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Assessing Assisted Reproductive Technology

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ASSESSING ASSISTED REPRODUCTIVE TECHNOLOGY

*Raymond C. O'Brien**

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Among the most formidable defenses of the medieval world was the triple collar of walls, studded with closely spaced towers, surrounding Constantinople, the successor city to the glory of Rome. The triple walls are attributed to Emperor Theodosius, the last emperor to rule over the combined eastern and western portions of the Roman Empire. The triple walls were intended to protect the capital of the ancient empire of Byzantium, a city renowned for its culture,

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art, and extravagance. For more than one thousand years the city's walls had never been breached, "they had held firm, so that when the army of Sultan Mehmet finally reined up outside the city on April 6, 1453, the defenders had reasonable hopes of survival."¹ However, technological advances developed by a Hungarian cannon founder named Orban, and enthusiastically embraced by the Ottoman Sultan Mehmet, resulted in the creation of an epic cannon never seen before. "It was twenty-seven feet long . . . [w]ith a shattering roar and a cloud of smoke that hazed the sky, the mighty bullet was propelled across the open countryside for a mile before burying itself six feet down in the soft earth."²

The introduction of the cannon's massive technological development, coupled with thousands of lesser cannons, brought about the end of the Byzantine Empire and, the Eastern Roman Empire, which had been established in the fourth century by Constantine the Great. "By nightfall on Monday, May 28, [1453,] the great guns had been firing at the land walls for forty-seven days,"³ causing the city's defenses to collapse. The Ottomans conquered Constantinople, sacking it and the treasures it housed, renaming it Istanbul. For the Western world, "the consequences were religious, military, economic, and psychological."⁴ The unimaginable became reality because of a technological breakthrough underappreciated by the defenders of Constantinople, but readily utilized by those able to afford and employ its advantages.

The utilization of assisted reproductive technology (ART), among those able to afford it, has been no less abrupt or consequential. As with all technological developments, there has been an evolution. Even though surrogacy was practiced among the Hebrews, as described in the Hebrew Scriptures,⁵ artificial insemination, another variant of ART, has been utilized since the late 18th century, and was characterized as artificial insemination in the 19th century.⁶ By the 1970s, a third procedure became available, in vitro fertilization (IVF), which describes a procedure in which an egg is fertilized outside of a woman's body and is then inserted into any woman's womb for gestation.⁷ These assisted reproductive technologies precipitated businesses, such as fertility clinics, and the use of cryopreservation, also known as banking. Banking is a process that

¹ ROGER CROWLEY, 1453: THE HOLY WAR FOR CONSTANTINOPLE AND THE CLASH OF ISLAM AND THE WEST 5-6 (2005).

² *Id.* at 93-94.

³ *Id.* at 203.

⁴ *Id.* at 241.

⁵ See *Genesis* 16:2 (Hagar, a surrogate, giving birth to Abraham's child because his wife, Sarah, was barren).

⁶ See Kara W. Swanson, *Adultery by Doctor: Artificial Insemination 1890-1945*, 87 CHI.-KENT L. REV. 591, 592-93 (2012).

⁷ See Janet L. Dolgin, *The Law Debates the Family: Reproductive Transformations*, 7 YALE J. L. & FEMINISM 37, 44 (1995).

enables the preservation of sperm, eggs, and embryos for possible future implantation into a woman for gestation.⁸

Fertility clinics, cryopreservation of human reproductive materials, and the increasing number of persons employing their services, precipitated legal disputes involving the clinics, state agencies, and the clients themselves. These disputes arose out of posthumous conception and its effect on state and federal benefits; such as whether the preserved human products constituted divisible marital property upon divorce, whether wrongful death law suits are applicable when an embryo is destroyed. Increasing concern over the religious, ethical and sociological issues involving these human reproductive materials, the donors, and any child born as a result.⁹ Eventually, ethical and moral commentary developed as religious, government, and advocacy groups became aware of the technological possibilities surrounding assisted reproduction. For example, by the mid-1970s the U.S. Department of Health, Education and Welfare (DHEW) appointed an ethics advisory board to study IVF and review proposals for funding IVF research.¹⁰ That ethics advisory board was soon disbanded in 1980, with oversight shifting to the Food and Drug Administration in 1998,¹¹ where it remains today. Congress continues to annually renew the Dickey-Wicker amendment to the U.S. Department of Health and Human Services appropriations bill, which prohibits federal funding “for research that creates embryos for research purposes or destroys, discards, or subjects an embryo to risks with no prospect of medical benefit for the embryo.”¹²

Commentators and religious organizations continue to offer opinions on the ethical and moral uses of developing technologies involving assisted reproduction.¹³ There is indirect federal supervision of the fertility industry through the Food and Drug Administration, which regulates testing

⁸ See PRESIDENT’S COUNCIL ON BIOETHICS, REPRODUCTION & RESPONSIBILITIES—THE REGULATION OF NEW BIOTECHNOLOGIES, 29-30 (2004).

⁹ See, e.g., *P.M. v. T.B.*, 907 N.W.2d 522, 533-34 (Iowa 2018) (holding that surrogacy contracts do not violate public morals); *Morrissey v. U.S.*, 871 F.3d 1260, 1269 (11th Cir. 2017) (acknowledging that ART involves multiple moral and ethical issues affecting divergent interests).

¹⁰ NAT’L ACADS. OF SCIS. ENG’G MED., MITOCHONDRIAL REPLACEMENT TECHNIQUES: ETHICAL, SOCIAL, AND POLICY CONSIDERATIONS 60 (Anne Claiborne et al. eds., 2016).

¹¹ See *id.* (EAB no longer functioned in 1980, but the regulations required a federal ethics board).

¹² *Id.* at 62; see also 45 C.F.R § 46.204(d); see generally MICH. COMP. LAWS § 333.2685 (2017); 18 PA. CONS. STAT. § 3216(a).

¹³ See, e.g., Justo Aznar et al., *Moral Assessment of Frozen Human Embryo Adoption in the Light of the Magisterium of the Catholic Church*, 23 ACTA BIOETHICA 137, 138 (2017) (discussing moral evaluation of embryo adoption in the Catholic Church); Ainsley J. Newton et al., *Ethical and Legal Issues in Mitochondrial Transfer*, 8 EMBO MOLECULAR MED. 589, 589 (2016); Kevin H. Theriot & Ken Connelly, *Free to Do No Harm: Conscience Protections for Healthcare Professionals*, 49 ARIZ. ST. L. J. 549, 551-52 (2017).

requirements for donated human tissues including eggs and sperm.¹⁴ Finally, the Federal Trade Commission is charged with promoting truth in advertising clinic success rates.¹⁵

In 1978, the first baby was born as a result of IVF technology; only a few decades ago.¹⁶ The baby, Louise Joy Brown may have been the first baby born as a result of IVF, but she was certainly not the last.¹⁷ Forty years later, 7 million children are the product of this form of medical technology and “the world’s fertility clinics have blossomed into a \$17 billion business.”¹⁸ Undoubtedly, individuals and couples utilizing assisted reproduction will increase as insurance begins paying for procedures heretofore reserved to those who could afford them.¹⁹ In addition, medical advances will not abate and new reproductive technologies will challenge “our collective notions about family and the significance of biology in assigning parental rights.”²⁰

One response to the technological challenge presented by ART is the approval of a revised Uniform Parentage Act (UPA) by the National Conference of Commissioners on Uniform State Laws in 2017.²¹ The revised Act includes a new article, Article 9, addressing the right of children born through assisted reproductive technology to access medical and identifying information regarding any gamete providers.²² Article 9 does not require disclosure of the identity of a gamete donor, but it does require gamete banks and fertility clinics to ask donors if they want to have their identifying information disclosed when

¹⁴ PRESIDENT’S COUNCIL ON BIOETHICS, *Reproduction and Responsibility: The Regulation of New Biotechnologies*, <https://bioethicsarchive.georgetown.edu/pcbe/reports/reproductionandresponsibility/chapter2.html> (last visited Nov. 26, 2018).

¹⁵ See Jillian Casey et al., *Assisted Reproductive Technologies*, 17 GEO. J. GENDER & L. 83, 84 n.5 (2016) (the Federal Trade Commission is charged with promoting truth in advertising clinic success rates under the Clinical Laboratories Improvement Act of 1988).

¹⁶ Ariana Eunjung Cha, *Happy birthday, Louise Brown! 40 years after the first IVF baby, 8 million more and counting*, WASH. POST (July 25, 2018), <https://www.washingtonpost.com/news/to-your-health/wp/2018/07/25/happy-birthday-louise-brown-40-years-after-the-first-ivf-baby-8-million-more-and-counting>.

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ Valarie Blake, *It’s an ART Not a Science: State-Mandated Insurance Coverage of Assisted Reproductive Technologies and Legal Implications for Gay and Unmarried Persons*, 12 MINN. J.L. SCI. & TECH. 651, 653 (2011).

²⁰ Deborah Zalesne, *The Intersection of Contract Law, Reproductive Technology, and the Market: Families in the Age of ART*, 51 U. RICH. L. REV. 419, 420 (2017).

²¹ Courtney Joslin & Jamie Pedersen, *Updated National Uniform Parentage ACT (UPA 2017) Approved*, SOC’Y FOR ASSISTED REPROD. TECH. (Nov. 12, 2017), <https://www.sart.org/news-and-publications/news-and-research/legally-speaking/updated-national-uniform-parentage-act-upa-2017-approved>.

²² UNIF. PARENTAGE ACT, § 905 (NAT’L CONFERENCE OF COMM’RS ON UNIF. STATE LAWS 2017).

the resulting child attains 18 years of age.²³ However, it does require disclosure of non-identifying medical history of the gamete donor.²⁴ The newly approved code also purposely revised paternity presumptions, acknowledgements, genetic testing, and assisted reproduction provisions to make them gender neutral.²⁵ Finally, the surrogacy provisions recommended in the Act were updated to make them more consistent with modern surrogacy practice.²⁶ Additional codes, practices, and judicial holdings will increasingly accommodate the ascendant use of assisted reproductive technology.

Building upon reproductive technologies such as artificial insemination (whether by donor or by husband), IVF, and traditional or gestational surrogacy, technology has evolved to the point whereby it is possible for a child to be born with more than two genetic parents.²⁷ On April 6, 2016, a baby boy was born in Mexico through mitochondrial replacement therapy (MRT) using the genetic material of three different people.²⁸ Lawsuits involving multiple parental claims pertaining to the same child have proliferated in recent decades. Most of these claims rely on equitable or contractual causes of action to establish parental rights over the child.²⁹ However, technology is now available to permit a child to have a genetic relationship with more than two adults. Viewed from a perspective of the brief time period between the use of artificial insemination and IVF, the reality of three-genetic parents is startling.

As judicial disputes and commentary reveal, there currently exists uncertainty in how to address this technological development resulting in multiple genetic parents.³⁰ The unique status of a human being is at stake. While “the UK has taken steps towards explicit authorization of the [mitochondrial replacement] procedure for use in clinical research, it remains effectively banned or heavily

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ *See id.* § 802 cmt. (explaining how this section is based on newly developed surrogacy law in several states).

²⁷ *See* Daniel Green, *Assessing Parental Rights for Children with Genetic Material from Three Parents*, 19 MINN. J. L. SCI. & TECH. 251, 251 (2018) (explaining how a baby was born with the genetic material of three people).

²⁸ *Id.*

²⁹ *See* Raymond C. O'Brien, *Obergefell's Impact on Functional Families*, 66 CATH. U. L. REV. 363, 385-87 (2016) (describing de facto, contractual, and equitable parentage).

³⁰ *See* Ruth L. Fischbach et al., *Creating a Three-Parent Child: An Educational Paradigm for the Responsible Conduct of Research.*, 15 J. OF MICROBIOLOGY & BIOLOGY EDUC. 186, 188 (2014) (admitting there are questions surrounding new reproductive technology that the legal system needs to address); *see also* Green *supra* note 27, at 260 (explaining there are four tests that courts commonly use to resolve parentage disputes: “the application of state statutes and public policy, basing the decision on the best interests of the child, assigning parentage based on genetic relationship to the child, and assigning parental rights based on the intent of the potential parents”).

restricted in many parts of the world, including most of Europe, the USA, Australia, New Zealand and Singapore, among others.”³¹ Experience suggests that this is a current cautionary approach, but the reality is that the technology is there and it will be utilized both in reference to multiple genetic parents, but also for what is yet to come.

Undoubtedly, the possibility of multiple genetic parents challenges the traditional status of motherhood, family, personhood, and intercourse between a man and a woman.³² However, this technological challenge will not abate the opportunity of scientific advances.³³ One commentator provides an assessment: “Public law cannot anticipate the bounds of science in the formation of family and is not equipped to respond to the myriad questions that go along with cultural shifts. But what is clear is that as technology continues to evolve, a growing disconnect between law and technology is inevitable.”³⁴

This Article does not seek to address all of the issues developing around assisted reproductive technology. For example, the technology used in ART has created what some have called, the “Wild West of American medicine.”³⁵ Such technological advances challenge historical, sociological, and religious underpinnings of family.³⁶ Different assisted reproductive technologies, “such as ova donation, sperm donation, and gestational surrogacy, typically involving between three and four parties, present a more complicated landscape because they fragment the roles of the presumptive, genetic, gestational, and intentional parents.”³⁷

This Article provides a current assessment of assisted reproductive technology to understand and address what society must do next. To accomplish such a goal this Article is divided into four parts. First, this Article provides statistics on the current utilization of the many forms of technological assistance employed by single persons, married, and unmarried couples seeking to become parents. Second, public perception of surrogacy continues to evolve, and this

³¹ G. Owen Schaefer & Markus K. Labude, *Genetic Affinity and the Right to ‘Three-Parent IVF,’* 34 J. ASST. REPROD. GENET. 1577, 1577 (2017).

³² See generally Zalesne, *supra* note 20, at 419, 487.

³³ See generally *id.*

³⁴ *Id.* at 481.

³⁵ Karen Wright, *Human in the Age of Mechanical Reproduction*, DISCOVER (May 1, 1998), <http://discovermagazine.com/1998/may/humanintheageofm1443>.

³⁶ See Yehezkel Margalit et al., *The New Frontier of Advanced Reproductive Technology: Reevaluating Modern Legal Parenthood*, 37 HARV. J.L. & GENDER 107, 108 (2014) (citing Judith F. Daar, *The Prospect of Human Cloning: Improving Nature or Dooming the Species?*, 33 SETON HALL L. REV. 511, 514 (2003)) (noting that as a result of assisted reproductive technology, there is still complex, legal, and societal questions yet to be answered).

³⁷ *Id.* at 115; see also Green, *supra* note 27 (discussing the three relevant relationships courts have identified when identifying parents).

Article discusses the judicial and legislative pronouncements both supporting and forbidding the practice of surrogacy. Third, the technology that makes ART possible has also precipitated separate legal issues that continue to involve judicial and legislative action. Among these issues are posthumous conception, distribution or destruction of genetic materials, and parentage.³⁸ Any exhaustive treatment of any of these issues is beyond the scope of this particular Article. But a current assessment is possible and needed; one that speaks to how the issue is currently being addressed. This discussion illustrates the extent to which ARTs have influenced the law. Finally, this Article assess what is currently being decided regarding technological procedures resulting in a child being born with more than two genetically related parents.

The technological advances made in the last fifty years pertaining to human reproduction have been both rapid and challenging. Concomitant with these advances has been the increasing utilization of assisted means of reproduction by persons and couples able to afford the expensive and risky procedures. Legislatures are challenged to provide objective, deliberative guidance; funding organizations, both private and government, must balance the fact that human life is involved against the goal of medical advancement; courts must balance standards of public policy against the complaints made by individuals in pursuit of reproductive autonomy. This Article involves items of grave concern, seeking only to offer an assessment of where we are presently, amidst these technological changes.

I. UTILIZATION OF ASSISTED REPRODUCTION

A number of national organizations work together to provide commentators with nationwide statistics derived from ART surveillance.³⁹ Reporting is mandated by the Fertility Clinic Success Rate and Certification Act of 1992 (FCSRCA), enacted by Congress, which requires all clinics performing ART in the United States to annually report their success rate data to the Centers for Disease Control and Prevention (CDC).⁴⁰ These fertility clinics rely upon the

³⁸ See generally *Raftopol v. Ramey*, 12 A.3d 783, 785 (Conn. 2011) (explaining that the law is not as advanced as the scientific technology behind assisted reproductive technology and providing an example of a dispute over parentage).

³⁹ Saswati Sunderam et al., *Assisted Reproductive Technology Surveillance – United States, 2015*, MORBIDITY & MORTALITY WKLY. REP., CTR. FOR DISEASE CONTROL & PREVENTION (2018) (describing the National ART Surveillance System developed by the CDC in which “clinics [...] that are members of the Society for Assisted Reproductive Technology (SART) can report their data to NASS through SART”).

⁴⁰ 42 U.S.C.A. § 263a(a); Fertility Clinic Success Rate and Certification Act of 1992, Pub. L. No. 102-493, 106 Stat. 3146 (1992); 42 U.S.C.A. § 263a-5. This law is the only federal law regulating the infertility industry in the United States, but the Clinical Laboratories Improvement Act of 1988, 42 U.S.C.A. § 263a, provides for federal

National ART Surveillance System (NASS), which is a web-based data collection system used by all ART clinics, to report data for each ART procedure to the CDC.⁴¹ The data collected is then used to guide physicians, advocacy groups, and possible patients in decision-making. The CDC, the Society for Reproductive Medicine, and the Society of Assisted Reproductive Technology, work with other groups, such as the National Infertility Association and Path2Parenthood to amass statistics on procedures and the use of ARTs.⁴² The number and variety of these organizations illustrate the scope of technological reproductive procedures increasingly utilized by a diverse range of citizens.

The National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health (National Center), publishes an annual national report on the use of ART in the United States.⁴³ Utilizing data provided by multiple reporting fertility clinics, the National Report provides data that “can give potential ART patients an idea of the average chances of success.”⁴⁴ Likewise, the data also provides insight into the utilization of ART, the evolution of ART procedures, and the trends within this medical process.⁴⁵ In addition, the CDC collects and publishes data on an annual basis since 2004.⁴⁶ The National Report is submitted two years after the data is assembled and analyzed.⁴⁷ For example, the 2013 Report was published in 2015.⁴⁸ To provide an assessment of trends and current parameters, this Article will focus on three years of numerical statistics provided by the National Report, the years 2013-2015.

A. Statistical Trends

1. ART Cycles and Births

The United States Code defines assisted reproductive technology as any treatment or procedure that includes the handling of human eggs or embryos,

certification of clinical laboratory.

⁴¹ Sunderam, *supra* note 39.

⁴² See *National ART Surveillance*, CTR. FOR DISEASE CONTROL AND PREVENTION (May 16, 2018), <https://www.cdc.gov/art/nass/index.html>.

⁴³ See *ART Success Rates*, CTR. FOR DISEASE CONTROL AND PREVENTION (May 16, 2018), <https://www.cdc.gov/art/nass/index.html> [hereinafter CDC ART Success].

⁴⁴ See CTR. FOR DISEASE CONTROL AND PREVENTION, *2015 Assisted Reproductive Technology: National Summary Report* at 3 (2017), <https://www.cdc.gov/art/pdf/2015-report/ART-2015-National-Summary-Report.pdf> [hereinafter 2015 CDC Report].

⁴⁵ *Id.* at 3-5.

⁴⁶ *Assisted Reproductive Technology*, CTR. FOR DISEASE CONTROL & PREVENTION (Aug. 13, 2018), <https://www.cdc.gov/art/reports/archive.html>.

⁴⁷ CDC ART Success, *supra* note 43.

⁴⁸ See generally CDC ART Success, *supra* note 43.

which encompasses many procedures today.⁴⁹ Recent technological advances made assisted reproduction possible on a scale not imagined a century ago. Generally, ART involves combining sperm with ova that has been surgically removed from a woman's body and then returning the resulting embryos—fertilized eggs—to the woman's uterus or donating the produced embryos to another woman or couple.⁵⁰ In addition, the eggs, the semen, or the embryos may be “banked” with a fertility clinic for potential use in the future.⁵¹ While this may be the most common, this is not the only form of ART.⁵²

References throughout this Article are made to ART cycles and a description of what this entails illustrates the level of technology now available, and also provides a glimpse into that which lies ahead. An ART cycle begins when a woman commences taking medication to stimulate her ovaries so that they will develop eggs or, if no drugs are given, when the woman begins having her ovaries monitored (using ultrasound or blood tests) for natural egg production.⁵³ If eggs are produced then the cycle progresses to egg retrieval, which involves a surgical procedure to collect those eggs from the woman's ovaries.⁵⁴ In 2015, as seen in preceding years, the overwhelming majority of cases involving the cancellation of the ART cycle, was due to insufficient egg production, or no egg production at all.⁵⁵

Once eggs are retrieved, the woman's eggs are combined with sperm in a laboratory with the intent to fertilize the eggs.⁵⁶ If this is successful then the resulting embryos become available and one or more are selected for transfer, most often into a woman's uterus through the cervix (IVF), but sometimes into the fallopian tubes (GIFT or ZIFT).⁵⁷ Transfer usually occurs within six days after retrieval, though transfers occurring five days after retrieval have higher

⁴⁹ See 42 U.S.C.A. § 263a-7.

⁵⁰ 2015 CDC Report, *supra* note 44, at 8, 10.

⁵¹ *Id.* at 51.

⁵² *Infertility FAQ*, CTR. FOR DISEASE CONTROL AND PREVENTION, (Apr. 18, 2018), <https://www.cdc.gov/reproductivehealth/infertility/index.htm>.

⁵³ CTR. FOR DISEASE CONTROL AND PREVENTION, *2014 Assisted Reproductive Technology: National Summary Report* at 12 (2016), <https://www.cdc.gov/art/reports/2014/national-summary.html> [hereinafter 2014 CDC Report].

⁵⁴ See generally *In vitro fertilization (IVF)*, MAYO CLINIC (Mar. 22, 2018), <https://www.mayoclinic.org/tests-procedures/in-vitro-fertilization/about/pac-20384716>.

⁵⁵ 2015 CDC Report, *supra* note 44, at 14.

⁵⁶ *Id.* at 13.

⁵⁷ 2014 CDC Report, *supra* note 53 (stating that in 2014, there were 92,862 cycles started, 83,114 retrievals, 67,070 transfers, 30,647 pregnancies, and 25,016 live-birth deliveries. Additionally, of these transfers, in 83% of cases, one or two embryos were transferred to the woman. One embryo was transferred 28.8% of the time, while two were transferred 54.1% of the time. In general, multiple embryos resulting in multiple fetus pregnancies raise the risk of premature birth, low birth weight, and pregnancy complications).

live-birth percentages, assuming that the embryo survives that long.⁵⁸ The goal of the ART cycle is for one or more of the transferred embryos to implant within the woman's uterus and achieve a clinical pregnancy.⁵⁹ The hope is that this clinical pregnancy will progress to a live birth. As stated previously, in the majority of cases there is not enough egg production to proceed and more than 82% of cycles were cancelled in 2014 for this reason.⁶⁰ However, in more than 11% (12.5% in 2015)⁶¹ of the cases reported, the patient withdraws from the process for other reasons.⁶²

Success rates for ART cycles have increased slightly since the CDC began monitoring data in 1995.⁶³ A consistent pattern indicates that a "woman's age is the most important factor for having a live birth when her own eggs are used."⁶⁴ On the other hand, when donor eggs are used, women aged 40 or older generally have much higher percentages of live births.⁶⁵ To illustrate, in 2015, of the ART cycles that used frozen eggs from a donor and a fresh embryo, 6% resulted in cancellations, 47% in pregnancies, 39% in live births, and 30% in single infant births.⁶⁶

In 2013, the National Center collected data from 467 fertility clinics then in operation and able to verify data submitted.⁶⁷ These clinics reported in 2013, that the number of ART cycles performed in the United States increased 25% from 2004 to 2013,⁶⁸ for a total of 190,773 ART cycles performed in 2013.⁶⁹ From these cycles "[t]he number of infants born who were conceived using ART increased from 49,458 in 2004 to 66,706 in 2013."⁷⁰ The CDC reports that in 2013 approximately 1.5% of all infants born in the United States were conceived

⁵⁸ 2015 CDC Report, *supra* note 44, at 37-38.

⁵⁹ *Id.*

⁶⁰ 2014 CDC Report, *supra* note 53, at 13.

⁶¹ *Id.*; 2015 CDC Report, *supra* note 44, at 14.

⁶² 2014 CDC Report, *supra* note 53, at 13.

⁶³ 2015 CDC Report, *supra* note 44, at 7.

⁶⁴ *Id.* at 21.

⁶⁵ *Id.* at 22.

⁶⁶ *Id.* at 12.

⁶⁷ CTR. FOR DISEASE CONTROL AND PREVENTION, *2013 Assisted Reproductive Technology: National Summary Report*, at 3 (2015), <ftp://ftp.cdc.gov/pub/Publications/art/ART-2013-Clinic-Report-Full.pdf> [hereinafter 2013 CDC Report].

⁶⁸ *Id.* at 49 (defining Assisted Reproductive Technology as: "All treatments or procedures that include the handling of human eggs or embryos to help a woman become pregnant. ART includes but is not limited to in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT), tubal embryo transfer, egg and embryo cryopreservation, egg and embryo donation, and gestational surrogacy.").

⁶⁹ *Id.*

⁷⁰ *Id.*

using some form of ART.⁷¹ Because more than one infant may be born during a live-birth delivery (for example, twins), the total number of infants born will be greater than the number of ART cycles performed.⁷² In addition, the number of ART cycles using eggs or embryos not genetically related to the parent(s) who will raise the child increased 32% between 2004 and 2013.⁷³ This figure indicates greater reliance upon donor eggs or embryos when seeking parenthood.

From 2005 through 2014 the number of ART cycles performed in the United States has increased 26%, and the number of live births in 2014 was almost one and a half times higher than in 2005.⁷⁴ Likewise, the number of infants born who were conceived using ART increased from 52,041 in 2005 to 68,791 in 2014.⁷⁵ By 2014, the number of fertility clinics within the United States rose to 498 and the number of clinics submitting data was 458.⁷⁶ ART cycles performed at these clinics rose to 208,604 in 2014, a substantial increase from the 190,773 recorded in 2013.⁷⁷ The CDC reports that “[t]he number of clinics, cycles performed, live-birth deliveries, and infants born as a result of ART have all increased steadily since CDC began collecting this information in 1995.”⁷⁸ Indeed, by 2014 the “CDC estimates that ART accounts for slightly less than 2% of total US births.”⁷⁹

By 2015, there were 464 clinics reporting data and 231,936 ART cycles were performed at these reporting clinics.⁸⁰ As a result of the ART cycles performed in 2015, 72,913 infants were born, a dramatic increase from the previous year.⁸¹

From 2005 through 2014, the percentage of transfers using fresh nondonor eggs or embryos that resulted in single-infant live births increased from 28% in 2005 to 35% in 2014 for women younger than 35 (the percentage rose in every other age group as well).⁸² This increasing trend continued in 2015, when 39% of ART cycles used fresh nondonor eggs or embryos.⁸³ Parties participating in

⁷¹ Casey et al., *supra* note 15, at 86 (citing *2013 ART Fertility Success Rates: Latest Data*, 2013).

⁷² 2014 CDC Report, *supra* note 53, at 7.

⁷³ 2015 CDC Report, *supra* note 44, at 50.

⁷⁴ 2014 CDC Report, *supra* note 53, at 49 (stating that from 1993 to 2013 the use of ART in the United States tripled); *see also* CTR. FOR DISEASE CONTROL AND PREVENTION, *2011 Assisted Reproductive Technology: National Summary Report* at 8 (2013), https://www.cdc.gov/art/pdf/2011-report/fertility-clinic/art_2011_clinic_report-full.pdf [hereinafter 2011 CDC Report].

⁷⁵ 2014 CDC Report, *supra* note 53, at 49.

⁷⁶ *Id.* at 7.

⁷⁷ *Id.* at 3; *see also* 2013 CDC Report, *supra* note 67, at 5.

⁷⁸ 2014 CDC Report, *supra* note 53, at 7.

⁷⁹ *Id.*

⁸⁰ 2015 CDC Report, *supra* note 44, at 3.

⁸¹ *Id.* at 3.

⁸² 2014 CDC Report, *supra* note 53, at 54.

⁸³ 2015 CDC Report, *supra* note 44 at 8.

the ART cycles who intended to become parents through ART may have contributed to a higher probability of having a child even when there were other adverse conditions present.⁸⁴ The fertility clinics' data reports that "[o]f the 190,773 ART cycles performed in 2013 at these reporting clinics, 163,209 cycles (86%) were started with the intent to transfer at least one embryo.⁸⁵ These 163,209 cycles resulted in 54,323 live births (deliveries of one or more living infants) and 67,996 infants."⁸⁶ Furthermore, "[i]n 2013, the percentage of ART cycles resulting in live births was higher than the national percentage for patients with ovulatory dysfunction, endometriosis, male factor, or unknown factor infertility; it was lower for patients with tubal factor, diminished ovarian reserve, uterine factor, 'other' factor, or multiple infertility factors."⁸⁷

2. Cryopreservation

Cryopreservation involves the practice of freezing eggs or embryos from a patient's ART cycle for potential future use.⁸⁸ Whenever frozen (cryopreserved) embryos are thawed and transferred to a woman, this is referred to as a "frozen embryo cycle."⁸⁹ The use of frozen nondonor embryos are both less expensive and less invasive because the woman does not have to go through the fertility drug stimulation and egg retrieval process again.⁹⁰

During 2013, of the 163,209 ART cycles started with the intent to transfer at least one embryo, "2,655 cycles were reported with the intent to thaw a previously frozen egg, fertilize the egg, and then transfer the resulting embryo."⁹¹ In addition, in the same year, "27,564 cycles (14%) were started with the intent of cryopreserving (freezing) and storing all resulting eggs or embryos for potential future use."⁹² The "banking" or cryopreservation of fresh nondonor

⁸⁴ *Id.* at 22.

⁸⁵ 2013 CDC Report, *supra* note 67 at 3.

⁸⁶ *Id.* (stating that an "ART cycle is started when a woman begins taking medication to stimulate the ovaries to develop eggs or, if no drugs are given, when the woman begins having her ovaries monitored (using ultrasound or blood tests) for natural egg production."); 2014 CDC Report, *supra* note 53, at 63 ("ART cycles include any process in which (1) an ART procedure is performed, (2) a woman has undergone ovarian stimulation or monitoring with the intent of having an ART procedure, or (3) frozen embryos have been thawed with the intent of transferring them to a woman.").

⁸⁷ 2013 CDC Report, *supra* note 67, at 25.

⁸⁸ *Id.* at 61.

⁸⁹ *Id.* at 62.

⁹⁰ Mary Ellen Pavone et al., *Comparing thaw survival, Implantation and live births from cryopreserved zygotes, embryos and blastocysts*, J. HUM. REPROD. SCI., 23-28 (2011), <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3136065>.

⁹¹ 2013 CDC REPORT, *supra* note 67, at 3.

⁹² *Id.*

eggs or embryos increased dramatically from 2004 through 2013, approaching nearly 30,000.⁹³

By 2014, there were 208,604 cycles started, and of these cycles 173,198 of them were started with the intent of transferring at least one embryo.⁹⁴ Of this number, there were 3,596 cycles reported with the intent to thaw a previously frozen egg, fertilize the egg, and then transfer the resulting embryo.⁹⁵ However, the majority of persons choosing cryopreservation did so to store all eggs or embryos for potential future use, a practice referred to as banking.⁹⁶ In 2014, 27% of all ART cycles used frozen nondonor embryos,⁹⁷ the number rising to 30% in 2015.⁹⁸ Between 2005 and 2014, banking of nondonor eggs for future use increased dramatically.⁹⁹ The increase in banking continued in 2015 with 20% of the 231,936 ART cycles initiated with the intent of cryopreserving and storing all resulting eggs or embryos for potential future use.¹⁰⁰

Cryopreservation is increasingly utilized in the technological process of ART. In about 49% of ART cycles performed in 2013 fresh (non-frozen) nondonor eggs or embryos were used.¹⁰¹ ART cycles that used frozen nondonor embryos were the next most common type, accounting for 25% of the total.¹⁰² The percentages of transfers from a total of 46,779 ART cycles resulting in pregnancies, live births and single-infant live births were higher for frozen nondonor embryos than for fresh nondonor embryos in 2013.¹⁰³ However, note that the percentages of transfers resulting in pregnancies, live births, and single-infant live births were lower for transfers using frozen donor embryos compared with fresh donor embryos.¹⁰⁴ While the statistics may be anesthetizing, they point to the increased utilization of ART, by a wider range of patients, and the

⁹³ *Id.* at 50 (stating that the freezing of embryos for possible future use is controversial because of an embryo's potential for life); *see, e.g.,* Zalesne, *supra* note 20, at 461-67; Theriot & Connelly, *supra* note 13, at 560-63.

⁹⁴ 2014 CDC Report, *supra* note 53, at 3.

⁹⁵ *Id.* at 3, 55 (quoting "From 2005 through 2014, transfers of one embryo more than tripled from 9% to almost 29%.").

⁹⁶ *Id.* at 3.

⁹⁷ *Id.* at 8.

⁹⁸ 2015 CDC Report, *supra* note 44, at 8.

⁹⁹ 2014 CDC Report, *supra* note 53, at 50.

¹⁰⁰ 2015 CDC REPORT, *supra* note 44, at 3 ("Banking continues to be a subject of concern. Some argue that the woman who banks her eggs disrespects the sacredness of motherhood, while others argue that given "her particular circumstances, if a woman believes that freezing her embryos is the best way to bring about . . . future flourishing, respecting the dignity of motherhood does not warrant interference."); Zalesne, *supra* note 20, at 463; *but see* John S. Grabowski & Christopher Gross, *Dignitas Personae and the Adoption of Frozen Embryos*, 10 NAT'L. CATH. BIOETHICS Q. 307, 309 (2010).

¹⁰¹ 2013 CDC Report, *supra* note 67, at 8.

¹⁰² *Id.*

¹⁰³ *Id.* at 43.

¹⁰⁴ *Id.* at 43, 46.

varied forms of technological procedures now available.

3. Age as a Factor in Utilizing ART

All of the data provided by the CDC since reporting started in 1995, concludes that the likelihood of a successful response to ovarian stimulation and progression to egg retrieval decreases as a woman grows older.¹⁰⁵ In addition, whenever egg retrieval is successful, the eggs are less likely to reach the transfer phase, and even if successful, it is less likely to result in pregnancy or live birth because the possibility of miscarriage increases as a woman ages.¹⁰⁶ To illustrate, in 2014, 37% of all cycles involving women younger than 35 resulted in live births, but that percentage drops to 1% for women older than 44.¹⁰⁷

Consistent among most age groups was the fact that ART cycles using fresh nondonor eggs or embryos resulting in live births was lower among women who previously had one or more unsuccessful ART cycles.¹⁰⁸ This is because as a woman ages the likelihood of a successful response to ovarian stimulation and progression to egg retrieval decreases (there is also less likelihood of a successful transfer, pregnancy, and live birth).¹⁰⁹ The CDC has reported that “a woman’s age is the most important factor for having a live birth when her own eggs are used.”¹¹⁰ Often cycles that progress to pregnancy result in miscarriage.¹¹¹ In contrast, women using donor eggs had a much higher percentages of live births no matter what their age, since the egg donors are typically in their 20s and 30s.¹¹² “The percentage of cycles performed with donor eggs increased sharply after age 40. Among women older than age 48, for example, approximately 90% of all ART cycles used donor eggs, of which more than two-thirds used frozen embryos created from donor eggs.”¹¹³

The “average age of women using ART services in 2013 was 36,”¹¹⁴ but it should be noted that this is the average age—the largest group of women using ART being younger than 35 (38%).¹¹⁵ Around “20% of ART cycles were performed among women aged 35-37, 19% among women 38-40, 11% among

¹⁰⁵ 2015 CDC Report, *supra* note 44, at 24; *see also* Sunderam, *supra* note 39.

¹⁰⁶ 2014 CDC Report, *supra* note 53, at 23.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.* at 28.

¹⁰⁹ *Id.* at 23.

¹¹⁰ 2015 CDC Report, *supra* note 44, at 21.

¹¹¹ 2014 CDC Report, *supra* note 53, at 22.

¹¹² *Id.* at 46.

¹¹³ 2015 CDC Report, *supra* note 44, at 46.

¹¹⁴ *Id.* at 9 (In 2015 the average age was slightly more than 35 and the median age was 35. Nearly 65% of all women utilizing ART cycles in 2015 were women aged 30-39).

¹¹⁵ 2013 CDC Report, *supra* note 67, at 9.

women aged 41-42, 7% among women aged 43-44, and 5% among women older than 44.”¹¹⁶ The age of the woman continues to be a major factor in determining whether the ART cycle will result in a live birth.¹¹⁷ “Overall, 40% of cycles started in 2013 among women younger than age 35 resulted in live births. “This percentage decreased to 32% among women aged 35-37, 21% among women aged 38-40, 11% among women aged 41-42, 5% among women aged 43-44, and 2% among women older than age 44.”¹¹⁸

In 2013 and 2014, the average age of women using ART was 36 years-of-age.¹¹⁹ However, women less than 35 years-of-age represented approximately 38% of all ART cycles performed in that year: 20% of ART cycles were performed among women aged 35-37, 19% among women aged 38-40, 10% among women aged 41-42, 7% among women aged 43-44, and 6% among women older than 44.¹²⁰ The percentages of “fresh nondonor cycles performed were greater than frozen nondonor cycles in all age groups. Percentages of fresh or frozen donor cycles were about the same in younger age groups.”¹²¹ While older age groups typically undergo frozen donor cycles more than fresh donor cycles.¹²²

4. Embryos Transferred

Of the ART cycles studied that used fresh nondonor eggs or embryos in 2013, “36% of cycles resulted in clinical pregnancy; about 24% resulted in a single-fetus pregnancy, 10% [resulted] in a multiple-fetus pregnancy, and 2% [of this group resulted] in a pregnancy where the number of fetuses could not be determined.”¹²³ In addition, about “82% of the pregnancies resulted in a live birth (about 60% in the birth of a single infant and 22% in the birth of multiple infants).”¹²⁴ Meanwhile, “about 17% of pregnancies resulted in miscarriage, stillbirth, abortion, or maternal death prior to birth.”¹²⁵ Additionally, it should be noted that “single-infant births have a lower risk than multiple-infant births for poor infant health outcomes, including prematurity, low birth weight,

¹¹⁶ *Id.*

¹¹⁷ Hye Ok Kim et al., *Predictors of Live Birth and Pregnancy Success After in Vitro Fertilization in Infertile Women Aged 40 and Over*, CLINICAL EXPERIMENTAL REPROD. MED., June 2017, at 111.

¹¹⁸ 2013 CDC Report, *supra* note 67, at 23.

¹¹⁹ 2014 CDC Report, *supra* note 53, at 9.

¹²⁰ *Id.*

¹²¹ *Id.* at 10.

¹²² *Id.*

¹²³ 2013 CDC Report, *supra* note 67, at 15.

¹²⁴ *Id.* at 16.

¹²⁵ *Id.*

disability, and death.”¹²⁶ This finding is consistent throughout the data and recent reports find similar results. The “percentage of transfers of fresh nondonor eggs or embryos in 2014 resulting in the live birth of a single, term, and normal birth weight infant decreased as the number of embryos transferred increased.”¹²⁷ Indeed, the 2014 data revealed that “the percentage of single-infant live births was highest with the transfer of one embryo (98%).”¹²⁸ Likewise, in 2015 data concluded that the “percentage of transfers resulting in the live birth of a single, term, and normal birth weight infant decreased from approximately 30% among cycles that involved the transfer of one embryo to 11% among cycles that involved the transfer of four or more embryos.”¹²⁹

In 2013, the majority of ART cycles that used fresh nondonor eggs or embryos and that progressed to the embryo transfer stage involved the transfer of one (23.6%) or two (55.7%) embryos.¹³⁰ Almost 21% of transfers involved three or more embryos, 6% involved four or more embryos, and 2% of transfers involved five or more embryos.¹³¹ Once an egg is retrieved for fertilization and then fertilized, the resulting embryo may be transferred into the woman’s uterus anytime in the next 1 to 6 days, the most common were transfers after three or five days.¹³² Furthermore, “[t]he percentage of transfers resulting in the live birth of a single, term, and normal birth weight infant decreased as the number of embryos transferred increased.”¹³³

5. Gestational Carriers/Surrogates

Often a surrogate¹³⁴ is used to carry a child to term, using her own eggs or eggs from a donor. Between 2005 and 2014 the number of ART cycles using a gestational carrier nearly doubled in number.¹³⁵ “The percentage of transfers using a gestational carrier among all transfers also increased, from about 2% in 2005 to about 3% in 2014.”¹³⁶

¹²⁶ *Id.* at 53.

¹²⁷ 2014 CDC Report, *supra* note 53, at 33.

¹²⁸ *Id.* at 35.

¹²⁹ 2015 CDC Report, *supra* note 44, at 34.

¹³⁰ 2013 CDC Report, *supra* note 67, at 31.

¹³¹ *Id.*

¹³² *Id.* at 36.

¹³³ *Id.* at 33.

¹³⁴ UNIF. PARENTAGE ACT § 801(1-2) cmt. (NAT’L CONFERENCE OF COMM’RS ON UNIF. STATE LAWS 2017) (defining a surrogate as a woman who is not an intended parent and who agrees to become pregnant through assisted reproduction using her own gametes (genetic surrogate) or gametes that are not her own (gestational surrogate)).

¹³⁵ 2014 CDC Report, *supra* note 53, at 52.

¹³⁶ *Id.*

In 2013, data reported to the CDC showed, the “percentages of transfers that resulted in live births were higher among gestational carrier [surrogates] cycles in all age groups except older than age 44.”¹³⁷ Gestational carriers were used in about 1% of fresh nondonor ART cycles in 2013 (822 cycles) and similarly in 2014.¹³⁸ Overall, the percentage of live births when using a gestational carrier was 8% higher among women younger than age 35, 4% higher among women aged 35-37, 10% higher among women aged 38-40, 12% higher among women aged 41-42, and 8% higher among women aged 43-44.¹³⁹ There are similar statistics in both 2014 and 2015.¹⁴⁰

Greater acceptance of surrogacy agreements occurred following the famous 1988 decision, *In re Baby M*, where the Supreme Court of New Jersey held that the genetic surrogacy agreement violated state public policy.¹⁴¹ Presently, the District of Columbia, New York, and only three other jurisdictions ban surrogacy outright.¹⁴² While seven states allow surrogacy through case law precedent, there are twenty-two states that statutorily permit surrogacy with certain limitations.¹⁴³ Alternatively, twenty-one states remain silent on the issue.¹⁴⁴

B. Financial Cost of ART

1. Cycles

Because of location, the health status of participants, and the extent of treatment options, it is difficult to provide an accurate assessment of the cost of an ART cycle. One study estimates that the cost of one IVF treatment, often not covered by the few insurance policies that do cover infertility treatments, is \$12,500.¹⁴⁵ Costs for achieving a live birth can range from \$66,000 to \$114,000.¹⁴⁶

One published report provides that:

IVF treatment costs can vary widely depending on age, medical history, location, and the number of accessible fertility clinics. According to

¹³⁷ 2013 CDC Report, *supra* note 67, at 41.

¹³⁸ *Id.*; 2014 CDC Report, *supra* note 53, at 41.

¹³⁹ 2013 CDC Report, *supra* note 67, at 41.

¹⁴⁰ *See* 2014 CDC Report, *supra* note 53, at 41; 2015 CDC Report, *supra* note 44, at 42.

¹⁴¹ *Matter of Baby M*, 537 A.2d 1227, 1253 (N.J. 1988).

¹⁴² Zalesne, *supra* note 20, at 429.

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ *See* Katie Falloon & Philip M. Rosoff, *Who Pays? Mandate Insurance Coverage for Assisted Reproductive Technology*, 16 AM. MED. ASS'N J. OF ETHICS 63, 63 (2014).

¹⁴⁶ *Id.*

RESOLVE, the National Infertility Association, the average cost of a single IVF cycle using fresh embryos is \$8,158—not including medications. Each IVF treatment cycle is a multistep process, in which eggs are extracted, fertilized with sperm in a lab, then placed in the uterus once the embryo develops to a certain point. The fertility drugs that release the hormones that boost egg production and make the uterus more receptive to embryo implantation can vary from \$60 to \$6,000 per cycle.¹⁴⁷

Some commentators predict that competition among clinics, plus increased technological efficiency over time, will eventually drive the prices down, as happens with most new technologies.¹⁴⁸ Indeed, it is arguable that the increasing use of assisted reproductive technology and greater access to financing, work in tandem. “In most cases, the market is a necessary catalyst for technological change—commercialization is what propels technological advancements forward.”¹⁴⁹

At least one organization, RESOLVE, provides assistance in making resources accessible to persons seeking to use fertility services, establishing a network of support, and advocating on behalf of fertility options. RESOLVE is a non-profit organization, founded in 1974, that is certified under the National Health Council Standards of Excellence.¹⁵⁰ It describes itself as the national fertility association and seeks to provide help to those who may be victimized by unequal access due to the high cost of treatments that is often not covered by insurance.¹⁵¹ RESOLVE offers many aspects of infertility response.¹⁵² For example, it provides access to information about area support groups, available insurance coverage, legislative advocacy, and advice on the ways to address infertility.¹⁵³

¹⁴⁷ *In Vitro Fertilization Cost: Can you Afford IVF Treatment?*, DISCOVER: Health and Family (Aug. 21, 2017) https://www.discover.com/personal-loans/resources/major-expenses/fertility-costs/#_edn2 (last visited Dec. 1, 2018); see also *State Laws Related to Insurance Coverage for Infertility Treatment*, NAT’L. CONF. OF STATE LEGIS. (April 27, 2018), <http://www.ncsl.org/research/health/insurance-coverage-for-infertility-laws.aspx> (quoting the University of Iowa Stead Family Children’s Hospital study reporting that each cycle of IVF costs \$12,000 to \$17,000 on average).

¹⁴⁸ See Zalesne, *supra* note 20, at 445.

¹⁴⁹ *Id.* at 487; see also Jillian Casey et al., *supra* note 15, at 113-15 (discussing progress being made to supply insurance coverage for ART).

¹⁵⁰ *Fast Facts About Resolve: The National Infertility Association*, RESOLVE, <https://resolve.org/about-us/fast-facts-resolve-national-infertility-association/> (last visited Oct. 8, 2018).

¹⁵¹ *Id.*; *Uddoh v. United Healthcare*, 254 F. Supp. 3d 424, 426 (E.D. N.Y. 2017) (showing an example of insurance refusing to pay for fertility treatments).

¹⁵² *Coping Techniques*, RESOLVE, <https://resolve.org/support/managing-infertility-stress/coping-techniques/> (last visited Dec. 1, 2018).

¹⁵³ *Id.*

Location of fertility clinics is important because not only does the cost of infertility treatments vary among the states, so do the laws mandating insurance, treatment options, and religious exemptions for treatment of persons seeking infertility treatments.¹⁵⁴ Legislatures are at the cusp of addressing issues of sex discrimination under Title VII and whether IVF should be encompassed within the purview of the Pregnancy Discrimination Act (PDA).¹⁵⁵ Similarly, the liberty interest guaranteed to same-sex couples under the Supreme Court's decision in *Obergefell v. Hodges*¹⁵⁶ has yet to be fully explored.¹⁵⁷

There are also the ethical and moral issues to consider: "Though unsurprising, [the fact that access to ART is more accessible to the wealthy, than the poor] is morally problematic. If genetic reproduction is broadly believed to be of truly fundamental importance, then access to IVF in a just society would depend on need, not on morally irrelevant characteristics like wealth or education status."¹⁵⁸ Meaning "[t]he service would be available to everyone who could medically benefit from it, rather than only to those who could pay for it."¹⁵⁹ Insurance mandates create "lower costs for ART services so that use of the technology would be based less on financial status."¹⁶⁰ The proven success of insurance mandates is shown in the fact that "ART is higher in states where insurance coverage . . . is mandatory."¹⁶¹

¹⁵⁴ See, e.g., Camille M. Davidson, *Octomom and Multi-Fetal Pregnancies: Why Federal Legislation Should Require Insurers to Cover In Vitro Fertilization*, 17 WM. & MARY J. WOMEN & L. 135, 165-66 (2010); see generally Katherine Johnson, *Charting Infertility in the Workplace: An Analysis of Hall v. Nalco and the Seventh Circuit's Recognition of Sex Discrimination Based on In Vitro Fertilization*, 59 DEPAUL L. REV. 1283, 1317-19 (2010); Gwenn Dobos, *The Relevance of "Related": Should "Related Medical Conditions" Include In Vitro Fertilization Under the PDA? - Hall v. Nalco*, 534 F.3d 644 (7th Cir. 2008), 78 U. CONN. L. REV. 399, 399 (2009).

¹⁵⁵ See generally Johnson, *supra* note 157, at 1283, 1296; see generally Dobos, *supra* note 157 at 399.

¹⁵⁶ *Obergefell v. Hodges*, 135 S. Ct. 2584, 2604-05 (2015) (holding that same-sex couples have a liberty interest under the United States Constitution to enter into marriage, and to have their marriages recognized by other states).

¹⁵⁷ See *Masterpiece Cakeshop, Ltd. v. Colo. Civil Rights Comm'n*, 138 S. Ct. 1719, 1747 (2018) (analyzing *Obergefell* in the context of First Amendment liberty rights and same-sex couples); *Pavan v. Smith*, 137 S. Ct. 2075, 2079 (2017) (reinforcing *Obergefell* by invalidating Arkansas statute that required the name of mother's male spouse to appear on child's birth certificate when mother conceived child by means of artificial insemination, but allowed omission of mother's female spouse from child's birth certificate under the same circumstances).

¹⁵⁸ Falloon & Rosoff, *supra* note 146, at 64.

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*

¹⁶¹ *Id.*

2. Insurance Coverage

Commentators suggest that, in time, insurance coverage for fertility treatments will become increasingly available.¹⁶² “As use of ARTs become more widespread, consumers of insurance policies will begin to demand better coverage of fertility treatments.”¹⁶³ However, there is not currently a universal state, or federal requirement that infertility be covered by insurance.¹⁶⁴ Medicaid will not pay for infertility treatments, but Congress, as part of the fiscal year 2018 budget, extended IVF services for qualified wounded veterans for another two years.¹⁶⁵ Due to lack of public funding, ART is most often paid for with private funds, restricting treatments to wealthier individuals.¹⁶⁶

There are many reasons why mandated insurance coverage is appealing and why it would be desirable for this technology to be available to all those who want it. Infertility affects approximately 10 percent of couples at any given time worldwide, and the high cost of ART is a major barrier to its use [citation omitted]. National survey data indicate that insurance coverage and finances are the main factors in whether or not a woman seeks medical help to become pregnant. [citation omitted]. There is an 11 percent chance that low-income women will pursue ART, while high-income women are almost twice as likely to do so [citation omitted.]. It is therefore not surprising that those who have access to ART are wealthier and have had more education than the average person [citation omitted].¹⁶⁷

Currently, fifteen states have enacted legislation requiring that private insurance cover all or some of infertility treatment.¹⁶⁸ The fifteen states include: Arkansas, California, Connecticut, Hawaii, Illinois, Louisiana, Maryland, Massachusetts, Montana, New Jersey, New York, Ohio, Rhode Island, Texas and West Virginia.¹⁶⁹ The laws of these states also vary greatly, some requiring

¹⁶² See generally Casey et al., *supra* note 15, at 123.

¹⁶³ *Id.*

¹⁶⁴ See Falloon & Rosoff, *supra* note 146, at 63.

¹⁶⁵ See SOC’Y FOR ASSISTED REPROD. TECH., *Congress Approves FY18 Budget; Extends IVF Services for Wounded Veterans* (Mar. 22, 2018), <http://www.sart.org/news-and-publications/news-and-research/press-releases-and-bulletins/congress-approves-fy18-budget-extends-ivf-services-for-wounded-veterans>.

¹⁶⁶ Falloon & Rosoff, *supra* note 146, at 65.

¹⁶⁷ *Id.* at 63-64.

¹⁶⁸ See NAT’L CONF. FOR STATE LEGIS., *supra* note 150; Eight states mandate reimbursement for ART. See CTR. FOR DISEASE CONTROL AND PREVENTION, *Key Findings: Infertility Mandates and Use of Assisted Reproductive Technology* (Apr. 13, 2016), <https://www.cdc.gov/art/key-findings/insurance.html>.

¹⁶⁹ Henry J. Kaiser Family Found., *Mandated Coverage of Infertility Treatment*, KFF (2015), <https://www.kff.org/womens-health-policy/state-indicator/infertility-coverage/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort>

insurers to cover or offer coverage of infertility diagnosis and treatment.

To illustrate differences among the states, California law requires group health care service plans to offer coverage for the treatment of infertility, except for in vitro fertilization.¹⁷⁰ The law also accommodates religious beliefs by exempting employers from compliance if this would be inconsistent with the organization's religious or ethical values.¹⁷¹ Arkansas, on the other hand, provides that all individual and group insurance policies that provide maternity benefits must cover IVF, including cryopreservation.¹⁷² Insurers may choose to include other infertility procedures or treatments under the IVF benefit; however, insurers relying upon the mandated coverage are required to meet the following standards:

(1) there is a lifetime maximum of \$15,000 for coverage; (2) the patient's eggs must be fertilized with her husband's sperm; (3) the patient has been unable to obtain successful pregnancy through any less costly infertility treatments covered by insurance; (4) the IVF procedure must be performed at a facility licensed or certified by the state in conformity with state law; (5) coverage is limited to preexisting conditions of 12 months; (6) the patient and her spouse must have at least a two year history of unexplained infertility or the infertility must be associated with at least one of the following: endometriosis, DES exposure, blocked or surgically removed fallopian tubes that are not the result of voluntary sterilization, or abnormal male factors contributing to the infertility.¹⁷³

However, New Jersey requires health insurers in the state to provide coverage for "medically necessary expenses incurred in the diagnosis and treatment of infertility."¹⁷⁴ This includes medications, and procedures, including "surgery, in vitro fertilization, embryo transfer, artificial insemination, gamete intrafallopian transfer, zygote intrafallopian transfer, intracytoplasmic sperm injection, and four completed egg retrievals per lifetime of the covered person."¹⁷⁵ The law includes some restrictions as well as a religious exemption for employers that provide coverage to fewer than fifty employees.¹⁷⁶

Looking to the future, there is some indication that government will become

%22:%22asc%22%7D; *see, e.g.*, ARK. CODE § 23-85-137 (2011); CAL. HEALTH & SAFETY CODE § 1374.55 (2014); OHIO REV. CODE § 1751.01 (2016); TEX. INS. CODE § 1366.001 et seq. (2003).

¹⁷⁰ CAL. INS. CODE § 10119.6(a) (2014).

¹⁷¹ CAL. HEALTH & SAFETY CODE § 1374.55(e) (2014); CAL. INS. CODE § 10119.6(e)(1) (2014).

¹⁷² ARK. ADMIN. CODE § 054.00.1-8 (2018).

¹⁷³ ARK. CODE ANN. §§ 23-85-137(c) (2018); ARK. CODE ANN. 23-86-118(c) (2018).

¹⁷⁴ N.J. STAT. ANN. § 17:48-6x(a) (2001) (amended 2017).

¹⁷⁵ *Id.*

¹⁷⁶ *Id.* §§ 17:48-6x(a)(8)(b), 7w(a), 35.22 (a, b), 46.1x(4)(a).

more proactive in mandating insurance coverage for fertility treatments. For example, Governor Andrew M. Cuomo, as part of his agenda for his 2018 Women's Agenda for New York: Equal Rights, Equal Opportunity, announced plans to improve access to in vitro fertilization and fertility treatment services for New Yorkers.¹⁷⁷ The governor directed the New York State Department of Financial Services to examine approaches for incorporating fertility treatments into what already exists under New York law.¹⁷⁸ The governor cited statistics stating that approximately 12% of women between the ages of 18 and 44 years old struggle to conceive or carry a pregnancy to term.¹⁷⁹ The Department of Financial Services is tasked with ensuring that all New Yorkers have access to infertility treatment and preservation services, regardless of sexual orientation or marital status.¹⁸⁰

Currently, New York state law prohibits individual and group health insurance policies from excluding coverage for hospital care, surgical care, and medical care for diagnosis and treatment of correctable medical conditions otherwise covered by the applicable policy, solely because the medical condition results in infertility.¹⁸¹ In 2002, the New York legislature amended state law to require certain insurers to cover infertility treatment for women between the ages of 21 and 44, but the law excludes coverage for in vitro fertilization, gamete intrafallopian tube transfers, and zygote intrafallopian tube transfers.¹⁸² Then in 2011, New York law was further amended to mandate that every insurance policy provides coverage for prescription fertility drugs and permits these drugs to be purchased at all types of pharmacies.¹⁸³

II. SURROGACY

Surrogacy as a parenting option has ancient roots, even biblical references,¹⁸⁴ but historically, surrogacy is distinctive in that the woman, not intending to be a

¹⁷⁷ See N.Y. LAWS A779 ch. 598 (2011); N.Y. PUB. HEALTH LAW § 2807 (2015); see also N.Y. GOV., *New York Governor Announces Actions to Improve Access to IVF and Fertility Preservation Services*, (Mar. 1, 2018), <https://www.governor.ny.gov/news/governor-cuomo-announces-actions-improve-access-ivf-and-fertility-preservation-services>.

¹⁷⁸ *New York Governor Cuomo Makes Access to IVF Care a Priority in 2018 Policy Agenda for Women*, AM. SOC'Y REPROD. MED. (Jan. 11, 2018), <https://www.asrm.org/news-and-publications/news-and-research>

¹⁷⁹ Press Release, Dep't. Fin. Servs., Governor Cuomo Announces Actions to Improve Access to IVF and Fertility Preservation Services (Mar. 1, 2018), <https://www.dfs.ny.gov/about/press/pr1805231.htm>.

¹⁸⁰ *Id.*

¹⁸¹ N.Y. INS. LAW § 3216(i)(13)(A,B); N.Y. INS. LAW § 4303 (2011).

¹⁸² See N.Y. INS. LAW §3221(g)(6).

¹⁸³ See NAT'L CONF. FOR STATE LEGIS., *supra* note 150.

¹⁸⁴ See *Genesis*, *supra* note 5 at 16:1-16.

parent, agrees to become pregnant and carry a child to term using her own gamete under a genetic surrogacy agreement.¹⁸⁵ The 2017 version of the UPA refers to this woman as a genetic surrogate.¹⁸⁶ The fact that the woman is using her own gamete provides a heightened scrutiny and claim to parentage on her part.

However, modern ART has expanded surrogacy options beyond genetic surrogacy, enabling a woman, not intending to be a parent, to become pregnant using gametes that are not her own under a surrogacy agreement.¹⁸⁷ The 2017 UPA refers to this woman as a gestational surrogate.¹⁸⁸ Through IVF, adult parties may enter into “collaborative reproduction” arrangements whereby a surrogate may gestate a fetus using donor gametes.¹⁸⁹ The surrogacy contract may include any of these assisted reproduction means, meant to cause pregnancy, other than through sexual intercourse, such as: (1) intrauterine or intracervical insemination; (2) donations of gametes; (3) donation of embryos; (4) in vitro fertilization and transfer of embryos; or (5) intracytoplasmic sperm injection.¹⁹⁰ These technological advances far exceed the sole means envisioned in ancient times.

Surrogates in the United States tend to live above the poverty level, have already given birth to at least one child, and have a stable, sensible lifestyle.¹⁹¹ One profile describes a surrogate in the following fashion: married, Christian, middle-class, with two to three biological children, working a part-time job, living in a small town or suburb, rather than a big city, with at least some education from a higher institution, but usually a bachelor’s degree.¹⁹² In the

¹⁸⁵ See, e.g., *P.M. v. T.B.*, 907 N.W.2d 522, 530-31 (Iowa 2018) (illustrating how a successful surrogacy contract operates among consenting parties), *petition for cert. filed*, (U.S. June 4, 2018) (No. 17-1631).

¹⁸⁶ UNIF. PARENTAGE ACT § 801(1).

¹⁸⁷ *Id.* §§ 102(10), 801(1), (3) (defining a ‘gamete’ as “sperm, egg, or any part of a sperm or egg”, a ‘genetic surrogate’ as “one who uses her own gamete”, and a ‘surrogacy agreement’ as an agreement between intended parent(s) and woman who agrees to become pregnant through assisted reproduction); Susan Imrie et al., *The Long-term Experiences of Surrogates: Relationships and Contact with Surrogacy Families in Genetic and Gestational Surrogacy Arrangements*, 29 REPROD. BIOMEDICINE ONLINE 424, 425 (2014).

¹⁸⁸ UNIF. PARENTAGE ACT § 801(2) (defining “gestational surrogate” as one who does not use her own gamete).

¹⁸⁹ *In re Marriage of Buzzanca*, 72 Cal. Rptr. 2d 280, 282-83 (Cal. Ct. App. 1998) (considering surrogacy agreement in which a woman gave birth to baby with whom she shared no genetic connection).

¹⁹⁰ UNIF. PARENTAGE ACT § 102(4).

¹⁹¹ *Surrogate Requirements*, CONCEIVEABILITIES, <https://conceiveabilities.com/surrogates/surrogate-requirements> (last visited Nov. 16, 2018); *Surrogacy Question: What You Need to Know*, JOY OF LIFE SURROGACY, <http://www.joyoflifesurrogacy.com/surrogacy-question> (last visited Nov. 16, 2018).

¹⁹² Leslie Morgan Steiner, *Who Becomes a Surrogate?*, THE ATLANTIC (Nov. 25, 2013), <https://www.theatlantic.com/health/archive/2013/11/who-becomes-a-surrogate/281596>.

United States, statistics show that surrogates fall into the average household income category of under \$60,000.¹⁹³ About 15% to 20% of surrogates are military wives and some are single women.¹⁹⁴ “Of the women who serve as surrogates for CSP” (the Center for Surrogate Parenting) and “are married [to] husbands who support paid surrogacy . . . roughly 35 percent repeat the experience.”¹⁹⁵

A. Disparate Couples

While surrogacy may have begun with an infertile married couple seeking to have a child with a biological connection to at least one spouse, that paradigm has expanded to include unmarried opposite-sex and same-sex couples. These two groups have expanded drastically in recent decades.¹⁹⁶ Some argue that one reason why surrogacy has been increasingly accepted is because there has been a concomitant expansion of rights for the LGBTQ community, especially for gay men seeking to become parents through a biological connection.¹⁹⁷

However, opposite-sex nonmarital couples have also had an impact on surrogacy. One of the first decisions involving opposite-sex nonmarital partners involved the disposition of cryogenically-preserved sperm and whether public policy allowed the man to release his sperm to his nonmarital partner during his lifetime, or at his death.¹⁹⁸ In *Hecht v. Superior Court*, a man committed suicide prior to releasing his sperm to his partner, but he bequeathed the sperm in his last will and testament, which she subsequently requested from the sperm bank.¹⁹⁹ The man’s then living children opposed giving her their father’s sperm, arguing that doing so violated public policy because the two partners were unmarried and any birth would impose a step-sibling upon them.²⁰⁰ However, the California Appellate Court held that the man’s sperm was his separate, personal property and, as such, could be bequeathed through his estate.²⁰¹ Furthermore, artificially inseminating the decedent’s partner with the decedent’s

¹⁹³ *Id.*

¹⁹⁴ *Id.*

¹⁹⁵ *Id.*

¹⁹⁶ See generally O’Brien, *supra* note 29, at 385-87 (discussing the impact of de facto parenthood and same-sex marriage on functional families); Anne R. Dana, *The State of Surrogacy Laws: Determining Legal Parentage for Gay Fathers*, 18 DUKE J. GENDER L. & POL’Y 353, 356-58 (2011) (advocating for an intent test to determine parentage in surrogacy arrangements).

¹⁹⁷ See, e.g., Zalesne, *supra* note 20, at 428.

¹⁹⁸ *Hecht v. Superior Court*, 20 Cal. Rptr. 2d 275, 285-87, 289-91 (Ct. App. 1993).

¹⁹⁹ *Id.* at 276-78.

²⁰⁰ *Id.* at 279, 284.

²⁰¹ *Id.* at 283.

sperm is a personal decision and did not violate public policy of the state.²⁰²

But significant resistance to surrogacy remains, especially when it involves a genetic surrogate. As one commentator observes, “American culture heralds a natural mother-child bond,” and “surrogate women are sometimes seen as deviant mothers, making the decision to give up a child before getting pregnant and violating the sacred bond between mother and child in the process.”²⁰³

For same-sex couples the issue of surrogacy is more complicated since same-sex marriage was not an option in all of the states until 2015.²⁰⁴ In addition, some states had policies discouraging same-sex parenthood, and there were, and are, continuing restraints upon enforcing surrogacy contracts that may be accentuated by the fact that same-sex parties are involved.²⁰⁵ The difficulties encountered by same-sex couples is illustrated in *Pavan v. Smith*.²⁰⁶ The United States Supreme Court granted certiorari to resolve a dispute regarding the right of same-sex parents to have their names be listed on their child’s birth certificates.²⁰⁷ An Arkansas state statute provided that when a couple was married and the female spouse gave birth to a child via in vitro fertilization, her male spouse’s name was placed on the birth certificate as the other parent of the resulting child.²⁰⁸ Arkansas state officials refused to extend this right to now-married same-sex female couples and, as a result, the Court was forced to intervene.²⁰⁹ The Court held that the statute had to be gender neutral in light of the Court’s ruling in *Obergefell*, thereby mandating that the woman’s female spouse have her name placed on the birth certificate as a parent of the child conceived through in vitro fertilization.²¹⁰

In addition to any animus concerning same-sex couples today, there still exists, “the attitude towards the practice of surrogacy both inside and outside the U.S. [that] . . . is still ambivalent at best, and many researchers and judges oppose freedom of contract concerning this issue.”²¹¹ Objections to surrogacy focus on public policy prohibiting trafficking of babies, prohibitions against taking

²⁰² *Id.* at 289.

²⁰³ Zalesne, *supra* note 20, at 433-34.

²⁰⁴ See *Obergefell v. Hodges*, 135 S. Ct. 2584 (2015) (holding that the Due Process Clause of the United States Constitution prohibited states from denying same-sex couples the right to enter into marriage).

²⁰⁵ Rachel Wexler, *Artificial Reproductive Technology and Gendered Nations of Parenthood After Obergefell: Analyzing the Legal Assumptions That Shaped the Baby M Case and the Hodge-Podge Nature of Current Surrogacy Law*, 27 TUL. J. L. & SEXUALITY 1, 4-5 (2018).

²⁰⁶ See *Pavan*, 137 S.Ct. at 2078 (2017).

²⁰⁷ *Id.* at 2076-77.

²⁰⁸ ARK. CODE § 20-18-401 (e), (f) (2016).

²⁰⁹ See *Pavan*, 137 S.Ct. at 2078 (2017).

²¹⁰ *Id.* at 2077.

²¹¹ Yehezkel Margalit, *In Defense of Surrogacy Agreements: A Modern Contract Law Perspective*, 20 WM. & MARY J. WOMEN & L. 423, 429 (2014).

children from parents, and concerns over the capacity or voluntariness of persons entering into surrogacy contracts.²¹² One author summarized the issues with surrogacy as follows:

Because surrogacy contracts deal with elementary human rights, which are of high personal and social importance, any rigid enforcement of such contracts or total withdrawal from them may cause damage that is detrimental to the sides. Similarly, every considered solution, such as monetary refund or compensation, which may be appropriate in the commercial context, is irrelevant in the intimate context of surrogacy contracts since the sole goal of the agreement is the birth of a child and the establishment of that child's legal parenthood. Likewise, we should not forget that the subject of such agreement is a child whose interests and rights could be badly damaged should the parties be unable to reach a just compromise.²¹³

Nonetheless, there is the suggestion that evidence “demonstrates the recent shift and accelerated social and legal acceptance of the surrogacy practice.”²¹⁴ If attitudes toward surrogacy are changing, then “the dilemma now centers on the question of how to execute such contracts in the best possible way in order to maximize their feasibility and durability at the state, federal, and international levels.”²¹⁵

Comments to the newly revised UPA (2017) illustrate the tentative acceptance of surrogacy contracts among the states, particularly genetic or traditional surrogacy, which involves the woman using her own gametes.²¹⁶ As this Article will discuss, the revised UPA, while recognizing “the controversial nature of surrogacy itself,”²¹⁷ takes note that more “states address surrogacy by statute, and more people are having children through surrogacy.”²¹⁸ Technological advances during the recent decades have made surrogacy an option for persons and couples, which the states gradually accommodate through revised statutes. But the process is fraught with challenge and scrutiny.

²¹² *Id.*

²¹³ *Id.*

²¹⁴ *Id.* at 437; see also Zalesne, *supra* note 20, at 428 (citing Anne R. Dana, *The State of Surrogacy Laws: Determining Legal Parentage for Gay Fathers*, 18 DUKE J. GENDER L. & POL'Y 353, 373-74, 376 (2011) (“Surrogacy is becoming more widely accepted in the United States each year.”).

²¹⁵ Zalesne, *supra* note 20, at 438.

²¹⁶ UNIF. PARENTAGE ACT § 904 cmt.; Yvonne M. Warlen, *The Renting of the Womb: An Analysis of Gestational Surrogacy Contracts Under Missouri Contract Law*, 62 UMKC L. REV. 583, 592-93 (1994).

²¹⁷ UNIF. PARENTAGE ACT art. 8 cmt.

²¹⁸ *Id.*

B. Challenge and Scrutiny

1. Heightened Scrutiny

When the Supreme Court of the United States ruled that the Constitution guaranteed same-sex couples the right to enter into marriage, the Court mandated that same-sex couples be treated equally with opposite-sex couples.²¹⁹ Commensurate with the Supreme Court's decision, the National Conference of Commissioners on Uniform State Laws enacted a 2017 revision of the UPA that, among other revisions, amended the Act's provisions so that they "address and apply equally to same-sex couples."²²⁰ These changes include broadening the presumptions, acknowledgement, genetic testing, and assisted reproduction articles to make them gender neutral."²²¹ Prior versions of the Act distinguished between paternity and maternity and created different mechanisms for establishing each one. "Not only did this distinction erect different rules for men and women, but it also reinforced the notion that some inherent difference exists between mothers and fathers."²²² To illustrate, all states have what is referred to as a marital presumption, which provides that a child born to a married woman is presumptively the child of that woman's husband, not that woman's wife.²²³ This was the issue illustrated in the *Pavan* decision.²²⁴ "The UPA addresses this potential constitutional infirmity by making the marital presumption expressly apply equally to both male and female spouses of the woman who gave birth."²²⁵

International surrogacy, especially in Thailand and Mexico, has become an option for couples and individuals seeking to become parents through arrangements with foreign women willing to carry a child to term.²²⁶ Currently, there is debate over monitoring international surrogacy, but most often the debate centers on the legality of the surrogacy contract and not the practice

²¹⁹ See *Obergefell v. Hodges*, 135 S. Ct. 2584, 2608 (2015).

²²⁰ UNIF. PARENTAGE ACT, art. 8 prefatory note; see Leslie Joan Harris, *Obergefell's Ambiguous Impact on Legal Parentage*, 92 CHI.-KENT L. REV. 55, 66 (2017).

²²¹ UNIF. PARENTAGE ACT, prefatory note (2017).

²²² Courtney G. Joslin, *Nurturing Parenthood Through the UPA* (2017), 127 YALE L. J. F. 589, 606 (2018).

²²³ See U.S. DEP'T OF HEALTH & HUM. SERVS., CHILDREN'S BUREAU, THE RIGHTS OF PRESUMED (PUTATIVE) FATHERS: SUMMARY OF STATE LAWS (2007).

²²⁴ *Pavan*, 137 S.Ct. at 2078-79 (2017).

²²⁵ Joslin, *supra* note 225, at 609.

²²⁶ See generally Adeline A. Allen, *Surrogacy and Limitations to Freedom of Contract: Toward Being More Fully Human*, 41 HARV. J. L. & PUB. POL'Y 753, 759, 769-70 (2018) (arguing that surrogacy contracts should be invalid as contrary to public policy); but see Sharmila Rudrappa, *Why Is India's Ban on Commercial Surrogacy Bad for Women?*, 43 N.C. J. INT'L L. 70, 93 (2018) (arguing that surrogacy is a valid form of employment for women and should be permitted).

itself.²²⁷ Understandably, scrutiny of foreign contracts will intensify as countries, such as India, ban the practice of international surrogacy, and cases arise of economic coercion of young women or now, because of further technological advances, sex-based selection of embryos. This new technology is called pre-implementation genetics (PGD) and involves a procedure “by which an embryologist removes one cell from an eight-cell embryo and tests that cell for the presence of genetic defects.”²²⁸ However, what are the limits on this technology? Gender selection and designer babies are matters of concern. Proposals will be put forth by academics and legislatures, but as technology advances, the law is slow to meet the challenges posed. The international arena will offer possibilities not available in the United States and this will precipitate added scrutiny of what develops.

Finally, not only in reference to surrogacy, but also pertinent to other forms of ART, scientific advancements “could allow two women to create a child without any male genetic contribution, or six parents to all contribute genetically to the creations of a child.”²²⁹ This technological advance is at the heart of the mitochondrial replacement evolution and involves, in addition, the parameters of posthumous conception.²³⁰ Just as surrogacy challenged traditional notions of parenthood, the possibility of a child with more than two parents—genetically or behaviorally—has arrived, prompting new issues:

Do all parents, whatever their numbers, acquire equal parental standing, with equal liability for child support and equal standing to seek custody and visitation? If they do, how should the courts apply such principles? Should they seek to equalize child support obligations and custody and visitation rights in accordance with the parents’ ability to provide for

²²⁷ See, e.g., Sarah Mortazavi, *It Takes a Village to Make a Child: Creating Guidelines for International Surrogacy*, 100 *Geo. L. J.* 2249, 2252 (2012); Barbara Stark, *Transnational Surrogacy and International Human Rights Law*, 18 *ILSA J. INT’L & COMP. L.* 369, 370 (2012); Richard Storrow, “*The Phantom Children of the Republic*”: *International Surrogacy and the New Illegitimacy*, 20 *AM. U. J. GENDER SOC. POL’Y & L.* 561, 595-96 (2012); Brock A. Patton, *Buying a Newborn: Globalization and the Lack of Federal Regulation of Commercial Surrogacy Contracts*, 79 *UMKC L. REV.* 507, 528 (2010); Katherine Drabiak et al., *Ethics, Law and Commercial Surrogacy: A Call for Uniformity*, 35 *J.L. MED. & ETHICS* 300, 301 (2007).

²²⁸ See Aziza Ahmed, *Race and Assisted Reproduction: Implications for Population Health*, 86 *FORDHAM L. REV.* 2801, 2807-08 (2018); see also Tara R. Melillo, *Gene Editing and the Rise of Designer Babies*, 50 *VAND. J. TRANSNAT’L L.* 757, 759 (2017); Molina B. Dayal, *Preimplantation Genetic Diagnosis*, *EMEDICINE* (Aug. 29, 2018), <https://emedicine.medscape.com/article/273415-overview>.

²²⁹ Margalit et al., *supra* note 36, at 107 (the advances in stem cell and somatic cell nuclear transfer technologies can allow for more genetic modifications or alterations).

²³⁰ See Robert Klitzman et al., *Controversies concerning mitochondrial replacement therapy*, *NCBI* (Nov. 20, 2014), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4505924/> (explaining mitochondrial replacement therapy and then doctors “playing god”).

the child or should they take other approaches?²³¹

Two commentators suggest that when a child has multiple parents, the “recognition [of parental rights is] to be hierarchical, rather than equal, in relationships.²³² The hierarchical structure presumes that a child’s best interest lies in the stability found in a relationship with a primary parent, and that other parents should receive physical custodial awards only to the extent that it does not undermine the relationship with the primary parent.²³³ Increasingly, this debate over the rights of multiple parents will become clearer as there are more cases presented before courts for judicial resolution.

2. *Parameters of Scrutiny*

A perennial issue with surrogacy contracts is what is often termed as the unequal power of the contracting parties.²³⁴ Technology has made it possible for someone in the developed world to transfer a gamete to a surrogate in the developing world for purposes of becoming a parent as a result of that developing world surrogate’s gestational labors.²³⁵ The scenario is fraught with issues of conscionability. There are those who decide that a fair contract is impossible and have banned surrogacy.²³⁶ However, for others, a surrogacy contract “should be seen as legitimate and enforceable, but premised upon a regulated, narrower notion of freedom of contract in order to protect the public interest.”²³⁷ The manner in which this protection will be provided is “through a variety of doctrines, the most relevant being: trust, fairness, reasonableness, good faith, increased disclosure obligation, consideration of the reliance interest of the other party and his individual needs, and unconscionability.”²³⁸ The most important of these factors is unconscionability. “Using this doctrine, courts weigh the fairness of the bargain when the contract was signed from both procedural and substantive aspects.”²³⁹

²³¹ June Carbone & Naomi Cahn, *Parents, Babies, and More Parents*, 92 CHI.-KENT L. REV. 9, 10 (2017) (arguing that equal status among all parents does not follow from parental recognition).

²³² *Id.* at 46.

²³³ *Id.*

²³⁴ Margalit, *supra* note 214, at 430-31.

²³⁵ See Jessica M. Caamano, *International, Commercial, Gestational Surrogacy through the Eyes of Children Born to Surrogates in Thailand: A Cry for Legal Attention*, 96 B.U. L. REV. 571, 574 (2016).

²³⁶ See, e.g., *Rosecky v. Schissel*, 349 Wis. 2d 634, 659 n.17 (Wis. 2013).

²³⁷ Margalit, *supra* note 214, at 440.

²³⁸ *Id.* at 445 (listing the following as grounds for unconscionability: fraud, lack of capacity, undue influence, duress, gross inequality of bargaining power, inability to read or understand the provisions of the agreement, a significant gap in age, intelligence or education, or unfair surprise).

²³⁹ *Id.* at 446 (referencing Richard L. Barnes, *Rediscovering Subjectivity in Contracts*:

As the law grapples with an increasing number of people utilizing surrogacy, plus the expansion of technological options, legislatures address the parameters of scrutiny.²⁴⁰ Some will ban genetic (traditional) surrogacy, and some will ban both genetic and gestational surrogacy. However, some groups such as the National Commissioners on Uniform State Laws, will posit benchmarks of what appear to be conscionable based on current circumstances.²⁴¹ The core factors to determine conscionability include: (1) age of the surrogate and intended parents; (2) adequate medical and mental health evaluation of the surrogate and intended parents; (3) independent legal representation for both the surrogate and the intended parents; (4) grounds and a process of rescission; (5) means of establishing parenthood; and (6) consideration and payment of expenses.²⁴²

There are too many variables to consider for one set of parameters. For example, it is important to note that the States and the UPA both impose additional requirements on surrogacy agreements when the surrogate uses her own gametes, which is referred to as a genetic or traditional surrogacy.²⁴³ To illustrate, the UPA allows a genetic surrogate to withdraw her consent up until 72 hours after birth.²⁴⁴ Additionally, to be enforceable, “a genetic surrogacy agreement must be validated by the [designated court], and the proceeding to validate the agreement must be commenced before assisted reproduction related to the surrogacy agreement.”²⁴⁵

In those jurisdictions permitting surrogacy, standard eligibility requirements

Adhesion and Unconscionability, 66 LA. L. REV. 123, 155-61 (2005)).

²⁴⁰ New Jersey Gestational Carrier Agreement Act of 2018, 9 N.J.S.A §§17-60 (2018); Linda S. Anderson, *Legislative Oppression: Restricting Gestational Surrogacy to Married Couples Is an Attempt to Legislate Morality*, 42 U. OF BALT. L. REV. 611, 634 (2013).

²⁴¹ See Arthur Allen Leff, *Unconscionability and the Code – The Emperor’s New Clause*, 115 U. OF PENN. L. REV. 485, 487 (1967); Deborah S. Mazer, *Born Breach: The Challenge of Remedies in Surrogacy Contracts*, 28 YALE J. OF L. & FEMINISM 211, 218-19 (2017).

²⁴² See, e.g., UNIF. PARENTAGE ACT § 802 (the Act requires the surrogate, genetic or gestational, to be at least 21 years of age, previously have given birth to at least one child, have a medical evaluation performed by a licensed medical doctor relating to the surrogacy arrangement, complete a mental health consultation by a licensed mental health professional, and have independent legal representation throughout the surrogacy arrangement regarding the terms of the surrogacy agreement, and the potential legal consequences of the agreement. In some states, the intended parents must pay for the surrogate’s legal representation. Any intended parent, either genetically related or not, must be at least 21 years of age, have a medical and a mental health examination done by either a medical doctor or a licensed mental health professional, and have independent legal counsel chosen by the intended parent throughout the surrogacy arrangement regarding the terms of the agreement and the potential legal consequences).

²⁴³ *Id.* § 815.

²⁴⁴ *Id.* § 814(a)(2).

²⁴⁵ *Id.* § 813(a).

are similar to the factors used to determine the validity of a contract, including age of the parties, medical condition, adequate consent to the procedure, and legal representation appear to be the standard eligibility requirements.²⁴⁶ Surrogacy agreements must also be signed and notarized prior to the medical procedure in connection with the contemplated surrogacy.²⁴⁷ In addition, at least one of the parties to the agreement must be a resident of the state where the agreement is to be enforced.²⁴⁸ Also, the surrogacy agreement itself must contain a clause in which the surrogate agrees to become pregnant by means of assisted reproduction and both she and her spouse, if any, renounce any claim to the child conceived, and that the intended parents agree to become the parents of the child regardless of the number of children born or the gender, mental, or physical condition of each child.²⁴⁹ At any time, the surrogate retains the right to make her own health and welfare decisions regarding her pregnancy, including the right to terminate the pregnancy itself.²⁵⁰

The intended parents must disclose in the agreement how they will pay for the surrogacy arrangement plus the financial responsibility for the child or children once born.²⁵¹ Disclosure requirements are quite specific, including a summary of health-care policy provisions, any third-party liability liens, other insurance available, and any disclosure that could affect coverage or liability of the surrogate.²⁵² While not required, the agreement may specify for payment of consideration, payment of reasonable expenses, and for reimbursement of specific expenses if the agreement is terminated.²⁵³ Likewise, the agreement must disclose any information about the right of any party to the agreement to terminate the surrogacy agreement.²⁵⁴

In addition to the requirements listed by the UPA, other commentators suggest

²⁴⁶ See, e.g., D.C. CODE §§ 16-405, 16-405(a)(2), 16-406(3) (2017); MAINE PARENTAGE ACT, ME. REV. STAT. tit. 19-a, § 1931 (2015); NEV. REV. CODE § 126.740 (2013); N.H. REV. CODE § 168-B: 9 (2014).

²⁴⁷ See UNIF. PARENTAGE ACT § 803(6)-(9),

²⁴⁸ *Id.* §§ 803(1) (“During the period after execution of a surrogacy agreement until 90 days after the birth of a child conceived by assisted reproduction under the agreement, a court of this state conducting a proceeding under this [Act] has exclusive, continuing jurisdiction over all matters arising out of the agreement.”).

²⁴⁹ *Id.* §§ 804(a)(1)-(4), 809(a) (“Except as otherwise provided in subsection (c) or Section 810(b) or 812, on birth of a child conceived by assisted reproduction under a gestational surrogacy agreement, each intended parent is, by operation of law, a parent of the child.”).

²⁵⁰ *Id.* § 804(a)(7).

²⁵¹ *Id.* § 804(a)(5).

²⁵² *Id.* § 804(a)(6).

²⁵³ *Id.* § 804(b).

²⁵⁴ *Id.* §§ 804(a)(8), 808(a) (“A party to a gestational agreement may terminate the agreement, at any time before or after an embryo transfer, by giving notice of termination in a record to all other parties. If an embryo transfer does not result in a pregnancy, a party may terminate the agreement at any time before a subsequent embryo transfer.”).

that all parties receive social and psychological support during the contractual period.²⁵⁵ Appropriate to the evolution of new technologies and the international character of surrogacy, “state and federal legislatures create and publish an accepted comprehensive form of standard surrogacy contract that includes mandatory stipulations in order to avoid (to the extent possible) any acute contractual problems that would abolish the legality and enforcement of surrogacy contracts.”²⁵⁶ Currently, the revised UPA provides the most comprehensive model of legislation.

III. POSTPONED CONCEPTION

A. Posthumous Conception

From the start of parenthood until the present time, women were pregnant and the father of their child or children sometimes died prior to the birth of their children, who were in gestation at the time of the father’s death. Children born after the death of their parent, but in gestation at the death of that parent, are referred to as a “posthumous birth.” There are statutory provisions prescribing that such children are able to inherit as if they were alive at the death of the decedent, but many statutes require the infants to survive a certain number of days after birth.²⁵⁷ However, technological advances associated with ART have enhanced this paradigm. First, since it is possible that a woman may cryopreserve her gametes, it is now possible that a woman may predecease the birth or conception of her own child.²⁵⁸ Therefore, posthumous birth may now occur with women who die prior to their egg or eggs, implanted in a surrogate, progressing toward a live birth.²⁵⁹ Second, both women and men may cryopreserve gametes—eggs, sperm, or embryos—for conception and birth after their death.²⁶⁰ This development is described as “posthumous conception.”²⁶¹

²⁵⁵ Margalit, *supra* note 214, at 464.

²⁵⁶ *Id.* at 466.

²⁵⁷ See, e.g., UNIF. PROBATE CODE § 2-104 (1969) (an individual in gestation at a decedent’s death is deemed to be living at the decedent’s death if the individual lives 120 hours after birth. If it is not established by clear and convincing evidence that an individual in gestation at the decedent’s death lived 120 hours after birth, it is deemed that the individual failed to survive for the required time).

²⁵⁸ Raymond C. O’Brien, *The Momentum of Posthumous Conception: A Model Act*, 25 J. CONTEMP. HEALTH L. & POL’Y 332, 333 (2009).

²⁵⁹ Daniel C. Perrone, *Breaking the Ice: Expanding the Class of “Issue” to Include Posthumously Conceived Children*, 27 J. CIV. RTS. & ECON. DEV. 369, 370 (2014).

²⁶⁰ Helene S. Shapo, *Matters Of Life And Death: Inheritance Consequences Of Reproductive Technologies*, 25 HOFSTRA L. REV. 1091, 1153 (1997).

²⁶¹ Gloria L. Banks, *Traditional Concepts and Nontraditional Conceptions: Social*

The science is new, as is the discussion of any ethical implications.²⁶²

ART makes it possible for babies to be born without sexual intercourse. Included within this technology is the ability to bring about conception of a human baby after the death of the male or female donor of the gamete.²⁶³ It is difficult to estimate how long the gamete may be cryopreserved prior to commencing its final cycle leading to birth of a child. In 2009, ABC News reported that a baby girl was born from a man's frozen sperm that had been cryopreserved for more than 22 years.²⁶⁴ More attention will be paid to long term banking in the future, but at present, most facts involve a man or woman seeking to become a parent in the not-too-distant future, usually with a current partner, and therefore "banking" gametes for this purpose now.

In *Woodward v. Commissioner of Social Security*, one of the earliest cases regarding posthumous conception, a man and a woman were married when the couple was informed that the husband had leukemia and that necessary medical treatments may leave him sterile.²⁶⁵ Thereupon the couple arranged for a quantity of the man's sperm to be withdrawn and cryopreserved for future use.²⁶⁶ Sadly, the man died of the disease shortly after his diagnosis, leaving behind his wife and his cryopreserved sperm.²⁶⁷ Because the wife had access to the sperm, she underwent artificial insemination using his sperm and subsequently gave birth to twin girls in 1995.²⁶⁸ Three months later, the mother of the twins applied for surviving child benefits on behalf of the twin girls from the Social Security Administration.²⁶⁹ These benefits are allowed for the minor children of a decedent parent qualified to take under the Social Security Act and permit the children to receive monetary awards each month until turning majority.²⁷⁰

The mother's application on behalf of the twins was denied by the Social Security administrator because the federal benefits are contingent upon whether the twins qualify as the husband's children.²⁷¹ To be his children they must be

Security Survivor's Benefits for Posthumously Conceived Children, 32 LOY. L.A. L. REV. 251, 258 (1999).

²⁶² See, e.g., Katarina Lee, *Ethical Considerations of Ovarian and Testicular Tissue Cryopreservation in Pre-Pubertal Children Who Cannot Consent*, 36 LAW & INEQ. 95, 95 (2018) (arguing that while parents and guardians normally have the best interests of their wards in mind when they make medical decisions, pre-pubertal fertility cryopreservation is ethically too problematic to permit parental or guardian consent without the child's assent).

²⁶³ Banks, *supra* note 265, at 272-73.

²⁶⁴ See ROBERT H. SITKOFF AND JESSE DUKEMINIER, WILLS, TRUSTS, AND ESTATES 117 (10th ed. 2017).

²⁶⁵ *Woodward v. Commissioner of Social Security*, 760 N.E.2d 257, 260 (Mass. 2002).

²⁶⁶ *Id.*

²⁶⁷ *Id.*

²⁶⁸ *Id.*

²⁶⁹ *Id.*

²⁷⁰ *Id.* at 260 n. 3.

²⁷¹ *Id.*

entitled to inherit from his intestate estate under the laws of the husband's state.²⁷² Thus, are children conceived after the death of a parent to be considered as the decedent's children?

Massachusetts, like most states at the time, never considered posthumous conception.²⁷³ The state statute on intestacy was drafted and enacted long before such technology became available. However, as the Massachusetts court pointed out in its opinion, "Neither the statute's 'posthumous children' provision . . . nor any other provision of our intestacy law limits the class of posthumous children to those in utero at the time of the decedent's death."²⁷⁴ Specifically, the "Massachusetts intestacy statute thus does not contain an express, affirmative requirement that posthumous children must "be in existence" as of the date of the decedent's death."²⁷⁵ Based in part on the state's statutory failure to require that the baby be born or in utero in order to inherit from a decedent, the state's highest court ruled that the twins were eligible to inherit, thus making them eligible to receive minor children survivorship Social Security benefits.²⁷⁶

While the silence of the state's statute was a significant factor in the court's decision, the court stressed the importance of the best interest of children,²⁷⁷ the technological advances made in the area of assisted reproductive technology,²⁷⁸ and the state's concerns over the timely distribution of a decedent's estate.²⁷⁹ As do many of the state and federal courts, the Massachusetts court called upon the legislature to address the advances in reproductive technology that generated the issue involved.²⁸⁰

The Massachusetts court then ruled, based on common law principles and existing state statutes:

[We] conclude that limited circumstances may exist, consistent with the mandates of our Legislature, in which posthumously conceived children may enjoy the inheritance rights of "issue" under our intestacy law. These limited circumstances exist where, as a threshold matter, the surviving parent or the child's other legal representative demonstrates a genetic relationship between the child and the decedent. The survivor or representative must then establish both that the decedent affirmatively consented to posthumous conception and to the support of any resulting child. Even where such circumstances exist, time limitations may preclude

²⁷² *Id.* at 260 n. 4.

²⁷³ *Id.*

²⁷⁴ *Id.* at 262, citing then applicable MASS. G.L. c. 190, § 8.

²⁷⁵ *Id.* at 264.

²⁷⁶ *Id.* at 272.

²⁷⁷ *Id.* at 265.

²⁷⁸ *Id.*

²⁷⁹ *Id.* at 268.

²⁸⁰ *Id.* at 272.

commencing a claim for succession rights on behalf of a posthumously conceived child. In any action brought to establish such inheritance rights, notice must be given to all interested parties.²⁸¹

This Massachusetts decision was the first of many involving guardians applying for Social Security survivorship benefits on behalf of children conceived posthumously. The response of other state courts, based solely on more restrictive state inheritance statutes, was to deny the benefits because the children could not inherit from the decedent's estate under intestate succession.²⁸² In 2012, the Supreme Court of the United States entered the fray and confirmed that the wording of the Social Security Act was operative and that a posthumously conceived child is eligible for Social Security survivorship benefits, but only if that child would be an intestate heir of the predeceasing parent.²⁸³ Gradually, uniform commissions and state legislatures are enacting legislation to accommodate posthumous conception.²⁸⁴

B. Statutory Framework

Today, more than a quarter of the states have enacted legislation specifically governing posthumous conception, but there has yet to be an approved model act.²⁸⁵ Indeed, even though legislation has acknowledged the technological advances occurring through assisted reproduction, the parameters of the statutes vary. The revised UPA (2017) provides that an individual who, (1) consents in a record to assisted reproduction, (2) dies prior to transfer of gametes or embryos, that individual is a parent of the resulting child only if, (3) the record states that the individual consented to parenthood through posthumous conception or there is clear and convincing evidence providing the individual's intent.²⁸⁶ In addition, (4) the embryo must be in utero not later than 36 months after the decedent's death or the child is born not later than 45 months after the decedent's death.²⁸⁷

The approach of the UPA is meant to be consistent with the Uniform Probate Code (UPC). The UPC provides that an individual is a parent of a child of assisted reproduction even though the child is conceived after the individual's

²⁸¹ *Id.*

²⁸² Nicole M. Barnard, *Astrue v. Capato: Relegating Posthumously Conceived Children to Second-Class Citizens*, 72 MD. L. REV. 1039, 1052 (2013).

²⁸³ *Astrue v. Capato*, 566 U.S. 541, 559 (2012); Barnard, *supra* note 286, at 1039-40.

²⁸⁴ CAL. PROB. CODE § 249.5 (2006); UNIF. PARENTAGE ACT § 708; O'Brien, *supra* note 262, at 356.

²⁸⁵ See generally O'Brien, *supra* note 288 at 375-76 n.195-97; see, e.g., CAL. PROB. CODE § 249.5.

²⁸⁶ UNIF. PARENTAGE ACT § 708.

²⁸⁷ *Id.*

death as long as the child is either in utero no later than 36 months after the individual's death or born not later than 45 months after the individual's death.²⁸⁸ The child is treated as in gestation at the time of the individual's death and must still survive for five days after birth.²⁸⁹ To qualify as a parent through posthumous conception, there must be a record establishing the decedent's consent or, in the absence of this, clear and convincing evidence of the same.²⁹⁰

State statutes may vary slightly from the uniform acts cited.²⁹¹ For example, California provides for posthumous conception by requiring that such a child be treated as if born during the lifetime of the decedent if there is clear and convincing evidence of the following: (1) in writing, signed and dated, the decedent specifies that his or her genetic materials was to be used for posthumous conception, (2) the writing may be revoked or amended if signed and dated, (3) the decedent designates a person to control the use of the genetic materials, (4) notice is given to this person within four months of the decedent's death, and (5) the intended child was in utero within two years of death.²⁹²

Current legislation seeks to balance the right of a person to procreate,²⁹³ even posthumously, with the need for the state to accommodate speedy administration of estates and distribution of any concomitant benefits. Future technological

²⁸⁸ UNIF. PROBATE CODE § 2-120(k).

²⁸⁹ *Id.*; see also UNIF. PROBATE CODE § 2-115 (providing definitions of persons qualifying as a parent).

²⁹⁰ *Id.* § 2-120(f).

²⁹¹ See C. Raymond Radigan & David R. Schoenhaar, *Statutory Inheritance Rights of a Posthumously Conceived Child*, 253 N.Y.L. J. (Jan. 12, 2015) (stating that New York now joins 20 other states permitting a statutory solution to inheritance rights for posthumously conceived children); compare FLA. STAT. ANN. § 742.17 (4) (2018) ("A child conceived from the eggs or sperm of a person or persons who died before the transfer of their eggs, sperm, or preembryos to a woman's body shall not be eligible for a claim against the decedent's estate unless the child has been provided for by the decedent's will"); with CONN. GEN. STAT. ANN. § 45a-785(a) (2014) ("For purposes of determining rights to property to be distributed upon the death of a decedent, a child of the decedent conceived and born after the death of the decedent shall be deemed to have been born in the lifetime of the decedent and after the execution of all of the decedent's testamentary instruments, if: (1) The decedent executed a written document that: (A) Specifically set forth that his sperm or her eggs may be used for the posthumous conception of a child, (B) specifically provided his or her spouse with authority to exercise custody, control and use of the sperm or eggs in the event of his or her death, and (C) was signed and dated by the decedent and the surviving spouse; and (2) The child posthumously conceived using the decedent's sperm or eggs was in utero not later than one year after the date of death of the decedent spouse.").

²⁹² See CAL. PROB. CODE § 249.5.

²⁹³ See *Skinner v. Oklahoma*, 316 U.S. 535, 536 (1942) ("a right which is basic to the perpetuation of a race-the right to have offspring"); Greer Gaddie, *The Personhood Movement's Effect on Assisted Reproductive Technology: Balancing Interests Under a Presumption of Embryonic Personhood*, 96 TEX. L. REV. 1293, 1305-06 (2018) (suggesting that *Skinner* contributed to what would be described as the right to privacy).

developments may outpace the current statutes, as the pace of legislative enactments is slow to accommodate evolving technologies. Hence, statutes that limit birth of a child to two or three years may seriously jeopardize the decedent's fundamental right to procreate should science be able to "bank" his or her gametes for longer and longer periods of time.²⁹⁴ Because these statutes are meant to establish foreseeable entitlement to benefits, such as inheritance claims, dynastic legacies, and federal benefits such as those illustrated in the *Woodward* decision, ambivalence in statutory language will inhibit the orderly administration of estates.²⁹⁵ Inheritance is not only about a time frame for inheritance, it is about who may inherit within that time frame too.

Technology will continue to challenge even recently modified parameters of parenthood. Many of these challenges may involve postponed conception too. As one commentator illustrates, and as this Article will address in the next section, the "ability to create a child from two women, two men, or multiple parents emerges from two developing technologies, somatic cell nuclear transfer (SCNT) and stem cell technology."²⁹⁶ The commentator describes the process as follows: "SCNT entails removing the original nucleus from an egg (which is then known as an 'enucleated egg') and replacing the nucleus with nuclear material from one or more individuals and sources. After being induced to divide in a laboratory, the embryo, also known as a blastocyst, is then implanted into a uterus and allowed to gestate to form a complete organism."²⁹⁷ Similarly, advances "in reproductive medicine, such as uterine transplantation, animal-human chimeric technology, and artificial wombs, may obviate the need for a female gestational mother in the future."²⁹⁸ Indeed, the "success of uterine transplantation in sheep, dogs, and mice, the initiation of human uterine transplantation scheduled in the United Kingdom and Sweden, and the various other planned attempts to pursue human uterine transplantation raise the

²⁹⁴ See CONN. GEN. STAT. § 45a-785(a) (2014); Susan C. Stevenson-Popp, "I Have Loved you in my Dreams": *Posthumous Reproduction and the Need for Change in the Uniform Parentage Act*, 52 CATH. U. L. REV. 727, 728-29 (2003) (explaining "Through the use of advanced reproductive technology, children have been born using sperm up to ten years after the sperm was originally preserved."); see, e.g., IOWA CODE § 633.220A (2011).

²⁹⁵ See Bruce A. Fowler & Teresa C. Baird, *Frozen in Time: Planning for the Posthumously Conceived Child*, 37 COLO. LAW. 45, 47 (2008) (outlining how one court acknowledged the "struggle to balance the finality and certainty of administration of estates with the rights of children born as a result of scientific advances.").

²⁹⁶ Margalit et al., *supra* note 36, at 117; see also Karita Shah Asora and Valerie Blake, *Uterus Transplantation: Ethical and Regulatory Challenge*, J. MED. ETHICS 396, 396-97 (2013) (providing an update on the procedure).

²⁹⁷ Margalit et al., *supra* note 36, at 117 (citing Erez Aloni, *Cloning and the LGBT Family: Cautious Optimism*, 35 N.Y.U. REV. L. & SOC. CHANGE 1, 3-7 (2011)); David Orentlicher, *Beyond Cloning: Expanding Reproductive Options for Same-Sex Couples*, 66 BROOK. L. REV. 651, 653 (2001).

²⁹⁸ Margalit et al., *supra* note 36, at 125.

possibility that one day a uterus could be transplanted into a man.”²⁹⁹ It remains to be seen, but, as was true with surrogacy, the acceptance of uterine transplantation may well occur because of its utilization by the LGBTQ community.³⁰⁰

Currently the debate occurring among commentators is over parental rights and responsibilities toward the child, duties of support, and associated claims of parentage.³⁰¹ Which persons may become parents? But there is another side to the equation: from whom may a child take when a decedent dies survived by that child? Inheritance occurs because of defined—often traditionally defined—rules based on blood or adoption.³⁰² There are few exceptions, one being when a child is born via in vitro fertilization,³⁰³ and the other is when a child is born to a gestational carrier, such as a surrogate.³⁰⁴ These exceptions, both permitting inheritance by someone not related through blood or adoption, are premised upon defined circumstances precipitating inheritance.³⁰⁵ Other than when a decedent has been prescient enough to execute a valid last will and testament, inheritance is premised upon state intestate statutes and these are, as the cases readily illustrate, slow to incorporate the technological advances made by assisted reproductive technology.

IV. MULTIPLE GENETIC PARENTS

A. Functional Parenthood

The concept of family, parent, and even marriage continues to evolve. Today, this evolution embraces the concept of multiple parents for the same child or children.³⁰⁶ Traditionally, when a child is adopted by a non-genetic person, or

²⁹⁹ *Id.*

³⁰⁰ See Seema Mohapatra, *Assisted Reproduction Inequality and Marriage Equality*, 92 CHI.-KENT L. REV. 87, 88 (2017); but see Michael Boucai, *Is Assisted Procreation an LGBT Right?*, 2016 WIS. L. REV. 1065, 1066, 1124 (2016) (arguing for a critique of the rights-based claims of equality and of procreative liberty that permeate LGBTQ arguments about assisted reproduction).

³⁰¹ See also Margalit et al., *supra* note 36, at 138 (arguing for preauthorized surrogacy contracts in which parties utilizing ART could delineate the rights and obligations of the various parties); see, e.g., Carbone & Cahn, *supra* note 235, at 10, 12 (arguing for hierarchical status among persons claiming parental status).

³⁰² See, e.g., UNIF. PROBATE CODE § 2-103(a)(1).

³⁰³ *Id.* § 2-120(a).

³⁰⁴ *Id.* § 2-121.

³⁰⁵ *Id.* § 2-103 cmt.; see also UNIF. PROBATE CODE § 2-121.

³⁰⁶ Michael S. Deprince, *Same-Sex Marriage and Disestablishing Parentage: Reconceptualizing Legal Parenthood Through Surrogacy*, 100 MINN. L. REV. 797, 811-12 (2015).

persons, the adoption severs the relationship between the child and that child's genetic parents.³⁰⁷ However, gradually parents of children wanted their current spouses to share a committed family relationship with children from other partners or spouses. The law accommodated this by permitting a stepparent to adopt a stepchild but retain a modicum of rights in the non-custodial parent.³⁰⁸ The effect of this is to retain the rights of both genetic parents and to include the rights of a third parent, the former stepparent.³⁰⁹ There are three restrictions to effectuate the granting of such rights. First, there must be a valid marriage between the genetic parent and his or her spouse to initiate stepparent adoption.³¹⁰ Second, the other genetic parent (the one not married to the stepparent) must agree to the stepparent's adoption of his or her genetic child.³¹¹ Unless the other genetic parent agrees, there can be no stepparent adoption.³¹² Third, statutes limit the right of the other genetic parent, the non-spouse, to inherit from or through the child in the event that the child should die intestate.³¹³ However, the child may still inherit from or through that genetic parent.³¹⁴

The UPC creates another parental status, a person who has "functioned as a parent of the child."³¹⁵ However, this status refers to a doctrine known as

³⁰⁷ See, e.g., UNIF. PROBATE CODE ART. II § 2-119(a) ("Except as otherwise provided in subsections (b) through (e), a parent-child relationship does not exist between and adoptee and the adoptee's genetic parents.").

³⁰⁸ See *id.* § 2-119(b) (1) - (2) ("A parent-child relationship exists between an individual who is adopted by the spouse of either genetic parent and: the genetic parent whose spouse adopted the individual; and the other genetic parent, but only for the purpose of the right of the adoptee or a descendant of the adoptee to inherit from or through the other genetic parent.").

³⁰⁹ See *id.* § 2-119(b)(1) - (2).

³¹⁰ See U.S. DEP'T OF HEALTH & HUMAN SERVS., CHILDREN'S BUREAU, STEPPARENT ADOPTION (2013) (explaining how "some states will not approve a stepparent adoption unless you [as the stepparent] have been married to the child's parent.").

³¹¹ *Id.* (stating that if one wants to adopt a stepchild, he or she must have the consent of both his or her spouse and "the child's other parent (the noncustodial parent), unless that parent has abandoned the child").

³¹² See e.g., *In re Adoption of GLV*, 190 P.3d 245, 262 (Kan. 2008) (holding that even the best interest of the child does not preclude consent by the genetic parent to the adoption).

³¹³ UNIF. PROBATE CODE § 2-119 cmt. b (stating that section 2-119(b)(2) does not allow the non-custodial genetic parent and his or her relatives to inherit through the adopted stepchild).

³¹⁴ *Id.* ("Section 2-119(b)(2) provides that a parent-child relationship also continues to exist between an adopted stepchild and his or her other genetic parent (the noncustodial genetic parent) for purposes of inheritance from and through that genetic parent.").

³¹⁵ *Id.* § 2-115(4) ("Functioned as a parent of the child" means behaving toward a child in a manner consistent with being the child's parent and performing functions that are customarily performed by a parent, including fulfilling parental responsibilities toward the child, recognizing or holding out the child as the individual's child, materially participating in the child's upbringing, and residing with the child in the same household as a regular member of that household.").

equitable adoption. “Equitable adoption is not adoption. Rather, it is an equity device, sometimes called ‘virtual adoption’ or ‘adoption by estoppel,’ by which the courts permit an intended heir to share in the intestate estate of a decedent.”³¹⁶ The majority of states permit a person to inherit intestate – there is an absence of a valid last will and testament—from an individual when certain conditions are met, such as the decedent “functioned as a parent of the child.”³¹⁷ Hence, functioning as a parent is more of an inheritance device for persons with no genetic or adoptive connection but who have been treated as a child by the decedent for a sufficient period of time.³¹⁸

There are other models granting parental status. For example, the “American Law Institute’s Principles of the Law of Family Dissolution and an increasing number of states provide recognition to adults who have assumed parental roles without a biological tie to the child, in some cases on the basis of function alone and in other cases on the basis of a combination of intent, assumption of a parental role, and/or the consent of the initial legal parent.”³¹⁹ Function serves to establish parenthood whenever adults who, though not otherwise legal parents, have assumed a parental role “as part of a prior co-parenting agreement with the child’s legal parent (or, if there are two legal parents, both parents).”³²⁰

The second category is *de facto* parent, defined as someone who:

- (1) Lived with the child for a significant period of time not less than two years;
- (2) with the agreement of the legal parent;
- (3) primarily to form a parent-child relationship and not primarily for financial compensation, or

³¹⁶ RAYMOND C. O’BRIEN & MICHAEL T. FLANNERY, *DECEDENTS’ ESTATES: CASES AND MATERIALS* 118 (3d ed. 2016).

³¹⁷ *See, e.g.*, *DeHart v. DeHart*, 986 N.E.2d 85, 104 (2013) (quoting “A plaintiff must prove an equitable adoption claim to recover against an estate by clear and convincing evidence. Moreover, the decedent’s intent to adopt and form a close and enduring familial relationship must be clear and conclusive. And it must not be just as readily harmonizable with the mere intention to provide a good home, but must instead indicate a clear intent to adopt or to continuously represent to the plaintiff and the world at large that the plaintiff was the decedent’s natural child.”); *but see* *In re Estate of Scherer*, 336 P.3d 129, 133 (Wyo. 2014) (stating that “Wyoming does not recognize the doctrine of equitable adoption” and thus an unrelated individual cannot inherit from a decedent’s intestate estate pursuant to the doctrine, but that “the majority of states recognize equitable adoption in one form or another... [and] the application of the doctrine has been limited to intestate estates.”).

³¹⁸ *See* *Lankford v. Wright*, 489 S.E.2d 604, 606-07 (N.C. 1997) (listing the specific conditions for equitable adoption: (1) “an express or implied agreement to adopt the child; (2) reliance on the agreement; (3) performance by the natural parents of the child in giving up custody; (4) performance by the child in living in the home of the foster parts and acting as their child; (5) partial performance by the foster parents in the taking of the child into their home and treating the child as their own; and (6) the intestacy of the foster parent.”).

³¹⁹ Carbone & Cahn, *supra* note 235, at 14.

³²⁰ AM. LAW INST., *PRINCIPLES OF THE LAW OF FAMILY DISSOLUTION: ANALYSIS AND RECOMMENDATIONS* § 2.03(1)(b)(iii), (Ira M. Ellman et al. eds., 2002).

as a result of a legal parent's complete failure to perform caretaking functions; and (4) regularly performed a majority of the caretaking functions for the child or regularly performed a share of caretaking functions at least as great as that of the parent with whom the child primarily lived.³²¹

Professors of law, Carbone and Cahn, argue that the LGBTQ community began to use the concept of intent to establish parenthood, sometimes augmented with function.³²² As with the gradual acceptance of surrogacy in the overall population, “[LGBTQ] advocates have been in the forefront of efforts to gain recognition of more than two parents in part because they have consciously fought to create alternate models that better fit their circumstances.”³²³ Nonetheless, not all of categories of what has come to be called parents share equal parenting rights. “While a parent by estoppel occupies a status comparable to that of a legal parent, *de facto* parents do not. A *de facto* parent, for example, cannot receive primary physical custodial responsibility if a fit legal parent is able and willing to take such responsibility.”³²⁴

Finally, in its 2017 revision to the UPA, the National Conference of Commissioners on Uniform State Laws included a provision for the establishment of a “*de facto* parent” as a legal parent of a child.³²⁵ The Commissioners included this provision because of similar enactments, judicially and legislatively, among some of the states, “ranging from Massachusetts, to West Virginia, to North and South Carolina, to Texas.”³²⁶ Some states use different terms rather than *de facto* parent, such as “*in loco parentis*,” or “psychological parents.”³²⁷ If a petitioner has formed a bonded and dependent parent-child relationship with a child, then this individual may be recognized as a legal parent.³²⁸

For *de facto* parentage to be established under the UPA, the petition must be filed during the lifetime of the petitioner and the child, and before the child turns

³²¹ *Id.* § 2.03(1)(c).

³²² Carbone & Cahn, *supra* note 235, at 14 n.27.

³²³ *Id.* at 17.

³²⁴ *Id.* at 25.

³²⁵ UNIF. PARENTAGE ACT § 609; *see also* DEL. CODE ANN., tit. 13, § 8-201(c) (2003) (amended 2013) (explaining how *de facto* parent status is established); ME. REV. STAT. tit. 19-a, § 1891 (2016) (discussing how a “court may adjudicate a person to be a *de facto* parent”).

³²⁶ UNIF. PARENTAGE ACT, prefatory note.

³²⁷ *See, e.g.*, *Bethany v. Jones*, 378 S.W.3d 731, 734 (Ark. 2011) (“Jones argued that she did stand *in loco parentis* and that there was ample statutory authority for awarding her custody of the child on that basis.”); *McAllister v. McAllister*, 779 N.W.2d 652, 658 (N.D. 2010) (describing a psychological parent as “a person who provides a child’s daily care and who, thereby, develops a close bond and personal relationship with the child [and] becomes the psychological parent to whom the child turns for love, guidance, and security”).

³²⁸ UNIF. PARENTAGE ACT § 609 cmt.

18 years of age.³²⁹ There is a two-stage process to establish de facto parenthood. Assuming that the petitioner can establish a preponderance of the evidence³³⁰ and that he or she or they qualify as de facto parents, there can be an adjudication as to whether the petitioner can establish the following facts:

- (1) the individual resided with the child as a regular member of the child's household for a significant period;
- (2) the individual engaged in consistent caretaking for the child;
- (3) the individual undertook full and permanent responsibilities of a parent of the child without expectation of financial compensation;
- (4) the individual held out the child as the individual's child;
- (5) the individual established a bonded and dependent relationship with the child which is parental in nature;
- (6) another parent of the child fostered or supported the bonded and dependent relationship required under paragraph (5); and
- (7) continuing the relationship between the individual and the child is in the best interest of the child.³³¹

There are similarities between the UPA and the de facto provision offered by the American Law Institute (ALI). However, note there are differences too. First, note the absence of a time duration in the UPA, as there is in the ALI.³³² Second, the UPA requires that the petitioner resided with the child as a regular member of the child's household for a significant period of time.³³³ Third, the UPA mandates that any claimant must, as an initial matter, provide at least a preponderance of the evidence that he or she or they can meet the seven elements required by the statute.³³⁴ "This requirement is included to ensure that permitting proceedings by de facto parents does not subject parents to unwarranted and unjustified litigation."³³⁵ Fourth, the petitioner, with the encouragement of the parent, formed a bonded and dependent relationship with the child that is parental in nature.³³⁶ Fifth, only the petitioner may petition to become a de facto parent, thereby denying the right to any third party, such as the state, which may be seeking to obtain child support from a stepparent.³³⁷

All of the efforts to establish parental status outside of adoption or a genetic

³²⁹ *Id.* § 6-609(a)(1), (b).

³³⁰ *Id.* § 609(c)(3).

³³¹ *Id.* § 609(d)(1)-(7).

³³² *Id.* § 609(d)(1) (requiring only a "significant period" of time); PRINCIPLES OF FAMILY LAW DISSOLUTION: ANALYSIS AND RECOMMENDATIONS § 2.03(1)(c) (Am. L. Inst. 2002) (requiring a two-year time duration requirement to establish a de facto parent relationship).

³³³ UNIF. PARENTAGE ACT § 609(d)(1).

³³⁴ *Id.* § 609(c)(3).

³³⁵ *Id.* § 609 cmt.

³³⁶ *Id.* § 609(d)(5)-(6).

³³⁷ *Id.* § 609 cmt. ("[t]his section permits only the individual alleging himself or herself to be a de facto parent to initiate a proceeding under this section.").

connection rest upon the premise that, “actual parent-child bonds are important to children and that these relationships are worthy of protection.”³³⁸ The fact that the de facto parent relationship may come into existence after the birth of the child and is applied in gender-neutral terms is innovative.³³⁹ Addressing parental rights and responsibilities inherent in this status, at least one commentator suggests that de facto parents “stand in parity with any other legal parents, including genetic parents, for all purposes.”³⁴⁰ The full parameters of these relationships remain to be determined.

It is beyond the scope of this Article to analyze the arguments concerning the rights of genetic and functional parents, but this debate will continue as more claims occur based on non-genetic parental grounds.³⁴¹ Furthermore, because of technological advances, future debate must involve the possibility that a child now may have more than two genetic parents.³⁴² Previous discussion of stepparent adoption, equitable adoption, and the permeations of de facto parenthood offer context to what has already a reality, in vitro fertilization and a mitochondrial/nuclear transfer path to multiple genetic parenthood.

B. Mitochondrial Transfer

On April 6, 2016, a baby boy was born in Mexico City as a result of a procedure known as MRT,³⁴³ the birth involving genetic material from not two, but three different people.³⁴⁴ This procedure, MRT, and the resulting birth of a healthy baby mark a technological development of significant proportions as until then, “every child begins with two (and only two) suppliers of genetic material and one (and only one) gestational carrier.”³⁴⁵ While the purpose of MRT is to avoid the transmission of mitochondrial disease, a serious illness, the technology used involves the paradigm of human parentage, human genetics, and thus social consequences. The consequences occur because MRT donations challenge “prevailing cultural assumptions about the symbolic and biological

³³⁸ Joslin, *supra* note 225, at 600.

³³⁹ *Id.* at 601.

³⁴⁰ *Id.* at 602.

³⁴¹ See, e.g., Casey et al., *supra* note 15, at 94-97; Melanie B. Jacobs, *Parental Parity: Intentional Parenthood's Promise*, 64 BUFF. L. REV. 465, 469 (2016); Katherine Baker, *Bionormativity and the Construction of Parenthood*, 42 GA. L. REV. 649, 652-53 (2008).

³⁴² Margalit et al., *supra* note 36, at 109.

³⁴³ Newton et al., *supra* note 13 at 589 (noting that interventions to alter mitochondria have many names, among them “mitochondrial donation, mitochondrial replacement, mitochondrial therapy, mitochondrial transfer, and three-parent IVF”).

³⁴⁴ See Green, *supra* note 27 at 251.

³⁴⁵ Lynda Wray Black, *The Birth of a Parent: Defining Parentage for Lenders of Genetic Material*, 92 NEB. L. REV. 799, 812 (2014).

significance of genetic material.”³⁴⁶

A woman who carries mitochondrial disease risks a difficult pregnancy and the birth of a child with the serious effects of that disease.³⁴⁷ While it is possible for a woman to become a parent in other ways than using her own gametes and carrying the child to term, such as adoption or the use of donor eggs, the use of MRT permits a woman to have a genetic connection with her child. There are those who argue that genetic affinity is of sufficient importance and that it justifies expending private and public funds to make the procedure accessible to persons seeking to utilize its benefits.³⁴⁸ Others argue that since “human oocytes are essential to promising stem-cell technologies that would treat serious conditions—including Parkinson’s disease, Alzheimer’s, and indeed mitochondrial disease itself—allocation of this scarce resource to three-parent IVF is unjustified.”³⁴⁹ Indeed, this commentator argues that the technology does not meet a plausible social-value standard to render public research investment into its development. She reports that mitochondrial diseases are too rare to justify the expenditure. “If the incidence is one in 4,000 cases per birth, then roughly 80,000 Americans are affected. This is far below the threshold commonly used in the United States to define a disease as rare; by that standard, fewer than 200,000 people are affected.”³⁵⁰

Implicit in the debate over funding of MRT, is the fact that the procedure and resulting live birth of a healthy baby illustrates that it is possible to add the genetic material of a third party—in addition to the gestational mother and the father—to create a child with three genetic parents.³⁵¹ This is the technological innovation that will generate controversy, this and the question of what comes next.

1. Procedure

The procedure involving genetic material from three persons to create a child was developed to permit “a woman with a mitochondrial disorder to give birth to healthy children by pairing her nuclear DNA with the healthy mitochondria

³⁴⁶ Rebecca Dimond and Neil Stephens, *Three Persons, Three Genetic Contributors, Three Parents: Mitochondrial Donation, Genetic Parenting and the Immutable Grammar of the ‘Three x x’*, HEALTH 5 (2017).

³⁴⁷ AMEL KARAA ET AL., EFFECTS OF MITOCHONDRIAL DISEASE/DYSFUNCTION ON PREGNANCY: A RETROSPECTIVE STUDY 3-4 (2018).

³⁴⁸ See, e.g., Schaefer & Labude, *supra* note 31, at 1579.

³⁴⁹ See Tina Rulli, *What is the Value of Three-Parent IVF?*, 46 HASTING CTR. REP. 38, 44 (2016).

³⁵⁰ *Id.* at 43.

³⁵¹ *Id.* at 38.

from a donor's egg."³⁵² Medical findings suggest that

mtDNA is passed on from the egg, all children from affected women inherit these mitochondrial mutations . . . by removing the nuclear DNA from the target egg's defective mtDNA and placing it within a donated egg with healthy mtDNA . . . so that the healthy mtDNA is the only contribution by the donor. For families carrying mtDNA, MRT is a source of hope for a future with genetically related children.³⁵³

This is a breakthrough.

In February 2015, the United Kingdom gave its approval to the procedure, ending a three and one-half year study of "the safety and ethics of creating humans with DNA from three different people."³⁵⁴ The process is described as the following:

MRT is an in vitro fertilization (IVF) technique that involves removing an intended mother's nDNA [(nuclear DNA)] from her oocyte or zygote, which contains mutated mtDNA[(mitochondrial DNA)], and transferring it into a female provider's oocyte or zygote, which contains nonpathogenic mtDNA and from which the nDNA has been removed. The woman providing oocytes would have no personal or family history or genetic evidence of having mutated, pathogenic mtDNA . . . [The] term "MRT" encompasses both the transfer of the nuclear genetic material and the accompanying fertilization procedure that is necessary to produce a human embryo. These techniques could allow intended mothers to produce a child that would share their nDNA without passing on their pathogenic mtDNA. Three techniques are most advanced in development: maternal spindle transfer (MST); pronuclear transfer (PNT); and, most recent, polar body transfer (PBT).³⁵⁵

Another author describes the procedure as the following:

[MRT] divides the label of the genetic parent even further than the traditional forms of ART in that a single child conceived by MRT may have two legitimate 'genetic mothers.' This situation results because MRT works by manipulating egg cells prior to fertilization. Egg cells consist of nuclei with nuclear DNA—the "instruction manual" for the cell—and many intracellular organelles that carry on the functions of our cells—the "machinery" of the cell.' . . . MRT, then, is a process which removes the nucleus from one egg and transfers the nucleus into the remnants of different donated egg (which previously had its nucleus

³⁵² Garry Hamilton, *The Mitochondria Mystery*, 525 NATURE 444, 444 (2015).

³⁵³ Bob Zhao, *Mitochondrial Replacement Therapy and the Regulation of Reproductive Genetic Technologies in the United States*, 15 DUKE L. & TECH. REV. 121, 123-24, (2017).

³⁵⁴ Hamilton, *supra* note 356, at 444.

³⁵⁵ NAT'L. ACAD. OF SCI., ENG'G, MED., MITOCHONDRIAL REPLACEMENT TECHNIQUES: ETHICAL, SOCIAL AND POLICY CONSIDERATIONS 20 (Ann Claiborne, Rebecca English & Jeffrey Kahn, eds., 1st ed. 2016).

removed and discarded). The resultant egg has a nucleus from one individual (the “nuclear mother”) and mitochondrial DNA from a donor (the “mitochondrial mother”). The father’s sperm then fertilizes the newly assembled egg, and it is implanted in the nuclear mother in order to begin the pregnancy.³⁵⁶

With regards to solely its treatment for mitochondrial disease, successful MRT can make it easier for a woman to conceive, to carry the child to term, and then to permit the resulting child to live a healthier life.³⁵⁷ Without the procedure, mitochondrial “DNA mutations can cause diseases and defects in many vital organs including the brain, liver, heart, and kidneys, they can affect muscles and the central nervous system, and they ‘may contribute to the development of common multifactorial disorders such as diabetes mellitus and neurodegenerative disease.’”³⁵⁸

2. Prospective Regulation

Currently, MRT is legal only in the United Kingdom.³⁵⁹ “In the United States, in February 2016, a specially constituted committee of the National Academy of Sciences, Engineering and Medicine (NASEN) sanctioned a slightly narrower use of MRT than that regulated in the United Kingdom.”³⁶⁰ Concerning prospective regulation, the statement released by the Committee is cautious: “The committee concludes that the most germane ethical, social, and policy considerations associated with MRT could be avoided through limitations on the use of MRT or are blunted by meaningful differences between the heritable genetic modification of nDNA and that introduced by MRT. Therefore, the committee concludes that it is ethically permissible to conduct clinical investigations of MRT, subject to certain conditions and principles laid out in this report.”³⁶¹

Overall, the National Academy of Sciences Committee recommends clinical studies that will minimize “a future child’s exposure to risk, while ascertaining the safety and efficacy of the techniques.”³⁶² Specifically, the Committee recommends:

³⁵⁶ Green, *supra* note 27, at 255.

³⁵⁷ *Id.* at 256-57.

³⁵⁸ *Id.* at 256 (“Mitochondrial DNA in women’s eggs tend to deteriorate as they age thereby increasing risks of disorders developing in both the pregnancy and the resulting child.”).

³⁵⁹ Schaefer & Labude, *supra* note 31.

³⁶⁰ Newton et al., *supra* note 13, at 589.

³⁶¹ NAT’L. ACAD. OF SCI., ENG’G, MED., *supra* note 359, at 2.

³⁶² *Id.*

(1) limiting clinical investigations to women who are otherwise at risk of transmitting mtDNA disease, where the mutation's pathogenicity is undisputed, and the clinical presentation of the disease is predicted to be severe, as characterized by early mortality or substantial impairment of basic functions; and (2) transferring only male embryos for gestation to avoid introducing heritable genetic modification during initial clinical investigations.³⁶³

It has been suggested that the United States, overall, takes a more laissez-faire approach to regulation of assisted reproduction, perhaps due to concerns over privacy rights implicit in the Constitution.³⁶⁴ However, as the Committee appointed by the National Academy of Sciences points out, in the United States, "MRT would be subject to a complex landscape of state and federal laws and regulations. The legality of the research on MRT—and perhaps even the clinical application—would vary from state to state as a result of differing laws on fetal and embryo research, including cloning."³⁶⁵ Any evaluation of the applicable regulatory mechanism governing the regulation of MRT is beyond the scope of this Article, but it illustrates the complexity of the technology—and the debate it precipitates—when the Committee admits that potential "oversight of both the research on and clinical use of MRT would be complex, with uncertainty over the precise interpretation of how laws and regulations would apply."³⁶⁶

After the MRT baby was successfully born in Mexico in 2016, "it is likely that other countries will advance consideration of the appropriateness of mitochondrial treatments being allowed to proceed to implementation and term birth."³⁶⁷ Currently, MRT "remains effectively banned or heavily restricted in many parts of the world, including most of Europe, the USA, Australia, New Zealand and Singapore, among many others."³⁶⁸

Many competing claims will be raised in any future discussion of prospective regulation of MRT.³⁶⁹ In addition to the ones mentioned *infra*, including utility of resources, multiple parenthood, and the procreative rights of citizens, there

³⁶³ *Id.* at xv-xvi. (The Committee recommends a policy of transparency, public engagement, continuing partnership with all regulatory authorities, maximizing data quality, and limited use of MRT until there is public engagement, and long-term follow-up).

³⁶⁴ Newton et al., *supra* note 13, at 589.

³⁶⁵ NAT'L. ACAD. OF SCI., ENG'G, MED., *supra* note 35, at 59.

³⁶⁶ *Id.* at 59-60.

³⁶⁷ Kevan MA Gartland et al., *Advances in Biotechnology: Genomics and Genome Editing*, 1 EUROBIOTECH J. 2, 9 (2017).

³⁶⁸ Schaefer & Labude, *supra* note 31.

³⁶⁹ See, e.g., Philip Ball, *Designer Babies: An Ethical Horror Waiting to Happen?*, THE GUARDIAN (Jan. 8, 2017, 3:30 AM), <https://www.theguardian.com/science/2017/jan/08/designer-babies-ethical-horror-waiting-to-happen> (quoting Dartmouth bioethicist, Ronald Green, in stating that gene editing "is unavoidably in our future . . . [and] will become one of the central foci of our social debates later in this century and in the century beyond").

are the issues of future cloning of humans,³⁷⁰ possible health effects arising from mitochondrial replacement therapy,³⁷¹ and the possibility and consequence of designer babies.³⁷² Opponents of MRT raise ethical and conceptual concerns over whether “it is a form of germline gene therapy, and whether children born following [MRT] are genetically modified.”³⁷³ Religious and ethical groups will demand input, all parties producing a composition of the ethical, legal and social issues involved in this new technology.³⁷⁴ While this discussion continues, technology will continue to advance calling into question further issues.

V. CONCLUSION

Technological innovation is relentless and ignoring its innovations is perilous. Change always invites controversy, and this is especially true when change involves human reproduction. For now, we can make the following assessment of assisted reproductive technology. First, statistically, an increasing number of persons and couples are utilizing the various forms of assisted reproduction to become parents now or in the future. As insurance becomes available to subsidize the assistance, more persons and couples will take advantage of this technology and the technology yet to be available. Likewise, surrogacy is more accepted by the public and by states, especially gestational surrogacy. It is arguable that the increasing use of assisted reproduction, especially surrogacy, is influenced by the utilization and acceptance of the LGBTQ community. The rise of a more functional, rather than form families supports the acceptance of ART. This is illustrated in the rise of nonmarital cohabitation and statutory recognition of status arrangements such as de facto parenthood.

Second, states accommodate ART in the postponing of conception until after the death of the gamete provider. Uniform legislation and an increasing number of states have enacted posthumous conception statutes, thereby acknowledging

³⁷⁰ See, e.g., Russell A. Spivak et al., *Germ-line Gene Editing and Congressional Reaction in Context: Learning from Almost 50 Years of Congressional Reactions to Biomedical Breakthroughs*, 30 J. L. & HEALTH 20, 31-34 (2017).

³⁷¹ Hamilton, *supra* note 356, at 446.

³⁷² See, e.g., Daryl F. Sas & Hannah Martin Lawrenz, *CRISPR-Cas9: The Latest Fashion in Designer Babies*, 33 ETHICS & MED. 81 (2017); see generally *In U.S. First, Scientists Edit Genes of Human Embryos*, N.Y. TIMES, (July 27, 2017), <http://www.nytimes.com/aponline/2017/07/27/health/ap-us-med-embryos-gene-editing.html>; Ronald T.K. Pang & P.C. Ho, *Designer Babies*, 26 OBSTETRICS, GYNAECOLOGY AND REPROD. MED. 59, 60 (2016).

³⁷³ Newson et al., *supra* note 13, at 589; see also Gartland et al., *supra* note 371, at 7, 9.

³⁷⁴ See, e.g., Raphaelle Dupras-Leduc et al., *Mitochondrial/Nuclear Transfer: A Literature Review of the Ethical, Legal and Social Issues*, 1 CAN. J. OF BIOETHICS, 1, 2-10 (2018).

that a decedent donor could become a parent long after his or her death. Undoubtedly, this technology will strain state efforts to accommodate testate, intestate, and non-probate wealth after the decedent's death. However, as with other advances, an accommodation will be found. The fact that courts and states are grappling with issues presented signals an ascending acceptance of the fact of ART technology.

Third, ART's technological advances will test the limits of the Constitution: privacy, the right to liberty, equal protection, due process, and freedom of religion will all be inculcated into an ongoing debate of what is right, wrong, or simply a slippery slope.

Fourth, for the first time in history, it is now possible for a baby to have more than two genetic parents. Conceptually, it is possible that a child could have more than two parents through stepparent adoption, surrogacy, or intentionality and functionality. However, until recently, the fact was that a baby only had two genetic parents. Today, technology makes it possible—and the birth of a baby in 2016—illustrates this, for a child to have more than two genetic parents through mitochondrial transfer (MRT). While the transfer will allow for a woman to have a genetic connection to her baby, it also prevents the debilitating effects of mitochondrial disease. The technological parameters of this innovation are nascent, and the procedure and prospective regulations are undetermined.

This Article makes no assessment of the ethical, legal or sociological assessments of the evolution of assisted reproductive technology. Instead, the goal of this Article is to provide an assessment of where the technology is at this point in history. Providing an assessment will make it easier to formulate an approach to human reproduction through assisted means.

