Comparative preimplantation genetic diagnosis policy in Europe and the USA and its implications for reproductive tourism

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Abstract

Unlike many European nations, the USA has no regulations concerning the use of preimplantation genetic diagnosis (PGD), a technique employed during some fertility treatments to select embryos based on their genes. As such, PGD can and is used for a variety of controversial purposes, including sex selection, selection for children with disabilities such as deafness, and selection for ‘saviour siblings’ who can serve as tissue donors for sick relatives. The lack of regulation, which is due to particular features of the US political and economic landscape, has ethical and practical implications for patients seeking PGD around the world. This paper contrasts the absence of PGD oversight in the USA with existing PGD policies in Switzerland, Italy, France and the UK. The primary reasons why PGD is not regulated in the USA are addressed, with consideration of factors such as funding for assisted reproductive technology treatments and the proximity of PGD to the contentious abortion debate. The obstacles that would need to be overcome in the USA for PGD to be regulated in the future are outlined. Then, the significance of the current divergence in PGD policy for patients around the world are discussed. Regulatory differences create opportunities for reproductive tourism, which result in legal, health and moral challenges. The paper concludes with comments on the need for policymakers around the world to balance respect for the characters and constitutions of their individual countries with appreciation of the needs of infertile patients across the globe.

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KEYWORDS: comparative policy, embryo, preimplantation genetic diagnosis, reproductive tourism, selection

☆ This paper was presented at the Brocher Symposium 'Between Policy and Practice: Interdisciplinary Perspectives on Assisted Reproductive Technologies and Equitable Access to Health Care,’ held at the Brocher Foundation, Hermance, Switzerland in July 2015. The Brocher Foundation’s mission is to encourage research on the ethical, legal and social implications of new medical technologies. Its main activities are to host visiting researchers and to organize symposia, workshops and summer academies. More information on the Brocher foundation program is available at www.brocher.ch.

http://dx.doi.org/10.1016/j.rbms.2017.01.001
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Introduction

Preimplantation genetic diagnosis (PGD) is a technique which can be employed during fertility treatment to test an embryo’s genes before deciding whether to transfer the embryo to a woman’s uterus. The technique is primarily used to detect serious heritable disorders, such as Tay-Sachs or cystic fibrosis, which the parents wish to avoid passing on to their children. It can also be used for more controversial purposes, however, such as selecting for a child who can serve as a tissue donor for a sick sibling, selecting for a child with a certain condition, such as deafness, and selecting for a child of a particular sex. In nearly all countries with advanced fertility clinics carrying out PGD, the technique is limited by legal restrictions on its acceptable use. The USA stands apart in its laissez-faire approach towards the use of PGD. Elective sex selection is reported to account for 9% of PGD uses in the USA, and a small number of clinics offer PGD to select for conditions such as deafness and dwarfism (Baruch et al., 2008).

This paper compares the lack of regulatory oversight of PGD in the USA with the regulations in place in Italy, Switzerland, France and the UK. It aims to answer two related questions: what is different about the USA, and what implications does the US approach have for PGD patients globally? To address these questions, this paper analyses the similarities and differences among the national laws in the selected countries and examines medical professional guidelines in the USA. Factors such as the absence of public funding for fertility treatment, the contentiousness of the abortion debate and the relative independence of physicians in the USA are discussed. It also draws upon the scholarly literature on cross-border reproductive care (CBRC) to argue that the lack of regulation in the USA, like other very lenient or stringent policies, helps to foster global reproductive tourism, which poses well-documented health and legal risks for patients and their offspring. Ultimately, it concludes that when creating rules for the use of PGD, policymakers around the world should consider not only the need for laws to reflect the desires and beliefs of their citizenry, but also the very real impact of policies – particularly extremely permissive or strict policies – on patients within their country and abroad.

PGD policy in Europe

There is wide variation in PGD policy in Europe, but a majority of European countries restrict the use of PGD in some way (Soini, 2007). Italy, Switzerland, France and the UK were selected as case studies in order to demonstrate the variation in PGD policy in Europe and the range and types of forces at play in the development of regulations on the acceptable use of PGD.

Italy

In 2004, taking advantage of its unprecedented majority, the Italian Parliament’s conservative coalition passed one of the most restrictive laws on assisted reproduction in Europe, Italian Law 40 (Biondi, 2013). The law limited the number of embryos created during IVF to a maximum of three and required that all viable embryos be transferred into the patient’s uterus so no embryos would be stored or destroyed. The law also banned the use of PGD and restricted access to assisted reproductive technology to only those with a diagnosis of infertility (Gianaroli et al., 2014), rather than also allowing access to fertile patients with a hereditary condition who need assisted reproductive technology to ensure the birth of unaffected children. Under the restrictive law, PGD was not performed in Italy and Italian couples in need of PGD had to travel abroad for treatment.

Many patients, scientists and members of the general public were opposed to the controversial law, but when a referendum was called in 2005 to have it repealed, only 25.9% of eligible citizens voted, falling short of the 50% needed to meet the quorum. Patient advocates also challenged the law in court and in January 2008 the Regional Administrative Court of Latium declared the ban on PGD unconstitutional (Gianaroli et al., 2014). However, since all embryos, regardless of whether they test positive for the unwanted genetic condition, had to be transferred to the woman’s uterus, in practice PGD still could not be carried out. Finally, in May 2009, the Italian Constitutional Court declared that the rule that only three embryos could be created and that all must be transferred was unconstitutional (Molinelli et al., 2012) and PGD began to be performed in Italy once more.

PGD can now be carried out in Italy for purposes aimed at protecting the health and development of the embryo itself – in other words, to prevent the transmission of a hereditary disease. What remains of Law 40 bans ‘any form of eugenic selection’ or ‘breeding techniques ... intended to alter the genetic heritage of the embryo or gamete or to predetermine genetic characteristics, except interventions with diagnostic or therapeutic purposes’ (2004 (Italy)/2004). There is no formal mechanism for determining what constitutes a sufficiently serious disease to merit PGD, but social uses of PGD, such as sex selection, are prohibited.

Switzerland

From January 2001, Switzerland's legal environment was much like Italy’s under Italian Law 40. PGD was prohibited, only three embryos could be created during IVF, and all needed to be transferred. As with Italy, fertility treatment success rates declined and rates of multiple pregnancies increased under the restrictive law (De Geyter, 2012). Switzerland has since changed its law, however. In June 2013, the Federal Counsel sent to Parliament proposed changes that included allowing PGD for serious heritable disorders, allowing eight, rather than three, embryos to be created, and allowing embryo freezing so that not all viable embryos need to be transferred. In December of 2014, Parliament considered the proposed changes and decided to allow the screening of embryos for chromosomal abnormalities (PGS) in addition to PGD for serious heritable conditions. In order for the proposed changes to come into effect, the Swiss needed to amend their Constitution, which required a popular vote. The vote for modifying Switzerland’s assisted reproductive technology law took place on June 14, 2015, and 62% of voters decided to allow PGD and PGS (Wurz, 2015). Now in Switzerland, as in Italy,
PGD is legal, but the particular set of conditions for which PGD is be permitted is not specified.

France

France, in contrast, has a more detailed regulatory framework for PGD. National law stipulates that PGD can only be performed by a specially certified fertility specialist and can only be used to select against a serious, incurable disease (Loi no. 2011–814). Beyond these general requirements, the 2004 Loi relative à la bioéthique created the Agence de la Biomédecine, which is charged with overseeing assisted reproductive technology and PGD, among other areas (Loi no. 2004–800). The Agence has the power to extend the uses of PGD laid out in France’s bioethics laws (Conseil D’Orientation, 2013a). In 2013, following recommendations from a multidisciplinary Advisory Board, the Director of the Agence decided to permit the use of PGD for human leukocyte antigen (HLA) tissue matching, to select for siblings who can serve as tissue donors, on a trial, case-by-case basis (Conseil D’Orientation, 2013b). Aside from cases of HLA matching, each request to use PGD is reviewed by a Centre Pluridisciplinaire de Diagnostic Prénatal (CPDPN) comprised of physicians, biologists and others. CPDPN decisions to allow PGD are based on an evaluation of whether conditions are sufficiently severe and whether the relevant genetic information is sufficiently diagnostic (Le Diagnostic Préimplantatoire et Vous, 2012).

The United Kingdom

In the UK, a statutory body called the Human Fertilization and Embryology Authority (HFEA) regulates what assisted reproductive technology may be offered. The HFEA receives its authority from the Human Fertilization and Embryology Acts of 1990 and 2008. These bills allow for the use of PGD only for medical purposes, including HLA matching, and the HFEA maintains a detailed list of disorders for which PGD is permitted (PGD Conditions Licensed by the HFEA, 2015). License committees determine whether new conditions qualify as appropriate medical uses of PGD after reviewing an application submitted by a fertility clinic on behalf of a patient. Before it is considered by a License Committee, the application is sent to clinical geneticists and is posted on the HFEA website for public comment. Licenses may be given when there is a significant risk that an embryo will have ‘a. a serious physical or mental disability; b. a serious illness; or c. any other serious medical condition’ (Human Fertilization and Embryology Act, 1990). For lower penetrance and later onset conditions, the HFEA has conducted wider policy reviews that involved public consultation. Like France, the UK regulates precisely the conditions for which PGD can be used and has concluded that PGD can be used to select against serious medical conditions or to select for an HLA match for a sick relative.

PGD policy (or lack thereof) in the USA

In the USA, no agency such as the HFEA or the Agence de la Biomédecine exists and there are no state or federal laws on the acceptable use of PGD. The genetic testing process itself (i.e. the analytic quality of the tests and the qualifications of the technicians who carry them out) are subject to the Clinical Laboratory Improvement Amendments (CLIA), and the Food and Drug Administration may soon begin ensuring that all laboratory-developed tests, including most genetic tests, are clinically valid, but the use of the tests – the reason for which they are carried out – is left to doctors’ discretion and the recommendations of professional organizations.

However, professional guidance relevant to the use of PGD is scant and insufficient. Society guidelines are not legally binding, and many guidelines state that they are educational resources, not requirements (Bayefsky and Jennings, 2015). Furthermore, none of the relevant professional societies have promulgated conclusive guidelines aimed at restricting PGD to a set of ethically acceptable uses. For instance, in 1999, the American Society for Reproductive Medicine (ASRM) published a document on sex selection discouraging the use of PGD for non-medical sex selection, but the subsequently revised ASRM Ethics Committee document on sex selection states that ‘there are reasoned differences of opinion about the permissibility of non-medical sex selection, and therefore practitioners ‘are under no ethical obligation to provide or refuse to provide non-medically indicated methods of sex selection’ (Ethics Committee of the American Society for Reproductive Medicine, 2015). Furthermore, a 2013 ASRM Ethics Committee opinion considers PGD for adult-onset conditions ‘ethically justifiable’ when the condition is serious and there are no known, or only extremely burdensome, interventions available. For less serious or lower penetrance conditions, though, the opinion states that PGD is ‘ethically acceptable as a matter of reproductive liberty’ (Ethics Committee of the American Society for Reproductive Medicine, 2013a). Thus, while ASRM addresses some uses of PGD, their guidelines do not draw a clear line between acceptable and unacceptable uses.

The American Congress of Obstetricians and Gynecologists (ACOG) draws a clearer line regarding the use of assisted reproductive technology for sex selection, recommending against elective sex selection for any reason (Committee on Ethics of the American Congress of Obstetricians and Gynecologists, 2007). However, their guidelines are not binding and sex selection is performed nonetheless. ACOG does not directly address other uses of PGD.

The American College of Medical Genetics (ACMG) does not have a policy specifically on PGD, but its policy on prenatal and preconception screening states there must be validated associations between a mutation and the severity of a disorder (Grody et al., 2013). However, the ACMG also suggests that for adult-onset disorders and disorders with mild phenotypes, variable expression and low penetrance, parents should be able to decide whether to learn this information (Grody et al., 2013). It is left up to the parents, therefore, whether they want to receive and act upon information about less serious genetic conditions regarding their future child.

What explains the lack of regulation of PGD in the USA, as compared with Italy, Switzerland, France and the UK? The USA, like the other countries discussed in this paper, is a Western liberal democracy with high-quality fertility centres offering advanced reproductive care. A combination of interrelated factors contributes to the unusual dearth of
regulation. In the following segments, this paper will describe the most salient economic, political and social features of the USA that bear on the current regulatory landscape for PGD, and the factors that would need to shift in order for PGD to be regulated in the USA. The lack of regulation in the USA effects patients around the world because it makes the country a destination for reproductive tourism for patients from countries with more restrictive laws.

Lack of government-sponsored healthcare

Italy, France and the UK all have healthcare systems that are largely or nearly entirely funded through the government. Since the government plays a major role in financing healthcare, government officials must consider the applications of medical treatments in order to determine what to cover. In France, for example, government-sponsored insurance funds up to four IVF cycles, but only for heterosexual couples. In the UK, the National Health Service (NHS) funds three cycles of IVF for women between ages 23 and 39, one cycle for women between 40 and 42, and coverage is not restricted to heterosexuals or couples. (In practice, coverage for IVF depends in part on the funding available in a given NHS locality. Thus, depending on her postcode, a woman may receive one, two or three three cycles of IVF funded by the NHS.) Italy does not specify to what extent assisted reproductive technology will be funded, but allocates a certain amount of funding for assisted reproductive technology (White and Case LLP, 2009). In the US, by contrast, most people are covered by private insurance and government-funded care (through Medicare, Medicaid and the Veterans Health Administration) does not cover advanced fertility treatment such as IVF and PGD. Fifteen states in the US have insurance mandates that require some coverage of fertility treatment by private insurers, but coverage requirements and eligibility criteria vary widely and several of the mandates specifically do not require coverage for IVF. Since the US government does not directly fund assisted reproductive technology, it is not forced to stipulate when assisted reproductive technology, including PGD, is permissible. While it is possible for a government to regulate medical practice without subsidizing medical care, regulation by such a government is not necessary or inevitable as it is in places where the government also funds care. Though it has not been required to regulate PGD, it remains an interesting question why the US government has not opted to do so. This question is at least partially explained by the other pressures discussed below.

Switzerland also has no government-sponsored healthcare, but unlike the USA, it has developed PGD regulations nonetheless. (Like the USA after the passage of the Affordable Care Act, Switzerland requires individuals to purchase private health insurance.) In Switzerland, other factors – notably the history of eugenics in Germany, and the large portion of culturally-German Swiss people – have contributed to their relatively strict laws (Ehrenberger, 2015). The old Swiss reproductive law was developed as a counter-proposal to a popular initiative entitled ‘Against the misuse of reproductive technologies and genetic manipulation to the human species’, which was launched in 1985 by a German-language newspaper. In the parliamentary debate surrounding the law, the issue of eugenics was raised repeatedly (Parliamentary Debate on the ‘Federal Law on Medically Assisted Procreation’, 1998). Furthermore, a study on the attitudes of Swiss couples concerning the fate of supernumary IVF embryos found that couples from German-speaking areas were less comfortable with research on embryos, suggesting that German-speaking Swiss may have distinct “cultural factors” that influence their attitudes towards the manipulation of human embryos (Mohler-Kuo et al., 2009). In the USA, while the spectre of eugenics is occasionally invoked in the context of PGD (see, for example, Sparrow, 2013), there is not the same widespread public concern about a resurgence of eugenic beliefs.

Independence of medical professionals

The lack of government-funded healthcare is both a product of and contributor to the attitudes of physicians towards government regulation of medical practice. Without a single-payer system, medicine in the USA is largely-market driven (Hartzband and Groopman, 2009), and the field of assisted reproduction in particular is directed by market forces rather than a top-down regulatory approach (Spar, 2006). The market system provides considerable leeway to physicians to offer the services they want to provide and charge the fees they deem appropriate, within certain limits (Spar, 2006). Many physicians have come to value their relative independence – sometimes called ‘physician sovereignty’ (Starr, 1982) or ‘physician autonomy’ (Emanuel and Pearson, 2012) – especially their fiscal independence (Kirch and Vernon, 2009), and therefore have a strong motivation to resist government regulation.

In a paper written by past presidents of the ASRM on the regulation of PGD, the authors state that they ‘espouse self-regulation, eschewing legislative mandates’ (Simpson et al., 2006). They concede that they ‘might feel differently if assisted reproductive technology were funded entirely by the government’ since ‘If the US government or a state were to fund IVF and PGD fully, one could agree that the right to regulate would increase proportionally’. The ASRM leaders believe that as the government does not provide any funding, it lacks the right to regulate their practice. In the UK, by contrast, the NHS directly employs most physicians, and as the employer, the right of the NHS to regulate medical practice is taken somewhat for granted (see, for example, Nettleton et al., 2007). Physicians in the USA continue to hold political capital (Timmermans and Oh, 2012), and their resistance to government regulation creates a significant obstacle in this area.

Embryo politics

Fertility treatment often involves the destruction of excess embryos, and PGD involves the added dimension that discarded embryos contain an ‘undesired’ genetic feature (Bayefsky, 2015). The destruction of embryos is a contentious topic in many places due to the proximity to the abortion debate, but in the USA, intense controversy has resulted in the federal government, for the most part, distancing itself from the issue. The 1995 Dickey-Wicker Amendment prohibits the use of federal funds for research that involves the creation or destruction of human embryos.
The prohibition covers funding allocated to the National Institutes of Health’s (NIH) intramural and extramural research, and even the medical care provided by the NIH Clinical Centre’s fertility programme. In addition, a 1992 law (106 STAT. 4943. Public Law 102-585) prohibits the Veterans Administration from paying for IVF. Rather than adopting a hands-on regulatory approach, as in Italy, the government reached a compromise in which research on embryos and IVF treatment is not banned but also is not publicly funded. It remains an open question whether this compromise was reached due to greater disagreement in the USA, a different balance of political force or other factors. The greater diversity of the USA as compared with most Western European countries (Morin, 2013) may also have contributed, since it is more difficult to design regulations on divisive topics such as the destruction of embryos and the appropriate use of PGD in an extremely diverse representative democracy (Bayefsky, 2015). In order to delineate when PGD is acceptable, the government would need to stake a position on the controversial question of how to handle excess embryos with harmful genetic conditions. As bioethics scholar Thomas Murray writes, ‘Persistent passionate conflicts over the legal and moral status of embryos and fetuses have discouraged American legislators from proposing sensible regulation, lest they be drawn into the abortion debate’ (Murray, 2014). Legislating on contentious issues is particularly difficult during election years, and in Congress, deep divisions on issues related to abortion regularly cause major pieces of legislation to be stalled or blocked (see, for example, Reuters, 2015). States within the USA have adopted a smattering of laws regarding assisted reproductive technology-related issues such as cloning, surrogacy and insurance coverage for IVF, but none have addressed the question of the appropriate uses of PGD. Any state that wished to do so would have to tackle the contentiousness of embryo politics.

The lack of government involvement in funding IVF or PGD, the independence of medical professionals, and the controversial nature of embryos politics in such a diverse country have all contributed to the lack of regulation of PGD in the USA as compared with other Western nations. Other factors, including governmental structure and the moral complexity of when PGD should be allowed, have no doubt also contributed to the dearth of regulation on the topic in the USA, but these will not be discussed in the present paper.

Divergent laws and reproductive tourism

A variety of internal political, economic and cultural factors have contributed to the development, or lack thereof, of PGD regulations in Europe and the USA. While it is reasonable for countries to have laws that reflect the views of the majority of their populace, there are well-documented consequences of divergent laws on assisted reproductive technology. One consequence of note is that patients travel abroad to receive care that is not permitted or difficult to access in their home country (Ferraretti et al., 2010). Cross-border reproductive care (CBRC) is a relatively common phenomenon, accounting for 5% of all European fertility care and 4% of US fertility treatment (Ethics Committee of the American Society for Reproductive Medicine, 2013b). ‘Law evasion’ is a primary driver of CBRC (Inhorn and Patrizio, 2012) and laws on PGD have directly impacted the number of patients seeking treatment from countries with restrictive rules (Gianaroli et al., 2014; Shenfield et al., 2010). Patients are prepared to travel great distances for reproductive care, including PGD, that they cannot receive in their home country (Preimplantation Genetic Diagnosis in Europe, 2007; Spar, 2005), indicating that for some couples, geographic barriers are smaller than legal barriers.

While CBRC can be viewed as a useful option for patients seeking access to treatments prohibited at home, the practice also poses a number of health risks to patients and the resulting offspring. It can be difficult for foreigners to identify high-quality fertility centres where they can access standard-of-care treatment. Furthermore, patients who have travelled to receive care may feel pressured to transfer multiple embryos at once, exposing the patient and offspring to the greater risks of morbidity and mortality associated with multiple pregnancy (Ethics Committee of the American Society for Reproductive Medicine, 2013b). Moreover, some clinics may be reluctant to treat patients who become pregnant abroad as a result of a prohibited treatment, making it difficult to perform monitoring and follow-up after IVF and PGD to ensure a healthy pregnancy and live birth (Preimplantation Genetic Diagnosis in Europe, 2007). These potential health risks are concerning and more data are needed to determine the probability and severity of the risks, as well as which patients are most vulnerable.

Patients seeking CBRC also expose themselves and others to legal risks. It may be illegal to travel abroad for assisted reproductive technology prohibited at home, or illegal to advise or assist patients seeking treatment elsewhere (Storrow, 2011). Furthermore, countries may refuse to recognize the legal parental status of those who have crossed borders to illegally have a child (Storrow, 2011). While this risk applies mainly to surrogacy, it is possible for a country, in theory, to deny parental status following PGD obtained abroad because the parents achieved the pregnancy illegally. Patients could, at minimum, feel pressured to withhold medical information about their child’s conception from their doctors to protect themselves from legal trouble and physicians from complicity in illegal behaviour. To minimize the health and legal risks of CBRC, laws could specifically protect physicians who provide recommendations for where to obtain treatment abroad and care for patients upon their return.

Finally, CBRC may also foster inequalities in access to assisted reproductive technology due to the expense of travel and out-of-pocket care (Ferraretti et al., 2010), which may be exacerbated for such a specialized and costly treatment as PGD. For a foreign couple to undergo IVF and PGD in the USA, they must pay approximately $16,000 out-of-pocket per cycle (RESOLVE, 2015), in addition to travel expenses and the costs of multiple cycles. This cost will be prohibitive to many European couples, even if they decide that they are willing to expose themselves to the medical and legal risks. Only those who are relatively wealthy will be able to obtain PGD abroad from a high-quality clinic.

While CBRC may appear to be a practical solution for patients seeking fertility treatments forbidden in their home countries, it will only be available to patients of sufficient means and is associated with significant medical and legal challenges.
Conclusion

Assisted reproductive technology, and PGD in particular, raise profound ethical questions about which reasonable people, and different cultures and societies, can disagree. It is therefore understandable and morally appropriate for PGD policy to vary in different countries around the world. Distinct societies develop standards that are suited to their histories, circumstances and the beliefs of their respective populations. Nonetheless, in the process of devising these standards, the risks of CBRC should give policymakers pause when designing national regulation on PGD, particularly at the two extremes of banning PGD and permitting all uses. If both very lenient and very restrictive policies were tempered, patients would have a diminished incentive to seek CBRC. In the USA, policymakers have largely avoided the controversial issue, failing to recognize that not regulating PGD involves taking a moral position too (Pennings, 2004); it means allowing patients with sufficient financial resources to obtain whatever service they desire and helping to foster global reproductive tourism. Legislators in the USA and around the world should consider the negative effects of CBRC when reviewing and designing national regulations on PGD. While the significance of national autonomy should not be undervalued, neither should policymakers’ need to acknowledge and address the impact of divergent legal frameworks on patients internationally.

Acknowledgements

The author wishes to thank Benjamin E. Berkman in the Department of Bioethics, National Institutes of Health and National Human Genome Research Institute for his helpful comments and advice.

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Declaration: The author reports no financial or commercial conflicts of interest. The opinions expressed herein are the author’s and do not reflect the policies and positions of the National Institutes of Health, the US Public Health Service or the US Department of Health and Human Services.

Received 30 November 2015; refereed 27 July 2016; accepted 23 January 2017; Available online 22 February 2017.