

Assisted reproductive technology in Europe. Usage and regulation in the context of cross-border reproductive care

Patrick Präg and Melinda C. Mills

© Copyright is held by the authors.



Assisted reproductive technology in Europe. Usage and regulation in the context of cross-border reproductive care^{*}

Patrick Präg¹ and Melinda C. Mills¹

Department of Sociology and Nuffield College, University of Oxford

Abstract:

This study reviews assisted reproductive technologies (ART) usage and policies across European countries and scrutinizes emerging issues related to cross-border reproductive care (or, 'reproductive tourism'). Although Europe is the largest market for ART, the extent of usage varies widely across countries. This can be attributed to legislation, affordability, the type of reimbursement, and norms surrounding childbearing and conception. ART legislation in Europe has been growing in the past four years, with all countries now having some form of legislation. Countries with complete coverage of treatments via national health plans have the highest level of ART utilization. Legal marriage or a stable union is often a prerequisite for access to ART, with only half of European countries permitting single women and few granting access to lesbian women. Restrictive national legislation can be easily circumvented when crossing national boundaries for ART treatments, but raises important questions pertaining to safety and equity of treatments.

Keywords: Childlessness; In vitro fertilization; Surrogacy; Fertility treatment; Infertility

Affiliation:

1) Department of Sociology and Nuffield College, University of Oxford

Acknowledgement: The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 320116 for the research project FamiliesAndSocieties.

* Forthcoming as a chapter in the volume *Childlessness in Europe. Patterns, Causes, and Contexts*, edited by Michaela Kreyenfeld and Dirk Konietzka

Contents

1. Introduction.....	2
2. Usage of Assisted Reproductive Technologies in European Countries.....	4
3. Regulation of Assisted Reproductive Technology in Europe.....	9
4. Cross-Border Reproductive Care in Europe.....	15
5. Discussion.....	18
References.....	20

1. Introduction

Involuntary childlessness, or infertility, is a condition that affects a sizeable number of couples around the world (Mascarenhas, Flaxman, Boerma, Vanderpoel, & Stevens, 2012). Assisted reproductive technologies (ART) are an important means to address involuntary childlessness. While the exact distinction between voluntary and involuntary childlessness has always been difficult to define, important reasons for childlessness, such as a perceived lack of a suitable partner or problems of balancing work and children, can be considered to be both voluntary and involuntary (Sobotka, 2010). The current trend of fertility postponement in European societies (Mills, Rindfuss, McDonald, & te Velde, 2011) has exacerbated the issue of involuntary childlessness by the fact that female fecundity declines strongly at higher ages and the heterogeneity between women in the pace of fecundity loss, making it difficult for individual women to ascertain how long they can postpone childbearing (te Velde, Habbema, Leridon, & Eijkemans, 2012; te Velde & Pearson, 2002).

ART is increasingly perceived as one way to alleviate the problems of involuntary childlessness. Between the birth of the first live ART baby Louise Brown in 1978 (Steptoe & Edwards, 1978) and the Nobel Prize in Physiology or Medicine to Robert G. Edwards for the development of *in vitro* fertilization in 2010, ART has become a standard medical practice and a profitable commercial enterprise for thousands of firms in Europe. An estimated five million babies have been born with the help of assisted reproduction in the past four decades (Adamson, Tabangin, Macaluso, & de Mouzon, 2013), a sizable share of them in Europe.

ART generally refers to treatments in which gametes or embryos are handled *in vitro* ('in glass,' i.e., outside of the body) for establishing a pregnancy. A key technique of ART is *in vitro fertilization* (IVF). In IVF, oocytes are fertilized using sperm in a laboratory and the embryo is surgically implanted into the woman's womb. IVF was invented for treating cases of female infertility. When only a single sperm cell is injected into the oocyte during IVF, the procedure is referred to as *intracytoplasmic sperm injection* (ICSI). ICSI was developed to tackle male fertility problems, such as low sperm counts or poor sperm quality, but is becoming a standard form of fertilization in ART in recent years. *Frozen or thawed embryo transfers* refer to IVF procedures where embryos are used that have previously been cryopreserved for storage (as opposed to 'fresh' transfers of never frozen embryos). One reason for this procedure is that obtaining oocytes from a woman is a rather invasive act. Therefore, after a hormonal treatment, several oocytes are collected at the same time, fertilized, and frozen in case the first embryo transfer fails—a likely event given the

relatively low success rate of ART (Malizia, Hacker, & Penzias, 2009). An alternative collection strategy focuses on immature eggs which are then matured in a lab (*in vitro maturation*), indicated when women are at risk to react adversely to the fertility drugs given before oocytes are collected.

Frozen oocyte replacement is a technique where oocytes are retrieved, frozen, stored (oocyte cryopreservation), and fertilized only after thawing them for transfer. This technique allows women to preserve the future ability of having genetically related children at later points in life, even when no suitable father is present at the time of cryopreservation. Frozen oocyte replacement was first used for cancer patients before undergoing chemo- or radiotherapy (which will likely damage their testes or ovaries), however it can also be used for delaying motherhood for any reason, for instance for having a work career. This option generated substantial public attention in recent years under the name ‘social freezing’ (Mertes & Pennings, 2011). Large companies such as Facebook and Apple have recently included social freezing for female employees as an employment benefit, offering them up to \$20,000 towards egg freezing (Tran, 2014).

In cases of hereditary diseases (such as cystic fibrosis) among prospective parents, it can be useful to conduct *preimplantation genetic diagnosis* (PGD) or *screening* (PGS), where in the former case embryos are examined for specific genetic and structural alterations and in the latter case for any aneuploidy, mutation, or DNA rearrangement. In cases of *egg donation*, an oocyte from a woman is fertilized and then transferred to another woman’s womb. These can for instance be cases of gay male parenthood, *surrogate motherhood*, or when a woman is unable to have her own oocytes fertilized (e.g., late motherhood). Another type of egg donation is called ‘egg sharing:’ Women who underwent ART can share any non-used frozen oocyte with other women, sometimes for a discount on their payments for the ART treatment.

Globally, Europe has the largest number of ART treatments. In 2005, the most recent year for which global data are available, 56 per cent of ART aspirations² were in Europe, followed by Asia (23 per cent) and North America (15 per cent) (Zegers-Hochschild et al., 2014). Given that many European countries have been characterized as having the ‘lowest-low’ fertility (Kohler, Billari, & Ortega, 2002), ART is sometimes expected to not only be a means to alleviate the individual sufferings from involuntary childlessness, but also as a potential policy lever to raise fertility rates in Europe, thus interest in ART is substantial.

² Aspirations are initiated ART cycles in which one or more follicles are punctured and aspirated irrespective of whether or not oocytes are retrieved. See Footnote 3 for more details on metrics with which ART treatments are recorded.

Another key aspect of ART in Europe is the stark variation in terms of ART uptake and ART regulations both across countries and over time. This variation in terms of regulations between and within European countries allows comparisons that potentially yield important insights in the antecedents and outcomes of ART usage that might have implications for ART globally.

The aim of the current study is to present comparative data on ART usage in Europe, demonstrating the wide variability across European countries. In a second step, we will explore forms of ART governance across European countries, illustrating the variation in how ART is regulated and who gets access to which techniques. We then turn to the specific case of surrogacy, which has often fallen outside of ART legislation. We conclude with a related discussion on cross-border reproductive care—sometimes characterized as ‘reproductive tourism.’ The concluding section will summarize the findings, discuss implications and point to future areas of research.

2. Usage of Assisted Reproductive Technologies in European Countries

The usage of ART across European countries varies considerably. Although diagnostic and treatment services are currently available in all European countries, the variation in ART usage indicates that there are substantial differences in equity of access. We will first draw on data that have been collected by the European IVF Monitoring (EIM) Consortium of the European Society of Human Reproduction and Embryology (ESHRE). The EIM data go back until 1997 and are based on information from national registries (with voluntary or mandatory participation) of European countries, or, if those are not available, stem from information reported by clinics. We largely draw on information from the most recent report that reflects the period of 2010 (Kupka et al., 2014) and present information from the countries which have complete or almost complete figures.

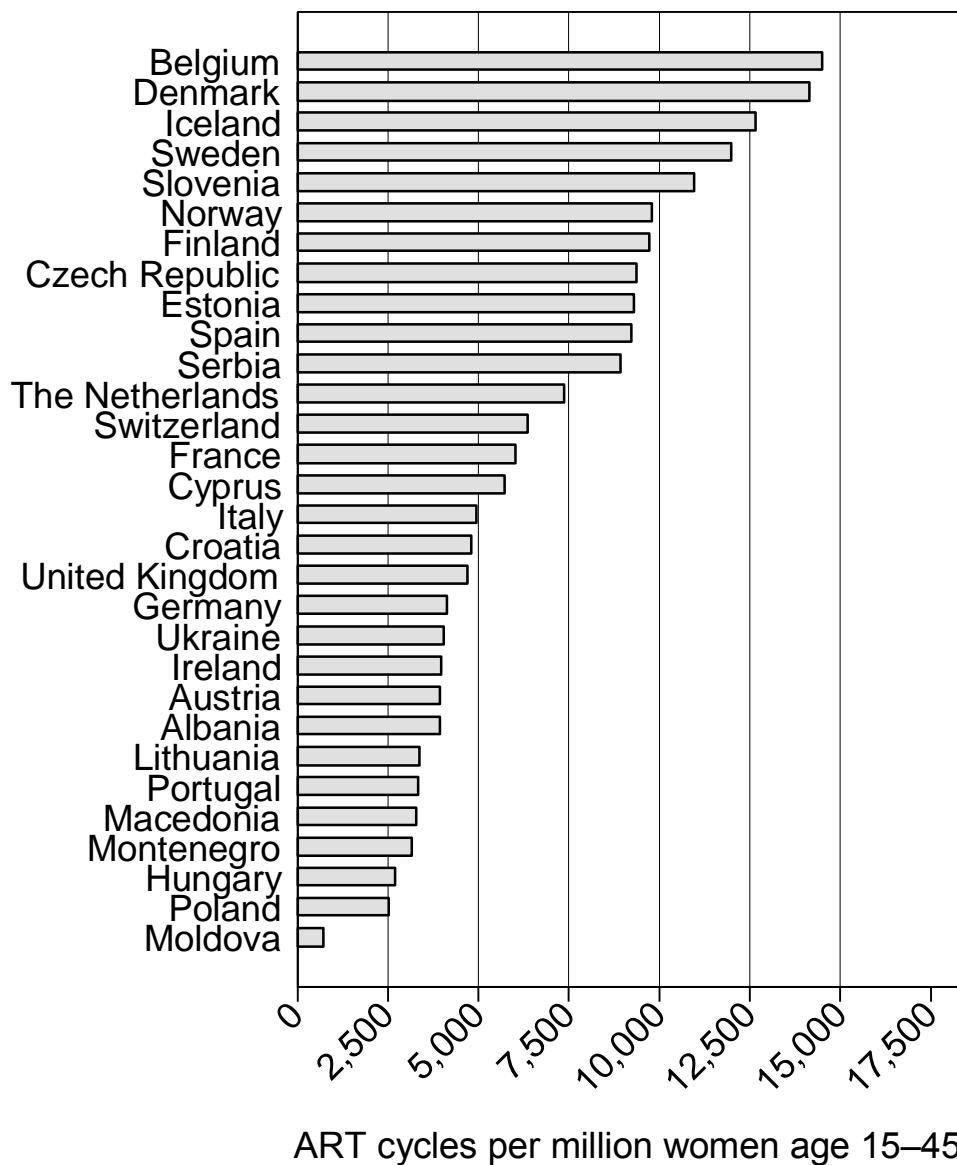


Figure 1: ART cycles per million women age 15–45 per country, 2010

Sources: Ferraretti et al. (2012; 2013) and Kupka et al. (2014).

Notes: Values for Albania, Estonia, Ireland, Lithuania, Poland, Spain, Serbia, Switzerland, and Ukraine refer to 2008; for Croatia, Cyprus, France, and Denmark to 2009. ART cycles refer to IVF, ICSI, frozen embryo replacement (thawings), preimplantation genetic diagnosis and screening, egg donation (donation cycles), *in vitro* maturation, and frozen oocyte replacement (thawings).

Figure 1 illustrates the vast variation in ART usage in Europe. The Figure reports the number of treatments³ by the main group of potential ART patients in a country, namely women

³ There are different metrics according to which ART treatments are recorded. Initiated ART *cycles* refer to menstrual cycles in which women receive ovarian stimulation (or, in the rare case of natural-cycle IVF, receive monitoring) with the intention to conduct ART, regardless of whether a follicular aspiration is attempted. *Aspirations* refer to attempts to retrieve oocytes from one or more follicles, regardless of whether oocytes are successfully retrieved. *Transfers* refer to procedures in which embryos are placed in the uterus or Fallopian tube, irrespective of whether a pregnancy is achieved (Zegers-Hochschild et al., 2009). However, for frozen embryo replacements, frozen oocyte replacements, and egg donations, cycles and aspirations are usually not recorded, here *thawings* and *transfers* are the relevant metrics.

between the ages of 15 and 45 years. Denmark, Belgium, Iceland, Sweden, and Slovenia are countries where the largest number of ART cycles is initiated. A comparison of these four countries shows that there is substantial heterogeneity at the top of the distribution. ART treatments in Belgium and Denmark are considerably higher than in Iceland, Sweden, and Slovenia. Furthermore, it is striking that the top group is not completely dominated by affluent western European countries, the reasons of which we discuss shortly in relation to nation-specific regulations, cross-border reproductive care, and the commercialization of ART. Next to Slovenia, the Czech Republic, Estonia, and Serbia are also in the upper half of the distribution, well ahead of wealthy nations such as Switzerland, the Netherlands, or Germany. Towards the bottom of the distribution, it is striking that ART in Germany, Austria, or Ireland is just as widespread as in the Ukraine or in Albania.

A number of studies have tried understanding the vast country differences in ART usage. Several factors have emerged. ART costs and affordability appear to play an important role. Belgium and Denmark are known for their comparably generous reimbursement policies for couples and individuals undergoing ART. In a cross-national study, Chambers et al. (2014) were able to show that greater affordability of ART—measured as the net cost of an ART cycle in a country as a share of the average disposable income in that country—is associated with greater ART utilization. Remarkably, this finding holds even after accounting for important factors such as GDP per capita, the number of physicians, and the number of ART clinics in a country. Studies exploiting variation within countries and over time (e.g. Hamilton & McManus, 2012) also support the notion that affordability is an important driver not only of utilization, but also of safer ART practices.

Norms and beliefs also seem to play an important role for understanding cross-national differences in ART usage. Billari et al. (2011) were able to show that there is a sizable positive association between higher social age deadlines for childbearing—these are generally shared assumptions about when one is too old for having children—and the availability of ART in European countries. The higher the social age norm for women considered too old to have any more children, the greater the availability of ART clinics. Kocourkova et al. (2014) are able to show that ART use and the total fertility rate in a country are correlated, which they interpret as a sign of increasing demand for children. This interpretation is plausible as most studies showed that the net impact of ART on fertility rates is actually small (Präg, Mills, Tanturri, Monden, & Pison, 2015). Mills and Präg (2015) suggest that beliefs about the moral status of a fertilized egg—a human embryo can be seen as a human being right after fertilization—are associated with ART utilization, in the sense

that in countries where the belief that eggs can be seen as human beings right after fertilization is less widespread, ART is used more often.

Next to the differences in the extent of ART usage in Europe, there is also considerable variation in the range which ART techniques are utilized. Figure 2 reports the share of single ART treatments among all ART treatments for selected countries in 2010. The classical form of ART, *in vitro* fertilization, is not the most popular type of IVF anymore. The share of IVF treatments among all ART treatments ranges from less than ten per cent in Spain to slightly more than 40 per cent in Denmark. ICSI, a method invented more recently (Palermo, Joris, Devroey, & Van Steirteghem, 1992) to treat male factor infertility, has overtaken IVF in the past years as the method of choice for ART (Kupka et al., 2014). The reasons for this development are not fully understood, especially since important professional organizations of reproductive health carers discourage the routine practice of ICSI in absence of male factor infertility diagnoses (Boulet et al., 2015). It is likely related to what demographic researchers have noted as the ‘absent and problematic men’ issue in fertility research and infertility diagnoses, due to the difficulties in collecting data on men and establishing male factor infertility (Greene & Biddlecom, 2000). Nonetheless, the share of ICSI treatments is greater in terms of magnitude than the share of IVF treatments in virtually all countries displayed in Figure 2; only in Denmark the share of IVF treatments is slightly larger (42 per cent) than the ICSI proportion (35 per cent). In the United Kingdom, IVF and ICSI are used to a similar extent (37 and 40 per cent, respectively). The substantial differences between countries have been noted in the literature, yet explanations are still lacking (Nyboe Andersen, Carlsen, & Loft, 2008). Taken together, IVF and ICSI make up the bulk of treatments in all countries.

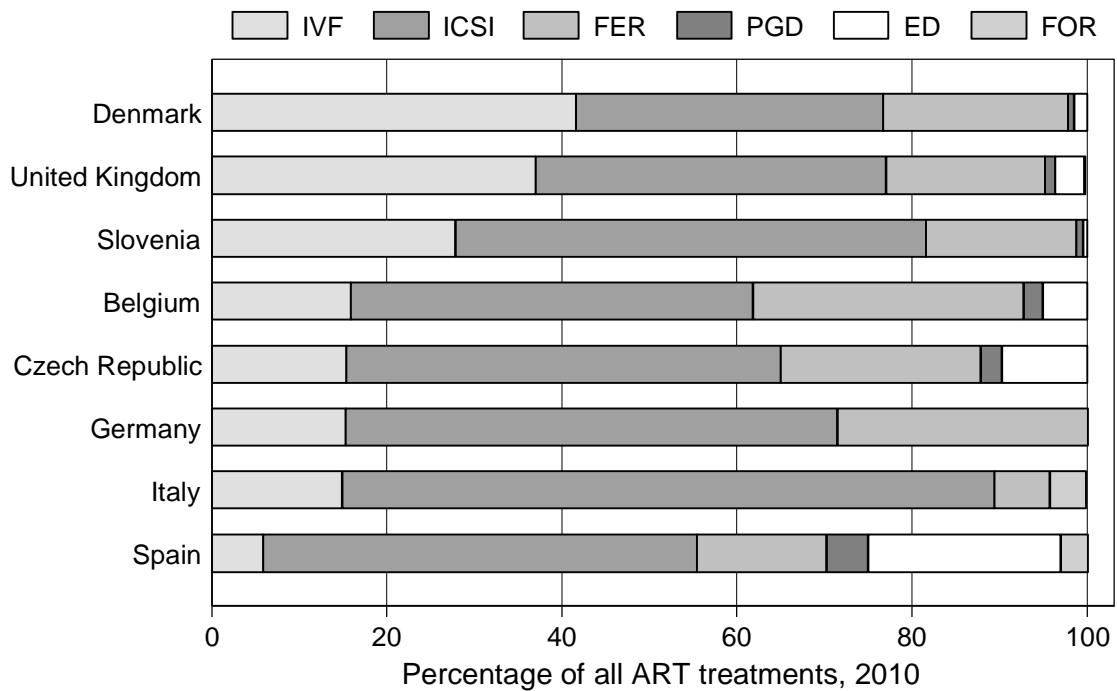


Figure 2: ART treatments in selected countries, 2010

Source: Kupka et al. (2014).

Notes: IVF: *in vitro* fertilization (cycles), ICSI: intracytoplasmic sperm injection (cycles), FER: frozen embryo replacement (thawings), PGD: preimplantation genetic diagnosis (cycles), ED: egg donation (donations), FOR: frozen oocyte replacement (thawings). *In vitro* maturation (aspirations, 0.0–0.1 per cent per country) not displayed.

The third-most popular form of treatment is frozen embryo replacement, making up six (Italy) to 31 per cent (Belgium) of ART treatments. The small FER share in Italy is a repercussion of the restrictive IVF legislation which had rigorously banned embryo cryopreservation (except under exceptional circumstances) from 2004 to 2009 (Benagiano & Gianaroli, 2010). The large share of FER in Germany is actually striking, as German legislation with respect to embryo freezing is fairly restrictive, banning non-emergency freezings of embryos and only allowing freezing of fertilized eggs in their earliest stages of development. Preimplantation genetic diagnosis (PGD), practiced since the early 1990's (Simpson, 2010), is likely the ethically most controversial ART variant. It has clear benefits for not passing inheritable conditions to one's children, is generally considered safe, and has a low frequency of errors (Ory et al., 2014). However, the fear of 'designer babies' and moral concerns about the use of PGD for non-medical purposes (such as sex selection) play an important role in public discourse over ART. The data show that PGD is, overall, a very small aspect of ART. The share ranges from no reported cases of PGD (Germany, Italy) to 4.7 per cent in Spain. In Denmark, Slovenia, and the United Kingdom, the share ranges from

around one per cent of ART treatments, whereas in Belgium and the Czech Republic it is slightly above two per cent. Considering this controversy, it is interesting to note that PGD is generally allowed in all countries listed in Figure 2 (Ory et al., 2014), Denmark and Slovenia however restrict its use to specific hereditary disorders.

Egg donation is also a technique that is not practiced in all countries, which is shown in Figure 2. Germany and Italy report no cases, in Slovenia and Denmark below two per cent. In the United Kingdom and Belgium, shares are slightly higher (3.3 and five per cent, respectively). In the Czech Republic and Spain a significant share (9.7 and 22 per cent) of ART treatments consist of egg donation. As we turn to in more detail shortly, one of the reasons for this inequality between countries is cross-border reproductive care. Couples and single women who are unable to receive the desired treatment in their home country are sometimes willing or able to travel abroad to receive that treatment in another country. Frozen oocyte replacement (FOR), which builds on fertilizing thawed oocytes, is rather minor aspect of ART: FOR treatments are reported only in the United Kingdom, Spain, and Italy (0.1, 3.1, and 4.1 per cent, respectively). One reason for the relative popularity of FOR in Italy that is reported in the literature was the ban on cryopreserving embryos, which created incentives to further develop and refine technologies to cryopreserve oocytes.

3. Regulation of Assisted Reproductive Technology in Europe

In terms of the legal regulation of ART, Europe is the only continent where legal regulation of ART is widespread. Other major countries where ART is not uncommon, such as India, Japan, and the US, rely largely on voluntary guidelines. While ART regulation is sometimes portrayed as a novel phenomenon, the general notion of governments interfering with the reproductive realm has important historical precedents, for instance when looking at regulations pertaining to marriage and divorce, contraception, births out of wedlock, adoption, and abortion (Spar, 2005).

There are three major ways of regulating the practice of and the access to ART. First, ART can be regulated via *guidelines* that are sets of rules to be voluntarily followed by practitioners. These guidelines are generally proposed by professional organizations (e.g. obstetrics and gynaecology societies). Second, as an alternative or a supplement to guidelines, ART is also often subject to governmental *legislation*, which are sets of rules codified by law, and that come with penalties for violation. A third route that regulates access to ART is *insurance coverage*, which given the high costs of infertility treatments can

be seen as an indirect regulation of access to ART. Infertility is nowadays seen as a condition leading to disability (WHO & World Bank, 2011) and as such should give infertile individuals a right to treatment.

The International Federation of Fertility Societies (IFFS) takes stock of ART guidelines, regulations, and insurance coverage in their triennial ‘Surveillance Reports,’ which have been published since 1999 (Jones & Cohen, 1999). The data are based on surveys among designated experts from national fertility societies. The IFFS data come in rather broad categories and are sometimes incomplete or inconsistent, however give a glimpse into the cross-national differences that comprise ART governance in Europe. In the following, we are presenting data from the most recent IFFS Surveillance Report (Ory et al., 2014), which refers to the year 2013. We include all European countries featured in the report plus a number of contrasting non-European cases.

The left column of Table 1 reveals that in all European countries, ART is regulated via governmental legislation. In about half of the countries, this governmental regulation is supplemented by voluntary guidelines. For two of the three contrasting cases listed at the bottom of the Table (India and Japan), ART is however fully governed by voluntary guidelines. While the distinction between legislation and guidelines does not reveal the scope and extent of the actual daily regulation, it roughly illustrates the importance that governments attach to ART. The second column shows that ART legislation is a salient issue for governments, since half of the countries have introduced new ART legislation in the relatively short period of four years.

When it comes to the financing of ART treatments, virtually all European countries offer some form of cost coverage. Only Belarus, Ireland, and Switzerland do not provide their citizens with some form of coverage. Whereas most countries provide coverage via national health plans, some work via mandates for private insurances or combinations. Six countries—Denmark, France, Hungary, Russia, Slovenia, and Spain—have complete coverage via national health plans. A comparison with the results from Figure 1 reveals that indeed Denmark, Slovenia, and Spain are among the countries with particularly high ART utilization. Countries which partial coverage is provided vary considerably in the extent of coverage. Whereas in Austria two thirds are covered by the national health system, in Finland this is in some cases only forty per cent. Furthermore, insurance coverage usually depends on patient characteristics. Coverage in Spain is for instance only available for women up to age 40. Slovenia covers six cycles for the first child and four cycles after a first live birth, but only for women up to age 42. In some parts of the United Kingdom, women

who are obese are being denied coverage. For the US, substantial heterogeneity between the federal states should be taken into account: a few states provide rather generous coverage, whereas the vast majority does not.

Table 1: Types of ART regulation in Europe, India, Japan, and the US, 2013

Country	Type of ART governance	New ART legislation since 2009	Type of coverage	Extent of coverage
Austria	Legislation and guidelines	No	National health plan	Partial
Belarus	Legislation and guidelines	No	No coverage	None
Belgium	Legislation only	Yes	National health plan and private insurance	Partial
Bulgaria	Legislation only	Yes	National health plan	Partial
Croatia	Legislation only	Yes	National health plan and private insurance	Partial
Czech Republic	Legislation only	Yes	National health plan	Partial
Denmark	Legislation only	Yes	National health plan	Complete
Finland	Legislation only	No	National health plan	Partial
France	Legislation and guidelines	Yes	National health plan	Complete
Greece	Legislation only	No	National health plan	Partial
Hungary	Legislation only	No	National health plan	Complete
Iceland	Legislation only	No	National health plan	Partial
Ireland	Legislation and guidelines	No	No coverage	None
Italy	Legislation and guidelines	Yes	National health plan	Partial
Latvia	Legislation and guidelines	Yes	National health plan	Partial
Norway	Legislation and guidelines	No	National health plan	Partial
Portugal	Legislation only	Yes	National health plan	Partial
Russia	Legislation and guidelines	Yes	National health plan	Complete
Slovenia	Legislation only	No	National health plan	Complete
Spain	Legislation and guidelines	No	National health plan and private insurance	Complete
Sweden	Legislation and guidelines	No	National health plan	Partial
Switzerland	Legislation and guidelines	No	No coverage	None
Turkey	Legislation and guidelines	Yes	National health plan	Partial
United Kingdom	Legislation and guidelines	Yes	Private insurance	Partial
India	Guidelines only	No	No coverage	None
Japan	Guidelines only	No	National health plan	Partial
United States	Legislation and guidelines	No	Private insurance	Partial

Source: Ory et al. (2014).

Couple and sexuality requirements are a socially relevant aspect of ART policies, as they govern access to ART treatments over and above the financial restrictions that infertile couples and individuals face. Table 2 lists couple and sexuality requirements as reported by Ory et al. (2014) for all European countries and India, Japan, and the US. Note that these requirements can stem from both legislation or guidelines. The first column of Table 2 reveals that marriage is a requirement for ART treatment in most countries. Only six out of 22 European countries in Table 2 report that marriage is not a requirement for ART access. However, apart from Turkey (and Japan), all European countries listed will also provide

treatment to couples who live in stable relationships. Ory et al. (2014) acknowledge that ‘stable relationship’ is a poorly-defined concept open to interpretation, yet it is widely embraced across countries. When it comes to unpartnered women who want to undergo ART treatment, countries are somewhat more restrictive. Only ten of the 22 European countries as well as India and the US permit singles to utilize ART services. When it comes to lesbian women, the situation is even less liberal: Only seven European countries and the US grant them access to ART.

Table 2: Couple and sexuality requirements for ART in Europe, India, Japan, and the US, 2013

	Marriage required	Stable relationship permitted	Singles permitted	Lesbians permitted
Austria	Yes	Yes	No	No
Belgium	Yes	Yes	Yes	Yes
Bulgaria	Yes	Yes	Yes	Yes
Croatia	Yes	Yes	No	No
Czech Republic	Yes	Yes	No	No
Denmark	Yes	Yes	Yes	Yes
Finland	No	Yes	Yes	Yes
France	No	Yes	No	No
Greece	No	Yes	Yes	No
Hungary	Yes	Yes	Yes	No
Ireland	No	Yes	No	No
Italy	Yes	Yes	No	No
Latvia	Yes	Yes	Yes	Yes
Russia	Yes	Yes	Yes	No
Slovenia	No	Yes	No	No
Spain	Yes	Yes	Yes	Yes
Sweden	Yes	Yes	No	No
Switzerland	No	Yes	No	No
Turkey	Yes	No	No	No
United Kingdom	No	Yes	Yes	Yes
India	Yes	Yes	Yes	No
Japan	Yes	No	No	No
United States	No	Yes	Yes	Yes

Source: Ory et al. (2014).

Turning to a more concrete example that illustrates how European countries vary in their approach to regulating forms of ART, we examine a particularly controversial variant of surrogacy. There are several forms of surrogacy (see Notes below Table 3). The most prominent form is a traditional variant that uses the surrogate mother’s egg. In gestational surrogacy, the egg is provided by the intended mother or a donor, fertilized via IVF, and then transferred to the surrogate mother’s womb. Regulations also differ according to whether the surrogate mother is altruistic or commercially compensated, which varies widely by country.

The first central difference, shown in Table 3, is whether surrogacy is prohibited or not (column 1) or whether there are special laws on surrogacy (column 3). Surrogacy is strictly prohibited in many countries such as France, Germany, Italy, Spain and Portugal. Surrogate motherhood is explicitly allowed in Belgium, Belarus, Denmark, Greece, Ireland, the Russian Federation, Ukraine, and the United Kingdom. Although surrogacy is permitted in some of these countries, a second distinction is that it is often only on the basis of non-commercial grounds, i.e. the surrogate mother is not allowed to be paid above ‘altruistic costs.’ Conversely, commercial surrogacy is legal in certain US states, India, the Ukraine, and the Russian Federation. In countries where surrogacy is prohibited, stakeholders have produced evidence that there is considerable travel to other countries for cross-border care and the use of ‘commercial surrogacy.’⁴ A third aspect relates to access. Since the laws demand that both partners should provide gametes, singles are generally unable to become parents via surrogacy.

Finally, due to the frequent cross-border nature of surrogacy, a highly controversial ethical and legal debate has arisen about the citizenship and parental rights of surrogate and adoptive parents. Recent cases have abounded in the media such as babies being left without citizenship or parents. A renowned case which demonstrates the difficulties of diverse pan-European surrogacy laws is the case of twins who were born to a gay male British couple of which one was the biological father, with an anonymous egg donor and Ukrainian surrogate mother (Henderson, 2008). Owing to conflicts between British and Ukrainian laws, the British father was not treated as a parent of the twins and his children were not allowed to enter the United Kingdom. Conversely, the Ukrainian surrogate mother had waived all rights over her biological offspring in a surrogacy agreement, which however was only recognized by Ukrainian and not by British legislation. In the end, the British couple was able to gain custody over the twins in a British court of law. Cases in Germany have reported that babies born outside of the country using surrogacy have been denied citizenship despite the fact that the German parents are named on the birth certificate (The Local, 2011). The ‘Baby Gammy’ case in Australia, where a child with Down’s syndrome born to a Thai surrogate mother was reported to be abandoned by the intended Australian parents raised further concerns, with the child recently granted Australian citizenship under the care of the Thai surrogate mother (Farrell, 2015). The legal mechanisms to grant parenthood status remain unclear and differ according to whether the surrogate mother can be located or the court’s

⁴ See e.g. Surrogacy UK, <http://www.surrogacyuk.org/>

view on the best interest of the child. It appears that when many ART laws were drawn up and reformed, surrogacy was often excluded or barely acknowledged.

Table 3: Overview of legal approaches to surrogacy, Europe and selected other countries, 2013

	General prohibition	Commercial surrogacy allowed or prohibited?	Special law on surrogacy?	Adoption rules or recognition of citizenship of children from cross-border surrogacy
Austria	Egg donation prohibited; gestational surrogacy allowed	No specific prohibition for traditional surrogacy	no for traditional surrogacy	No recognition of child's citizenship
Belarus	Allowed	Unknown	Unknown	Unknown
Belgium	Allowed†	Prohibited on public policy grounds	no for altruistic surrogacy	Adoption required to transfer legal parenthood
Bulgaria	Prohibited	n/a	No, but draft legislation under consideration	n/a
Cyprus	Allowed	Allowed/no prohibition	Yes	Surrogate mother and biological father listed on birth certificate
Czech Republic	Allowed	Allowed/no prohibition	Yes	Unknown
Denmark	Allowed†	Prohibited	No for altruistic surrogacy	Adoption required to transfer legal parenthood
Estonia	Allowed	Allowed/no prohibition	Yes	Unknown
Finland	Prohibited for IVF	No specific prohibition for traditional surrogacy	no for traditional surrogacy	Unknown
France	Prohibited	n/a	n/a	Unknown
Germany	Prohibited	n/a	n/a	No recognition of child's citizenship
Greece	Allowed	Allowed/no prohibition	Yes: altruistic gestational surrogacy subject to restrictions	Surrogate mother and biological father listed on birth certificate
Hungary	Allowed	Prohibited	No for altruistic surrogacy	Adoption required to transfer parents; genetic intended
Ireland	Allowed†	Prohibited	No for altruistic surrogacy but formal guidelines for cross-border surrogacy agreements	parents' names as legal parents on birth registry
Italy	Prohibited	n/a	n/a/	Unknown
Latvia	Allowed	Prohibited	No for altruistic surrogacy	Unknown
Lithuania	Allowed	Allowed/no prohibition	Yes	Unknown
Luxembourg	Allowed	Allowed/no prohibition	Yes	Unknown
Malta	Prohibited	n/a	n/a	Unknown
Norway	Prohibited	n/a	No	
Netherlands	Allowed†	Prohibited	Yes altruistic gestational	No special law for

			surrogacy required by law to abide by professional guidelines	parenthood: adoption required
Poland	Allowed	Allowed/no prohibition	Yes	Surrogate mother and biological father listed on birth certificate
Portugal	Prohibited	n/a	n/a	Unknown
Russian Fed.	Allowed	Allowed/no prohibition	Unknown	Unknown
Slovakia	Allowed	Allowed/no prohibition	Yes	Unknown
Slovenia	Allowed	Allowed/no prohibition	Yes	Unknown
Spain	Prohibited	n/a	n/a	Unknown
Sweden	Prohibited for fertility clinics to make surrogacy arrangements	Prohibited	No law for privately arranged surrogacy; Swedish Council Medical Ethics recently recommended altruistic surrogacy should be permitted	Adoption required to transfer parenthood
Switzerland	Prohibited	n/a	n/a	No recognition of child's citizenship
Turkey	Prohibited	n/a	n/a	Unknown
Ukraine	Allowed	Allowed/no prohibition	Unknown	Intended parents' names on birth certificate
United Kingdom	Allowed†	Prohibited	No for altruistic surrogacy	Parenthood only transferred in certain circumstances
India	Allowed	Allowed/no prohibition	Yes	Parents' names on birth certificate, Indian surrogates cannot be named as mother
Japan	Prohibited	n/a	n/a	Unknown
Canada	Allowed†	Prohibited	Unknown	Unknown
United States*	Allowed*	Allowed/certain prohibitions	Yes	Parents' names on birth certificate

Source: Brunet et al. (2013), Ory et al. (2014), Families Thru Surrogacy (2015). When expert interviews from IFFS data from Ory et al. (2014) differed from legal and clinical survey data reported by Brunet et al. (2013), the latter data was adopted over the expert interviews.

Notes: Traditional surrogacy is where surrogate mother's eggs are used and she is the genetic mother with insemination of sperm of intended father or donated sperm (either IVF or insemination). Altruistic surrogacy is where surrogate mother is paid nothing or only expenses. Commercial surrogacy is where surrogate mother is remunerated beyond expenses with a fee. *allowed in California, Maryland, Massachusetts, Ohio, Pennsylvania, South Carolina, Alabama, Arkansas, Connecticut, Illinois, Iowa, Nevada, North Dakota, Oregon, Tennessee, Texas, Utah, West Virginia. † Allowed only for non-commercial surrogacy (i.e., mother not paid or only reasonable expenses).

4. Cross-Border Reproductive Care in Europe

As we touched upon in our discussion on surrogate motherhood, the variety in regulations in Europe has given rise to an important phenomenon of cross-border reproductive care (Nygren, Adamson, Zegers-Hochschild, & de Mouzon, 2010; Shenfield et al., 2010). Cross-border reproductive care refers to couples or individuals seeking assisted reproduction

treatments in a country other than their country of permanent residence.⁵ Despite the phenomenon being widely known among practitioners, patients, and policy makers alike, there is little empirical research on the actual extent of cross-border reproductive care. The review article by Hudson et al. (2011) tellingly reports that the number of commentaries on the topic greatly exceeds the number of empirical studies.

Establishing the incidence of cross-border reproductive care has proven to be elusive for researchers. The biggest attempt at a global survey care was undertaken by Nygren et al. (2010), reporting information received from informants in 23 countries worldwide. Virtually all reports were based on estimates by informants rather than empirical data, and the authors conclude that their efforts yielded ‘little, if any, solid data’ on cross-border reproductive care. The estimates of Nygren et al. suggest that most cross-border reproductive care in Europe involves traveling to other European countries, not to other continents.

The largest study of patients undergoing cross-border reproductive care in Europe was conducted in 2008/09 by Shenfield et al. (2010) of all women coming abroad and undergoing treatment in 44 fertility clinics in Belgium, the Czech Republic, Denmark, Switzerland, Slovenia, and Spain were surveyed. Italy (32 per cent), Germany (15 per cent), the Netherlands (twelve per cent), and France (nine per cent) are the most strongly represented countries of origin among those seeking care. Geographic and cultural proximity is a driving factor in the choice of treatment country: The majority of Italians traveled to Spain and Switzerland, most Germans to the Czech Republic, the majority of Dutch and French women went to Belgium, and Norwegian and Swedish patients to Denmark. Shenfield and colleagues suggest that a conservative estimate of cross-border reproductive care (i.e., crossing country borders in order to undergo ART) in 2008/2009 would be one of 11,000–14,000 patients and 24,000–30,000 treatment cycles in the six countries alone. When confronted with the number of ART cycles (2008: 532,000; 2009: 537,000) counted in all of Europe at that time (Ferraretti et al., 2012; Ferraretti et al., 2013), this is a small, yet substantial share of patients and cycles.

The reasons for seeking cross-border reproductive care are diverse, with patients reporting a combination of factors (Culley et al., 2011). The main reasons are legal restrictions, difficulties of accessing ART treatments (e.g., long waiting lists), hopes for better-quality treatment in the destination country, and previous failed treatments in the

⁵ This phenomenon is also sometimes known as ‘reproductive tourism’ or ‘reproductive exile’ (Pennings, 2005), but given the charged nature of both terms, we follow Shenfield et al. (2010) in their usage of the more descriptive and neutral term ‘cross-border reproductive care.’

patient's country of origin. Studies have illustrated many legal reasons that ART patients might attempt to seek treatment in other countries. Egg donation is a form of assisted reproduction banned in some European countries, for instance Germany, enticing German couples to seek such treatments in the Czech Republic and Spain (Bergmann, 2011). Access to donor sperm is prohibited for single women and lesbian couples in France (see Table 2), enticing them to travel to Belgium to seek treatment there (Rozée Gomez & de La Rochebrochard, 2013; van Hoof, Pennings, & de Sutter, 2015). Some countries like the United Kingdom have long waiting lists for donor gametes, and patients wishing to avoid lengthy waiting periods seek treatment abroad, where donor gametes might be more easily accessible (Culley et al., 2011). Reasons for this can be that some countries have banned anonymous gamete donation (e.g. Finland, Sweden, or the United Kingdom), thus raising the bar for potential donors, and there is large variation in the generosity of reimbursements of donors across countries. Hopes for better-quality treatments are prevalent among patients from some countries such as Italy (Shenfield et al., 2010; Zanini, 2011) and previous failed treatments in the country of residence have also been identified as important reasons (Culley et al., 2011; Shenfield et al., 2010). Shenfield and colleagues (2010) are able to corroborate the notion that differences in regulations are important drivers of cross-border fertility care in their comparative study of patients seeking treatment abroad. Fifty-seven to eighty per cent of patients from Italy, Germany, Norway, France and Sweden who are seeking fertility treatment abroad state (among others) legal reasons as explanations of their behavior, whereas for patients from the Netherlands and the United Kingdom it is only 32 and nine per cent, respectively. Conversely, patients from the Netherlands are particularly likely to report seeking treatment abroad for better-quality treatment (53 per cent, average across the six countries mentioned: 43 per cent), and patients from the United Kingdom are more likely to go abroad because of access difficulties (34 per cent, six-country average: seven per cent).

Despite the presumably limited extent of cross-border reproductive care in Europe, the consequences and implications for ART regulation, access, and treatment success are potentially far-reaching. Due to the relative ease of cross-border reproductive care in Europe (free movement of services and people, relatively low travel costs), restrictive legislation on ART has largely symbolic value (van Beers, 2015). Furthermore, some national stakeholders such as patient groups have reduced incentives to voice their interests in the policy-making process, as patients can easily circumvent national regulation by seeking treatment abroad. In turn, this enables policy-makers to impose stricter laws than they would be able to when facing more resistance from stakeholders (Storrow, 2010). Furthermore, cross-border

reproductive care also has implications for equity of access to ART. Rozée Gomez and de la Rochebrochard (2013) report that less well-off French patients seek fertility treatment in Greece for financial reasons. This in turn might affect domestic service provision for ART, as local patients in Greece might be ‘priced out’ of the market for ART services.

5. Discussion

This study showed that there is a remarkable variation in the level of ART treatments across Europe, with not only affluent countries such as Denmark and Belgium at the highest levels, but also in Slovenia, the Czech Republic, Estonia and Serbia. Reasons for this variation include affordability, reimbursement, and social and cultural norms surrounding childbearing. A striking shift has been the move from IVF as the dominant form of ART to the growth of ICSI, a method to primarily treat male infertility. We also show that the type of treatments vary across countries.

The growth of ART legislation in the past four years has risen sharply, with all European countries now having legislation on ART and virtually all providing some sort of financial coverage (with the exception of Belarus, Ireland and Switzerland). Those with complete coverage for treatments via national health plans such as Denmark, Slovenia and Spain, have the highest ART utilization. Coverage also differs by patient characteristics, depending on e.g. the age of the prospective mother or the number of previous children. Legal marriage or stable partnerships are required in most countries for ART access, with only half of European countries permitting single women, and few countries granting access to lesbian women.

We then turned to the increasingly relevant issue of surrogacy and cross-border reproductive care. Surrogacy is strictly prohibited in many countries and where it is allowed, there are often restrictions on commercial surrogacy. Due to the frequent cross-border nature of surrogacy, there is considerable confusion and variation in relation to the citizenship of the child and parental rights of surrogate and adoptive parents. The growth in cross-border reproductive care means that restrictive national legislation can be easily circumvented, but raises questions of the equity of access for who can afford to travel for treatment. Cross-border reproductive care is a transnational practice that forces social scientists and policy makers to think beyond the confines of the nation-state (Mau & Verwiebe, 2010; Wimmer & Glick Schiller, 2002). Notwithstanding all of the problems related to patients crossing borders to achieve fertility treatment, it is important to acknowledge that women have been

crossing borders in Europe for a long time to abort pregnancies, exploiting differences in reproductive legislation across countries.

Although there has been a rise in techniques such as the ‘social freezing’ of eggs or suggestions that ART could help nations to heighten fertility levels, we would be hesitant to argue that it is an upcoming policy to reconcile career and family aspirations, next to flexible work schedules (Präg & Mills, 2014) and publicly available childcare (Mills et al., 2014). The reason for this are the low success rates of ART at higher ages and thus that the ‘biological clock’ likely cannot be reversed (Präg et al., 2015; Wyndham, Marin Figueira, & Patrizio, 2012).

This study also showed some strong limitations in what we are able to conclude, which is largely attribute to the lack of data and clarity about ART in Europe. Future endeavors should firstly move towards a greater standardization of data collection of ART treatments and their outcomes to improve the knowledge base on individual antecedents and effects of ART. Second, national databases should be developed to collect quantitative information that allows linking across countries, as cross-border reproductive care needs to be registered properly. Third, there should be initiatives to not only monitor cross-border reproductive care in Europe, but also to support caregivers in providing help for patients both undergoing and returning from cross-border fertility care in these often legally diffuse situations.

Despite the fact that Europe is currently the biggest market for ART in the world, it should be kept in mind that it is among the places with the lowest demand for ART. Paradoxically, involuntary childlessness is most prevalent (and is perceived by infertile women as most pressing) in Africa, where—at the same time—fertility is highest in the world. Given the increasing international recognition of the problem and push for low-cost provision of ART (Ombelet, 2014), the ‘globalization of ART’ has yet to be achieved (Inhorn & Patrizio, 2015).

References

- Adamson, G. D., Tabangin, M., Macaluso, M., & de Mouzon, J. (2013). The Number of Babies Born Globally after Treatment with the Assisted Reproductive Technologies (ART). *Fertility and Sterility*, *100*(3, Supplement), S42. doi: 10.1016/j.fertnstert.2013.07.1807
- Benagiano, G., & Gianaroli, L. (2010). The Italian Constitutional Court Modifies Italian Legislation on Assisted Reproduction Technology. *Reproductive Biomedicine Online*, *20*(3), 398-402. doi: 10.1016/j.rbmo.2009.11.025
- Bergmann, S. (2011). Reproductive Agency and Projects. Germans Searching for Egg Donation in Spain and the Czech Republic. *Reproductive Biomedicine Online*, *23*(5), 600-608. doi: 10.1016/j.rbmo.2011.06.014
- Billari, F. C., Goisis, A., Liefbroer, A. C., Settersten, R. A., Aassve, A., Hagestad, G., & Spéder, Z. (2011). Social Age Deadlines for the Childbearing of Women and Men. *Human Reproduction*, *26*(3), 616-622. doi: 10.1093/humrep/deq360
- Boulet, S. L., Mehta, A., Kissin, D. M., Warner, L., Kawwass, J. F., & Jamieson, D. J. (2015). Trends in Use of and Reproductive Outcomes Associated with Intracytoplasmic Sperm Injection. *JAMA*, *313*(3), 255-263. doi: 10.1001/jama.2014.17985
- Brunet, L., Carruthers, J., Davaki, K., King, D., Marzo, C., & McCandles, J. (2013). *A Comparative Study on the Regime of Surrogacy in EU Member States*. Brussels: European Parliament.
- Chambers, G. M., Hoang, V. P., Sullivan, E. A., Chapman, M. G., Ishihara, O., Zegers-Hochschild, F., ... Adamson, G. D. (2014). The Impact of Consumer Affordability on Access to Assisted Reproductive Technologies and Embryo Transfer Practices. An International Analysis. *Fertility and Sterility*, *101*(1), 191-198.e194. doi: 10.1016/j.fertnstert.2013.09.005
- Culley, L., Hudson, N., Rapport, F., Blyth, E., Norton, W., & Pacey, A. A. (2011). Crossing Borders for Fertility Treatment. Motivations, Destinations, and Outcomes of UK Fertility Travelers. *Human Reproduction*, *26*(9), 2373-2381. doi: 10.1093/humrep/der191
- Families Thru Surrogacy. (2015). *Surrogacy by Country*: <http://www.familiesthrusurrogacy.com/surrogacy-by-country>.
- Farrell, P. (2015). Baby Gammy, Born into Thai Surrogacy Scandal, Granted Australian Citizenship. *The Guardian* (19 January), <http://www.theguardian.com/australia-news/2015/jan/2020/baby-gammy-born-into-thai-surrogacy-scandal-granted-australian-citizenship>.
- Ferraretti, A. P., Goossens, V., de Mouzon, J., Bhattacharya, S., Castilla, J. A., Korsak, V., ... the European IVF Monitoring Consortium for the European Society of Human Reproduction and Embryology. (2012). Assisted Reproductive Technology in Europe, 2008. Results Generated from European Registers by ESHRE. *Human Reproduction*, *27*(9), 2571-2584. doi: 10.1093/humrep/des255
- Ferraretti, A. P., Goossens, V., Kupka, M., Bhattacharya, S., De Mouzon, J., Castilla, J. A., ... the European IVF Monitoring Consortium for the European Society of Human Reproduction and Embryology. (2013). Assisted Reproductive Technology in Europe, 2009. Results Generated from European Registers by ESHRE. *Human Reproduction*, *28*(9), 2318-2331. doi: 10.1093/humrep/det278

- Greene, M. E., & Biddlecom, A. E. (2000). Absent and Problematic Men. Demographic Accounts of Male Reproductive Roles. *Population and Development Review*, 26(1), 81-115. doi: 10.1111/j.1728-4457.2000.00081.x
- Hamilton, B. H., & McManus, B. (2012). The Effects of Insurance Mandates on Choices and Outcomes in Infertility Treatment Markets. *Health Economics*, 21(8), 994-1016. doi: 10.1002/hec.1776
- Henderson, M. (2008). British Surrogacy Ruling Saves Baby Twins from Ukraine Orphanage. *The Times* (12 December), <http://www.thetimes.co.uk/tto/law/article2212834.ece>.
- Hudson, N., Culley, L., Blyth, E., Norton, W., Rapport, F., & Pacey, A. (2011). Cross-Border Reproductive Care. A Review of the Literature. *Reproductive Biomedicine Online*, 22(7), 673-685. doi: 10.1016/j.rbmo.2011.03.010
- Inhorn, M. C., & Patrizio, P. (2015). Infertility around the Globe. New Thinking on Gender, Reproductive Technologies, and Global Movements in the 21st Century. *Human Reproduction Update*, 21(4), 411-426. doi: 10.1093/humupd/dmv016
- Jones, H. W., Jr., & Cohen, J. (1999). IFFS Surveillance 1998. *Fertility and Sterility*, 71(5, Supplement 2), S1-S34. doi: 10.1016/S0015-0282(99)80001-6
- Kocourkova, J., Burcin, B., & Kucera, T. (2014). Demographic Relevancy of Increased Use of Assisted Reproduction in European Countries. *Reproductive Health*, 11(1), 37. doi: 10.1186/1742-4755-11-37
- Kohler, H.-P., Billari, F. C., & Ortega, J. A. (2002). The Emergence of Lowest-Low Fertility in Europe During the 1990s. *Population and Development Review*, 28(4), 641-680. doi: 10.1111/j.1728-4457.2002.00641.x
- Kupka, M. S., Ferraretti, A. P., De Mouzon, J., Erb, K., D'Hooghe, T., Castilla, J. A., ... the European IVF Monitoring Consortium for the European Society of Human Reproduction and Embryology. (2014). Assisted Reproductive Technology in Europe, 2010. Results Generated from European Registers by ESHRE. *Human Reproduction*, 29(10), 2099-2113. doi: 10.1093/humrep/deu175
- Malizia, B. A., Hacker, M. R., & Penzias, A. S. (2009). Cumulative Live-Birth Rates after In Vitro Fertilization. *New England Journal of Medicine*, 360(3), 236-243. doi: 10.1056/NEJMoa0803072
- Mascarenhas, M. N., Flaxman, S. R., Boerma, T., Vanderpoel, S., & Stevens, G. A. (2012). National, Regional, and Global Trends in Infertility Prevalence Since 1990. A Systematic Analysis of 277 Health Surveys. *PLoS Medicine*, 9(12), e1001356. doi: 10.1371/journal.pmed.1001356
- Mau, S., & Verwiebe, R. (2010). *European Societies. Mapping Structure and Change*. Bristol: Policy.
- Mertes, H., & Pennings, G. (2011). Social Egg Freezing. For Better, not for Worse. *Reproductive Biomedicine Online*, 23(7), 824-829. doi: 10.1016/j.rbmo.2011.09.010
- Mills, M., & Präg, P. (2015). *Norms, Politics, and Assisted Reproductive Technology (ART) Policies. A Cross-National Comparative Analysis*. San Diego, CA: Paper presented at the Annual Meeting of the Population Association of America.
- Mills, M., Präg, P., Tsang, F., Begall, K., Derbyshire, J., Kohle, L., ... Hoorens, S. (2014). *Use of Childcare Services in the EU Member States and Progress towards the Barcelona Targets*. Brussels: European Commission DG Justice.

- Mills, M., Rindfuss, R. R., McDonald, P., & te Velde, E. (2011). Why Do People Postpone Parenthood? Reasons and Social Policy Incentives. *Human Reproduction Update*, 17(6), 848-860. doi: 10.1093/humupd/dmr026
- Nyboe Andersen, A., Carlsen, E., & Loft, A. (2008). Trends in the Use of Intracytoplasmic Sperm Injection. Marked Variability Between Countries. *Human Reproduction Update*, 14(6), 593-604. doi: 10.1093/humupd/dmn032
- Nygren, K., Adamson, D., Zegers-Hochschild, F., & de Mouzon, J. (2010). Cross-Border Fertility Care. International Committee Monitoring Assisted Reproductive Technologies Global Survey. 2006 Data and Estimates. *Fertility and Sterility*, 94(1), e4-e10. doi: 10.1016/j.fertnstert.2009.12.049
- Ombelet, W. (2014). Is Global Access to Infertility Care Realistic? The Walking Egg Project. *Reproductive Biomedicine Online*, 28(3), 267-272. doi: 10.1016/j.rbmo.2013.11.013
- Ory, S. J., Devroey, P., Banker, M., Brinsden, P., Buster, J., Fiadjoe, M., ... Sullivan, E. (2014). IFFS Surveillance 2013. Preface and Conclusions. *Fertility and Sterility*, 101(6), 1582-1583. doi: 10.1016/j.fertnstert.2014.03.045
- Palermo, G. D., Joris, H., Devroey, P., & Van Steirteghem, A. C. (1992). Pregnancies After Intracytoplasmic Injection of Single Spermatozoon into an Oocyte. *Lancet*, 340(8810), 17-18. doi: 10.1016/0140-6736(92)92425-F
- Pennings, G. (2005). Reproductive Exile versus Reproductive Tourism. *Human Reproduction*, 20(12), 3571-3572. doi: 10.1093/humrep/dei224
- Präg, P., & Mills, M. (2014). *Family-Related Working Schedule Flexibility across Europe*. Brussels: European Commission DG Justice.
- Präg, P., Mills, M., Tanturri, M. L., Monden, C., & Pison, G. (2015). *The Demographic Consequences of Assisted Reproductive Technologies*: Deliverable D4.6 of Families and Societies.
- Rozée Gomez, V., & de La Rochebrochard, E. (2013). Cross-Border Reproductive Care among French Patients. Experiences in Greece, Spain, and Belgium. *Human Reproduction*, 28(11), 3103-3110. doi: 10.1093/humrep/det326
- Shenfield, F., de Mouzon, J., Pennings, G., Ferraretti, A. P., Nyboe Andersen, A., de Wert, G., ... the ESHRE Taskforce on Cross Border Reproductive Care. (2010). Cross-Border Reproductive Care in Six European Countries. *Human Reproduction*, 25(6), 1361-1368. doi: 10.1093/humrep/deq057
- Simpson, J. L. (2010). Preimplantation Genetic Diagnosis at 20 Years. *Prenatal Diagnosis*, 30(7), 682-695. doi: 10.1002/pd.2552
- Sobotka, T. (2010). Shifting Parenthood to Advanced Reproductive Ages. Trends, Causes and Consequences. In J. C. Tremmel (Ed.), *A Young Generation Under Pressure? The Financial Situation and the "Rush Hour" of the Cohorts 1970–1985 in a Generational Comparison* (pp. 129-154). Berlin: Springer.
- Spar, D. (2005). Reproductive Tourism and the Regulatory Map. *New England Journal of Medicine*, 352(6), 531-533. doi: 10.1056/NEJMp048295
- Steptoe, P. C., & Edwards, R. G. (1978). Birth After the Reimplantation of a Human Embryo. *Lancet*, 312(8085), 366. doi: 10.1016/S0140-6736(78)92957-4
- Storrow, R. F. (2010). The Pluralism Problem in Cross-Border Reproductive Care. *Human Reproduction*, 25(12), 2939-2943. doi: 10.1093/humrep/deq270

- te Velde, E. R., Habbema, D., Leridon, H., & Eijkemans, M. (2012). The Effect of Postponement of First Motherhood on Permanent Involuntary Childlessness and Total Fertility Rate in Six European Countries Since the 1970's. *Human Reproduction*, 27(4), 1179-1183. doi: 10.1093/humrep/der455
- te Velde, E. R., & Pearson, P. L. (2002). The Variability of Female Reproductive Ageing. *Human Reproduction Update*, 8(2), 141-154. doi: 10.1093/humupd/8.2.141
- The Local. (2011). Surrogate Children Have No Right to German Passport, Court Rules. *The Local* (28 April), <http://www.thelocal.de/20110428/20134681>.
- Tran, M. (2014). Apple and Facebook Offer to Freeze Eggs for Female Employees. *The Guardian* (15 October), <http://www.theguardian.com/technology/2014/oct/2015/apple-facebook-offer-freeze-eggs-female-employees>.
- van Beers, B. C. (2015). Is Europe 'Giving in to Baby Markets?' Reproductive Tourism in Europe and the Gradual Erosion of Existing Legal Limits to Reproductive Markets. *Medical Law Review*, 23(1), 103-134. doi: 10.1093/medlaw/fwu016
- van Hoof, W., Pennings, G., & de Sutter, P. (2015). Cross-Border Reproductive Care for Law Evasion. A Qualitative Study into the Experiences and Moral Perspectives of French Women Who Go to Belgium for Treatment with Donor Sperm. *Social Science and Medicine*, 124, 391-397. doi: 10.1016/j.socscimed.2014.09.018
- WHO & World Bank. (2011). *World Report on Disability*. Geneva: WHO.
- Wimmer, A., & Glick Schiller, N. (2002). Methodological Nationalism and Beyond. Nation-State Building, Migration, and the Social Sciences. *Global Networks*, 2(4), 301-334. doi: 10.1111/1471-0374.00043
- Wyndham, N., Marin Figueira, P. G., & Patrizio, P. (2012). A Persistent Misperception. Assisted Reproductive Technology Can Reverse the "Aged Biological Clock". *Fertility and Sterility*, 97(5), 1044-1047. doi: 10.1016/j.fertnstert.2012.02.015
- Zanini, G. (2011). Abandoned by the State, Betrayed by the Church. Italian Experiences of Cross-Border Reproductive Care. *Reproductive Biomedicine Online*, 23(5), 565-572. doi: 10.1016/j.rbmo.2011.08.007
- Zegers-Hochschild, F., Adamson, G. D., de Mouzon, J., Ishihara, O., Mansour, R., Nygren, K. G., ... Vanderpoel, S. (2009). International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) Revised Glossary of ART Terminology, 2009. *Fertility and Sterility*, 92(5), 1520-1524. doi: 10.1016/j.fertnstert.2009.09.009
- Zegers-Hochschild, F., Mansour, R., Ishihara, O., Adamson, G. D., de Mouzon, J., Nygren, K. G., & Sullivan, E. A. (2014). International Committee for Monitoring Assisted Reproductive Technology. World Report on Assisted Reproductive Technology, 2005. *Fertility and Sterility*, 101(2), 366-378. doi: 10.1016/j.fertnstert.2013.10.005