

Survey on ART and IUI: legislation, regulation, funding and registries in European countries

The European IVF-monitoring Consortium (EIM) for the European Society of Human Reproduction and Embryology (ESHRE)

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STUDY QUESTION: How are ART and IUI regulated, funded and registered in European countries?

SUMMARY ANSWER: Of the 43 countries performing ART and IUI in Europe, and participating in the survey, specific legislation exists in only 39 countries, public funding (also available in the 39 countries) varies across and sometimes within countries and national registries are in place in 31 countries.

WHAT IS KNOWN ALREADY: Some information devoted to particular aspects of accessibility to ART and IUI is available, but most is fragmentary or out-dated. Annual reports from the European IVF-Monitoring (EIM) Consortium for ESHRE clearly mirror different approaches in European countries regarding accessibility to and efficacy of those techniques.

STUDY DESIGN, SIZE, DURATION: A survey was designed using the online SurveyMonkey tool consisting of 55 questions concerning three domains—legal, funding and registry. Answers refer to the countries' situation on 31 December 2018.

PARTICIPANTS/MATERIALS, SETTINGS, METHODS: All members of EIM plus representatives of countries not yet members of the Consortium were invited to participate. Answers received were checked, and initial responders were asked to address unclear answers and to provide any additional information they considered important. Tables of individual countries resulting from the consolidated data were then sent to members of the Committee of National Representatives of ESHRE, asking for a second check. Conflicting information was clarified by direct contact.

MAIN RESULTS AND THE ROLE OF CHANCE: Information was received from 43 out of the 44 European countries where ART and IUI are performed. Thirty-nine countries reported specific legislation on ART, and artificial insemination was considered an ART technique in 35 of them. Accessibility is limited to infertile couples in 11 of the 43 countries. A total of 30 countries offer treatments to single women and 18 to female couples. In five countries ART and IUI are permitted for treatment of all patient groups, being infertile couples, single women and same sex couples, male and female. Use of donated sperm is allowed in 41 countries, egg donation in 38, the simultaneous donation of sperm and egg in 32 and embryo donation in 29. Preimplantation genetic testing (PGT) for monogenic disorders or structural rearrangements is not allowed in two countries, and PGT for aneuploidy is not allowed in 11; surrogacy is accepted in 16 countries. With the exception of marital/sexual situation, female age is the most frequently reported limiting criteria for legal access to ART—minimal age is usually set at

18 years and maximum ranging from 45 to 51 years with some countries not using numeric definition. Male maximum age is set in very few countries. Where permitted, age is frequently a limiting criterion for third-party donors (male maximum age 35 to 55 years; female maximum age 34 to 38 years). Other legal constraints in third-party donation are the number of children born from the same donor (in some countries, number of families with children from the same donor) and, in 10 countries, a maximum number of egg donations. How countries deal with the anonymity is diverse—strict anonymity, anonymity just for the recipients (not for children when reaching legal adulthood age), mixed system (anonymous and non-anonymous donations) and strict non-anonymity.

Public funding systems are extremely variable. Four countries provide no financial assistance to patients. Limits to the provision of funding are defined in all the others i.e. age (female maximum age is the most used), existence of previous children, maximum number of treatments publicly supported and techniques not entitled for funding. In a few countries, reimbursement is linked to a clinical policy. The definition of the type of expenses covered within an IVF/ICSI cycle, up to what limit and the proportion of out-of-pocket costs for patients is also extremely dissimilar.

National registries of ART and IUI are in place in 31 out of the 43 countries contributing to the survey, and a registry of donors exists in 18 of them.

LIMITATIONS, REASONS FOR CAUTION: The responses were provided by well-informed and committed individuals and submitted to double checking. Since no formal validation was in place, possible inaccuracies cannot be excluded. Also, results are a cross section in time and ART and IUI legislations within European countries undergo continuous evolution. Finally, several domains of ART activity were deliberately left out of the scope of this ESHRE survey.

WIDER IMPLICATIONS OF THE FINDINGS: Results of this survey offer a detailed view of the ART and IUI situation in European countries. It provides updated and extensive answers to many relevant questions related to ART usage at national level and could be used by institutions and policymakers in planning services at both national and European levels.

STUDY FUNDING/COMPETING INTEREST(S): The study has no external funding, and all costs were covered by ESHRE. There were no competing interests.

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Key words: ART / IVF / ICSI / IUI / gamete donation / embryo donation / surrogacy / legislation / public funding / European registries

Introduction

IVF started more than 40 years ago, and it is estimated that more than 8 million human beings resulted from ART techniques so far. It started as a therapeutic treatment for infertile couples with irreversible tubal factor and expanded to infertility situations caused by other factors (and even to unexplained infertility) and to cases of impairment of a person's capacity to reproduce (single women, same sex couples). Owing to many political, social and sensitive ethical issues related to ART and IUI practice, it is not unexpected that different societies have adhered to these techniques from many diverse perspectives.

Many factors have been studied and accepted as contributing to those very important differences among countries. Some are related to financial issues, for example affordability, treatment costs and out-of-pocket payment by users. Others refer to cultural and belief dimensions (i.e. level of acceptance by the society, customary law and religious pattern of the community). Finally, individual decisions and professional options (postponement of reproductive desire, fertility preservation) are not equally valued in every society. Several publications have already approached many of the issues in this complex field (Adamson, 2009; Balbo et al., 2013; Präg and Mills, 2017).

In 1999, the European IVF Monitoring (EIM) Consortium was established by ESHRE with the mission to organize an IVF data collection programme for Europe. In 2002, IUI data started to be collected as well. Over the years, the Consortium included representatives of an increasing number of European countries, reaching a total of 43 at present (De Geyter et al., 2018). So far, 18 annual reports on ART

and IUI activity have been published that mirror the huge diversity of the use of these therapeutic techniques in Europe. In spite of the well-accomplished International Federation of Fertility Societies (IFFS) Surveillance that was made public some years ago (IFFS, 2016), a detailed survey was organized under the umbrella of the EIM with the aim to fill the relevant recognized gaps and update the information on these topics.

The present paper provides a global picture of the legislation, regulations, public funding and registry systems on ART and IUI in Europe on 31 December 2018.

Materials and Methods

Relevant questions were defined by the Steering Committee of EIM. A survey was then designed using the online SurveyMonkey tool including a total of 55 questions divided into three domains—legal frame, funding frame and registry. All members of EIM (plus representatives of countries not yet members of the Consortium) were invited to participate. The survey was performed in two steps, ending with referring to the countries' situation on 31 December 2018.

Answers were transposed to an Excel file and checked. Initial responders were asked to clarify doubtful points and to provide any additional information they considered important. Tables of individual countries resulting from the consolidated data were sent to members of the Committee of National Representatives (CNR) of ESHRE, asking for a second check. The rationale was to do external auditing since, with a few exceptions, members of the CNR are not members of EIM. Conflicting information was clarified by direct contact.

Results

Information was received from 43 out of the 44 European countries in which ART and IUI is performed (Azerbaijan missing). Bosnia and Herzegovina consist of two individual political entities—Federation of Bosnia and Herzegovina, and Republika Srpska. Their answers are presented separately when appropriate. Occasionally countries could not provide complete responses to all queries.

Legal framework

Most countries referred to having specific legislation on ART. Exceptions were Albania, Bosnia and Herzegovina (Federation), Ireland, Romania and Ukraine.

Accessibility is legally restricted to heterosexual couples in 11 countries—Albania, Bosnia and Herzegovina, Czech Republic, France, Italy, Lithuania, Poland, Slovakia, Slovenia, Switzerland and Turkey. In five, ART and IUI techniques are also permitted for single women and same sex couples. Most countries are somewhere between these two extremes with a total of 30 offering treatments to single women and 18 to female couples.

Use of donated sperm in ART and IUI is allowed in the majority of countries except Bosnia and Herzegovina and Turkey. However, participants from Croatia and Montenegro stated that no local donors are available in their countries and in Croatia sperm may be imported from abroad. Egg donation is not permitted in Bosnia and Herzegovina, Germany, Norway, Switzerland and Turkey. Although accepted in Croatia, Ireland, Italy and Montenegro, no local donations are performed. The simultaneous donation of sperm and egg is not permitted in the countries where egg donation is forbidden and also in Armenia, Croatia, France, Montenegro, Slovenia and Sweden. Embryo donation is not allowed in 14 countries (Austria, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Denmark, Iceland, Italy, Kazakhstan, Norway, Slovenia, Sweden, Switzerland and Turkey). Information on individual countries is shown in [Table I](#).

Countries also differ with regards to some particular techniques ([Supplementary Table S1](#)). It is the case for preimplantation genetic testing (PGT) for monogenic disorders/chromosome structural rearrangements (PGT-M/SR; formerly PGD), which is allowed in all countries except Bosnia and Herzegovina and Malta. PGT for aneuploidies (PGT-A; formerly preimplantation genetic screening) is not permitted in Bosnia and Herzegovina and Malta, as well as in Denmark, France, Germany, Hungary, Lithuania, Norway, Slovenia, Sweden and The Netherlands. Surrogacy is allowed in Albania, Armenia, Belarus, Belgium, Cyprus, Czech Republic, Georgia, Greece, Kazakhstan, Macedonia, Romania, Russia, The Netherlands, UK and Ukraine.

Embryo sex selection (outside PGT-M for sex-linked diseases) is not allowed in any of the 43 countries.

IUI is considered an ART technique under the national legislation of 35 countries. Additional information will be presented in an individual subsection.

Legal limits for ART access

Marital status and sexual orientation are often seen as limitations for ART. However, 34 out of the 43 countries have also legal age limits for candidates to ART ([Table II](#)). In 21, males and females must be above 18 years. Belgium, Kazakhstan and Malta define a minimal female age but have no such limitation for males. Maximum female age is

also a legal limit in 18 countries, ranging from 45 years in Denmark and Belgium (in the latter, this limit applies to oocyte retrievals while embryo replacement and insemination are allowed up to 47 years) to 51 in Bulgaria. In Austria, 'natural cycle available' is an undefined criterion for a maximum age. Male maximum age is legally set in Portugal (60 years) and is recommended in Finland (60 years) and Sweden (56 years). According to Swiss regulations, 'the potential father should be able to be alive until the child is 18 years-old'. A particular case is France where no definition of numerical age limits exists, and it is the responsibility of the centres to define in practice the legal concept of 'normal reproductive age'. Other potential legal/regulatory limitations were explored—maximum BMI, female active smoking, male active smoking and previous children of the couple/woman. None of these potential legal/regulatory limitations was reported to be a legal constraint for access to ART. In Lithuania, ART is not permitted if the patients have medical contraindications listed in the specific ART law. In Germany, ART is not reimbursed for individuals after sterilisation, such as vasectomy and tubal ligation.

Legal limits in third-party donations

Sperm donation is limited to men over 18 years in 16 out of the 41 countries where the donation is permitted ([Table III](#)). No minimal age is defined in other countries where the procedure is allowed. A maximum male age for donors is established in 21 countries, ranging from 35 years old in Hungary, Kazakhstan, Russia and Slovakia to 55 years old in Slovenia. The most common maximum age is 40 years old. Some limitations in the number of infants originating from the same donor are in place in 30 countries, although in five of them it is just a recommendation and not a legal obligation. This number ranges from 1 in Cyprus to 25 in The Netherlands. In 7 out of the 30 countries (Belgium, Denmark, Finland, Portugal, Slovenia, Sweden and UK), there is a maximal number of families/women that may have children resulting from the same donor (ranging from two for Slovenia to 12 for Denmark).

Egg donors must be over 18 years old in 15 out of the 36 countries where the donation is performed. A maximum age for donors is established in 25 countries, ranging from 34 years in Serbia to 38 years in France, with the vast majority of countries setting the limit at 35 years. Bulgaria and Denmark are less restrictive about the donor's maximum age if the donors/relatives are known to one another. In Belarus, Bulgaria, Hungary and Ukraine, egg donors must have at least one child. This condition is considered desirable but not mandatory in the selection of egg donors in Romania and Sweden. The maximum number of donations is specified in 10 countries—from one (two in rare exceptions) in Slovenia to 20 in Belarus; most common numbers are between four and six. A maximum number of infants originating from the same donor is defined in 25 countries, although in 3 of them it is just a recommendation and not a legal requirement. This value ranges from 2 in Montenegro to 10 in France, Greece, Kazakhstan and Italy. In 6 out of the 25 countries (Belgium, Finland, Serbia, Slovenia, Sweden and UK), there is a maximal number of families/women that may have children resulting from the same egg donor (ranging from one for Serbia to 10 for UK).

The anonymity issue

The issue of anonymity is addressed in very diverse ways across Europe ([Supplementary Table SII](#)). As regards gamete donation, four different

Table 1 Legislation on ART in European countries—third-party donation.

Countries	Is there a specific ART law?	Who can have access to IVF/ICSI															
		with donated sperm?				with donated eggs?				with donated sperm plus donated eggs?							
		Hetero- sexual couples	Female couples	Single women	Male couples	Hetero- sexual couples	Female couples	Single women	Male couples	Hetero- sexual couples	Female couples	Single women	Male couples				
Albania	No	x				x				x				x			
Austria	Yes	x	x			x				x							
Armenia	Yes	x		x		x				x							
Belarus	Yes	x		x		x				x							
Belgium	Yes	x		x		x				x				x			x
**Bosnia and Herzegovina – Fed	No																
Bosnia and Herzegovina – Rep	Yes																
Bulgaria	Yes	x				x				x							
Croatia	Yes	x	x			x				x							x
Cyprus	Yes	x	x			x				x				x			x
Czech Republic	Yes	x				x				x				x			
Denmark	Yes	x				x				x							
Estonia	Yes	x	x			x				x				x			x
Finland	Yes	x	x			x				x				x			x
France	Yes	x				x				x				x			
Georgia	Yes	x				x				x				x			x
Germany	Yes	x	x*			x				x				x			x
Greece	Yes	x	x			x				x				x			x
Hungary	Yes	x				x				x				x			
Iceland	Yes	x	x			x				x				x			
Ireland	No	x	x			x				x				x			x
Italy	Yes	x				x				x				x			
Kazakhstan	Yes	x				x				x				x			
Latvia	Yes	x	x			x				x				x			
Lithuania	Yes	x				x				x				x			
Macedonia	Yes	x				x				x				x			
Malta	Yes	x	x			x				x				x			x
Moldova	Yes	x				x				x				x			x

(Continued)

Table 1 Continued

Countries	Is there a specific ART law?	Who can have access to IVF/ICSI											
		with donated sperm?				with donated eggs?				with donated sperm plus donated eggs?			
		Hetero- sexual couples	Female couples	Single women	Male couples	Hetero- sexual couples	Female couples	Single women	Male couples	Hetero- sexual couples	Female couples	Single women	Male couples
Montenegro	Yes	X		X									X
Norway	Yes	X	X										
Poland	Yes	X				X							X
Portugal	Yes	X	X	X				X	X			X	X
Republic of Serbia	Yes	X	X	X									X
Romania	No	X	X	X	X			X	X			X	
Russia	Yes	X	X	X	X			X	X			X	X
Slovakia	Yes	X	X	X	X			X	X			X	X
Slovenia	Yes	X	X	X	X			X	X			X	X
Spain	Yes	X	X	X	X			X	X			X	X
Sweden	Yes	X	X	X	X			X	X			X	X
Switzerland	Yes	X	X	X	X			X	X			X	X
The Netherlands	Yes	X	X	X	X			X	X			X	X
Turkey	Yes	X	X	X	X			X	X			X	X
UK	Yes	X	X	X	X			X	X			X	X
Ukraine	No	X	X	X	X			X	X			X	X

* Not possible in some areas

** Bosnia and Herzegovina consist of two individual political entities – Federation of Bosnia and Herzegovina (Fed) and Republika Srpska (Rep).

Table II Legal limits for ART access.

Countries	Are there legal limits?	Female		Male	
		Minimal age (years)	Maximum age (years)	Minimal age (years)	Maximum age (years)
Albania	x	No	50	No	No
Austria	x	18	Natural cycle available	18	No
Armenia	No				
Belarus	x	18	50	18	No
Belgium	x	18	45 y for oocyte retrieval; 47 y for embryo transfer	No	No
Bosnia and Herzegovina – Fed	No				
Bosnia and Herzegovina – Rep	No				
Bulgaria	x	18	51	18	No
Croatia	x	18	No	18	No
Cyprus	x	18	50	18	No
Czech Republic	x	18	49	18	No
Denmark	x	18	45	18	No
Estonia	x	18	50	18	No
Finland	x	No	40-45 (not in the law but in practice)	No	60 (not in the law but in practice)
France	x	'normal reproductive age'			
Georgia	Yes				
Germany	No				
Greece	x	18	50	18	No
Hungary	x	18	49	18	No
Iceland	No				
Ireland	No				
Italy	x	No	46***	No	No
Kazakhstan	x	19	No	No	No
Latvia	x	18		18	
Lithuania	x	18	No	18	No
Macedonia	x	No	No	No	No
Malta	x	25	48	No	No
Moldova	No				
Montenegro	x	18	No	18	No
Norway	x	No	No	No	No
Poland	No				
Portugal	x	18	50	18	60
Republic of Serbia	No				
Romania	x	18	48 (own eggs); 50 (donated eggs)	18	No
Russia	No				
Slovakia	x	18	50	18	No
Slovenia	x	18	Reproductive age	18	No
Spain	x	18	Age of menopause (50 x 2)	18	No
Sweden	x	18	No	18	56 (not in the law; recommendation)
Switzerland	x	No	No	No	see foot-note**
The Netherlands	x	No	49	No	No
Turkey	No				
UK	x	18		18	
Ukraine	x	18	No	18	No

* 'normal reproductive age', decided by the multidisciplinary staff of the centre, with valid consent of both members of the couple

**The potential father should be able to be alive until the child is 18 years old

***In all regions of the country with one exception where ART is allowed up to 50 years old

Table III Legal limits in third-party donation, where permitted.

Countries	Age (years)		Maximum no. of infants from the same donor	Parity of donors	Maximum no. of donations	Maximum no. of infants from the same donor
	Minimal	Maximum				
Albania		35				
Austria		35				3
Armenia		35	Internal protocol: no more than 7 babies	Internal protocol: 10		Internal protocol: 7
Belarus	18	40	Up to 20 attempts of fertilization	1 child minimum	20	
Belgium			Children in 6 families			Children in 6 families
Bulgaria	18		5	Minimum 1 born child	6	5
Croatia			Legally 18 (no donors in practice – imported sperm)			
Cyprus		45	1			1
Czech Republic	18	40	7 (recommended)			5 (recommended)
Denmark		45	Children in 12 families		6	No
Estonia		40	6			6
Finland	18	No law. In practice 40	Same donor can produce children to max 5 women			Same donor can produce children to max 5 women
France		45	10		2	10
Georgia			No	No	No	No
Germany		40	No			
Greece		40	10			10
Hungary		35	4			4
Iceland						
Ireland						
Italy	18	40	10 (embryologist regulated)	All abroad		10
Kazakhstan		35	10			10
Latvia	18	45	3			3
Lithuania	18		5			5
Macedonia			2			2
Malta	18	36				
Moldova		35				

(Continued)

Table III Continued.

Countries	Age (years)		Maximum no. of infants from the same donor	Parity of donors	Maximum no. of donations	Maximum no. of infants from the same donor
	Minimal	Maximum				
Montenegro	No local donors. Sperm imported		3			2
Norway			8	Egg donation not allowed		
Poland			10			10
Portugal	18	45	Children in 8 families		4	
Republic of Serbia		40	One donor for only one couple, regardless of children number			One donor for only one couple, regardless of children number
Romania	18		5 (recommended)	Preferably with children	2 (recommended)	5 (recommended)
Russia	18	35				
Slovakia		35	5		5	5
Slovenia	18	55	Children in 2 families		1 (rare exceptions 2)	Children in 2 families
Spain	18	50	6			6
Sweden	18		Children in 6 families	but we prefer that the woman has delivered.		Children in 6 families
Switzerland			8	Egg donation not allowed		
The Netherlands			not enforced by law, but 25			
UK	18	40	Children in 10 families			Children in 10 families
Ukraine		40		At least one healthy child	8	

Iceland provided no information, except that gamete donations are allowed
 refers to countries where egg donation is forbidden

scenarios were identified. Strict anonymity is the rule in 18 countries, although in 5 of these countries disclosure of donors' identity is possible in cases of severe health conditions of the child born. A particular situation is Lithuania where a donor's identity can be known for other (non-specified) important reasons, after a court decision. In some countries (Estonia, Poland and Russia), general information about the donors (nationality, age, weight, height, education) is available for recipients and children born. In a second group of countries, anonymity applies to recipients, but the born children can have access to donor identity when above a defined age (Austria, Croatia, Finland, Malta, Portugal, UK). A third scenario is gamete donations under a mixed system (anonymous and non-anonymous) as was described in 13 countries. In Bulgaria non-anonymity is exceptional and involves donors who are relatives, whereas in Germany and Switzerland the recipients may bring their own donor who donates just for that couple. In Belgium, non-anonymous donation is only allowed when there is a formal agreement between the donor and the recipient. In Hungary, egg donors must be a relative of the recipient but a sperm donor must be anonymous. In Romania, local donations must be non-anonymous but imported gametes can be from anonymous donors. Finally, non-anonymity is reported as the rule for gamete donations in Georgia and The Netherlands.

Embryo donation is permitted in 29 countries under one of three perspectives: strict anonymity, anonymity except for children born and non-anonymity. No country follows a mixed system in embryo donation. Five out of the 13 countries with a mixed situation for gamete donation allow embryo donation under strict anonymity (Belgium, Germany, Hungary, Ireland and Ukraine). In Romania embryo donation is possible only with non-anonymous donors. Embryo donation is not performed in the seven remaining countries.

Preservation of fertility potential

Cryopreservation of gametes for medical conditions that jeopardize fertility is allowed in all countries in spite of the absence of specific legislation in 17 of them (Supplementary Table SIII). The same is true for the cryopreservation of gonadal tissue (with the exception of Bosnia and Herzegovina, where the technique is not performed). Embryo cryopreservation for medical conditions is not permitted in Italy and Portugal, but it is possible only at the two-pronuclear stage in Germany and is performed in all other countries. Non-medical oocyte freezing is not permitted in Austria, France, Hungary, Lithuania, Malta, Norway, Serbia and Slovenia and is also not performed in Bosnia and Herzegovina and Moldova in spite of the absence of legislation that outlaws the technique.

Surrogacy

Out of the 15 countries reporting that surrogacy is either allowed or performed in the absence of specific legislation, eight detailed some criteria involved (Supplementary Table SIV). Applications must be approved by the Competent Authority and a Court in Cyprus, and a favourable Court decision is also required in Greece and Russia. In Belarus, partners in a couple must provide at least one of the gametes while in The Netherlands the beneficiary may or may not provide the eggs. Ukraine has the least restrictive criteria as surrogacy can be used not only when a uterus is absent or has congenital or surgical deformities but also in the presence of structural–morphological or anatomic changes in the endometrium leading to so-called loss of

receptivity. In this country, surrogacy is also possible for cases of severe somatic diseases in which pregnancy can endanger the future health or life of the recipient but does not affect the health of the future child. Responders from Armenia and Russia reported that in their countries surrogate mothers must be under 35 years of age and have at least one healthy child themselves.

The particular situation of transgender

Gender reassignment is permitted in 27 of the countries that contributed to the survey (Supplementary Table SV). No information has been obtained regarding the situation in Cyprus. Cryopreservation of gametes and/or gonadal tissue prior to reassignment is allowed in 20 of the responding countries, is not allowed in Greece, Hungary, Slovenia and Turkey and is not regulated in Germany. Information is missing from Denmark and Poland.

Transgender individuals can have access to ART techniques in 21 countries. In 19 countries, previously cryopreserved gametes and/or gonadal tissue can be used. Transgenderism is not regulated in Germany.

Public Funding

The relative importance of public and private ART centres is extremely diverse across countries (Supplementary Table SVI). In Albania, Armenia, Georgia, Ireland, Bosnia-Herzegovina, Cyprus and Latvia only privately owned centres exist, although patients of the last three countries can get public funding for treatments performed in those centres. In Belgium, Bulgaria, Czech Republic, Finland, France, Iceland, Moldova, Slovenia, UK and Ukraine, there is no separation between the private and public sector and either patients get funding for undergoing ART in private centres or public centres receive private patients. All the other countries have distinct publicly funded and completely private ART centres. The number of ART centres is limited by legislation in France, Norway and The Netherlands.

Albania, Armenia, Georgia and Switzerland allocate no public funds for ART patients.

Limits for public funding

Access to public funding has some limiting criteria in 29 of the 39 countries with public financial support to ART (Table IV, Supplementary Table SVII). Austria, Belarus, Cyprus, Greece, Kazakhstan, Macedonia, Norway, Russia, Slovakia and Switzerland have no additional limitations to the legal ones. Maximum female age is a limiting criterion for public funding/reimbursement in 28 out of the 29 countries (the exception is Iceland). It ranges from 38 years in Latvia to 49 years in Czech Republic with no numeric limit in Finland and diversity across regions of Italy and the UK. Male maximum age is stated in a few countries only—49 years in Germany and Austria, 55 years in Sweden and Spain and 60 years in Portugal and Finland (not in law but in practice in the latter).

Additional relevant limits for public funding relate to the existence of previous children. In Denmark, Malta, Romania and Turkey a couple (or single women, when applicable) with a child(ren) cannot receive public assistance for ART and IUI. In Spain and Iceland one child, and in Montenegro two, is the limit. In Portugal and Sweden, only one birth of a live child(ren) is reimbursed (although Portuguese patients in that situation can get reimbursement for frozen embryo replacement [FER] of remaining embryos). A maximum female BMI is a limit for receiving public funding for ART in Romania, Serbia, Spain, Sweden and UK.

Table IV Legal limits for public funding in ART.

Countries	Are there legal limits?	Female		Male		Female BMI kg/m ²	Parity
		Minimum age (years)	Maximum age (years)	Minimum age (years)	Maximum age (years)		
Albania							
Austria	x		39	No public funding at all	49		
Armenia				No public funding at all			
Belarus	No						
Belgium	x		42				
Bosnia and Herzegovina – Fed	x	No	No	No	No		
Bosnia and Herzegovina – Rep	x		42		No		
Bulgaria	x		43		No		
Croatia	x		42		No		
Cyprus	No						
Czech Republic	x		49		No		
Denmark	x		40		No		The couple or single women cannot have children when receiving public IVF; a couple can have children with previous partner. For IUI there are no limitations
Estonia	x		40		No		
Finland	x		40-45 (not in law but in practice)		60 (not in law but in practice, in public centres only)		
France	x		43		"reproductive age"		
Georgia							
Germany	x	25	39	25	49		
Greece	No						
Hungary	x		45		No		
Iceland	x	No	No	No	No		I
Ireland							
Italy	x		46 (homologous and donor cycles)*	No public funding (except drugs)			
Kazakhstan	No						
Latvia	x		38		No		
Lithuania	x		42		No		

(Continued)

Table IV Continued

Countries	Are there legal limits?	Female		Male		Female BMI kg/m ²	Parity
		Minimum age (years)	Maximum age (years)	Minimum age (years)	Maximum age (years)		
Macedonia	No						
Malta	x		48		No		Existence of previous children of the couple
Moldova	x		40		No		
Montenegro	x		44		No		2
Norway	No				No		
Poland	x		40		No		
Portugal	x		40		60		Couples with one child resulting from ART can only get reimbursement to FER of leftover embryos
Republic of Serbia	x				No	30	
Romania	x		42		No	30	No living child
Russia	No		40				
Slovakia	No						
Slovenia	x		42		No		
Spain	x		40		55		
Sweden	x		39		55	35	1
Switzerland	No					Only for public funded IVF	Only one child reimbursed by public funding. No publicly funded IVF if children of their own
The Netherlands	x		42		No		
Turkey	x		39		No		No children
UK	x				According to NICE guidelines and diverse along the country		
Ukraine	x		40		No		

* But there are differences on a regional basis generally lowering the "admission" age to treatments.
FER: frozen embryo replacement, NICE: The National Institute for Health and Care Excellence

In Belgium, Czech Republic, Slovenia, Sweden and The Netherlands, public funding is linked to a clinical policy, namely the number of embryos transferred related to female age and the rank of the treatment attempt. With slight differences, elective single embryo transfer (eSET) in the first two ART cycles in women up to 35 years (38 years in The Netherlands) is the rule. In the Netherlands, there are imposed limitations in the use of gonadotrophins. Austria and Malta offer public funding combined with a clinical policy. In Austria, funding is only available in the presence of a medical indication (bilateral tubal defect, endometriosis and/or polycystic ovary syndrome and/or male factor infertility). No details were given for Malta. In UK, the diversity of public funding across the country makes it impossible to obtain a clear picture.

To establish contracts with the public funding system, centres must have a minimum success rate in Austria, Bulgaria, Finland, Romania and UK. A special case is Hungary where no minimum success rate is mandatory, but public centres receive a special amount of money for each live birth resulting from ART.

The number of cycles publicly funded is quite different from country to country. Three is the most common limit (in 16 countries). In the Czech Republic, if the two first attempts end in an eSET, the total number of cycles reimbursed increases from three to four. In Finland, the limit is set case by case—in general three to five. Patients in Moldova and Romania get public financial support for 1 cycle and in Kazakhstan for 1 cycle per year. In Bosnia and Herzegovina, Latvia and Lithuania 2 cycles is the limit. In Austria, Bulgaria, Croatia, France and Iceland, up to 4 cycles are publicly supported. Hungary offers support for up to 5 cycles, and Belgium and Slovenia up to six. Again, the situation in UK, with its regional particularities, precludes valuable detailed information. In Norway, there are a limited number of cycles under public financial support but the actual number was not communicated.

Information on some countries deserves additional details. In Austria, the subsidised number of cycles is per clinical pregnancy with no defined limit for the number of pregnancies. In Bulgaria, the upper limit refers to stimulated cycles (FER cycles are not limited) and can be substituted by up to 16 unstimulated cycles if the cost does not exceed that of four stimulated cycles. The limit in Denmark is three fresh embryo transfers or five started cycles (FER cycles not included). In Ireland and Poland, the public funding available refers to medication only; in Ireland, the state supports the cost of medication with a 144 euro exemption per monthly prescription. In The Netherlands, the maximum number of cycles ($n = 3$) includes thawed cycles. Several countries have specific stipulations for situations of live birth resulting from ART: Macedonia offers public support for 3 cycles for a first baby, 3 cycles for a second and 3 cycles for a third one; in France, Hungary and Slovenia, four additional cycles are publicly funded for a second child after a successful treatment.

Not all ART performed are entitled to benefit from public financial support in 19 countries. PGT is not funded in Bulgaria, Greece, Italy, Russia and Spain (in Spain only not supported for cases of repeated implantation failure). Expenses related to donor cycles get no financial assistance in Estonia, Montenegro and Russia. Cryopreservation of gametes and embryos is not publicly funded in the Czech Republic, Lithuania, Montenegro and Russia. In cases of premature ovarian failure, egg donation is not publicly supported in Spain for women over 36 years old. Iceland and Ukraine stated that only standard IVF/ICSI is

publicly funded, and the Czech Republic and Slovakia that ICSI receives no public financial support. In Austria, Latvia and Turkey, 'add-on' techniques are out-of-pocket costs. Bosnia and Herzegovina-Federation, Macedonia and UK stated that not all techniques are funded, but no details were provided.

ART were considered not to be equally publicly funded across the country in Belarus, Bosnia and Herzegovina-Federation, Estonia, Denmark, Germany, Italy, Kazakhstan, Norway, Russia, Spain and UK.

What is public funding available for?

Considering the three main areas of expenses in an ART cycle—medication costs, doctor/medical costs and laboratory costs—six different patterns can be identified across Europe: public funding to all three areas of ART performed either in public or in private centres—23 countries; public funding for drugs in public and private centres, but for doctor/medical and laboratory costs only in public centres—6 countries; public funding for drugs, doctor/medical and laboratory costs in public centres only—3 countries; no reimbursement for medications but public financial support for doctor/medical and laboratory supported costs in public centres only—2 countries; no reimbursement for medications but public financial support for doctor/medical and laboratory costs in public and private centres—2 countries; and public funding just for medications—3 countries (in Poland and Ukraine only for treatments performed in public centres). As already stated, no public funding at all is available in Albania, Armenia, Georgia and Switzerland (Supplementary Table SVIII).

Must patients pay a proportion of costs of ART publicly funded cycles? Patients in Bosnia and Herzegovina-Republic, Bulgaria, Croatia, Kazakhstan, Serbia (with the exception of cryopreservation), Russia, Slovenia and Spain do not pay a proportion of costs of ART publicly funded cycles. In France, Greece and Latvia, there are no costs regarding medications and the laboratory, but patients may have to pay costs related to doctor/medical services (Supplementary Table SIX).

Countries with public funding for medication can follow different systems as far as costs paid by patients are concerned: a settled maximum amount to be paid—seven countries; a fixed proportion of the total cost—eight countries; costs above a defined limit—four countries; depending on insurance contracts—two countries; and depending on local/regional Health Authority—two countries. In Romania, national public funding does not cover any medication (except in the Bucharest region). No details were provided by Lithuania, Moldova and Poland.

As regards the two other areas of an IVF/ICSI cycle costs—doctor/medical costs and laboratory costs—the situation is even more complex, as shown in Supplementary Table SIX.

Tax deductions. The possibility of getting tax deductions for expenses resulting from ART can be considered another facet of financial public assistance. Respondents identified that possibility in Germany (about 20%), Ireland (20%), Italy (up to 19%), Latvia (maximum 250 euros), Portugal (associated with all other health expenses, until a legal maximum), Russia (13%), Austria, Switzerland (depends on the Canton of residence) and Ukraine (no details provided).

Waiting lists for IVF/ICSI. Waiting time for treatment is a negative factor in accessibility to ART. Our survey found that, not unexpectedly, public centres have far longer lists than private ones. For public centres, waiting time is between 12 and 24 months in Italy, Spain, Ukraine and some areas of Portugal, and 6–12 months in Estonia, Denmark and the rest of Portugal. For private centres, waiting lists of 12–24-month duration were communicated in Latvia, 6–12 months in Estonia and Russia and less than 6 months in Belgium, Bosnia and Herzegovina-Republic, Iceland, Ireland, Serbia and Romania. No waiting time was reported in the remaining countries.

IUI. IUI is considered an ART under the national legislation of 35 countries (Supplementary Table SX). Allowed beneficiaries and resort to donor gametes follow the already described national characteristics. Public financial support was reported to exist in 14 countries. Limits for public funding were described by France (up to six IUIs), Italy and Portugal (up to three attempts).

Registries

Some type of national registry of ART activity is in place in 32 out of the 43 countries participating in the survey, many of them reporting also on IUI (Supplementary Table SXI). Exceptions are Albania, Armenia, Cyprus, Estonia, Ireland, Latvia, Lithuania, Montenegro, Poland, Serbia and Slovakia. The registry is mandatory in 26 of the 32 countries and organized by a Competent Authority in nine countries, the Ministry of Health in nine, another governmental body in four, a professional association in seven and a committed volunteer in Iceland. In Belgium, Croatia and Spain, more than one body participates in the organization of the registry.

A registry of donors exists in 16 countries (in France for egg donors only) and is mandatory in all of them except Iceland. It is organized by a Competent Authority in six countries, the Ministry of Health in three, another governmental body in two, a professional association in Sweden and a committed volunteer in Iceland; information was missing for three countries.

Discussion

EIM reports have shown a great diversity in ART and IUI practice across Europe, not only in terms of treatment outcomes and the organization of registry systems but also regarding the availability of techniques for infertile individuals in need. This survey details and updates the information on ART and IUI regulations, public financial assistance and registries in European countries on 31 December 2018.

The information gathered confirms marked variations across—and sometimes within—countries. This does not mean actual absence of legislation, as the practice of ART and IUI is regulated by legal norms (including European Union directives in Member States) in all European countries, in spite of the absence of specific legislation in a few.

It is undisputable that ART acceptance and usage in a particular country depends on a complexity of various aspects—financial, social, cultural and religious—which are virtually impossible to disentangle. Studies focusing on the relation of the above dimensions with the frequency of the utilisation of these therapeutic techniques have suggested several cultural normative values as relevant. This is the case

of Billari *et al.* (2011) who have concluded that the higher the social age norm for childbearing, the greater the availability of ART clinics. Exploring another perspective, Kocourkova *et al.* (2014) have reported that ART use and the total fertility rate in a country are correlated, which can be interpreted as a sign of increasing demand for children in that society. The associations between demographic and cultural factors, and the prevalence of ART in 35 European countries were the subject of a recent paper (Präg and Mills, 2017). The authors described a strong positive linear trend between the average ART normative approval in a country and the number of treatments there. Their data also suggest that the greater the number of Protestants in a country, the higher the use of ART; no relation was found between the proportion of Catholics in a population and ART usage. Although a link between women's higher educational status and reproductive postponement has been established (Balbo *et al.*, 2013), and the variation in the proportion of highly educated women across nations is a reality, no statistically significant relation between the percentage of middle-aged women with tertiary education and ART usage was apparent in this study. In the end, using a multiple regression model, the authors concluded that ART societal approval is effective in increasing ART usage only when a certain wealth level is reached in a country.

The above studies have not explored social, cultural or religious implications in other domains beyond the number of treatment cycles. Both the couple and the gender requirements have great social relevance as they seem to govern access to ART and IUI treatments over and above financial restrictions (Berg Brigham *et al.*, 2013). Therefore, information on permitted techniques and candidates' profiling is pivotal in comprehending usage of those techniques at national levels. In this context, third-party donation is a clear example, as well as surrogacy and reproductive services for the transgender population. Our data show how differently European countries have dealt with these issues.

Inquiring into the preservation of reproductive potential has highlighted interesting findings. Cryopreservation of gametes, gonadal tissue and embryos is performed virtually all over Europe (with some exceptions as far as embryos are concerned), even if no specific legal dispositions are in place, and public financial support apparently follows the same rules as 'classical' ART. On the other hand, oocyte cryopreservation for non-medical reasons is not allowed in eight countries and the availability of public funding is not clear in others. Apparently, no significant change has occurred in this particular field since a previous report on the oocyte cryopreservation situation (Shenfield *et al.*, 2017).

Public financial assistance (be it either any model of statutory health insurance or direct state funding) is quite variable across countries (and within some of them) resulting in important access inequities. Those differences are mainly related to affordability but also to (more or less) restrictive age limits, with the acceptance (or not) of patients who have already had children and/or to the number of publicly funded treatments. Although a relation between the generosity of a public health system and a country's wealth generally exists, there are some exceptions. A practical consequence of accessibility difficulties in some countries and disparities between countries is the increasing movement of people seeking treatments abroad—the so-called cross-border reproductive care. Lower treatment costs, access to techniques not possible in the home-country, donated

gametes being more readily available and expectations of better-quality treatments are the key drivers for this phenomenon. Data on these relevant social circumstances are very scarce and limited to only empirical information (Nygren et al., 2010) and one limited study (Shenfield et al., 2010). However, this is a reality of increasing importance, which raises some concerns about the possibility of exposing people to less controlled clinical environments. Furthermore, it leads to lack of tracking of reproductive cells across borders and limited knowledge of outcomes and hampers biovigilance by national authorities. To overcome this problem, a new Code System was recently proposed (De Geyter et al., 2016). This European Reproductive Coding System would identify individuals (and their reproductive material) travelling across Europe within a system of case-to-case data reporting to national ART data collecting institutions.

The present paper is a descriptive approach to a very complex reality, and the authors acknowledge some of its limitations. First, the responses were provided by well-informed committed individuals but, in spite of the checking and double-checking procedures adopted, we cannot assume that proper formal validation was in place. So, they mostly represent the perspective of clinicians and laboratory specialists, i.e. they mirror the interpretation of the legislative documents by hands-on experts, and possible inaccuracies cannot be excluded. Therefore, the data must be considered with some caution. Second, our results are a cross section in time as ART legislations undergo continuous evolution. For instance, Swedish law changed as recently as 1 January 2019. Planned updates will yield important insights into the evolution of ART regulations over time, besides allowing correction of any inconsistencies. Third, in a few countries there is a distinction to be made between current legislation and its application because ensuing regulation is not yet defined. This means that, in those countries, results presented may not necessarily imply the performance of a technique (or its relevant usage) but rather a regulatory framework. Finally, several domains of ART and IUI activity were left out of the scope of this ESHRE survey, such as donor/surrogate compensations, monitoring mechanisms for governance and centre inspections or the definition of required couple characteristics (marriage, living in stable relationship, for instance). Their inclusion will be considered for the future.

Notwithstanding, we obtained data from every European country in which ART is performed except one. Thus, this work represents the most complete up-to-date overview of the European situation referring to legislation, regulations, public financial assistance and registry systems on ART and IUI in Europe so far. Furthermore, having been provided mainly by experts involved in the daily performance of those techniques reinforces its value for use in real life.

In conclusion, this survey attests that the practice of ART and IUI in Europe is framed by an impressive diversity of social acceptance and public financial systems and provides updated extensive answers to many relevant questions in the use of ART at national level, which may hopefully contribute to patients' information and to enriching institutional and policymakers' work.

Supplementary data

Supplementary data are available at *Human Reproduction* Open.

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Authors' roles

V.G. collected all data. C.C.-J. did the analysis and wrote the manuscript. All other co-authors reviewed the final manuscript and made appropriate corrections and suggestions to improve it.

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