous psychological studies and news media reports have documented the psychological trauma, emotional distress, and identity crisis that donor-conceived offspring undergo, when they suddenly and unexpectedly learn the truth of their conception, for example through a family quarrel [14, 15]. Moreover, the advent of cheap mail-order DNA testing kits and associated online ancestry and genealogy websites may have rendered the concept of donor anonymity obsolete [17]. It is anticipated that universal DNA testing will become a health-care norm in the near future, which will increase the likelihood of donor-conceived offspring inadvertently learning the truth of their conception via DNA-matching with blood relatives on genomic databases [17]. Hence when prospective egg donors undergo mandatory counseling as required by law in Singapore [7], they should be warned of the possibility of being unexpectedly found and contacted by their donor-conceived offspring in the future, through DNA-matching on such publicly-accessible

genomic databases, even though their donation was originally anonymous. It is thus imperative that women who decide to donate their unused frozen eggs, be mentally and emotionally prepared for such unexpected contact with their donor-conceived offspring.

## Refund medical fees for donation of unused frozen eggs

Another regulatory aspect of egg donation in Singapore that needs amendment is stringent prohibitions against monetary payment of egg donors [5, 7]. While there are certainly overriding ethical concerns on undue financial inducements of egg donors and commercialized egg trading [18], for example in the case of “Freeze and Share” schemes [19], such ethical problems do not arise in reimbursed donation of unused frozen eggs, if former patients are just being refunded money that they had previously spent on freezing their eggs [20, 21]. Nevertheless, appropriate safeguards need to be put in place, such as rigorous counseling and informed consent of the donor and her spouse, if she is married at the time of donation [21–23], as well as the need to make prospective recipient patients aware that IVF success rates are significantly lower with frozen versus fresh eggs [24], as they will be the ones refunding the donor and spending so much money on medical fees. In a large-scale clinical study on the efficiency and efficacy of oocyte vitrification (egg freezing) involving 35,654 sibling oocytes (eggs) from about 2000 donation cycles by Cornet-Bartolome et al. [24] in 2020, it was reported that fertilization rates and embryo morphological scores were significantly lower when using vitrified oocytes (frozen eggs), which eventually resulted in lower reproductive outcomes than sibling fresh oocytes (eggs). Hence, to be fair to recipient patients and to enable them to have a reasonable chance of success, it is suggested that refunded donation be restricted to women who had frozen their eggs below 30 years of age [21]. This could serve as an incentive for women to freeze their eggs at a younger age for their own good.

## Rigorous and comprehensive genetic screening of women donating their unused frozen eggs

To avoid transmission of genetic diseases, women donating their unused frozen eggs should be required to undergo intensive and rigorous genetic screening, not usually required for regular egg freezing or IVF patients. For example, practice guidelines set by the American Society for Reproductive Medicine (ASRM) recommend that

egg donors should routinely undergo genetic screening for cystic fibrosis, spinal muscular atrophy, sickle cell disease, alpha and beta thalassemia, Tay-Sachs disease and fragile-X syndrome [25]. Similarly in Australia, prospective egg donors are also routinely screened for cystic fibrosis, thalassemia, spinal muscular atrophy, fragile-X syndrome, and normal karyotype [26]. In some private egg donor agencies or IVF clinics based in Western countries, egg donors may have had their chromosomes tested via high-resolution karyotype and screened for more than 200 genetic disorders [27]. Although regular patients at IVF clinics in Singapore are not normally required to undergo such intensive and rigorous genetic screening, this should be made mandatory if they decide to donate their unused frozen eggs, so as to safeguard the interests and welfare of recipient patients. More importantly, this would make egg donation in Singapore compliant with international standards.

### **Requirement for older women to have at least one child before being allowed to donate their unused frozen eggs**

Yet another suggested safeguard would be to require older women above 35 years of age to have at least one child, before being allowed to donate their unused frozen eggs. This would not apply to fresh egg donation, because of the mandatory requirement for fresh egg donors to be younger or equal to 35 years of age in Singapore [5–7]. The underlying rationale is that such older women would have much reduced chances of conceiving a child after donating their unused frozen eggs. Moreover, women donating their unused frozen eggs would have spent a substantial sum of money on medical fees, unlike fresh egg donation whereby all medical fees are borne by recipient patients rather than donors. Hence, requiring such older women to have at least one child before donation would enable them to experience maternal-infant bonding, which would put them in a far better position to make an informed decision on donating their unused frozen eggs. More importantly, having their own child would also prevent any future regret and psychological problems of remaining childless, while being unsure of whether they have an unknown genetic offspring out there.

### **Resolving potential conflicts of interests faced by fertility doctors and IVF clinics in frozen egg donation**

Finally, new regulations are also required to resolve potential conflicts of interest in the donation of unused frozen eggs. For example, manipulation and abuse of the doctor-patient

fiduciary relationship, if medical professionals are allowed to solicit and encourage their former patients to donate their unused frozen eggs [21–23, 28]. There is an obvious conflict of interest in this case, because additional medical fees will be earned by performing the egg donation procedure on other patients [21–23, 28]. Then, there is also the unsettling possibility of profiteering and covert egg trading by fertility clinics, if they are allowed to manage the distribution and allocation of donated unused frozen eggs to other patients [21]. For example, by surreptitiously marking up medical fees to unsuspecting patients [29]. Hence, to prevent such potential abuse and exploitation, the distribution and allocation of donated unused frozen eggs should be managed solely by a centralized donor registry and waiting list of prospective recipient patients, established and controlled by the Singapore government itself [21–23, 28].

## **Conclusions**

In conclusion, there is a dire and urgent need for a comprehensive overhaul and thorough revamp of outdated laws and regulations pertaining to frozen egg donation in Singapore. Otherwise, this could very well lead to a quagmire of unresolved ethical problems with the anticipated rise in frozen egg donation cases upon legalization of social egg freezing from 2023 onwards.

## **Declarations**

**Conflict of interest** The author declares no competing interests.

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