From Global Perspectives to Local Solutions: a Comparative Analysis and Policy Proposal for Pre-Implantation Genetic Testing in the United States

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I. INTRODUCTION

This note will discuss global approaches to pre-implantation genetic testing ("PGT"). PGT is a process typically performed on human embryos before implantation through an in-vitro fertilization ("IVF") procedure. This comparative analysis will detail policy approaches of different countries and international organizations to this type of genetic testing, specifically the United States, the European Union and Council of Europe, and India. These three actors were chosen for analysis as they each regulate PGT differently, some more extensively than others. The United States has the most permissive approach with no federal regulation, whereas India has legislation explicitly regulating the use of PGT. Comparatively, the European Union and

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Council of Europe operates somewhere in the middle of these two approaches.

Each approach has its own individual merits, and the best approach concerning the regulation of PGT will likely be some combination of the three. Further, the disadvantages of these three approaches will highlight the main concerns about regulating PGT properly. Countries allow PGT for many reasons, including medical purposes (such as detecting inheritable diseases) and nonmedical purposes (such as gender selection based on the parents' personal preferences). Many countries ban the use of PGT for nonmedical purposes, as sex selection of children may reinforce gender inequality. There are also concerns of genetic testing for curable inheritable diseases giving rise to eugenicist ideals.[1]

The structure of the note will begin with background information on PGT (Section II). Second, the note will review several countries' approaches to genetic testing (Sections III.A-C), and the policies behind their approaches will be discussed. Third, the note will highlight any negative policy implications on less restrictive regulations, such as gender inequality (Section IV.A), eugenics (Section IV.B), and "reproductive tourism" (Section IV.C). Finally, the note will conclude with the most favorable approach for the United States in light of the policy considerations and federalism principles previously discussed. (Section V).

II. WHAT IS PRE-IMPLANTATION GENETIC TESTING?

PGT identifies genetic abnormalities in embryos created during the IVF process.[2] The purpose of PGT is to allow one's physician to select embryos that are predicted to be free of genetic or chromosome abnormalities before implantation.[3] An individual pursuing PGT as part of their assisted reproduction plan, will need to undergo an IVF cycle to retrieve that individual's eggs and create embryos.[4] Those embryos, after several days of exponential cell reproduction, can then be taken for PGT.[5] To conduct PGT on an embryo, a small number of cells from the blastocyst, "a cluster of dividing cells

1 Eugenics is defined as the "selection of desired heritable characteristics in order to improve future generations, typically in reference to humans." Philip K. Wilson, *Eugenics*, ENCYCLOPEDIA BRITANNICA (Nov. 25, 2024), https://www.britannica.com/science/eugenics-genetics.

2 *Preimplantation Genetic Testing (PGT)*, FERTILITY & REPROD. MED. CTR., https://fertility.wustl.edu/treatments-services/genetic-counseling/preimplantation-genetic-testing-pgt/ (last visited Mar. 20, 2024).

3 *Id.*

4 *Id.*

5 *Id.*

made by a fertilized egg,"[6] will be removed from each embryo and sent to a lab for testing.[7]

There are three main types (or uses) of PGT: PGT-M, PGT-A, and PGT-SR. PGT for monogenic disorders ("PGT-M") is used to reduce the chance of a specific genetic condition occurring in their children if the patient has a genetic condition,[8] or both parents are carriers for a recessive genetic condition, such as cystic fibrosis.[9] PGT-M testing intends to predict which embryos are free of the genetic condition for which they are at risk, allowing the physician to choose which embryos to transfer in the IVF process.[10]

PGT for aneuploidy ("PGT-A") evaluates random chromosomal abnormalities such as missing or extra chromosomes, which are more likely to result in a miscarriage or failed IVF transfer.[11] While a typical IVF cycle involves choosing embryos for transfer based on their appearance under the microscope (grade), PGT-A provides additional information about the reproductive potential of the embryos, which may not be detected through a microscope alone, and can help the physician select the best embryo for transfer.[12]

PGT is also used for structural rearrangements of chromosomes ("PGT-SR"). PGT-SR is "performed when a patient or their partner has a rearrangement of their own chromosomes" or when the person "is at increased risk to produce embryos with missing or extra pieces of chromosomes."[13]

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6 *Blastocyst,* CLEVELAND CLINIC, https://my.clevelandclinic.org/health/body/22889-blastocyst (last visited Mar. 20, 2024).

7 *Preimplantation Genetic Testing (PGT)*, *supra* note 2.

8 *Id.* Genetic conditions that the patients may have include Neurofibromatosis type 1 (NF1) or Marfan syndrome. *Id.* NF1 is a genetic condition that causes typically non-cancerous (benign) tumors to grow along the nerves. *Neurofibromatosis Type 1*, NAT'L HEALTH SERV., https://www.nhs.uk/conditions/neurofibromatosis-type-1/ (last visited Mar. 20, 2024). Marfan syndrome is an inheritable disorder that affects connective tissue and primarily impacts the heart, eyes, blood vessels, and skeleton. *Marfan Syndrome*, MAYO CLINIC, https://www.mayoclinic.org/diseases-conditions/marfan-syndrome/symptoms-causes/syc-20350782 (last visited Mar. 20, 2024).

9 *Preimplantation Genetic Testing (PGT)*, *supra* note 2. Additionally, PGT-M may be used if the individual using their eggs may be a carrier for an X-linked condition such as Fragile X syndrome. *Id.*

10 *Id.*

11 *Id.* Less commonly, aneuploidy may result in a child with a chromosomal condition such as Down syndrome (Trisomy 21). *Id.* PGT-A is often considered for a patient who "has had recurrent pregnancy losses (miscarriages), multiple unexplained failed IVF cycles, a prior pregnancy or child with certain chromosomal abnormalities, or based on the age of the individual providing their eggs." *Id.*

12 *See id.*

13 *Id.* Embryos with missing or extra pieces of chromosomes are more likely to result in miscarriage or a child with serious health concerns. *Id.* Two types of chromosomal rearrangements include translocation and inversion. *Id.* Translocations are a common type of genetic rearrangements and are considered primary causes for cancers, especially lymphoma and leukemia. Mridula Nambiar & Sathees C. Raghavan, *How Does DNA Break During Chromosomal Translocations?*, 39 NUCLEIC ACIDS RSCH. 5813 (2011). A few diseases that inversion mutations may cause include Hemophilia A, Hunter syndrome, and Emery-

Depending on the testing that is done, PGT may or may not reveal embryo sex. PGT-A differs from PGT-M in that the number of sex chromosomes is generally reported in PGT-A, while not typically reported in PGT-M, simply because of what the test is aimed to detect.[14] However, many labs that perform PGT-M to detect single-gene disorders will also routinely conduct PGT-A testing to screen for aneuploidy.[15] This raises an important question of whether clinics may differ in their policies regarding disclosure and use of the embryo's sex in determining viability for transfer.[16]

While undergoing PGT can be understood as exercising reproductive liberty, this technology raises significant socioethical and legal controversies that must be acknowledged.[17] Concerns of the "specter of eugenics" are prevalent with this technology, especially considering historical eugenic practices.[18] Additionally, PGT has the implication of enabling the selection of offspring according to preference for specific characteristics without any

Dreifuss muscular dystrophy. Lars Feuk, *Inversion Variants in the Human Genome: Role in Disease and Genome Architecture*, 2 GENOME MED. 1, 5 (2010).

14 Ethics Comm. of the Am. Soc'y for Reprod. Med., *Disclosure of Sex when Incidentally Revealed as Part of Preimplantation Genetic Testing (PGT): An Ethics Committee Opinion*, 110 ASRM PAGES 625 (2018). To reprise, PGT-A will look at the chromosomal make-up of the embryo, which may include sex chromosomes, while PGT-M looks for a specific disease-causing gene.

15 *Id.* at 625.

16 *Id.* at 625-26. The ASRM Ethics Committee discussed, in light of the patient's preference to be informed of the embryo's sex, suggests that clinics have nondiscrimination policies in embryo transfer viability but did not create a hard rule that clinics must not use sex of the embryo as criterion for transfer. *See id.* at 625.

17 Margaret E.C. Ginoza & Rosario Isasi, *Regulating Preimplantation Genetic Testing across the World: A Comparison of International Policy and Ethical Perspectives*, 10 COLD SPRING HARBOR PERSP. MED. 1 (2020). Reproductive liberty (or reproductive rights) refers to an "individual's ability to make family planning decisions." *Reproductive Rights*, FINDLAW, https://findlaw.com/family/reproductive-rights.html (last visited Mar. 20, 2024).

18 Ginoza & Isasi, *supra* note 17, at 2. Social Darwinism theory ("survival of the fittest") advanced eugenics and its scientific study in the early 1900s to "determine the extent to which human characteristics of social importance were inherited." Wilson, *supra* note 1. It gained considerable support in the United States during the progressive era and remained active through the 1940s, even being supported by United States President Theodore Roosevelt. *Id.* After World War I, the United States feared that if the "healthy stock of the American people became diluted with socially undesirable traits, the country's political and economic strength would begin to crumble," and many prominent researchers aimed to breed out those undesirable traits, such as blindness, deafness, chronic recipients of charity, racial minorities, and sterilized institutionalized individuals. *Id. See* Buck v. Bell, 274 U.S. 200, 207 (1927). ("It is better for all the world, if instead of waiting to execute degenerate offspring for crime, or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind…[t]hree generations of imbeciles are enough.") "In the early 1930s Nazi Germany took after the American approach to 'identify and selectively reduce' of those deemed to be 'socially inferior' through involuntary sterilization." Wilson, *supra* note 1. And when Germany continued its eugenicist practices beyond sterilization and aimed to exterminate Jewish and other non-Aryan populations, the United States changed its tune. *Id. See infra* Part IV.B. for a discussion on how eugenicist ideals may still be present today with permissive PGT approaches.

medical indication of viability.[19] As popularly criticized with Assistive Reproductive Technology (ART), PGT could be considered as interfering with the natural processes of reproduction, and causing tension between reproductive liberty and state interests in reproductive regulations.[20]

III. GLOBAL APPROACHES TO PGT

A. United States

The United States is considered to have one of the most permissive approaches to PGT.[21] In the United States, PGT is "actively practiced and commercially available," including sex selection.[22] There is also no federal legislation directly regulating the use of PGT. However, the Prenatally and Postnatally Diagnosed Conditions Awareness Act,[23] passed in 2008, intends to increase the provision of scientifically sound information and support services to patients receiving a positive test diagnosis for Down syndrome or other prenatally and postnatally diagnosed conditions as part of genetic counseling. This legislation is intended to influence the patient's decision-making after conducting prenatal testing, and to reduce the number of patients opting for an abortion after receiving a prenatal diagnosis.[24]

Since no PGT legislation exists, its creation would likely fall to the individual states instead of the federal government. Federal oversight of ART generally involves the Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), and Centers for Medicare and Medicaid Services (CMS).[25] The Fertility Clinic Success Rate and Certification Act of 1992,[26] (FCSRCA) creates a certification system by which fertility

19 Ginoza & Isasi, *supra* note 17. *See infra* Part III.A.-C. for a discussion on how different countries vary as to the sex selection of embryos. *See also infra* Part IV.A. for a discussion on how sex selection can further entrench societal gender inequalities.

20 Ginoza & Isasi, *supra* note 17, at 4. *See infra* Part III.A.-C.

21 Ginoza & Isasi, *supra* note 17, at 10.

22 *Id.* at 4. In a survey sent to fertility clinics, nearly seventy-three percent of clinics reporting to the CDC and Society for Assisted Reproductive Technology offer sex selection in general. Sarah M. Capelouto et al., *Sex Selection for Non-Medical Indications: A Survey of Current Pre-Implantation Genetic Screening Practices Among U.S. ART Clinics*, 35 J. ASSISTED REPROD. AND GENETICS 409, 414 (2017).

23 Prenatally and Postnatally Diagnosed Conditions Awareness Act, Pub. L. No. 110-374, 122 Stat. 4051 (2008). This legislation was considered and passed by the Senate on September 23, 154 Cong. Rec. 151 (2008) and was considered and passed by the House on September 25, 154 Cong. Rec. 153 (2008). The law was enacted on October 8, 2008. Pub. L. No. 110-374, 122 Stat. 4051 (2008).

24 Ginoza & Isasi, *supra* note 17, at 7 ("However, PGT still raises the question of whether selecting against conditions such as Down syndrome is discriminatory toward persons with disabilities, who live fulfilling lives in spite of their medical conditions.").

25 *Oversight of Assisted Reproductive Technology,* AM. SOC'Y FOR REPROD. MED., https://www.asrm.org/advocacy-and-policy/media-and-public-affairs/oversite-of-art/ (last visited Mar. 20, 2024).

26 *See* 42 U.S.C.A. §§ 263a-1–a-7 (West, Westlaw through Pub. L. No. 117-168).

clinics must report their pregnancy success rates from IVF to the CDC.[27] With FSCRCA, Congress took a hand-off approach to ART, explicitly barring the Secretary of Health and Human Services (HHS) from establishing federal regulation "which has the effect of exercising supervision or control over the practice of medicine in assisted reproductive technology programs."[28] In protecting the public health, the FDA guarantees the "safety, efficacy, and security of drugs, biological products, and medical devices" in reproductive medicine, and also exercises jurisdiction over the screening and testing of reproductive tissues.[29] Laboratory testing performed on humans, including tests used in reproductive medicine, is under CMS oversight through the Clinical Laboratory Improvement Act (CLIA).[30] However, procedures performed in embryology labs are not considered diagnostic for purposes of the Act and do not fall under CLIA's regulatory oversight.[31]

States license their medical practitioners who meet minimum standards of education and skill, with the authority of state legislation and regulations created by the state medical licensing board.[32] State law defines grounds for practitioner misconduct, requires ongoing educational training, and some states impose specific regulatory requirements for practitioners in reproductive medicine.[33]

The *Dobbs v. Jackson Women's Health Organization*[34] decision, which emphasized that its ruling would return the issue of abortion "to the people's elected representatives,"[35] may have implications for the regulation of PGT and other assistive reproductive technology. The decision was grounded in

27 *Assisted Reproductive Technologies*, 24 GEO. J. GENDER & L. 337, 338 (2023). Around ninety percent of clinics participate in this reporting requirement, but there are no real penalties for failing to report. Rachel Cohen, *Why IVF Looks Different in the US than in the Rest of the World,* VOX, https://www.vox.com/policy/2024/3/26/24104638/abortion-ivf-duckworth-regulation-reproductive-technology (Mar. 26, 2024).

28 42 U.S.C.A. § 263a-2 (i)(2) (West, Westlaw through Pub. L. No. 117-168). States also have the same obligation of not incidentally exercising control over the practice of medicine "[i]n adopting the certification program." *Id.*

29 *Oversight of Assisted Reproductive Technology*, *supra* note 25. *See* 21 C.F.R. § 1271 (2016) for the FDA's tissue practices.

30 *See* 42 C.F.R. § 493.2 (2024) (defining laboratory as "a facility for the biological, microbiological, serological, chemical, immunohematological, hematological, biophysical, cytological, pathological, or other examination of materials derived from the human body for the purpose of providing information for the diagnosis, prevention, or treatment of any disease or impairment of, or the assessment of the health of, human beings. These examinations also include procedures to determine, measure, or otherwise describe the presence or absence of various substances or organisms in the body. Facilities only collecting or preparing specimens (or both) or only serving as a mailing service and not performing testing are not considered laboratories.").

31 *Oversight of Assisted Reproductive Technology*, *supra* note 25.

32 *Id.*

33 *Id.* States also regulate fertility clinic accreditation and inspection, and one state, Louisiana, goes as far as prohibiting the destruction of embryos, requiring patients to "pay forever" to store their embryos or donate them to a married couple. Cohen, *supra* note 27.

34 Dobbs v. Jackson Women's Health Org., 597 U.S. 215 (2022).

35 *Id.* at 232.

the Fourteenth Amendment's Due Process Clause, where, in order to determine whether the right at issue (abortion) is protected by Due Process, the right must be deeply rooted in American history and tradition, and essential to the American scheme of ordered liberty.[36] There, the Court decided that abortion does not fall under the protection of the Due Process Clause of the Fourteenth Amendment.[37] First, the Court stated the historical treatment of abortion, pre-*Roe*, was that the practice was prohibited and criminalized.[38] The Court distinguished abortion from other rights found to be under the "privacy" umbrella, as abortion is not so much about personal choices essential to one's autonomy, but rather about the moral issue of ending the life of a fetus.[39] Second, the Court stated that ordered liberty allows states to regulate conduct based on how its voters have balanced the competing interests.[40] Given this analysis, the Court concluded that, because the Constitution does not confer an express right to abortion, it is up to the individual states to regulate such practice, and such regulations are entitled to rational basis review.[41]

As issues concerning the personhood of an embryo and the disposal of embryos arise, the *Dobbs* decision suggests that ARTs can be regulated,[42] with such laws being held to mere rational basis review.[43] Many states, attempting to maneuver around the *Roe* era, had enacted laws banning abortion motivated by a diagnosis of a "genetic abnormality," with 13 other

36 *Id.* at 234.
37 *Id.* at 231.
38 *Id.* at 248-50.
39 *Id.* at 257.
40 *Id.* at 256.
41 *Id.* at 300.
42 *See* Judith Daar, *The Impact of Dobbs on Assisted Reproductive Technologies: Does It Matter Where Life Begins?*, PETRIE-FLOM CTR.: BILL OF HEALTH (May 9, 2023), https://blog.petrieflom.law.harvard.edu/2023/05/09/the-impact-of-dobbs-on-assisted-reproductive-technologies-does-it-matter-where-life-begins/ (discussing Dobbs' implication on the destruction/disposal of embryos, as well as the concern of PGT facing scrutiny because of the risks to a 5-day old embryo with insufficient benefits). For a very recent example of post-*Dobbs* state court jurisprudence, *see* LePage v. Ctr. for Reprod. Med., P.C., No. SC-2022-0515, 2024 WL 656591 (Ala. Feb. 16, 2024) (ruling that the Alabama Wrongful Death of a Minor Act applies to frozen embryos accidentally destroyed at a fertility clinic, as frozen embryos are declared persons for the purposes of the Act). This Alabama decision has sparked great concern for the availability of in-vitro fertilization, and Alabama Governor Kay Ivey signed a bill into law twenty days after the *LePage* decision, aiming to provide civil and criminal immunity to providers and patients for the destruction or damage to embryos. *See* S.B. 159, Reg. Sess. (Ala. 2024).
43 Kevin J. Hickey & Whitney K. Novak, *Congressional Authority to Regulate Abortion*, CONG. RSCH. SERV., 1 (2022), https://crsreports.congress.gov/product/pdf/LSB/LSB10787 (citing *Dobbs*, 597 U.S. at 301). To pass rational basis review, the statute or ordinance must involve a legitimate state interest, and there must be a rational connection between the state law's means and goals. *Rational Basis Test*, CORNELL LEGAL INFO. INST., https://www.law.cornell.edu/wex/rational_basis_test (last visited Mar. 20, 2024).

states passing similar laws.[44] In other cases, even Justice Clarence Thomas has voiced his support of such laws as appropriate responses to "modern-day eugenics."[45] In his concurring opinion in *Box v. Planned Parenthood of Indiana & Kentucky, Inc.*, Thomas stated that such abortions "eliminate children with unwanted characteristics, such as a particular sex or disability,"[46] so the *Dobbs* decision may also affect the sequence of events leading up to an abortion, such as genetic counseling. Now that such regulations have rational basis review, states could likely prohibit genetic counseling/PGT with little judicial review. A South Carolina bill proposed in 2022 would have made it a felony to help an individual arrange abortion care, and would prohibit anyone from providing information "by telephone, internet or any other mode of communication … knowing the information will be used, or is reasonably likely to be used, for an abortion."[47] This law likely would have implicated the use of genetic counseling and prenatal genetic testing, given that the information from such a test could be used to inform an abortion.

PGT may also be affected if states enact personhood laws, which can limit the number of embryos created through IVF or prohibit the destruction of unused embryos.[48] This will likely drive up the cost of accessing such medical care, which is already a costly endeavor to begin with.[49]

If states enact restrictions that ban abortions early in the first trimester, genetic anomalies may not be properly detected because physicians will rush to perform such procedures within the legally permissible time frame so that their patients have enough time to decide whether to pursue an abortion based on their results.[50] Genetic counselors also face an ethical and professional dilemma as they can be uncertain about what information they can give their patients or what to put in patients' medical records, due to potential civil or criminal liability.[51]

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44 Sonia M. Suter & Laura Hercher, *Dobbs Decision is a Huge Setback for Genetic Counseling and the People Who Need It*, STAT: FIRST OPINION (Aug. 25, 2022), https://www.statnews.com/2022/08/25/dobbs-decision-roadblocks-genetic-counseling/.

45 Box v. Planned Parenthood of Indiana & Kentucky, Inc., 587 U.S. 490, 494 (2019) (Thomas, J., concurring).

46 *Id.* at 1784.

47 S.B. 1373, 124th Gen. Assemb., Reg. Sess. (S.C. 2022). However, South Carolina's Governor, Henry McMaster, stated he will not advance this bill and that its restrictions on speech are "not going to see the light of day." Paige Collings, *Victory! South Carolina Will Not Advance Bill That Banned Speaking About Abortions Online*, ELEC. FRONTIER FOUND. (Aug. 26, 2022), https://www.eff.org/deeplinks/2022/08/victory-south-carolina-will-not-advance-bill-banned-speaking-about-abortions.

48 Suter & Hercher, *supra* note 44.

49 *Id. See* Marissa Conrad, *How Much Does IVF Cost?*, FORBES HEALTH, https://www.forbes.com/health/womens-health/how-much-does-ivf-cost/ (Aug. 14, 2023, 7:04 AM) ("[d]epending on your needs, a single IVF cycle can cost $30,000 or more. More often, the total bill will fall somewhere between $15,000 and $20,000").

50 Suter & Hercher, *supra* note 44.

51 *Id.*

Overall, it appears that reproductive regulation is left to the states to individually decide on its approach to the practice. It is unlikely that direct federal legislation regulating the use of PGT will be upheld, given that states generally have broad authority to enact its own legislation concerning matters related to the health and welfare of its citizens, so long as it is not violative of the Constitution.[52] Congress may only enact legislation under a specific power enumerated in the Constitution, and cannot exceed the scope of its power to impede state sovereignty.[53] Under the anti-commandeering doctrine, which prohibits the federal government from requiring states to use their own resources to enforce federal laws or programs,[54] Congress may not, for example, require states to adopt or enforce federal policies, such as those regulating PGT.[55] Under the Supremacy Clause,[56] however, such federal regulation may preempt state laws. Even so, it is unlikely that such a federal regulation would be created considering the *Dobbs* decision and the Court's typical deference to state legislatures.[57]

Two possible avenues of federal regulation worth discussing are the Commerce Clause and the Spending Clause.[58] The Commerce Clause grants Congress the power "[t]o regulate Commerce with foreign Nations, and

52 *See* Hickey & Novak, *supra* note 43, at 1.

53 *See* Bryan L. Adkins et al., *Federalism-Based Limitations on Congressional Power: An Overview*, CONG. RSCH. SERV., 1 (2023), https://crsreports.congress.gov/product/pdf/R/R45323.

54 Mike Maharrey, *The Anti-Commandeering Doctrine: An Introduction*, TENTH AMEND. CTR. (Jan. 4, 2021), https://tenthamendmentcenter.com/2021/01/04/the-anti-commandeering-doctrine-an-introduction/.

55 Hickey & Novak, *supra* note 43, at 2.

56 U.S. CONST. art. VI, cl. 2. However, the Court has employed a method of construction known as the "presumption against preemption," which instructs that federal law should not be read as preempting state law unless such preemption was the "clear and manifest purpose of Congress." Bryan L. Adkins et al., *Federal Preemption: A Legal Primer*, CONG. RSCH. SERV. 4 (2023), https://sgp.fas.org/crs/misc/R45825.pdf (quoting Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947)). There are two types of preemption: express and implied. Under implied preemption, there are two subcategories: field and conflict preemption. *Id*. at 17. Field preemption occurs when a pervasive federal regulatory scheme implicitly precludes state regulation, or when states regulate a field where there is a clear, dominant federal interest. *Id.* Conflict preemption occurs when state law interferes with federal goals and has two subcategories: impossibility preemption (when it is impossible to comply with both state and federal laws) and obstacle preemption (when federal law preempts state laws that pose an obstacle to the "full purposes and objectives" of Congress). *Id.* at 23 (quoting Hines v. Davidowitz, 312 U.S. 52, 67 (1941)). Under these categories of preemption, it is unlikely that Congress could preempt state laws on PGT, as *Dobbs* could likely prohibit a comprehensive federal regulatory scheme on assisted reproductive technology and there is not a dominant federal interest. Congress could preempt state laws under impossibility preemption, but the "presumption against preemption" is likely to cut in favor of the states, as regulating medical programs would be within the states' police powers.

57 *Cf.* Hickey & Novak, *supra* note 43, at 2-6 (providing examples of ways Congress may rely on certain enumerated powers to create more general federal legislation related to abortion).

58 *Id.* at 2-5. *See supra* note 43-44 and accompanying text for the discussion on how abortion and PGT regulation may be closely related and how the *Dobbs* decision affects access to these procedures.

among the several States, and with the Indian Tribes,"[59] which allows Congress to regulate economic and social activities. The modern test for determining whether a federal statute is within Congress' Commerce Clause power is in *United States v. Lopez.*[60] Under *Lopez*, Congress may regulate the "channels of interstate commerce," the "instrumentalities of interstate commerce, or persons or things in interstate commerce," and "activities that substantially affect interstate commerce."[61] There are several factors to determine whether an activity that Congress regulates "substantially affects" interstate commerce, such as (1) whether the activity is economic in nature, (2) whether the statute contains an express jurisdictional element linking the activity regulated by Congress to interstate commerce, (3) express congressional findings regarding the activity's effect(s) on interstate commerce, and (4) the link between the regulated activity and interstate commerce.[62] With these factors, it may be difficult to show that PGT is economic in nature, and to present express congressional findings showing such an activity affects interstate commerce.[63] The Court has traditionally upheld legislation that regulates "intrastate *economic* activity—the 'production, distribution, and consumption of commodities'—that substantially affects interstate commerce.[64] Congressional findings alone may not be enough to support the use of the Commerce Clause, especially when the activity is non-economic in nature and falls within the states' police powers.[65] There is an open question as to whether Congress can use its Commerce Clause power to regulate reproductive services, and whether such services can be considered a commodity.[66] But given *Dobbs*'s shift towards state authority in regulating healthcare under their police powers, it appears unlikely that such a regulation would be proposed by Congress or upheld by the Court.

The Spending Clause allows Congress to "lay and collect Taxes, Duties, Imposts, and Excises, to pay the Debts and provide for the common Defence

59 U.S. CONST. art. I, § 8, cl. 3.

60 *See* United States v. Lopez, 514 U.S. 549 (1995).

61 *Id.* at 558-59. The third category allowed Congress to regulate activities as long as they are considered a "class of activities [that] *as a whole* substantially affects interstate commerce…." *Id.* at 600.

62 *See* United States v. Morrison, 529 U.S. 598 (2000).

63 *Lopez* struck down a law that regulated purely local, non-economic activities lacking any jurisdictional element or congressional findings to link gun use in school zones to interstate commerce. *Lopez*, 514 U.S. at 567.

64 Hickey & Novak, *supra* note 43, at 2 (quoting Gonzales v. Raich, 545 U.S. 1, 26 (2005)) (original emphasis).

65 *See Morrison*, 529 U.S. at 618.

66 *See* Hickey & Novak, *supra* note 43, at 3 (noting that lower courts have held that the Freedom of Access to Clinic Entrances (FACE) Act of 1994 and the Partial-Birth Abortion Ban Act (PBABA) of 2003, which conclude that reproductive health services can be considered interstate commercial activity, but the Supreme Court did not address the ability to regulate reproductive services under the Commerce Clause, as PBABA was violative of the Fourteenth Amendment, when Roe v. Wade*,* 410 U.S. 113 (1973), and Casey v. Planned Parenthood, 505 U.S. 833 (1992) were still good law).

and general Welfare of the United States."[67] As incident to the spending power, Congress may attach conditions on the receipt of federal funds to further policy objectives.[68] The five main limitations on Congress' ability to attach conditions to federal funds are: (1) a funding condition must be in "pursuit of the general welfare,"[69] (2) the condition must be unambiguous as to give clear notice to the states or other entities of the condition,[70] (3) the condition must be related to "the federal interest in particular national projects or programs,"[71] (4) the condition may not be independently barred by other constitutional provisions,[72] and (5) the condition may not be so coercive to the point that "pressure turns into compulsion."[73] Despite these restrictions, Congress has broad authority to impose conditions on federal funds, and courts have rarely invalidated said conditions under the Spending Clause.[74] Regulating PGT through the Spending Clause would likely fail under the first or third restriction. The current Congress and Supreme Court would be unlikely to agree on whether regulating PGT falls within "the pursuit of the general welfare," given how divisive reproductive health services are today. Additionally, regulating PGT—or reproductive services in general—may not be related to a federal interest, given that the provision of health services has traditionally been within the purview of the states, with *Dobbs* putting a finer point on that issue. As it stands today, there is no federal legislation regulating the use of PGT or the instances in which the testing may be used. Based on this discussion, it remains unclear whether any such law by Congress would be upheld under either the Commerce Clause or the Spending Clause.

Given the lack of federal legislative regulation on PGT, the regulatory framework of the United States is mostly comprised of guidelines from multiple professional societies, which offer recommendations regarding the practice through self-regulation.[75] The degree to which the recommendations are followed rests entirely on the discretion of the provider, given that

67 U.S. CONST. art. I, § 8, cl. 1

68 *See* South Dakota v. Dole, 483 U.S. 203, 206 (1987).

69 *Id.* at 207.

70 *See id.*

71 *Id.*

72 *Id.* at 208.

73 *Id.* at 211.

74 Hickey & Novak, *supra* note 43, at 4. The Affordable Care Act's attempt to withhold federal grants from states that would not expand Medicaid funding remains the only modern instance where the Supreme Court invalidated Congress' power to impose conditions on federal funds. *Id.* (discussing National Federation of Independent Business v. Sebelius, 567 U.S. 519 (2012)).

75 *See* Ginoza & Isasi, *supra* note 17, at 4. The American Society for Reproductive Medicine (ASRM) and the Society for Assisted Reproductive Technology (SART) are generally supportive of the technology to prevent heritable and debilitating genetic disease to pass onto patients' children, although the two groups vary in their opinions on using PGT for sex selection and medical necessity. *Id.*

no federal regulations are in place for PGT.[76] The American Society for Reproductive Medicine's (ASRM's) Ethics Committee has released several opinions concerning the moral dilemmas involved in PGT. ASRM stated in a 2018 opinion that clinics *may* develop policies to deter/disallow selecting embryos for transfer based on sex and only to use embryo viability/quality as the appropriate criteria.[77] While acknowledging unethical clinic policies of transferring only male or female embryos, ASRM avoided creating a hard rule disallowing such practice, emphasizing the importance of informing patients of the possibility of incidentally revealing sex, and that it should be up to the patient on whether they receive such information.[78]

In another 2018 opinion concerning the use of PGT-M specifically, the Ethics Committee advised that PGT-M is permissible when the conditions are serious and there are no known adequate or effective interventions for the condition(s).[79] While PGT-M is still permissible as a form of reproductive liberty for less serious conditions, if IVF teams are not comfortable transferring embryos that would result in offspring affected by a genetic condition, they are not required to perform the procedure.[80] Critics of PGT-M argue that using the procedure risks devaluing certain lives, and operates by preventing the birth of people with the disease, not by treating a disease in the parent.[81] Given these concerns, the ASRM does not give a hard rule on PGT-M procedures for adult-onset conditions, grounding its opinion in the patient's reproductive liberties.[82]

Professional organizations in the United States differ on the issue of nonmedical sex selection in PGT. The American College of Obstetricians and Gynecologists (ACOG) has explicitly opposed the practice,[83] whereas ASRM opted against creating a hard rule allowing/prohibiting such a

76 *Id.*

77 Ethics Comm. of the Am. Soc'y for Reprod. Med., *supra* note 14. Under this opinion, clinics may also develop policies to use randomization to select embryos for transfer if more than one embryo is suitable for implantation. *Id.*

78 *Id.*

79 Ethics Comm. of the Am. Soc'y for Reprod. Med., *Use of Preimplantation Genetic Testing for Monogenic Defects (PGT-M) for Adult-Onset Conditions: an Ethics Committee Opinion,* 109 ASRM PAGES 989 (2018). Conditions of this sort may include Huntington's Disease, which is uniformly fatal, but varies as to the onset of the mutation. *Id.*

80 *Id.* The opinion also emphasized the importance of a genetic counselor knowledgeable of such genetic conditions to participate in the decision-making process to ensure that patients are adequately informed before determining their next steps. *Id.*

81 *Id.* ASRM also discussed PGT-M as potentially reinforcing the problematic view of "genetic causation," with the potential to send a negative message concerning the value of individuals currently living with the disease or mutation. *Id.*

82 *Id.*

83 The Am. Coll. of Obstetricians and Gynecologists, *ACOG Committee Opinion No. 360: Sex Selection*, 109 ACOG PUBLICATIONS 475 (2007) ("The Committee on Ethics supports the practice of offering patients procedures for the purpose of preventing serious sex-linked genetic diseases. However, the committee opposes meeting requests for sex selection for personal and family reasons, including family balancing, because of the concern that such requests may ultimately support sexist practices.").

practice. In its 2021 opinion, ASRM acknowledged that the practice of pre-implantation sex selection is "ethically controversial" and should not be encouraged for nonmedical reasons (i.e. sex-linked genetic diseases). However, ASRM encourages individual clinics to develop and make available their own policies regarding PGT.[84] ASRM stated that ART practitioners are "under no ethical obligation to provide or refuse to provide nonmedically-indicated methods of sex selection."[85] In detailing arguments supporting the use of ART for sex selection for nonmedical reasons, ASRM discusses patient autonomy "to have the experience of raising children of both sexes, and reproductive liberty, where such technologies "enable individuals to shape the course of their pregnancy and child-rearing experience."[86] Arguments against using PGT-A for nonmedical sex selection include harm to offspring, harm to both women and men, misusing medical resources, and risks of discrimination and perpetuating social injustice and gender inequality.[87]

The United States is considered one of the most permissive countries regarding PGT.[88] While some federal agencies have oversight on certain aspects of ART generally, the United States lacks legislative regulation explicitly regulating PGT. Based on the United States' conception of federalism, it is likely that PGT legislative regulation will fall to the states. The PGT regulatory framework in the United States consists of guidelines from professional organizations, and individual practitioners have discretion on whether they follow those guidelines. Because of the lack of regulation, the United States is commonly considered a "destination[] for reproductive tourism."[89] While the professional organizations have acknowledged the negative consequences of using PGT for nonmedical sex selection or adult-onset conditions, the reproductive autonomy of the patient to control their pregnancy plan appear to weigh heavily in favor for expansive uses of PGT.

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84 *See* Ethics Comm. of the Am. Soc'y for Reprod. Med., *Use of Reproductive Technology for Sex Selection for Nonmedical Reasons: An Ethics Committee Opinion*, 117 ASRM PAGES 720, 721 (2022).

85 *Id*.

86 *Id.* Additionally, practitioners "policing the underlying attitudes among individuals with preferences for the sex of a child may be judged to be beyond the scope of fertility care as a practical matter, and may violate patient autonomy and privacy when applied to evaluating individual circumstances." *Id.*

87 *Id.* at 722-23. *See infra* IV.A (discussing nonmedical sex selection and its role in entrenching gender inequalities). The 2021 opinion also discusses that PGT-A for purposes of nonmedical sex selection fails to show respect for embryos and risks creating a "slippery slope toward selection of many other traits in offspring that would be ethically problematic." Ethics Comm. of the Am. Soc'y for Reprod. Med., *supra* note 84 at 722. *See infra* IV.B (discussing possible eugenicist implications of PGT practices).

88 Ginoza & Isasi, *supra* note 17, at 10.

89 *Id. See infra* IV.C (discussing reproductive tourism concerns).

B. European Union and the Council of Europe

Regulation of PGT is largely left to the national governments of Member States in the European Union, but certain aspects of the Charter of Fundamental Rights and several Conventions from the Council of Europe, a distinct legal and monitoring organization, are heavily influential on the Member States' legal frameworks.

The Charter of Fundamental Rights of the European Union is a legally binding attachment to the EU Constitution,[90] and prospective Member States must agree to the Constitution and its charters to enter the Union. Article 3,[91] which governs the Right to the Integrity of the Person, is especially pertinent. When considering PGT, the provisions respecting informed consent of patients and prohibiting eugenic practice aimed at the selection of persons, may be relevant. Depending on the interpretation of what "eugenic practices" encompass, this may have restrictive applications for PGT.[92] Since regulation of medical ethical issues at the national level is not a matter for European Union jurisdiction, this provision in the Charter would be binding on Member States only in so far as they are implementing EU law.[93]

The Convention for the Protection of Human Rights and Fundamental Freedoms was opened for signature by Member States of the Council of Europe and for access by the European Union in 1950, and came into force

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90 *See* ANNIEK CORVELEYN ET AL., PREIMPLANTATION GENETIC DIAGNOSIS IN EUROPE, EUR. COMMISSION 58 (2007).

91 *See* E.U. Charter Art. 3. Article 3 of the Charter states:

1. Everyone has the right to respect for his or her physical and mental integrity.
2. In the fields of medicine and biology, the following must be respected in particular:
— The free and informed consent of the person concerned, according to the procedures laid down by law,
— The prohibition of eugenic practices, in particular those aiming at the selection of persons,
— The prohibition on making the human body and its parts as such a source of financial gain,
— The prohibition of the reproductive cloning of human beings.

Id.

92 CORVELEYN ET AL., *supra* note 90, at 58. Twenty-six European nations and the European Union have ratified the Istanbul Convention. Council of Eur. Treaty Off., *Chart of Signatures and Ratifications of Treaty 210*, https://www.coe.int/en/web/conventions/full-list?module=signatures-by-treaty&treatynum=210 (last visited Mar. 21, 2024). The convention declares that nonconsensual sterilization is a human rights violation, but several countries have made exceptions to the rule. Sarah Hurtes, *Despite Bans, Disabled Women are Still Being Sterilized in Europe*, N.Y. TIMES (Nov. 25, 2023), https://www.nytimes.com/2023/11/25/world/europe/europe-disabled-women-sterilization.html. "Eugenic practices" is not defined anywhere in the Charter itself, and the only statutory guidance for the definition is found in the Oviedo Convention, *see infra* note 106, which has only been ratified by twenty-nine of the forty-seven European states. GENETIC LITERACY PROJECT, *European Union: Germline/Embryonic*, https://crispr-gene-editing-regs-tracker.geneticliteracyproject.org/eu-germline-embryonic/ (last visited Mar. 21, 2024).

93 CORVELEYN ET AL., *supra* note 90, at 58. Nevertheless, it is likely that the Charter would at least influence Member States' regulations concerning medical ethical issues, especially PGT.

in 1953.[94] In order to implement the Convention's laws in a Member State, that Member State must sign onto the treaty, and then ratify the convention through its individual legislative processes.[95] A state may reserve the right not to abide by certain provisions of the treaty. Forty-six total countries signed and ratified this Convention.[96] Article 8[97] of this Convention is considered the most relevant to reproductive and genetic technologies, as it embodies the rights of patients, children, and donors, all in one.[98] Article 8 acknowledges the individual right to respect for a person's private and family life, along with related correspondences. It also prohibits public authorities from interfering with the exercise of that right, with exceptions for when national security or public safety concerns arise.[99] Anniek Corevelyn, in writing for the European Commission Joint Research Centre on PGT in Europe, stated that Article 8 protects rights to "self-determination and procreation," along with a stringent threshold that states must meet before they can intrude on that right.[100] While Article 8 is routinely applied to issues concerning reproductive autonomy,[101] Article 8 may be difficult to apply to PGT and other new reproductive technologies given their moral and ethical controversies.[102]

The 1997 European Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine (the Oviedo Convention) is intended to provide a methodology for the protection of human rights relating to biology and medicine.[103] The treaty was opened in 1997 for signature by the Member States, the non-Member States which participated in its elaboration, and the European

94 COUNCIL OF EUR. TREATY OFF. https://www.coe.int/en/web/conventions/cets-number-/-abridged-title-known?module=signatures-by-treaty&treatynum=005 (last visited Mar. 21, 2024) [hereinafter *Treaty 005 Signatures*].

95 EUROPEAN COMM'N, *Types of EU Law*, https://commission.europa.eu/law/law-making-process/types-eu-law_en (last visited Mar. 21, 2024).

96 *Treaty 005 Signatures*, *supra* note 94 (listing each country that ratified this convention, including both members and non-members of the Council of Europe).

97 *See* Convention for the Protection of Human Rights and Fundamental Freedoms, *opened for signature* Nov. 4, 1950, E.T.S. No. 5, (entered into force Sept. 3, 1953). Article 8 of the Convention states:

> (1) Everyone has the right to respect for his private and family life, his home and his correspondence.
>
> (2) There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others.

Id.

98 CORVELEYN ET AL., *supra* note 90, at 59.

99 Convention for the Protection of Human Rights and Fundamental Freedoms, *supra* note 97, at art. 8.

100 CORVELEYN ET AL., *supra* note 90, at 59.

101 *See infra* note 116.

102 CORVELEYN ET AL., *supra* note 90, at 59.

103 *Id.* at 60.

Union, and opened for accession by other non-Member States.[104] The treaty entered into force in 1999.[105] Article 12 of the Oviedo Convention discusses predictive genetic tests,[106] Article 13 discusses intentions on the human genome,[107] Article 14 provides a rule for non-selection of sex,[108] and Article 18 outlines research on embryos *in vitro*.[109]

The Explanatory Report on the Oviedo Convention provides guidance on how these articles should be applied.[110] Most notably, paragraph 83 of the Explanatory Report on the Oviedo Convention states that Article 12 "does not imply any limitation of the right to carry out diagnostic interventions at the embryonic stage to find out whether an embryo carries hereditary traits that will lead to serious diseases in the future child."[111] With regard to Article 14, it has been clarified that it is within the prerogative of internal law "to determine, according to the procedures applied in each state, the seriousness of a hereditary sex-related disease."[112]

The Oviedo Convention is far from receiving unanimous support. The Convention received very mixed responses within the European Union and several countries have declined to ratify the Convention.[113] Many have

104 COUNCIL OF EUR. TREATY OFF., *Chart of Signatures and Ratifications of Treaty 164*, https://www.coe.int/en/web/conventions/full-list?module=signatures-by-treaty&treatynum=164 (last visited Mar. 21, 2024).

105 *Id.*

106 *See* Convention for the Protection of Human Rights and Dignity of the Human Beings with regard to the Application of Biology and Medicine, Apr. 4, 1997, E.T.S. No. 164. ("Tests which are predictive of genetic diseases or which serve either to identify the subject as a carrier of a gene responsible for a disease or to detect a genetic predisposition or susceptibility to a disease may be performed only for health purposes or for scientific research linked to health purposes, and subject to appropriate genetic counselling.").

107 *Id.* ("An intervention seeking to modify the human genome may only be undertaken for preventive, diagnostic or therapeutic purposes and only if its aim is not to introduce any modification in the genome of any descendants.").

108 *Id.* ("The use of techniques of medically assisted procreation shall not be allowed for the purpose of choosing a future child's sex, except where serious hereditary sex-related disease is to be avoided.").

109 *Id.* ("(1) Where the law allows research on embryos in vitro, it shall ensure adequate protection of the embryo. (2) The creation of human embryos for research purposes is prohibited.").

110 Sec'y Gen. of the Council of Eur., *Explanatory Report to the Convention for the Protection of Human Rights and Dignity of the Human Being with Regard to the Application of Biology and Medicine,* E.T.S. No. 164 (Dec. 17, 1996).

111 *Id.* at ¶ 83.

112 *Id.* at ¶ 94. (following the principles that medical ethical issues at the national level are not a matter for European Union Jurisdiction and should be regulated by each individual Member State).

113 CORVELEYN ET AL., *supra* note 90, at 60-61. At the time of publication, Corveleyn also noted that Russia declined the ratify the Convention. *Id.* While not a Member State, Russia shared a "longstanding historical, cultural, scientific and economic" relationship with the European Union. EUR. EXTERNAL ACTION SERV., *Facts and Figures about EU-Russia Relations*, https://www.eeas.europa.eu/sites/default/files/eeas-eu-russia_relation-en_2021-07.pdf. Russia's relationship with the European Union has become strained since its annexation of Crimea in 2014 and its attacks on Ukraine in 2022. *Id.* Dialogues and cooperation between the two parties will remain suspended until Russia's full implementation of the Minsk agreements. *Id.* As of January 2024, Italy, Luxembourg, Netherlands, Poland,

criticized the Oviedo Convention for its methodology and political bias, and the Convention's broad reach has called its effectiveness into question.[114] Additionally, the Convention has been criticized for its failure to contain a mechanism for judicial or quasi-judicial review of violations, as such violations are not independently reviewable by the European Court of Human Rights ("ECtHR").[115] Even if the ECtHR could review such actions as alleged violations of the European Convention on Human Rights ("ECHR"), the degree to which the Oviedo Convention influences the Court's decision appears inconsistent and unsettled.[116] Ultimately, the ECHR and the Oviedo Convention remain two distinct legal instruments, and it is important not to blend them together.[117]

If a Member State agrees on certain matters within the convention but does not want to ratify the entire treaty, the State can simply incorporate similar provisions in their national law through their parliament and achieve a similar goal without wholesale ratification of the convention.

The European Union and Council of Europe's approach to regulating PGT is more from a birds-eye view, being a general framework for Member States to choose whether to opt-in or not. The EU has overarching

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Sweden, and Ukraine have signed the Oviedo Convention, but have failed to ratify. *Chart of Signatures and Ratifications of Treaty 164*, COUNCIL OF EUR. TREATY OFF., https://www.coe.int/en/web/conventions/full-list?module=signatures-by-treaty&treatynum=164 (last visited Mar. 21, 2024). For a discussion on potential reasons why certain countries have not yet ratified this convention, *see* Goffin et al., *Why Eight EU Member States Signed, but Not Yet Ratified the Convention for Human Rights and Biomedicine,* 86 HEALTH POL'Y 222, 225-29 (2008) (Italy failed to developing ratification procedure; Luxembourg had uncertain national law that should be resolved before ratification; Poland had divisive public opinion concerning the personhood of an embryo; the Netherlands had a conflict in national law and the Oviedo Convention; and Sweden does not have a legal framework for proxy decision-making in incapacitated adults or prohibition for predictive testing for non-health related purposes, conflicting with the Convention).

114 CORVELEYN ET AL., *supra* note 90, at 61. The broad regulation of controversial areas of medicine and science made it difficult for Member States to ratify the Convention wholesale. *Id.* Rather, it is more likely that individual Member States will take positive components from the Convention and incorporate it into their national law. *Id.*

115 For further critiques, *see* Francesco Seatzu, *The Experience of the European Court of Human Rights with the European Convention on Human Rights and Biomedicine*, 31 UTRECHT J. OF INT'L AND EUR. L. 5 (2015) (violations of the Convention can only be reviewed in two scenarios: "when the content of its provisions coincides with rights explicitly protected in the ECHR and when it helps to elucidate or better understand the ECHR.").

116 *See generally id.* In Costa and Pavan v. Italy, App. No. 54270/10, ¶ 57 (Aug. 28, 2012), https://hudoc.echr.coe.int/eng?i=001-112993, the Court widened the interpretation of Article 8 of the ECHR by stating that the right to family life encompasses the right of parents to give birth to a child who does not suffer from the disease they are carriers of, which likely implies a relationship between Article 8 of the ECHR and the Oviedo Convention. In Mouvement Raëlien Suisse v. Switzerland, App. No. 16354/06, ¶ 77 (July 13, 2012), https://hudoc.echr.coe.int/fre?i=001-112165, the alleged violation was directly related to a specific provision of the Additional Protocol to the Oviedo Convention on human cloning, which the Court found Switzerland not responsible for the violation. But, in Vo v. France, App. No. 53924/00, ¶¶ 84-89 (July 8, 2004), https://hudoc.echr.coe.int/fre?i=001-61887, the Oviedo Convention was not directly included in the assessment of France's responsibility but rather used to elucidate principles of the ECHR.

117 Seatzu, *supra* note 115, at 13.

mandatory objectives concerning human rights and its intersection with biology and medicine in the ECHR and the Charter of Fundamental Rights, with the Member States free to adopt principles promulgated in later Council of Europe Conventions or to create their own. Distinct from the United States, the overarching legislation created by the European Union and Council of Europe likely has an influence on the Member States' regulation of reproductive technology, especially PGT. In contrast, the United States has no federal regulation besides reporting pregnancy success rates to a federal agency. While certain objectives are required to be adopted to enter the Union, such as Article 3 of the Charter of Fundamental Rights, which protects against eugenic practices and prioritizes free and informed consent, the rest is left largely for Member States to determine for themselves.

C. India

India has legislative initiatives banning sex selection and providing restrictions on PGT, but the "hard" restrictions are not followed through with "soft" initiatives such as social movements and voluntary compliance by physicians.[118] A "hard" law or policy carries binding, legally enforceable obligations, which can be enforced by a governing body and can carry sanctions for failure to comply.[119] In India, the "hard" law regulating PGT is the Pre-Conception and Prenatal Diagnostic Techniques Act (PC-PDT).[120] The act outlines prohibitions for sex selection in pre-conception and prenatal testing and discusses the permissible uses of detection.[121] The first offense

118 Ginoza & Isasi, *supra* note 17, at 9.

119 *Id.* at 3.

120 Pre-Conception & Pre-Natal Diagnostic Techniques Act, (Act No. 57/1994) (India). The Act was amended in 2003 to stay updated with advancements in reproductive technology. APARNA CHANDRA ET AL., SECURING REPRODUCTIVE JUSTICE IN INDIA: A CASEBOOK 57 (2019).

121 The Act in relevant part(s) states:

Chapter II § 3A – Prohibition of sex-selection

> (a) No person, including a specialist or a team of specialists in the field of infertility, shall conduct or cause to be conducted or aid in conducting by himself or by any other person, sex selection on a woman or a man or on both or on any tissue, embryo, conceptus, fluid or gametes derived from either or both of them…

Chapter III § 4(2)

> (a) no pre-natal diagnostic techniques shall be conducted except for the purposes of detection of any of the following abnormalities, namely:—
> (i) chromosomal abnormalities;
> (ii) genetic metabolic diseases;
> (iii) haemoglobinopathies;
> (iv) sex-linked genetic diseases;
> (v) congenital anomalies;
> (vi) any other abnormalities or diseases as may be specified by the Central Supervisory Board…

Chapter III § 5(2)

> (a) No person including the person conducting pre-natal diagnostic procedures shall communicate to the pregnant woman concerned or her relatives or any other person the sex of the foetus by words, signs or in any other manner…

by the practitioner "'shall be punishable with imprisonment for a term which may extend to three years and with fine which may extend to ten thousand rupees,'" whereas the patient who sought the impermissible use of PGT "may receive 'imprisonment for a term which may extend to three years and with fine which may extend to fifty thousand rupees.'"[122]

While the PC-PDT places a blanket prohibition on prenatal determination of sex, using genetic counselling and PGT for chromosomal abnormalities, genetic diseases, congenital anomalies, and more are permissible under the Act.[123] In spite of these strict prohibitions, however, sex selection still appears to be widely practiced in India, demonstrating that "hard" restrictions are limited by the extent of its "soft" practices and support.[124] Prenatal testing in India was introduced in the 1970s (although rare and expensive) and abortion was legalized in 1971.[125] Since then, the sex ratio at birth shot up from 106.7 male births per 100 female births in 1980, to 111.2 male births per 100 female births in 2010, with the natural sex ratio at birth typically resting at around 105 males per 100 females.[126] Between 2000 and 2020, India had one of the world's most skewed sex ratios at birth after Azerbaijan, Armenia, Albania, China, and Vietnam.[127] Even though the PC-PDT made it illegal for doctors and other medical practitioners to reveal the fetus' sex,[128] at least nine million female births went "missing" between 2000 and 2019 "because of female-selective abortions."[129] However, "Save the Girl Child" campaigns spread throughout India in 2015,[130] and focused

Chapter III § 6 – Determination of Sex Prohibited

On and from the commencement of this Act –

(a) no Genetic Counselling Centre or Genetic Laboratory or Genetic Clinic shall conduct or cause to be conducted in its Centre, Laboratory or Clinic, pre-natal diagnostic techniques including ultrasonography, for the purpose of determining the sex of a foetus;

(b) no person shall conduct or cause to be conducted any pre-natal diagnostic techniques including ultrasonography for the purpose of determining the sex of a foetus;

(c) no person shall, by whatever means, cause or allow to be caused selection of sex before or after conception. Pre-Conception & Pre-Natal Diagnostic Techniques Act, (Act 57/1994) (India).

122 Ginoza & Isasi, *supra* note 17, at 3 (describing consequences for violating the Pre-Conception and Prenatal Diagnostic Techniques Act).

123 Pre-Conception & Pre-Natal Diagnostic Techniques Act, Chapter III § 4(2)(a)-(vi), (Act No. 57/1994) (India).

124 *See* Ginoza & Isasi, *supra* note 17, at 9.

125 Yunping Tong, *India's Sex Ratio at Birth Begins to Normalize*, PEW RSCH. CTR., at 19 (Aug. 23, 2022).

126 *Id.* Gender testing became more widespread and affordable once ultrasounds became available in the early 1980s. *Id.* The Pre-Conception and Prenatal Diagnostic Techniques legislation was promulgated in 1994, and later amended in 2003. CHANDRA ET AL., SECURING REPRODDUCTIVE JUSTICE IN INDIA: A CASEBOOK 57 (2019).

127 Tong, *supra* note 125.

128 *See* Pre-Conception & Pre-Natal Diagnostic Techniques Act, Ch. III §§ 5(2), 6, (Act No. 57/1994) (India).

129 Tong, *supra* note 125, at 9.

130 *Id.* at 19.

on tasking the appropriate authorities to take responsibility to stop sex-selective abortions and enforce the ban on sex detection in PGT.[131] The current trend of India's sex ratio returning to balance coincides with broader social changes in the country, including rising education and increased wealth.[132]

India has a legislative regulatory framework concerning the use of PGT. Such framework provides a blanket prohibition on sex-selective procedures in genetic testing, with threat of fines and imprisonment for both the provider and the patient.[133] However, PGT for permissible uses, such as detecting chromosomal abnormalities and genetic diseases, are expressly protected by legislation,[134] which is a unique approach compared to the other two regimes discussed in this paper. But such "hard" regulation has not been necessarily effective throughout the years since its enactment, as sex selection still appears to be widely practiced in the country.[135] Additionally, social norms in the country exhibit a strong bias towards having male children, which, in combination with PC-PDT's lack of societal support, lead to the stratification of the sex at birth ratio in the country.[136] However, with current social movements and increased education in the country, the sex ratios and sex-selective abortions appear to be decreasing,[137] and appropriate authorities will start to be held accountable for enforcing the country's "hard" regulations.

IV. CONSTRUCTING THE BEST APPROACH: POLICY CONSIDERATIONS

A. Gender Inequality

Not having a hard rule prohibiting sex selection in PGT can raise important questions of social justice concerning gender inequality. The use of ART, including PGT, for purposes of sex selection "may deny the resulting child a right to an open future" and creates concerns that the parents engaging in such a practice may impose inappropriate gender norms and reinforce ideals of "gender essentialism."[138]

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131 *Save The Girl Child Campaign*, ACTION INDIA, https://action-india.org/programs-and-campaigns/save-the-girl-child-campaign/ (last visited Mar. 22, 2024).

132 Tong, *supra* note 125, at 7.

133 Ginoza & Isasi, *supra* note 17, at 3, 9.

134 *See* Pre-Conception & Pre-Natal Diagnostic Techniques Act, Ch. III § 4(2) (Act No. 57/1994) (India).

135 Ginoza & Isasi, *supra* note 17, at 9. *See also* CHANDRA ET AL., *supra* note 126, at 67 (discussing the Supreme Court of India's suggestions for effective implementation of the PC-PDT).

136 *See generally* Tong, *supra* note 125.

137 *Id.* at 7.

138 Ethics Comm. of the Am. Soc'y for Reprod. Med., *supra* note 84. The ASRM described ideas of gender essentialism being such as that there are certain characteristics inherent only in being female and certain characteristics only belonging to men. *Id.* Additionally,

In contexts where there is not a preference for males, ASRM notes, prenatal diagnosis for sex selection may not necessarily be harmful to women.[139] However, countries that have more gender bias concerns, such as India, may tilt the presumption in the other direction. In India, son preference may be tied to cultural practices that can make daughters more expensive to raise compared to sons.[140] However, sex-selective abortions for female children can have rippling effects in the community beyond the family making the reproductive decision to terminate the pregnancy. High rates of sex-selective abortions in certain countries typically result in shortages of marriable women and a surplus of men seeking wives.[141]

In choosing the correct approach for regulating PGT, it is important to consider how permitting the use of sex selection for nonmedical reasons may lead to a flurry of ethical concerns and further entrench gender inequality in society. Understanding how nonmedical sex selection in a country without extreme gender inequality impacts gender equality as compared to how it impacts other countries with already significant gender biases is critical to this analysis.

There are some countervailing arguments *supporting* the use of PGT for sex selection. ASRM stated that using PGT for sex selection gives the patient autonomy to have the experience of raising children of both sexes and reproductive liberty, where such technologies "enable individuals to shape the course of their pregnancy and child-rearing experience."[142] To the organization, sex selection is "a material aspect of [a] person's reproductive decision-making."[143] ASRM noted that the desire for sex selection may be especially strong for couples who already have more than one child of one sex and who are unwilling to attempt another pregnancy without being sure that the additional child will be a certain sex.[144] Additionally, practitioners

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the organization noted that such concerns of intentional bias may raise more concerns for the child than if the parents were using sex selection for family balancing purposes. *Id.*

139 *Id.* The ASRM noted that gender discrimination may not be "as deeply intertwined with economic structures" in the United States as compared to other countries, but raised a concern that individuals from countries with significant gender injustice might travel to the United States to perform sex-selective procedures for nonmedical and discriminatory reasons. *Id. See infra* IV.C for a conversation on reproductive tourism concerns.

140 Tong, *supra* note 125 (describing that only sons pass down the family name, are expected to perform last rites for deceased parents, while daughters take wealth away in the form of dowries and are expected to move away from her parents and into her husband's family home).

141 *Id.* (citing Christophe Z. Guilmoto, *Skewed Sex Ratios at Birth and Future Marriage Squeeze in China and India, 2005-2100*, 49 DEMOGRAPHY 77 (2012)). This "marriage squeeze" could result in compounding societal effects, such as increases in sexual violence and trafficking of women. *Id.*

142 Ethics Comm. of the Am. Soc'y for Reprod. Med., *supra* note 84, at 721.

143 *Id.*

144 *Id.*

policing such sex preferences may go beyond the scope of fertility care and negatively affect patient autonomy.[145]

Just because a patient prefers a specific sex, ASRM notes, does not (and cannot) necessarily mean the patient is intending to promulgate discrimination, but rather their preferences could be tied to a multitude of reasons not relating to gender bias.[146]

B. Eugenics

There is a concern that having an overly permissive approach to PGT regulation can breed eugenicist ideals.[147] If a country allows genetic testing for non-life-threatening genetic conditions, then there is a possibility that parents whose fetuses test positive for a genetic condition will abort the fetus, due to concerns of additional resources being necessary to support them after birth. The most notable example of this concern is Iceland: since prenatal screening tests were introduced in Iceland in the early 2000s, close to 100% of pregnant individuals who received a positive test for Down syndrome terminated their pregnancy.[148]

While genetic testing in Iceland is not mandatory, around 80-85% of women choose to undergo testing.[149] The Icelandic government stresses the importance of informing expectant mothers about the availability of such tests,[150] and the numbers demonstrate their efforts. Many people born with Down syndrome are likely to live full and healthy lives,[151] so it is unclear why almost all women who are carrying a child with Down syndrome in Iceland choose to have an abortion. To demonstrate this stark reality, the United States has about 6,000 babies born with Down syndrome each year, and Iceland has about *one or two*, with those few births likely being attributed to the condition not being detected in the screening test.[152]

In an interview with CBS, geneticist Kari Stefansson stated that Iceland "has basically eradicated, almost, Down syndrome from our society."[153] But does that kind of language raise some concerns? The near eradication of Down syndrome, Stefansson suggests, reflects "relatively heavy-handed genetic counseling" in the country that is not necessarily desirable, showing how genetic counseling is impacting decisions that may not serve a wholly

145 *Id.*
146 *Id.*
147 *See* Ginoza & Isasi, *supra* note 17 for a background on eugenics.
148 Julian Quinones & Arijeta Lajka, *"What Kind of Society Do You Want to Live In?": Inside the Country Where Down Syndrome is Disappearing*, CBS NEWS (Aug. 15, 2017, 2:15 AM), https://www.cbsnews.com/news/down-syndrome-iceland/.
149 *Id.*
150 *Id.*
151 *Id.*
152 *Id.* The screening test for Down syndrome in Iceland is only 85 percent accurate. *Id.*
153 *Id.*

medical function.[154] Stefansson notes the aspiration of having healthy children is important in some respects,[155] but when aspiration bleeds into ethical dilemmas is a murky area. Pregnant individuals in Iceland may also be influenced by counseling to opt into the genetic test, even though Iceland attempts to provide "as neutral counseling as possible" – some posit that simply offering the test is suggestive and points patients in a certain direction.[156]

The use of PGT also has an increasingly strong presence in China. In China, genetic diseases carry heavy stigma, have little support from the community, and there is almost no push-back on the use of PGT on religious or ethical grounds.[157] Genetic screening for conditions linked to maternal age has drastically increased in popularity in the country, with "many see[ing] this as a precursor to wider adoption of [PGT]."[158] However, such an increase in popularity has its downsides. Some are worried that systematic efforts to increase access to PGT in order to eliminate disabilities "devalue[s] the lives of those who already have them" and may breed an interest to select for non-disease-related traits.[159] While there are currently no restrictions in place prohibiting the elimination of disabilities, China does prohibit the intentional selection of male children and restricts the practice of PGT only to hospitals with licenses.[160] Additionally, the ability to access reproductive healthcare is inherently based on income level,[161] and some worry that broadening access will only further the divide between classes.[162]

The issues in Iceland and China contrast those in the United States. In the United States, deaf couples "have used [PGT] to select *for* congenital

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154 *Id.*

155 *Id.*

156 *Id.* 80% of pregnant women in Iceland choose to take the genetic screening test. Knowing that so many women choose to opt into the test may very well influence a patient's decision, with one woman noting that the popularity of the test affected her "maybe a little bit." *Id.*

157 David Cyranoski, *China's Embrace of Embryo Selection Raises Thorny Questions*, SCI. AM. (Aug. 16, 2017), https://www.scientificamerican.com/article/chinas-embrace-of-embryo-selection-raises-thorny-questions/.

158 *Id.* In 2017, it was estimated that China's use of PGT had outpaced the United States and is growing five times faster. *Id.* A single clinic in the country was performing more PGT procedures each year than in the entire United Kingdom. *Id.* At CITIC-Xiangya, the number of PGT procedures increased by 277% from 2014 to 2016. *Id.*

159 *Id.* However, PGT in China has garnered significant success. For example, CITIC-Xiangya achieved China's first "cancer-free baby," in which the parents were able to use PGT to ensure the gene variant that causes retinoblastoma, a cancer that forms in the eyes during early development, was not present in the new embryo. *Id.*

160 *Id.*

161 Irene Moridi, *Addressing Reproductive Healthcare Disparities: Strategies for Achieving Health Equity*, 6 CLIN J. OBSTETRICS AND GYNECOLOGY 43, 43-44 (2023) ("[t]hese treatments can be expensive and many individuals, particularly those from low-income families or without insurance coverage, may not be able to afford them. People from lower socioeconomic backgrounds may face financial barriers to accessing fertility treatments and they may also experience higher stress levels that can affect fertility.").

162 Cyranoski, *supra* note 157.

deafness, in an effort to preserve Deaf culture."[163] Such a practice conflicts with the aims of PGT in China, which prioritize bearing the healthiest child possible rather than protecting an embryo.[164] However, criticisms of PGT and its eugenicist possibilities are still rampant. The most notable example is Justice Clarence Thomas's concurrence in *Box v. Planned Parenthood of Indiana and Kentucky, Inc.*[165] Speaking on an issue not addressed in the opinion, Justice Thomas showed support for laws such as Indiana's "Sex Selective and Disability Abortion Ban," which makes it illegal for an abortion provider to perform an abortion in the state when the provider knows that the patient is seeking the abortion "solely because of the child's race, sex, diagnosis of Down syndrome, disability, or related characteristics,"[166] as a method to combat abortion becoming a tool of "modern-day eugenics."[167] With today's prenatal screening tests, Justice Thomas states, "abortion can easily be used to eliminate children with unwanted characteristics."[168]

C. Reproductive Tourism

Reproductive tourism is "the phenomenon of people crossing international borders to access reproductive technologies," and is a multi-billion-dollar industry presenting "unique legal, ethical, and risk-management challenges."[169] The cost of a single IVF cycle in the United States can range from $15,000 to $30,000, and the United States spends the most per capita on health care compared to similar countries.[170] In other countries, like Mexico, IVF costs $8,000.[171] Individuals that live in countries that have more restrictive approaches to PGT might travel to a more permissible country, like the United States or Mexico, to obtain the reproductive procedures. Some countries may have restrictions on the kind of reproductive option

163 *Id. See Deaf Awareness*, NAT'L DEAF CTR., https://nationaldeafcenter.org/resources/deaf-awareness/ (defines "Deaf" and describes Deaf culture) (last visited Mar. 22, 2024).

164 Cyranoski, *supra* note 157. There is very little support for deaf children in China, as parents often feel the need to have a "normal child to help them take care of the deaf child" (quoting Wang Qiuju, a hearing-loss specialist at the Chinese PLA General Hospital). *Id.*

165 Box v. Planned Parenthood of Indiana and Kentucky, Inc., 139 S. Ct. 1780 (2019).

166 *Id.* at 1783 (Thomas, J., concurring).

167 *Id.*

168 *Id.* at 1790.

169 Raywat Deonandan, *Recent Trends in Reproductive Tourism and International Surrogacy: Ethical Considerations and Challenges for Policy*, 8 RISK MGMT. AND HEALTHCARE POL'Y 111 (2015).

170 Shelby Tadaki, *Fertility Tourism: What to Know Before You Go*, MARKKULA CTR. FOR APPLIED ETHICS (May 9, 2023), https://www.scu.edu/ethics/healthcare-ethics-blog/fertility-tourism-what-to-know-before-you-go/.

171 *Id.*

available depending on the identity of the patient(s).[172] Given the open-border system in the European Union between countries in the Schengen Area,[173] issues of reproductive tourism are especially concerning, given that reproductive regulation is largely left to individual Member States.[174]

The concept of reproductive tourism raises an important question: is it a good or bad thing? While citizens of countries with greater restrictions on PGT can simply obviate the regulations by traveling to different countries, is this merely a practice of an individual's reproductive autonomy? Additionally, access to such procedures through reproductive tourism is likely to be inconsistent across income levels, due to traveling costs. On the other hand, one could argue that reproductive tourism strengthens commerce across the globe.

An article by Shelby Tadaki discussed several considerations concerning reproductive tourism: patient, provider, and destination country. When considering the patient, she argued, participating in reproductive tourism could cause the procedures to be aggressive when done in a short period of time, causing patients to be at a higher risk for complications, not to mention the additional stress that comes with traveling.[175] Patients traveling to a foreign country to receive reproductive care may need to travel back home for work-related reasons or because of cost, meaning the patient is likely to miss out on essential long-term prenatal care.[176]

Providers must consider that their patients may be going through vulnerable or urgent situations and may proceed with treatment without considering all the risks.[177] To combat this issue, providers must fully inform their patients about the risks of certain procedures, as the standard of care may be different than the patient's home country.[178]

Reproductive tourism also raises concerns about access to assistive reproduction technology for citizens of the destination country. As with typical principles of supply and demand, prices of accessing such procedures may increase if there is an influx of potential patients coming in from

172 *See id.* ("16 European countries…prohibit single women from accessing artificial insemination and 25 European counties ban lesbian couples from accessing artificial insemination. In these cases, Belgium, Czechia, Denmark, and Spain are popular destination due to their lenient fertility regulations and high success rates.").

173 *See Schengen, Borders and Visa*, EUROPEAN COMM'N (Feb. 6, 2024), https://home-affairs.ec.europa.eu/policies/schengen-borders-and-visa.

174 *See supra* III.B.

175 Tadaki, *supra* note 170.

176 *Id.*

177 *Id.*

178 *Id.* Additionally, language barriers should be addressed so no information about potential risks is lost, and that informed consent is present for the procedure. At the end of the day, it is the provider's responsibility to adequately provide information in accessible terms to their patients. This may be more difficult to achieve if the patient is engaging in reproductive tourism and is from another country, where the risk of a language barrier affecting informed consent is high. *Id.*

outside of the destination country.[179] Is it fair that there is a possibility that citizens of the destination country cannot access healthcare that tourists can? Even if this is not fair, is there even a way this could be controlled? Raywat Deonandan raised a similar concern when discussing risks to the destination country for reproductive tourism. One of the most common criticisms of *all types* of medical tourism is that "a nation's taxpayers should be the ones who benefit from the attentions of doctors whose education and infrastructural support were taxpayer subsidized."[180] Is it fair for someone else to reap the rewards that the destination country's citizens paid for?

An additional concern voiced by Deonandan considers the risks to the source country – where the reproductive traveler is coming from. A common argument against any kind of medical tourism is that the tourist's money is being spent elsewhere and not contributing to their source country.[181] Given the size of the reproductive industry, the source country may be losing out on a great deal of money. Additionally, the source country may not be able to regulate their citizens if they travel to a different country to obtain a medical procedure that is banned in their home country.[182] For example, there is an open question on whether the PC-PDT, which prohibits using PGT for sex selection,[183] could be enforced on an Indian couple who travels to the United States in order to use PGT to discover the sex of their child for that prohibited purpose. But if India did not enforce their laws against the couple, this could indicate tacit approval of the practice, motivating others to do the same.

V. PROPOSAL

A combination of regimes is most appropriate for regulating PGT in light of the policy considerations previously discussed, as well as fitting within the federal framework in the United States. Most importantly, patient autonomy and reproductive liberty must be respected. This approach will likely look like an international covenant banning the use of "eugenic practices" by all signatories as well as a uniform model law for individual states to modify and/or adopt. While the outright federal ban of sex selection procedures in India is desirable on paper, such a regulation will likely not pass muster in the United States' federal regime, as the possibilities of enacting such a law were debated above.[184]

179 *Id.*
180 Deonandan, *supra* note 169, at 113.
181 *Id.*
182 *Id.*
183 *See* Pre-Conception & Pre-Natal Diagnostic Techniques Act, *supra* note 121.
184 *See supra* III.A.

The overarching approach by the European Union in creating charters and the Council of Europe in conventions that allow Member States to sign onto the convention is admirable. But as seen with the Oviedo Convention,[185] drafters of an international covenant must be careful in not creating something too broad and overreaching because signatories would be unlikely to sign such a treaty if it impinged too much on their national powers. To prevent the extreme results related to PGT, such as eugenics, there should be an international covenant banning such practices. The United Nations could be a likely organization to promulgate such a rule, as they have been increasingly concerned about the consequences of genetic interventions.[186] An international rule banning the use of "eugenic practices" could be tame enough not to impinge on national and/or state powers to regulate health, while also preventing the proliferation of eugenics using PGT or other mechanisms.[187]

In addition to an international covenant prohibiting "eugenic practices," steps can be taken nationally to address policy concerns of PGT leading to gender inequality and eugenics. Given that federal legislation may be difficult to pass, a model law can instead be introduced for states to modify and/or adopt. Like the Council of Europe, states may be able to pick apart what they like about a certain rule and adopt it into their own state regime. Here, the Uniform Law Commission (ULC) can create a model law limiting the use of PGT for sex selection and/or curable genetic conditions that may lead to selective abortions.[188] Obviously, how far the ULC would be willing to go on such a regulation is an important question. In drafting such a model law, ULC could work with the American Society for Reproductive Medicine (ASRM), American College for Obstetricians and Gynecologists (ACOG), and the Society for Assisted Reproductive Technology (SART), all of whom have promulgated ethics opinions on the issue, for assistance on drafting such a model law and to weigh the competing policy considerations with experts on the subject.[189] Creating a model law would, in essence,

185 *See supra* III.B.

186 *UN Panel Warns Against 'Designer Babies' Eugenics in 'Editing' of Human DNA*, U.N. (Oct. 5, 2015), https://news.un.org/en/story/2015/10/511732 ("[W]arning that rapid advances in genetics make "designer babies" an increasing possibility, a United Nations panel today called for a moratorium on "editing" the human genome, pending wider public debate lest changes in DNA be transmitted to future generations or foster eugenics."). The International Bioethics Committee (IBC) stated that "[i]nterventions on the human genome should be admitted only for preventive, diagnostic or therapeutic reasons and without enacting modifications for descendants," and "[t]he alternative [i.e. CRISPR gene-editing technology] would 'jeopardize the inherent and therefore equal dignity of all human beings and renew eugenics.'" *Id.*

187 *See supra* IV.B.

188 *See infra* n. 189.

189 The Uniform Law Commission has promulgated several acts in relation to family law and reproductive health services. Some of which include the Uniform Abortion Act (Unif. L. Comm'n 1972) (discussed in *Roe v. Wade*, 410 U.S. 113 n. 40-41(1973)); the

provide a national objective towards regulating PGT, that balances important policy concerns, while also providing the states with the latitude to adopt such a rule as they see fit and not disturb federalist principles.[190] Additionally, having support from professional organizations in drafting such a rule could avoid the issue seen in India, where "hard" regulations banned PGT for the purpose of sex selection, but lacked "soft" support from physicians in practice.[191]

Even with these two approaches, reproductive tourism may not be able to be regulated, despite being an important concern of PGT's availability.[192] Having an international covenant created by the United Nations might work if it *only* bans the most egregious uses of PGT, but the world's regulatory landscape is likely too heterogeneous for the United Nations to regulate reproductive tourism. If any more aggressive regulation was promulgated, no country would agree to it.

A state-level concern is present in the United States as well: what if patients simply travel to another state with more permissive regulations concerning PGT? Ideally, individual state regulation would be similar across the country with the implementation of a model state law, but the states remain free to adopt something different. Whether a state could create a law blocking out-of-state travel for reproductive services appears to be an unanswered question that raises constitutional concerns.[193] Ultimately, reproductive tourism might be a necessary consequence of regulating PGT, as more restrictive rules would lead to less consistent regulation overall.

Uniform Parentage Act (Unif. L. Comm'n 2017) (ensuring the equal treatment of children born to same-sex couples, establishing a de facto parent as a legal parent of a child, precluding establishment of a parent-child relationship by the perpetrator of a sexual assault that resulted in the conception of the child, updating surrogacy provisions from previous revisions of the rule, and setting forth requirements concerning access to medical history and identifying information regarding any gamete providers by children born through assisted reproduction and their parents); and the Uniform Status of Children of Assisted Conception Act (Unif. L. Comm'n 1988).

190 Adoption of the rule through individual state legislation, even if altered from the model law, would be entitled to rational basis review. *See Dobbs v. Jackson Women's Health Org.,* 597 U.S. 215, 301 (2022).

191 *See supra* III.C.

192 *See* Deonandan, *supra* note 169, at 117 ("National or continental regulations are meaningless unless states are also prepared to pursue their citizens who transgress abroad, which seems an unlikely path, given that one of main drivers of the industry is clients seeking to bypass legal restrictions at home.").

193 *See* Brendan Pierson, *Abortion Providers Sue Alabama to Block Prosecution Over Out-of-State Travel*, REUTERS (July 31, 2023, 2:26 PM), https://www.reuters.com/legal/abortion-providers-sue-alabama-block-prosecution-over-out-of-state-travel-2023-07-31/ (stating that providers in the suit claim Alabama's effort to criminally prosecute those who help others travel out of state to get abortions violates a basic right to travel between states under the U.S. Constitution). *See also* Stella Tallmon, *The Post-*Dobbs *Legality of Out-of-State Abortion Travel Bans*, COLUM. UNDERGRADUATE L. REV. (Jan. 6, 2023), https://www.culawreview.org/journal/the-post-dobbs-legality-of-out-of-state-abortion-travel-bans (noting the Commerce Clause, Dormant Commerce Clause, and Privilege and Immunities issues present in abortion travel bans). *See supra* III.A for the discussion tying together abortion jurisprudence and its effects on PGT regulation.

VI. CONCLUSION

There is no common approach to PGT regulation – the United States is largely unregulated; the European Union and Council of Europe has Member States adopting overarching objectives; and India has explicit bans on sex selection with strict eligibility requirements for the procedure, but "soft" restrictions, such as physician preferences and social movements, have not necessarily followed these rules in the past, but they may in the future.

In light of several policy considerations–gender inequality, eugenicist practices, reproductive tourism, state autonomy to regulate, and reproductive autonomy of the patient–it is difficult to say that one regime is better than others. The best solution may be a combination of different approaches and its proper application to the federal system in the United States. While the above proposal suggests that an international covenant banning eugenic practices along with a proposed model state law may be the preferable approach to regulating PGT, individuals may differ on which policy considerations should be given more weight. However, based on the overwhelming prioritization of reproductive autonomy and state police powers, this approach appears to best satisfy those tenets. In sum, this note was aimed to inform the reader of the policy considerations floating in the background of various global approaches to PGT, and to assist the reader in deciding how these considerations should be weighed, while applying them to our current governmental structure.