Supplement Article

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IFFS Surveillance 2019

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PREFACE

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PREFACE

The triennial Surveillance project, initiated in 1998 by Drs. Howard Jones, Jr and Jean Cohen, continues to evolve, now with a new name, the *International Federation of Fertility Societies' Surveillance (IFFS) 2019: Global Trends in Reproductive Policy and Practice, 8th Edition*. The new name more accurately reflects the scope and focus of the project, and makes the report more accessible to a global audience, particularly those seeking this information online. IFFS is a non-state actor (NSA) in official relations with the World Health Organization (WHO), and the publication of Surveillance serves as part of the IFFS' WHO mandate.

The 2019 version has several major changes. Some chapters have been expanded, and some topics have been combined to eliminate redundancies. The number of chapters has been reduced from 24 to 18, but all previous topics and questions have been retained.

The 2018 online questionnaire was the sole source of data for *IFFS* Surveillance *2019: Global Trends in Reproductive Policy and Practice, 8th Edition*. The online questionnaire was further refined, and was again administered by Medtech for Solutions®. The refined questionnaire consisted of 94 questions, in English, with translated versions available. On average, it took 90 minutes (cumulative on-site time) to complete. The survey was accessible online from February 1 through March 31, 2018.

Although a few responses were accepted shortly after the deadline, they reflect the practices of assisted reproductive technology (ART) (also called assisted reproductive treatment) through that time. Respondents representing 97 countries (22 more than in 2015) registered online at the website, and all provided at least some responses to the 2018 questionnaire, enough to be included in the analysis. There were 27 more usable responses than in the 2015 survey, in which 26 responses were new to Surveillance. Responses were not received for all questions, and this is reflected in the variations in amount of data submitted for the individual queries. The percent positive response is given for all answers, for that particular query. For specific questions, participants could answer "yes', "no" or "unknown" if the respondent did not know the answer to a particular query.

Many individuals contributed to the success of this project. I am profoundly grateful for the efforts of the 191 respondents, representing 97 countries, who completed the survey. The questionnaire is lengthy, and the answers to some questions are not readily accessible. The diligence and commitment of a wide array of colleagues around the world was essential to the successful completion of the publication.

Although Surveillance 2019 is a global project, relying on many individuals from many nations, the ultimate success in engaging such a diverse representation hinged on personal relationships. To this end, many IFFS officers and representatives gave generously of their time, contacting and enlisting many international colleagues who were new to Surveillance. I would particularly like to acknowledge the efforts of Drs. Silke Dyer and Fernando Zegers, who issued countless personal appeals; they deserve a large share of the credit for the increased representation this year. Closer to home, our administrative assistant, Leila Grass, resorted to extensive social media searches to identify ART centres in countries that we had previously been unable to engage; her efforts were ultimately successful. The Surveillance Editorial Board worked tirelessly; all had roles in developing the 2018 questionnaire, reformatting the organization of Surveillance, and conducting data analysis, and were also involved in chapter preparation and editing.

Special recognition is due Drs. Edgar Mocanu and Marcos Horton. The Assistant Editor, Dr. Horton, worked relentlessly, as he did in previous editions, and was particularly invaluable in this capacity. Our Managing Editor, Dr. Kathleen Miller, deserves the greatest accolades for her passionate pursuit of a comprehensive, high-quality product. Finally, I would like to recognize the continuing support, encouragement, and participation of the IFFS officers and Board of Directors, and the administrative staff of the IFFS Secretariat, for their essential roles in the project's successful completion.

Surveillance 2019 presents a more comprehensive global assessment of the status of reproductive policy and practice than previous editions, drawing input from 97 of the 132 countries believed to offer ART services. Data collection was improved by further refinements in the questionnaire, a more robust process for identifying and engaging prospective participants, and many local and regional developments that facilitated cooperation and participation. Consequently, Surveillance 2019 depicts a further maturation of the field, with wide adoption of technologic advances, and an emerging consensus regarding some of the more controversial aspects of ART.

Significant limitations remain, however. Although the report refers to practices and policies of countries, responses for most of the participating countries were provided by a single well-informed, responsible individual. The responses have not been validated for the majority, and may include inherent inaccuracies. Some respondents were not able to provide complete data sets. Some ART practices have undoubtedly changed since the survey was completed and answers may not reflect current practices. For

these reasons, caution should be exercised in interpreting the data. When feasible, responses from previous triennial surveys and multiple respondents have been compared. When discrepancies were identified among multiple respondents, or from other published reports, the editors adjudicated the inconsistencies. However, this occurred infrequently.

IFFS Surveillance 2019: Global Trends in Reproductive Policy and Practice, 8th Edition is unique in its depiction of world-wide ART policy and practice. This report attests to the dynamic, ongoing growth of the practice of ART, the local and regional differences, and the continued international collaboration that has characterized the field since its inception (Table 1).

Steven J Ory
Editor-in-Chief
Surveillance 2019
December 2018

Preface. Table 1

Participants.

Participant Name	Participant Country
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Preface. Table 1

(*Continued*)

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Ramgopal M. Pillai	India
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Preface. Table 1

(*Continued*)

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Nicole Lan	South Africa
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Carolina Sueldo	The United States of America
David Adamson	The United States of America
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Rumbidzai Majangara	Zimbabwe

*Reporting separately for this report.

CHAPTER 1: NUMBER OF CENTRES

As noted in previous editions, compiling a reliable estimate of the number of ART centres in any country entails considerable methodologic limitations. The total number of ART programmes in the world is dynamic; new ART programmes are emerging, and some centres are consolidating or closing. As we noted in 2016, "significant global progress in establishing registries and oversight has been made over the intervening three years, and the 2016 data for these countries may represent a more accurate and complete estimate than previous estimates. However, there are still many countries in which this information is collected sporadically, if at all, and there are no reliable estimates."

These conclusions remain valid three years later. The numbers cited herein represent the best estimate of the nations' respondents when the questionnaire was completed. In countries with national registries, accurate estimates are a matter of public record and are easily accessible. Compiling a list of centres in countries with more limited ART resources, but a more finite roster of known facilities, is often a less arduous task, and those reports are probably more reliable. For countries such as China and India, known to have many centres, but lacking comprehensive registries and validation mechanisms, compiling accurate estimates is considerably more challenging.

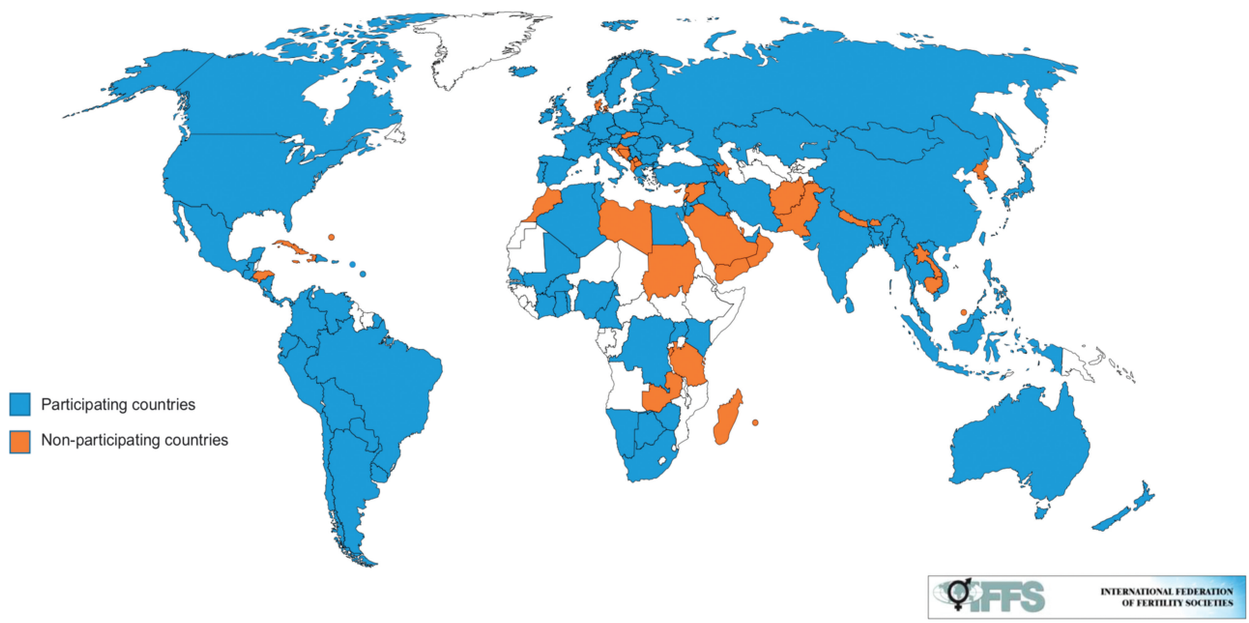
The 2018 questionnaire used to compile *Surveillance 2019: Global Trends in Reproductive Policy and Practice, 8th Edition* reveals that progress has been made in developing registries, monitoring ART activities, and, in many countries, tracking the number of centres. In 2018, we engaged 97 countries to register on our website and provide some ART data for their respective

Chapter 1. Table 1

Registered countries.

Algeria +	China	Greece	Latvia +	Paraguay	Switzerland
Argentina	Colombia	Guatemala	Lithuania +	Peru	Taiwan (China*)
Armenia +	Congo	Hong Kong (China*)	Malaysia	Philippines	Thailand +
Australia	Costa Rica +	Hungary	Mali	Poland	Togo +
Austria	Côte d'Ivoire +	Iceland +	Mexico	Portugal	Trinidad and Tobago
Bangladesh	Czechia	India	Moldova +	Romania	Tunisia
Barbados	Dominican Republic	Indonesia	Mongolia +	Russian Federation	Turkey
Belarus	Ecuador	Iran	Montenegro +	Senegal	Uganda +
Belgium	Egypt +	Iraq	Myanmar	Serbia +	Ukraine +
Bolivia +	El Salvador +	Ireland	Namibia +	Singapore	United Arab Emirates + (UAE)
Botswana +	Estonia	Israel	Netherlands	Slovenia	United Kingdom of Great Britain and Northern Ireland (UK)
Brazil	Finland	Italy	New Zealand +	South Africa	The United States of America (USA)
Bulgaria	France	Japan	Nicaragua +	The Republic of Korea	Uruguay
Burkina Faso +	Georgia +	Jordan	Nigeria	Spain	Venezuela
Cameroon	Germany	Kazakhstan	Norway	Sri Lanka	Viet Nam +
Canada	Ghana +	Kenya	Panama	Sweden	Zimbabwe +
Chile					

+ Denotes countries new to Surveillance.
*Reporting separately for this report.



Chapter 1. Chart 1. Participating and non-participating countries.

Chapter 1. Table 2

Countries without ART.

Andorra	Dominica	Holy See	Mauritania	Saint Kitts and Nevis	South Sudan
Angola	Equatorial Guinea	Kiribati	Micronesia	Saint Lucia	Suriname
Antigua & Barbuda	Eritrea	Kyrgyzstan	Monaco	Saint Vincent and the Grenadines	Eswatini
Belize	Ethiopia	Lesotho	Mozambique	Samoa	Tajikistan
Benin	Fiji	Liberia	Nauru	San Marino	Timor-Leste
Burundi	Gabon	Liechtenstein	Niger	Sao Tome and Principe	Tonga
Cabo Verde	Gambia	Luxembourg	Palau	Seychelles	Turkmenistan
Central African Republic	Grenada	Malawi	State of Palestine	Sierra Leone	Tuvalu
Chad	Guinea	Maldives	Papua New Guinea	Solomon Islands	Uzbekistan
Comoros	Guinea-Bissau	Malta	Congo	Somalia	Vanuatu
Djibouti	Guyana	Marshall Islands			

Chapter 1. Table 3

Non-responding countries with ART.

Afghanistan	Cambodia	Kosovo	Morocco	Saudi Arabia
Albania	Croatia	Kuwait	Nepal	Slovak Republic
Azerbaijan	Cuba	The Lao People's Democratic Republic	The Democratic People's Republic of Korea	Sudan
Bahamas	Cyprus	Lebanon	Oman	Syria
Bahrain	Denmark	Libya	Pakistan	United Republic of Tanzania
Bhutan	Haiti	The former Yugoslav Republic of Macedonia	Qatar	Yemen
Bosnia and Herzegovina	Honduras	Madagascar	Rwanda	Zambia
Brunei Darussalam	Jamaica	Mauritius		

Chapter 1. Table 4

Number of centres.

	Reporting Year				2019 Type of Centre				
Country	2010 (N)	2013 (N)	2016 (N)	2019 (N)	Private Physicians Clinic	Private Hospital Based Clinics	Private or Public University Based Clinics	Public Hospital Based Clinics	Sole Practitioner Clinic
Algeria	Did not report	Did not report	Did not report	2					
Argentina	23-25	30-44	60	65	37	1	2	2	
Armenia	Did not report	Did not report	Did not report	6	6				
Australia	63	Did not report	76	100	100				
Austria	25	25	27	28	17	3	5	2	0
Bangladesh	Did not report	Did not report	12	11	9	2			
Barbados	Did not report	Did not report	1	1	1				
Belarus	4	4	8	8		5		3	
Belgium	16-29	31	34	10	0	0	6	4	0
Bolivia	Did not report	Did not report	Did not report	10	10	0	0	0	0
Botswana	Did not report	Did not report	Did not report	1					1
Brazil	150	200	180	200	141	10	5	4	
Bulgaria	16	23	31	37	13	7	1	3	13
Burkina Faso	Did not report	Did not report	Did not report	1	6	60	1	12	
Cameroon	2	2	2	3	2			1	
Canada	Did not report	Did not report	32	34	31	0	0	3	
Chile	8-9	7	9	12	5	3	4		
China	102-300	> 200	358	400				400	
Colombia	19-21	27	25	23	15	3	0	0	5
Costa Rica	Did not report	Did not report	Did not report	2	2	0	0	0	0
Côte d'Ivoire	3	2	Did not report	4	0	3	0	1	0
Croatia	7-11	13	12	Did not report					
Czechia	30	38	42	42	27	5	5	3	2
Denmark	18-22	18-21	21	Did not report					
Dominican Republic	4	5	Did not report	7	7	0	0	0	10
Congo	1	1	Did not report	3					3
Ecuador	6-8	11	10	12	12				
Egypt	52-55	58	Did not report	70	40	10	5	3	12
El Salvador	Did not report	Did not report	0	2	30	0	0	0	30
Estonia	Did not report	Did not report	4	6	3		1	2	
Finland	19-20	18	24	21	11		9	1	
France	90-106	100	104	101		50		50	
Georgia	Did not report	Did not report	Did not report	9	4	5	0	0	0
Germany	Did not report	Did not report	134	125	110	10	5		
Ghana	Did not report	Did not report	Did not report	18		18	0	0	
Greece	50-60	~60	66	50	5	8	4	6	3
Guatemala	Did not report	Did not report	3	4	3	0	0	0	50
Honduras	Did not report	Did not report	2	Did not report					
Hong Kong (China*)	7	9-12	11	42	18	4	2	7	11

Chapter 1. Table 4

(*Continued*)

	Reporting Year				2019 Type of Centre				
Country	2010 (N)	2013 (N)	2016 (N)	2019 (N)	Private Physicians Clinic	Private Hospital Based Clinics	Private or Public University Based Clinics	Public Hospital Based Clinics	Sole Practitioner Clinic
Hungary	12	14	13	11		7	3	1	0
Iceland	1	1	Did not report	1	1	0	0	0	0
India	500	500-600	1000	1500	350	100	5	10	1000
Indonesia	Did not report	Did not report	26	32	0	23	6	3	0
Iran	Did not report	Did not report	62	60					
Iraq	Did not report	Did not report	13	5					
Ireland	7	7-8	28	8	7			1	
Israel	24-30	29	34	23			19	4	
Italy	360	350	350	350	200	150	100	100	100
Japan	606-618	591	587	574		44	71	10	400
Jordan	Did not report	Did not report	20	22	20	55	7	20	400
Kazakhstan	Did not report	12	19	23		2	2	3	16
Kenya	Did not report	Did not report	5	9	8	1	0	0	4
Latvia	4-5	4	Did not report	7	7				
Lithuania	Did not report	Did not report	Did not report	6	3	0	0	1	2
Malaysia	Did not report	Did not report	36	12					
Mali	Did not report	Did not report	1	1			3	13	
Mexico	"Uncertain"	~30	48	81	70	8	1	2	
Moldova	Did not report	Did not report	Did not report	1					
Mongolia	Did not report	Did not report	Did not report	4		3	1		
Montenegro	Did not report	Did not report	Did not report	5	3	1		1	
Myanmar	Did not report	Did not report	1	2	1			1	
Namibia	Did not report	Did not report	Did not report	2	1	1	0	0	0
Netherlands	Did not report	Did not report	13	15	1	1	8	5	0
New Zealand	7	7	9	8	7	0	0	1	0
Nicaragua	Did not report	Did not report	Did not report	1	1				
Nigeria	Did not report	Did not report	50	36	3	30	2	1	0
Norway	11	10	12	10	5	0	0	5	0
Oman	Did not report	Did not report	14	Did not report					
Panama	7	9	12	10	3	3	0	1	3
Paraguay	Did not report	Did not report	2	2	2	0	0	0	0
Peru	5-7	6	12	18	17	0	0	1	0
Philippines	4	5	6	7					
Poland	Did not report	Did not report	50	70	50			20	
Portugal	24	28	24	24					
Romania	Did not report	Did not report	21	23	21	3		2	
Russian Federation	80	110-130	170	200					
Saudi Arabia	24-30	30	50	Did not report					
Senegal	2	2	2	100	118	5	1	20	450
Serbia	Did not report	Did not report	Did not report	15	8	0	4	1	2
Singapore	9	11	11	11	2	5	0	3	1
Slovak Republic	Did not report	Did not report	9	Did not report					
Slovenia	3	3	3	3	0	1	2	0	0
South Africa	12-15	15	20	22	19		3	0	
The Republic of Korea	142	150	148	154	59	53	42	0	0
Spain	177-203	>100	371	150	110	40			
Sri Lanka	Did not report	Did not report	6	110	50	30	4	35	20
Sweden	15-16	16	17	10		3	4	3	
Switzerland	26	26	25	29	16	1	5	6	1
	72-78	76	79	78	7	29	19	5	18

Chapter 1. Table 4

(*Continued*)

	Reporting Year				2019 Type of Centre				
Country	**2010 (N)**	**2013 (N)**	**2016 (N)**	**2019 (N)**	**Private Physicians Clinic**	**Private Hospital Based Clinics**	**Private or Public University Based Clinics**	**Public Hospital Based Clinics**	**Sole Practitioner Clinic**
Taiwan (China*)									
Thailand	Did not report	Did not report	Did not report	75	30	27	11	2	5
Togo	1	1	Did not report	2			2		
Trinidad and Tobago	Did not report	Did not report	1	1	1	1	0	0	0
Tunisia	8	12	9	13	10	0	0	3	
Turkey	112-116	131	153	154	30	71	36	13	4
Uganda	1	2	Did not report	6	2	4	0	0	0
Ukraine	Did not report	Did not report	Did not report	40	20	5	4	3	8
United Arab Emirates	Did not report	Did not report	Did not report	10	100	50	5	5	150
UK	66	71-117	78	82				82	
USA	450-480	430	410	450	200	90	100	10	50
Uruguay	4	4	3	3	3				
Venezuela	17-18	10	30	22	14	8	0	0	0
Viet Nam	11-12	13	Did not report	26	0	12	4	10	0
Zimbabwe	Did not report	Did not report	Did not report	2	0	1	0	0	1
Totals	3524-3870	3701-3890	5335	6201	2245	1075	529	914	2775

*Reporting separately for this report.

countries (Table 1, Chart 1). This represents 19 more registrant countries and 23 more total responses than the 2015 questionnaire, and includes 28 countries new to Surveillance.

Unfortunately, six countries in the 2016 report (Croatia, Denmark, Guatemala, Oman, Saudi Arabia, and the Slovak Republic) did not respond to the current survey. In 2018, we compiled for the first time a list of countries that we believe currently have no ART activity. Countries were included in this list after a diligent effort was made to confirm the absence of ART services. This entailed contacting allied health professionals in the country, health ministry officials, fertility specialists in neighboring countries or within the region, and social media profiles. As many of these sources were used as was feasible.

We compiled a list of 63 countries that did not appear to have ART programmes as of March 31, 2018 (Table 2). This inclusion overcomes some of the limitations of previous surveys. We identified another 39 countries that are known to provide ART services, but that we were unable to recruit for our survey (Table 3). We included all 195 countries currently recognized by the United Nations in one of the three categories depicted in the three tables.

In 2018, all 97 countries that registered on our site provided some data regarding the number of ART centres in their countries (Table 4). Several countries were able to provide only estimates, but in aggregate these figures are consistent with previous totals. The estimated total number of ART facilities in the 2018 tally was 6,201, compared to 5,353 centres calculated in 2016. However, this figure does not include six countries that responded in 2015 but not in 2018 (previous total number of those centres was 108), but does include the 28 new respondents. Their inclusion added 334 centres. The new countries with the largest number of ART programmes were Egypt, Thailand, and Ukraine, with 70, 75, and 40 centres, respectively. Twenty-four of the 28 respondents new to Surveillance noted the presence of ten or fewer centres, suggesting that ART has only recently become available in some of these countries.

Many countries (34) reported a modest increase or no significant change in the number of centres over the triennial, but 22 countries recorded a decrease. Of particular note, India reported an increase in centres, from 1,000 to 1,500; Senegal, from 2 to 110; and Sri Lanka, from 6 to 110 centres. Conversely, Belgium saw a decrease, from 34 to 10 centres, as did Spain, from 371 to 150. It is not clear whether these changes are real, or if they reflect different methodologies or inclusion criteria for the tabulation. Nor is it clear what might have accounted for the differences, if they are actual changes.

We also queried about the type of ART programme, i.e., private physician clinic, private hospital-based clinic, private or public university-based clinic, public hospital-based clinic, or sole practitioner clinic. While not all respondents provided data regarding the breakdown for type of clinic, the solo practitioner and private physician clinics appear to be the predominant clinic models (Table 4). The popularity of the sole physician model represents a striking change from 2016, when it was the least commonly utilized.

Summary

Overall, the 2018 questionnaire results reflect a more modest increase in the total number of ART centres than noted in

previous surveys: from 5,353 to 6,201, with 500 centres alone accounted for by India's putative increase. An apparent reduction in the number of clinics in some developed countries is a new and provocative finding. If validated, this reduction might be due to consolidation, declining populations, or other economic drivers, and should be a topic for future queries. Priorities for the next edition of Surveillance will be to engage as many of the non-responding countries as is feasible, and to continue to refine our list of countries that are not performing ART procedures.

CHAPTER 2: LEGISLATION, POLICY, AND GUIDELINES

Introduction

The 2019 Surveillance Survey provides a unique comparison of governance systems among different countries. Data from respondents in 89 countries covered modes of regulation, governance, and oversight. The overall trend appears to be one of increasing uniformity, and some form of regulation now exists in most countries where ART is available. Most often the regulation consists of legislative requirements that establish the boundaries of practice. The legal framework often is supplemented with guidelines promulgated by the government, or by professional societies; many countries also have provisions for licensing and agency oversight.

The limits of such regulation are determined by the local stakeholders, including patient advocacy groups, local health care providers, professional organizations, local and national government agencies, legislative bodies, religious organizations, and insurance companies and other organizations responsible for payment. The position adopted for various issues is dependent on different social, cultural, and political norms, and is discussed in greater detail in later chapters of this report. Topics of extensive attention over the past three years include advances in the genetic assessment of embryos, trends in cross-border reproductive care, ethical controversies regarding the appropriateness of preserving anonymity for gamete donation, access to ART services for singles and for individuals in same-sex relationships, and proscriptions on commercial surrogacy.

Analysis of the survey

The 89 respondents reported as follows: 77 (87%): the practice of ART was regulated by legislation, guidelines, or both; 57 (64%): legislation existed in their country to regulate ART; and 29 (33%): no legislation existed. Respondents in two countries replied "Unknown". In the 2016 Surveillance report, respondents from 40 countries (57%) reported having legislation; that was fewer countries than did so in the 2018 survey (Table 1).

Of the 57 respondents that had legislation in 2018, 38 (67%) reported federal laws; 18 (32%) had both federal and state/provincial/regional laws; and one had state/provincial laws only. In addition, most respondents, 49 (86%), had some form of agency oversight, licensing body, or professional standards and guidelines: of these 49,14 (29%) had all three; 26 (53%) had agency oversight and licensing body (2); agency oversight and professional standards and guidelines (1); licensing body and professional standards and guidelines (23); and 15 (31%) had one of the following: agency oversight (1); licensing (5); professional standards/guidelines (9).

Of the 32 respondents who reported no legislation in their country, 20 (62.5%) acknowledged having some other form of regulation: 2 (6.0%), all three regulations; 12 (37.5%), two of the following: agency oversight and licensing body (3); agency oversight and professional standards and guidelines (3); licensing body and professional standards and guidelines (6); 10 (31%), one regulation: one had licensing, nine had a regulation related to professional standards or guidelines.

There were 64 countries that responded to the 2018 survey, and had also participated in the 2015 survey; 21 (33%) of these countries reported intervening updates to legislation, and 32 (50%) reported no changes since the previous survey. The 11 remaining respondents (17%) were unsure whether updates had occurred (Chart 1).

Table 2 lists the various aspects of ART addressed by legislation in the past three years, in rank order, illustrating the most prevalent topics in new legislation.

When the countries were queried about incidents in which national ART policies had been violated, 86 responded, as follows: violations had taken place in 13 countries (15%), and none had occurred in 50 (58%); the response from the remaining 23 countries (27%) was, "Unknown". Respondents also were asked about specific licensing criteria and credentialing bodies, and were questioned about the monitoring of governance pertaining to ART centres, physicians specializing in reproductive medicine, obstetrician/gynecologist specialists practicing ART, the ART laboratory, and the laboratory director and staff.

The ART centre

The survey noted that out of 88 countries, 63 (72%) required ART centres to be licensed. Most of these countries, 44 (70%), had multiple licensing requirements; only 3 (5%) had just one.

Of the 63 countries with multiple requirements, 3 (5%) required an examination or certification procedure; 10 (16%), an on-site inspection; and 21 (31%), continuing education.

ART centres were monitored in 56 of the countries (64%). Of the countries with monitoring systems in place, the principal mechanisms used were: a national registry, in 45 (80%); an on-site inspection, in 42 (75%); and a periodic report, in 32 (57%). Twenty-one of the countries (37%) also submitted their data to an international registry.

Government employees were responsible for monitoring ART centres in 30 of the 56 countries (53%), independent agencies monitored in 8 countries (14%), and medical officers did so in 16 countries (28.5%). Again, some countries used more than one method of monitoring. Thirteen countries (23%) reported that no one was responsible for monitoring.

Reproductive medicine physicians

Of the 89 countries responding, 45 (51%) had mechanisms for licensing or credentialing physicians in reproductive medicine, or endocrinologists who had special training in ART. In 40 of these 45 countries (89%), the mechanisms used were examination and certification.

In 87 of the 89 countries, 36 respondents (41%) said that ongoing monitoring of physicians in reproductive medicine was performed primarily by government agencies, medical officials, or both, but some physicians were monitored by an independent agency.

Chapter 2. Table 1

How is ART regulated in your country?

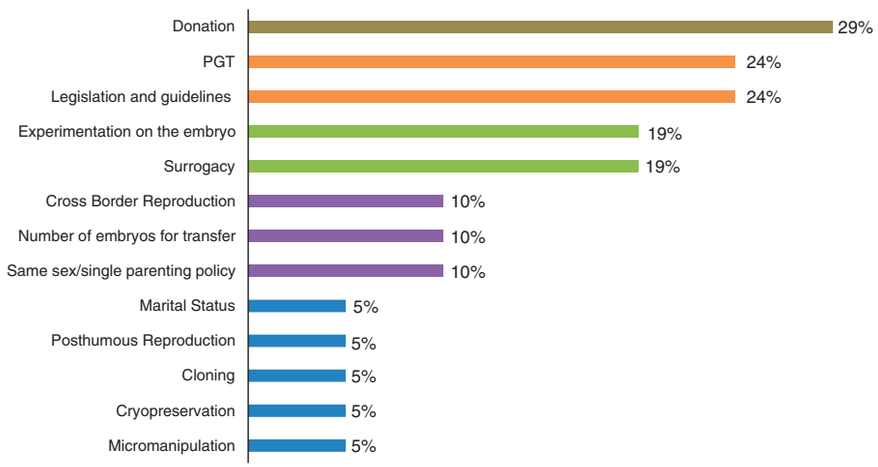
Country	No Regulations	Federal/National Laws/ Statutes/Ordinances/ Policies	State/Provincial/Regional Laws/Statutes/Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Licensing Body	Professional Organization Standards/ Guidelines
Argentina	No	Yes	Yes	No	No	Yes	Yes
Armenia		Yes				Yes	
Australia		Yes	Yes		Yes	Yes	Yes
Austria	No	Yes	Yes	Yes	Yes	Yes	Yes
Bangladesh	Yes	No	No	No	No	No	No
Barbados	Yes						
Belarus	No	Yes	Yes	Yes		Yes	No
Belgium	No	Yes	No	No	No	Yes	Yes
Bolivia	Yes					Yes	Yes
Botswana	Yes	Yes					
Brazil		Yes	No	No	Yes	Yes	Yes
Bulgaria	No	Yes	No	No	Yes	No	No
Burkina Faso	No	No	No	No	No	No	No
Cameroon	Yes	No	No	No	No	No	Yes
Canada	No	Yes	Yes	No	No	No	Yes
Chile	No	Yes	No	No	Yes	Yes	Yes
China	Yes	Yes	Yes	Unknown	Unknown	Unknown	Unknown
Colombia	Yes	No	No	No	Yes	Yes	Yes
Costa Rica	No	Yes	No	No	Yes	Yes	Yes
Côte d'Ivoire	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Czechia	No	Yes	Yes	No	Yes	Unknown	Yes
Congo	No						
Ecuador	Yes	No	No	No	No	No	Yes
Egypt						Yes	Yes
El Salvador	Yes	Unknown	Unknown	Unknown	Yes	Yes	Yes
Estonia	No	Yes	No	No	No	No	No
Finland	No	Yes	No	No	No	Yes	Yes
France	No	Yes	No	No	Yes	Yes	No
Georgia		Yes					
Germany		Yes	Yes			Yes	Yes
Ghana	Yes	No	No	No	No	No	Yes
Greece	Yes	Yes	No	No	No	No	Yes
Guatemala	Yes	No	No	No	No	No	No
Hong Kong (China*)	No	Yes	Yes	No	No	Yes	Yes
Hungary	No	Yes	No	No	No	Yes	Yes
Iceland	No	Yes	No	No	No	Yes	Yes
India	Yes	Unknown	Yes				
Indonesia	No	Yes	Yes		Unknown	Unknown	Yes
Ireland	No	Yes	No	No	Yes	Yes	Yes
Israel		Yes					
Italy	No	Yes	Yes	Yes	Yes	Yes	No
Japan	No	No	No	No	No	No	Yes
Jordan	Yes	Unknown	No	No	No	Yes	Yes
Kazakhstan	No	Yes	No	No	No	Yes	No
Kenya	Yes					Yes	Yes
Latvia	No	Yes	No	No	Yes	Yes	Yes
Lithuania	No	Yes	No	No	No	Yes	Yes
Mali	No						Yes
Mexico	Yes	No	No	No	No	No	
Mongolia	Yes	Yes	No	No	No	Yes	Yes
Montenegro	No	Yes				Yes	
Namibia		Yes				Yes	Yes
Netherlands	No	Yes	No	No	No	No	Yes
New Zealand		Yes	No	No	No	Yes	Yes
Nicaragua		Yes					Yes
Nigeria	No	No	No	No	No	Yes	No
Norway	No	Yes	No	No	No	Yes	Yes
Panama	No						
Paraguay	No	No	No	No	No	No	No

Chapter 2. Table 1

(*Continued*)

Country	No Regulations	Federal/National Laws/ Statutes/Ordinances/ Policies	State/Provincial/Regional Laws/Statutes/Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Licensing Body	Professional Organization Standards/ Guidelines
Peru	Yes	No	No	No	No	No	Yes
Philippines		No	No	No	No	Yes	Yes
Poland	No	Yes	Yes	Yes	Unknown	Unknown	Yes
Portugal	No	Yes	No		Yes	Yes	Yes
Romania	Yes	No	No	No	Yes	Yes	No
Russian Federation		Yes	Yes	No	Yes	Yes	Yes
Senegal	Yes	No	No	No	No	No	Yes
Serbia	No	Yes	No	No	Yes	Yes	Yes
Singapore		Yes				Yes	
Slovenia	No	Yes	No	No	No	Yes	Yes
South Africa	No	Yes	Yes	No	No	Yes	Yes
The Republic of Korea	No	Yes	No	No	No	No	Yes
Spain	No	Yes	Yes	Yes	Yes	Yes	Yes
Sri Lanka	No	No	No	No	Yes	No	Yes
Sweden	No	Yes	Yes	No	Yes	Yes	Yes
Switzerland	No	Yes	No	No	Unknown	Unknown	Yes
Taiwan (China*)	No	Yes	No	No	No	No	No
Thailand		Yes				Yes	Yes
Togo	Yes	No	No	No		No	Yes
Trinidad and Tobago	Yes	No	No	No	No	No	No
Tunisia	Yes	No	No	No	No	Yes	Yes
Turkey	No	Yes	No	No	No	No	No
Uganda	No	No	No	No	No		No
United Arab Emirates	No	Yes	Yes	No	No	Yes	Yes
UK	No	Yes	No	No	No	Yes	Yes
USA	No	Yes	Yes	No	Yes	Yes	Yes
Uruguay	No	Yes	No	No	Yes	Yes	Yes
Venezuela	Yes	No	No	No	No	No	Yes
Viet Nam	No	Yes	No	No	No	No	Yes
Zimbabwe	No	No	No	No	No	No	No

*Reporting separately for this report.



Chapter 2. Chart 1. % of countries reporting legislation changes since 2016 (more than one topic may have been modified per country).

Chapter 2. Table 2

Main modification to legislation in last 3 years.

Main Modification *(In rank order)*	% of Countries that Reported Legislation Change Out of 89 Countries *(More than One Topic May have been Modified Per Country)*
General changes to legislation and guidelines	29%
Donation	29%
IVF surrogacy	19%
Pre-implantation genetic diagnosis	19%
Experimentation on the embryo	14%
Same sex/single parenting policy	10%
Micromanipulation	10%
Posthumous reproduction	5%
Marital status	5%
Cross border reproduction	5%

The obstetrician/gynecologist practicing ART

For physicians in this category, licensing criteria were in place in 44 of the 89 countries responding (49%). In 35 of the countries (79.5%), examination or certification was the criterion for licensing; 28 of the 44 countries (64%) also required continuing education. The survey did not query respondents about whether they had separate sub-specialization fellowship programmes for reproductive medicine specialists. Overlap likely exists between the categories of obstetrician/gynecologist, with and without further fellowship qualifications.

The ART laboratory

Of the 89 countries, 52 (58%) reported licensing requirements specific to the ART laboratory. In all but 2 cases, this was in addition to the licensing requirements for the whole centre. Of those 52 countries with ART-specific requirements, 41 (79%) relied on a certification system; 42 (81%) required an on-site inspection; and 23 (44%) called for a periodic report. Most countries indicated they had a combination of such licensing requirements.

Of the 87 respondents with ongoing monitoring, 51 (58%) had ongoing monitoring criteria for the ART labs, and 39 (76%) used on-site inspection for this process. Others used a combination of periodic reporting, registry, and re-certification. Twenty-four respondents (47%) indicated the monitoring was performed by government employees, 22 (43%) said it was by medical officials, and 7 (14%) indicated it was by independent agencies. Again, some respondents used more than one such monitoring method.

Lab director and lab staff

Thirty-three of 88 respondents (37%) reported licensing criteria for the lab director, and 38 of 85 (45%) did so for the lab staff. Examination, certification, and continuing education were the criteria specified in more than 80% of these cases. Twenty-nine out of 84 (34%) reported using ongoing monitoring for the lab director; and 31 out of 87 (35%) used it for lab staff, with mechanisms similar to those of the original licensing criteria.

Penalties for violation of governance, licensure, or credentialing

Of 86 respondents, 51 (59%) indicated penalties existed for violations of governance, licensure, or credentialing. Twenty-nine of 86 respondents (34%) said no penalties were in place; and 6 of 86 (7%) answered "unknown".

The respondent countries described various types of penalties, including those listed below:

- admonishment;
- administrative penalties;
- publication of deficiencies;
- reporting to medical board (with possible sanctions);
- suspension of ART license;
- refusal of registration renewal;
- revocation of ART license;
- closure of the ART centre;
- financial penalties (fines);
- criminal charges against the person responsible;
- criminal penalties (including incarceration). The sanctions used most often were financial penalties, loss of license, and the possibility of criminal prosecution.

Summary

Eighty-nine country respondents to the 2018 IFFS Surveillance questionnaire provided data about the regulatory system governing the practice of ART, using monitoring, governance, oversight, or penalties. The response from the 89 countries was greater than the 2016 response of 70 countries, and greater than the 2013 response of 60 countries. The 2019 survey revealed a clear trend favoring some form of regulation, indicated by 86.5%. New or expanded areas for ART regulation included continued attention to anonymous donation, cross-border reproduction, IVF surrogacy, pre-implantation genetic diagnosis, experimentation on embryos, micromanipulation, marital status, and same-sex parenting. Other important topics: more active regulation of ART centres, professionals, laboratories, and staff, via extensive licensing and monitoring requirements. Certification, examination, continuing education, and periodic reporting featured prominently in the responses.

CHAPTER 3: INSURANCE COVERAGE

Introduction

Eighty-five responding countries submitted data on the extent of insurance coverage, a 21% increase (70 to 85) over the 2016 IFFS Surveillance report. The 2018 questions pertaining to insurance coverage sought information related to changes since the 2016

Chapter 3. Table 1

Are there regulations that address reimbursement of ART procedures in your country?

Country	Federal National Laws Statutes Ordinances	State Provincial Regional Laws Statutes Ordinances	Municipal Laws Statutes Ordinances	Religious Decree	Agency Regulations Oversight	Cultural Practice	Professional Organization Standards Guidelines
Argentina	Yes	Yes	No	No	Yes	No	No
Armenia	No	No	No	No	No	No	No
Australia	Yes	Yes			Yes		Yes
Austria	Yes	No	No	No	No	No	Yes
Bangladesh	No	No	No	No	No	No	No
Barbados	No	No	No	No	No	No	No
Belarus	No	No	No		No	No	
Belgium	Yes	No	No	No	No	No	No
Bolivia	No	No	No	No	No	No	No
Botswana	No	No	No	No	No	No	No
Brazil	No	No	No	No	No	No	No
Bulgaria	Yes	Yes	Yes	No	Yes	No	No
Burkina Faso	No	No	No	No	No	No	No
Cameroon	No	No	No	No	No	No	Yes
Canada	No	Yes	No	No	No	No	No
Chile	Yes	No	No	No	No	No	No
China	No	No	No	No	No	No	No
Colombia	No	No	No	No	No	No	No
Congo	No	No	No	No	No	No	No
Côte d'Ivoire	Yes	Unknown	Unknown	Yes	Yes	Unknown	Yes
Czechia	Unknown	Yes	No	No	No	No	No
Ecuador	No	No	No	No	No	No	No
Egypt	No	No	No	No	No	Yes	No
El Salvador	No	No	No	No	No	No	No
Finland	Yes	No	No	No	No	No	
France	Yes	No	No	No	No	No	No
Georgia	No	No	No	No	No	No	No
Germany	Yes	Yes	Yes	No	No	No	No
Ghana	No	No	No	No	No	No	No
Greece	No	No	No	No	No	Yes	No
Guatemala	No	No	No	No	No	No	No
Hong Kong (China*)	No	No	No	No	Yes	No	No
Hungary	Yes	No	No	No	No	No	Yes
Iceland	Yes	No	No	No	No	No	No
India	No	No	No	No	No	No	No
Ireland	Yes	No	No	No	No	No	No
Israel	Yes	Yes					
Italy	Yes	Yes	Yes	Yes	Yes	Yes	No
Jordan	No	No	No	No	No	Yes	Yes
Kazakhstan	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Yes
Kenya	Yes	No	No	No	No	No	No
Latvia	Yes	No	No	No	No	No	No
Lithuania	Yes	No	No	No	No	No	Yes
Mali	No	No	No	No	No	No	No
Mexico	No	No	No	No	No	No	Yes
Mongolia	Yes	No	No	No	Yes	No	No
Montenegro	Yes						
Namibia	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Yes
Netherlands	Yes	No	No	No	No	No	No
New Zealand	No	No	No	No	Yes	No	No
Nicaragua	No	No	No	No	No	No	No
Nigeria	No	No	No	No	No	No	No
Norway	Yes	No	No	No	No	No	
Panama	No	No	No	No	No	No	No
Paraguay	No	No	No	No	No	No	No
Peru	No	No	No	No	No	No	No
Philippines	No	No	No	No	No	No	No
Poland	No	Yes	Yes	No	Unknown	Unknown	Unknown
Portugal	Yes	No	No	No	Yes	No	Yes

Chapter 3. Table 1

(*Continued*)

Country	Federal National Laws Statutes Ordinances	State Provincial Regional Laws Statutes Ordinances	Municipal Laws Statutes Ordinances	Religious Decree	Agency Regulations Oversight	Cultural Practice	Professional Organization Standards Guidelines
Romania	Yes	No	No	No	No	No	No
Russian Federation	Yes	Yes	No	No	No	No	No
Senegal	No	No	No	No	No	No	No
Serbia	Yes	No	Yes	No	No	No	Yes
Singapore	Yes						
Slovenia	Yes	Yes	No	No	No	No	Yes
South Africa	Yes	No	No	No	No	No	No
The Republic of Korea	No	No	No	No	No	No	No
Spain	Yes	Yes	No		No	Yes	No
Sri Lanka	No	No	No	No	No	No	No
Sweden	No	No	No	No	No	No	Yes
Switzerland	No	No	No	No	No	No	No
Taiwan (China*)	No	Unknown	No	No	No	No	No
Thailand	No	No	No	No	No	No	No
Togo	No	No	No	No	No	No	No
Trinidad and Tobago	No	No	No	No	No	No	No
Tunisia	Yes	Yes	No	No	No	No	No
Turkey	Yes	No	No	No	No	No	No
Uganda	No	No	No	No	No	No	No
United Arab Emirates	Yes	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
UK	No	Yes	No	No	No	No	No
USA	Yes	Yes	No	No	Yes	No	No
Uruguay	Yes	No	No	No	Yes	No	No
Venezuela	No	No	No	No	No	No	No
Viet Nam	No	No	No	No	No	No	No
Zimbabwe	No	No	No	No	No	No	No

*Reporting separately for this report.

report, availability of funding for infertility treatments, existence of regulation governing the reimbursement of ART, extent of coverage and services covered by insurance, mode of reimbursement, and specifics related to demographics and good clinical practice.

Analysis of the survey

In 2018, 85 countries responded to a question about whether either insurance coverage or government funding was available for infertility treatment. Forty countries (47%) reportedly did provide such funding, compared to 37 in 2015. Moreover, 45 of the 85 countries responding (53%) did not offer any type of financial support. For the 2012 and 2015 questionnaires, the figures were 40% providing some funding, and 36% not offering any financial support.

Regarding other changes since previous reporting, Japan and the United Kingdom of Great Britain and Northern Ireland noted decreased financial support for ART, 16 countries reported expanded financial support, and 42 countries indicated no changes from three years ago. Notably, in Africa, Cameroon, and Senegal are progressing ART legislation, Burkina Faso is beginning to fund insurance and, in Asia, India has introduced restrictions for international patients seeking surrogacy access.

In Europe, Montenegro offered coverage for 3 full, fresh cycles of IVF; and in Slovenia, ART coverage spans 6 cycles for 1 live birth, and 4 for the next live birth, provided that single ET is used. The United States of America has seen an increase in access for small, selected populations, and increased coverage by some large employers.

Where ART reimbursement is in place, some countries regulate associated finances, as follows: at the national or federal level, 36 of 85 countries (42%); regional, 16 of 83 countries (19%); municipal, 5 of 81 countries (6%); and by religious decree, 2 of 79 countries (3%). Other countries regulate reimbursement through dedicated agencies, 11 of 82 countries (13%), or professional organizations, 14 of 79 countries (18%) (Table 1).

The extent of coverage for ART services varies with location. For this report, coverage was divided as complete coverage and partial reimbursement. When reimbursement or coverage was at a national level, 15 of 38 countries (39%) offered complete coverage, and 23 of 38 countries (61%) offered partial reimbursement. Where a regional plan was in place, 3 of the 15 countries responding (20%) offered complete coverage, and 12 (80%) offered partial coverage. Of note, private insurance offers

Chapter 3. Table 2

What is the coverage or reimbursement of ART services by health plans?

Country	National Health Plan	State/Provincial/Regional Health Plan	Private Insurance	Combination of Government Health Plan and Private Insurance
Argentina	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	No Coverage or Reimbursement
Australia	Partial Coverage or Reimbursement		Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Austria	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Bangladesh	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Barbados	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Belarus	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Belgium	Partial Coverage or Reimbursement	No Coverage or Reimbursement	Unknown	Unknown
Bolivia			Partial Coverage or Reimbursement	
Brazil	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Bulgaria	Complete Coverage or Reimbursement	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Burkina Faso	Unknown	Unknown	Unknown	No Coverage or Reimbursement
Cameroon	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Canada	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Chile	Complete Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
China	Unknown	Unknown	Unknown	Unknown
Colombia	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Czechia	Complete Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Congo	Unknown	Unknown	Unknown	Unknown
Ecuador	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Finland	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
France	Complete Coverage or Reimbursement			
Georgia	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Germany	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Complete Coverage or Reimbursement	Complete Coverage or Reimbursement
Greece	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Guatemala			Unknown	
Hong Kong (China*)	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Unknown	Unknown
Hungary	Complete Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Iceland	Partial Coverage or Reimbursement			
India	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Ireland	Partial Coverage or Reimbursement		Partial Coverage or Reimbursement	
Israel	Complete Coverage or Reimbursement			Partial Coverage or Reimbursement
Italy	No Coverage or Reimbursement	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Côte d'Ivoire	Unknown	Unknown	Unknown	Unknown
Japan	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Jordan	No Coverage or Reimbursement	Unknown	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Kazakhstan	Partial Coverage or Reimbursement	Unknown	Unknown	Unknown
Kenya	Partial Coverage or Reimbursement	Unknown	Partial Coverage or Reimbursement	Unknown
Latvia	Complete Coverage or Reimbursement	No Coverage or Reimbursement	Unknown	No Coverage or Reimbursement
Lithuania	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Mali	Unknown	Unknown	Unknown	Unknown
Mexico	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Mongolia	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Montenegro	Complete Coverage or Reimbursement			
Namibia	No Coverage or Reimbursement	No Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Netherlands	Complete Coverage or Reimbursement		Complete Coverage or Reimbursement	
New Zealand	Partial Coverage or Reimbursement		No Coverage or Reimbursement	
Nicaragua	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Nigeria	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Norway	Partial Coverage or Reimbursement			
Panama	No Coverage or Reimbursement	No Coverage or Reimbursement	Partial Coverage or Reimbursement	No Coverage or Reimbursement
Paraguay	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Peru		No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Philippines	Unknown	Unknown	No Coverage or Reimbursement	Unknown
Poland	No Coverage or Reimbursement	Partial Coverage or Reimbursement	Unknown	No Coverage or Reimbursement
Portugal	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Romania		No Coverage or Reimbursement	No Coverage or Reimbursement	Partial Coverage or Reimbursement
Russian Federation	Complete Coverage or Reimbursement	Complete Coverage or Reimbursement	Unknown	No Coverage or Reimbursement
Senegal	No Coverage or Reimbursement	No Coverage or Reimbursement	Complete Coverage or Reimbursement	No Coverage or Reimbursement

Chapter 3. Table 2

(*Continued*)

Country	National Health Plan	State/Provincial/Regional Health Plan	Private Insurance	Combination of Government Health Plan and Private Insurance
Serbia	Complete Coverage or Reimbursement	Unknown	Complete Coverage or Reimbursement	Unknown
Singapore	Partial Coverage or Reimbursement			
Slovenia	Complete Coverage or Reimbursement			
South Africa	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
The Republic of Korea	Partial Coverage or Reimbursement			
Spain	Complete Coverage or Reimbursement	Complete Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Sri Lanka	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Sweden	Complete Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	
Taiwan (China*)	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Thailand	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Togo	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Tunisia	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Turkey	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Uganda	Unknown	Unknown	Unknown	Unknown
UAE	Complete Coverage or Reimbursement	Complete Coverage or Reimbursement	Complete Coverage or Reimbursement	Unknown
UK	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
USA	No Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Uruguay	Partial Coverage or Reimbursement	no Coverage or Reimbursement	Partial Coverage or Reimbursement	Partial Coverage or Reimbursement
Venezuela	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement
Viet Nam	Unknown	Unknown	Unknown	Partial Coverage or Reimbursement
Zimbabwe	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement	No Coverage or Reimbursement

*Reporting separately for this report.

Chapter 3. Table 3a

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

Country	Diagnostic Evaluation	Fertility Medications	Intrauterine Insemination
Argentina	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance
Australia	National health plan Private insurance	National health plan Private insurance	National health plan Private insurance
Austria	No coverage	National health plan	No coverage
Bangladesh	No coverage	No coverage	No coverage
Barbados	No coverage	No coverage	No coverage
Belarus	National health plan State/Provincial/Regional health plan Private insurance	No coverage	No coverage
Belgium	National health plan	National health plan	National health plan
Bolivia	No coverage	No coverage	No coverage
Botswana	No coverage	No coverage	No coverage
Brazil	Private insurance	No coverage	No coverage
Bulgaria	No coverage	National health plan State/Provincial/Regional health plan	State/Provincial/Regional health plan
Burkina Faso	Private insurance	No coverage	No coverage
Cameroon	Private insurance	No coverage	No coverage
Canada	National health plan	Private insurance	National health plan
Chile	National health plan Private insurance	National health plan Private insurance	National health plan
China	No coverage	No coverage	
Colombia	No coverage	No coverage	No coverage
Congo	No coverage	No coverage	No coverage
Côte d'Ivoire	Private insurance	Unknown	Unknown
Czechia	National health plan	National health plan	National health plan
Ecuador	Private insurance		

Chapter 3. Table 3a

(*Continued*)

Country	Diagnostic Evaluation	Fertility Medications	Intrauterine Insemination
El Salvador	No coverage	No coverage	No coverage
Finland	National health plan	National health plan	National health plan
France	National health plan	National health plan	National health plan
Georgia	No coverage	No coverage	No coverage
Germany	National health plan Private insurance	National health plan Private insurance	National health plan
Ghana	No coverage	No coverage	No coverage
Greece	No coverage	No coverage	No coverage
Guatemala	Private insurance	No coverage	No coverage
Hong Kong (China*)	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance
Hungary	National health plan	National health plan	National health plan
Iceland		National health plan	No coverage
India	No coverage	No coverage	No coverage
Ireland	Private insurance	National health plan	Private insurance
Israel	National health plan	National health plan	National health plan
Italy	State/Provincial/Regional health plan	National health plan	
Jordan	No coverage	No coverage	No coverage
Kazakhstan	No coverage	National health plan	No coverage
Kenya	National health plan Private insurance	National health plan Private insurance	Unknown
Latvia	National health plan	National health plan	National health plan
Lithuania	National health plan	National health plan	No coverage
Mali	National health plan Private insurance	National health plan Private insurance	No coverage
Mexico	No coverage	No coverage	No coverage
Mongolia	No coverage	No coverage	No coverage
Montenegro	National health plan	National health plan	No coverage
Namibia	State/Provincial/Regional health plan Private insurance	No coverage	No coverage
Netherlands	National health plan Private insurance	National health plan Private insurance	National health plan Private insurance
New Zealand	National health plan	National health plan	National health plan
Nicaragua	No coverage	No coverage	No coverage
Nigeria	No coverage	No coverage	No coverage
Norway	National health plan	National health plan	National health plan
Panama	No coverage	No coverage	National health plan
Paraguay	Private insurance	No coverage	No coverage
Peru	No coverage	No coverage	No coverage
Philippines	No coverage	No coverage	No coverage
Poland	No coverage	No coverage	No coverage
Portugal	National health plan Private insurance	National health plan	National health plan
Romania	National health plan	National health plan	No coverage
Russian Federation	National health plan State/Provincial/Regional health plan	National health plan State/Provincial/Regional health plan	No coverage
Senegal	Private insurance No coverage	Private insurance No coverage	Private insurance No coverage
Serbia	National health plan	National health plan	National health plan
Singapore	No coverage	No coverage	National health plan
Slovenia	National health plan	National health plan	National health plan
South Africa	State/Provincial/Regional health plan Private insurance	No coverage	No coverage
The Republic of Korea	National health plan	National health plan	National health plan
Spain	National health plan Private insurance	National health plan	National health plan State/Provincial/Regional health plan Private insurance
Sri Lanka	No coverage	No coverage	No coverage
Sweden	National health plan	National health plan	National health plan
Switzerland	Private insurance	Private insurance	Private insurance
Taiwan (China*)	National health plan	No coverage	No coverage

Chapter 3. Table 3a

(Continued)

Country	Diagnostic Evaluation	Fertility Medications	Intrauterine Insemination
Thailand	No coverage	No coverage	No coverage
Togo	No coverage	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage	No coverage
Tunisia	National health plan Private insurance	National health plan Private insurance	No coverage
Turkey	National health plan	National health plan	National health plan
Uganda	Unknown	Unknown	Unknown
UAE	Private insurance	Private insurance	Private insurance
UK	State/Provincial/Regional health plan	State/Provincial/Regional health plan	State/Provincial/Regional health plan
USA	National health plan State/Provincial/Regional health plan Private insurance	State/Provincial/Regional health plan Private insurance	State/Provincial/Regional health plan Private insurance
Uruguay	National health plan	National health plan	Private insurance
Venezuela	No coverage	No coverage	No coverage
Viet Nam	No coverage	No coverage	No coverage
Zimbabwe	Private insurance	Private insurance	Private insurance

*Reporting separately for this report.

Chapter 3. Table 3b

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

Country	IVF	ICSI	Assisted Hatching
Argentina	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan, State/Provincial/Regional health plan Private insurance
Australia	National health plan Private insurance	National health plan Private insurance	No coverage
Austria	National health plan	National health plan	No coverage
Bangladesh	No coverage	No coverage	No coverage
Barbados	No coverage	No coverage	No coverage
Belarus	No coverage	No coverage	No coverage
Belgium		National health plan	Unknown
Bolivia	Private insurance	Private insurance	No coverage
Botswana	No coverage	No coverage	No coverage
Brazil	National health plan	No coverage	No coverage
Bulgaria	National health plan State/Provincial/Regional health plan	National health plan State/Provincial/Regional health plan	No coverage
Burkina Faso	No coverage	No coverage	No coverage
Cameroon	No coverage	No coverage	No coverage
Canada	National health plan	National health plan	National health plan
Chile	National health plan	National health plan	No coverage
China	No coverage	No coverage	No coverage
Colombia	No coverage	No coverage	No coverage
Czechia	National health plan	No coverage	No coverage
Congo	No coverage	No coverage	No coverage
El Salvador	No coverage	No coverage	No coverage
Finland	National health plan	National health plan	No coverage
France	National health plan	National health plan	No coverage
Georgia	No coverage	No coverage	No coverage
Germany	National health plan Private insurance	National health plan Private insurance	No coverage
Ghana	No coverage	No coverage	No coverage
Greece	No coverage	No coverage	No coverage
Guatemala	No coverage	No coverage	No coverage
Hong Kong (China*)	National health plan State/Provincial/Regional health plan	National health plan State/Provincial/Regional health plan	No coverage
Hungary	National health plan	National health plan	National health plan
Iceland	National health plan	National health plan	No coverage
India	No coverage	No coverage	No coverage

Chapter 3. Table 3b

(*Continued*)

Country	IVF	ICSI	Assisted Hatching
Ireland	Private insurance	Private insurance	Private insurance
Israel	National health plan	National health plan	National health plan
Italy	State/Provincial/Regional health plan	State/Provincial/Regional health plan	No coverage
Côte d'Ivoire	Unknown	Unknown	Unknown
Jordan	No coverage	No coverage	No coverage
Kazakhstan	National health plan	National health plan	
Kenya	National health plan	National health plan	Unknown
	Private insurance	Private insurance	
Latvia	National health plan	National health plan	No coverage
Lithuania	National health plan	National health plan	No coverage
Mali	No coverage	No coverage	No coverage
Mexico	No coverage	No coverage	No coverage
Mongolia	No coverage	No coverage	No coverage
Montenegro	National health plan	National health plan	No coverage
Namibia	No coverage	No coverage	No coverage
Netherlands	National health plan	National health plan	No coverage
	Private insurance	Private insurance	
New Zealand	National health plan	National health plan	No coverage
Nicaragua	No coverage	No coverage	No coverage
Nigeria	No coverage	No coverage	No coverage
Norway	National health plan	National health plan	No coverage
Panama	No coverage	No coverage	No coverage
Paraguay	No coverage	No coverage	
Peru	No coverage	No coverage	No coverage
Philippines	No coverage	No coverage	No coverage
Poland	No coverage	No coverage	No coverage
Portugal	National health plan	National health plan	National health plan
Romania	National health plan	National health plan	National health plan
Russian Federation	National health plan	National health plan	National health plan
	State/Provincial/Regional health plan	State/Provincial/Regional health plan	State/Provincial/Regional health plan
Senegal	Private insurance, No coverage	Private insurance, No coverage	Unknown
Serbia	National health plan	No coverage	National health plan
Singapore	National health plan	National health plan	National health plan
Slovenia	National health plan	National health plan	
South Africa	No coverage	No coverage	No coverage
The Republic of Korea	National health plan	National health plan	National health plan
Spain	National health plan	National health plan	National health plan
	State/Provincial/Regional health plan	Private insurance	State/Provincial/Regional health plan
	Private insurance		Private insurance
Sri Lanka	No coverage	No coverage	No coverage
Sweden	National health plan		No coverage
Switzerland	No coverage	No coverage	No coverage
Taiwan (China*)	No coverage	No coverage	No coverage
Thailand	No coverage	No coverage	No coverage
Togo	No coverage	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage	No coverage
Tunisia	National health plan	National health plan	National health plan
	Private insurance	Private insurance	Private insurance
Turkey	National health plan	National health plan	National health plan
Uganda	Unknown	Unknown	Unknown
UAE	Private insurance	Private insurance	Private insurance
UK	State/Provincial/Regional health plan	State/Provincial/Regional health plan	No coverage
USA	State/Provincial/Regional health plan	State/Provincial/Regional health plan Private insurance	State/Provincial/Regional health plan
	Private insurance		Private insurance
Uruguay	National health plan	National health plan	National health plan
Venezuela	No coverage	No coverage	No coverage
Viet Nam	No coverage	No coverage	No coverage
Zimbabwe	No coverage	No coverage	No coverage

*Reporting separately for this report.

Chapter 3. Table 3c

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

Country	Cryopreservation of Supernumerary Oocytes from an IVF Cycle	Cryopreservation of Supernumerary Embryos from an IVF Cycle
Argentina	National health plan	National health plan
	State/Provincial/Regional health plan	State/Provincial/Regional health plan
	Private insurance	Private insurance
Australia	No coverage	No coverage
Austria	No coverage	No coverage
Bangladesh	No coverage	No coverage
Barbados	No coverage	No coverage
Belarus	No coverage	No coverage
Belgium	National health plan	National health plan
Bolivia		No coverage
Botswana	No coverage	No coverage
Brazil	No coverage	No coverage
Bulgaria	No coverage	National health plan
		State/Provincial/Regional health plan
Burkina Faso	No coverage	No coverage
Cameroon	No coverage	No coverage
Canada	National health plan	National health plan
Chile	No coverage	No coverage
China	No coverage	No coverage
Colombia	No coverage	No coverage
Congo	No coverage	No coverage
Côte d'Ivoire	Unknown	Unknown
Czechia	No coverage	No coverage
El Salvador	No coverage	No coverage
Finland	No coverage	National health plan
France	National health plan	National health plan
Georgia	No coverage	No coverage
Germany	No coverage	No coverage
Ghana	No coverage	No coverage
Greece	No coverage	No coverage
Guatemala	No coverage	No coverage
Hong Kong (China*)	No coverage	No coverage
Hungary	National health plan	National health plan
Iceland	No coverage	National health plan
India	No coverage	No coverage
Ireland	Private insurance	Private insurance
Israel	National health plan	National health plan
Italy	No coverage	No coverage
Jordan	No coverage	National health plan
Kazakhstan	No coverage	No coverage
Kenya	Unknown	Unknown
Latvia	No coverage	National health plan
Lithuania	No coverage	No coverage
Mali	No coverage	No coverage
Mexico	No coverage	No coverage
Mongolia	No coverage	No coverage
Montenegro	No coverage	No coverage
Namibia	No coverage	No coverage
Netherlands	National health plan	National health plan
	Private insurance	Private insurance
New Zealand	National health plan	National health plan
Nicaragua	No coverage	No coverage
Nigeria	No coverage	No coverage
Norway	National health plan	National health plan
Panama	No coverage	No coverage
Paraguay	No coverage	No coverage
Peru	No coverage	No coverage

Chapter 3. Table 3c

(***Continued***)

Country	Cryopreservation of Supernumerary Oocytes from an IVF Cycle	Cryopreservation of Supernumerary Embryos from an IVF Cycle
Philippines	No coverage	No coverage
Poland	No coverage	No coverage
Portugal	National health plan	National health plan
Romania	No coverage	No coverage
Russian Federation	National health plan	National health plan
	State/Provincial/Regional health plan	State/Provincial/Regional health plan
Senegal	Private insurance	Private insurance
	No coverage	No coverage
Serbia	Unknown	Unknown
Singapore	National health plan	National health plan
Slovenia	National health plan	National health plan
South Africa	No coverage	No coverage
The Republic of Korea	National health plan	National health plan
Spain	National health plan	National health plan
	State/Provincial/Regional health plan	State/Provincial/Regional health plan
	Private insurance	Private insurance
Sri Lanka	No coverage	No coverage
Sweden	National health plan	National health plan
Switzerland	No coverage	No coverage
Taiwan (China*)	No coverage	No coverage
Thailand	No coverage	No coverage
Togo	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage
Tunisia	No coverage	No coverage
Turkey	No coverage	National health plan
Uganda	Unknown	Unknown
United Arab Emirates	Private insurance	Private insurance
UK	No coverage	State/Provincial/Regional health plan
USA	State/Provincial/Regional health plan	State/Provincial/Regional health plan
	Private insurance	Private insurance
		No coverage
Uruguay	No coverage	National health plan
Venezuela	No coverage	No coverage
Viet Nam	No coverage	No coverage
Zimbabwe	No coverage	No coverage

*Reporting separately for this report.

full coverage in 5 of the 19 countries (26%) and partial coverage in 15 of the 19 (74%) (Table 2). Tables 3a–h lists full details of services covered at these multiple levels. Additional information regarding coverage is presented in Chart 1.

The report also probed to determine which specific fertility procedures and therapies are reimbursed, such as diagnostic evaluation; fertility medications; intrauterine insemination (IUI); in vitro fertilization (IVF); intracytoplasmic sperm injection (ICSI); assisted hatching; use of donor sperm, eggs or embryos; use of surrogacy; and use of fertility preservation (sperm, oocytes, embryos, tissue) for medical ("social") and non-medical indications (Charts 3–5).

Additional data accrued addressed coverage for cryopreservation of oocytes or embryos for ART cycles, in which

Chapter 3. Table 3d

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

Country	PGT-M	PGT-A
Argentina	No coverage	No coverage
Australia	No coverage	No coverage
Austria	No coverage	No coverage
Bangladesh	No coverage	No coverage
Barbados	No coverage	No coverage
Belarus	No coverage	No coverage
Belgium	Unknown	Unknown
Bolivia	No coverage	No coverage
Botswana	No coverage	No coverage
Brazil	No coverage	No coverage
Bulgaria	No coverage	No coverage
Burkina Faso	No coverage	No coverage
Cameroon	No coverage	No coverage
Canada	No coverage	No coverage
Chile	No coverage	No coverage
China	No coverage	No coverage
Colombia	No coverage	No coverage
Czechia	National health plan	National health plan
Congo	No coverage	No coverage
El Salvador	No coverage	No coverage
Finland	No coverage	No coverage
France	No coverage	No coverage
Georgia	No coverage	No coverage
Germany	No coverage	No coverage
Ghana	No coverage	No coverage
Greece	No coverage	No coverage
Guatemala	No coverage	No coverage
Hong Kong (China*)	No coverage	No coverage
Hungary	No coverage	No coverage
Iceland	Unknown	Unknown
India	No coverage	No coverage
Ireland	Unknown	Unknown
Israel	National health plan	Private insurance
Italy	No coverage	No coverage
Côte d'Ivoire	No coverage	No coverage
Jordan	No coverage	No coverage
Kazakhstan	No coverage	
Kenya	Unknown	Unknown
Latvia	No coverage	No coverage
Lithuania	National health plan	No coverage
Mali	No coverage	No coverage
Mexico	No coverage	No coverage
Mongolia	No coverage	No coverage
Montenegro	No coverage	No coverage
Namibia	No coverage	No coverage
Netherlands	National health plan Private insurance	
New Zealand	National health plan	No coverage
Nicaragua	No coverage	No coverage
Nigeria	No coverage	No coverage
Norway	National health plan	No coverage
Panama	No coverage	No coverage
Paraguay	No coverage	No coverage
Peru	No coverage	No coverage
Philippines	No coverage	No coverage
Poland	No coverage	No coverage
Portugal	National health plan	National health plan
Romania	No coverage	No coverage
Russian Federation	No coverage	No coverage
Senegal	Unknown	Unknown
Serbia	National health plan	No coverage
Singapore	National health plan	National health plan
Slovenia	National health plan	No coverage
South Africa	No coverage	No coverage
The Republic of Korea	No coverage	No coverage
Spain	National health plan State/Provincial/Regional health plan Private insurance	No coverage
Sri Lanka	No coverage	No coverage
Sweden	National health plan	No coverage
Switzerland	No coverage	No coverage
Taiwan (China*)	No coverage	No coverage
Thailand	No coverage	No coverage
Togo	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage
Tunisia	No coverage	No coverage
Turkey	National health plan	No coverage
Uganda	Unknown	Unknown
United Arab Emirates	Private insurance	Private insurance
UK	State/Provincial/Regional health plan	No coverage
USA	State/Provincial/Regional health plan Private insurance	State/Provincial/Regional health plan Private insurance
Uruguay	No coverage	No coverage
Venezuela	No coverage	No coverage
Viet Nam	No coverage	No coverage
Zimbabwe	No coverage	No coverage

*Reporting separately for this report.

embryos are screened for chromosome abnormalities and genetic diseases. These procedures include preimplantation genetic screening (PGS), preimplantation genetic diagnosis (PGD), comprehensive chromosome screening (CCS), preimplantation genetic testing (PGT), and the PGT subtypes, PGT-M and PGT-A. (PGT-M refers to monogenic/single-gene disorders; the A in PGT-A is for aneuploidy, indicating an abnormal number of chromosomes.) The two tests offer at-risk patients an opportunity to select embryos that carry a reduced risk of birth defects.

Tables 4a–d present details of insurance coverage for fertility treatments. Of 83 responses, only 37 countries (45%) provide reimbursement for IVF/ICSI. The patient's demographic background affects the extent of ART support. As for infertility status (primary, secondary, or family-building), many countries set specific limits for ART funding (Table 5, Chart 2). Of 79 countries responding, 28 (35%) cover patients with primary infertility, while 23 of 77 countries queried (30%) cover secondary infertility. Of 75 countries responding to a query about family-building coverage, 25 (33%) say that they offer it.

Female age is also a determinant factor for reimbursement in 40 countries, with 31 respondents (78%) providing data. The lowest age limit for coverage, 38 years, was cited for Latvia and Lithuania; the highest was age 50, in Australia. Only two countries impose an age limit for males: Austria and Germany, both 50 years. Coverage also is influenced by duration of infertility. According to 5 responses from 40 countries reporting (12.5%), minimum duration varies widely, from 1 year in The United

Chapter 3. Table 3e

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

Country	Donor Sperm	Donor Egg	Donor Embryos
Argentina	State/Provincial/ Regional health plan Private insurance	State/Provincial/ Regional health plan Private insurance	State/Provincial/ Regional health plan Private insurance
Australia	National health plan Private insurance	National health plan Private insurance	National health plan Private insurance
Austria	No coverage	No coverage	No coverage
Bangladesh	No coverage	No coverage	No coverage
Barbados	No coverage	No coverage	No coverage
Belarus	No coverage	No coverage	No coverage
Belgium	Unknown	Unknown	Unknown
Bolivia	No coverage	No coverage	No coverage
Botswana	No coverage	No coverage	No coverage
Brazil	No coverage	No coverage	No coverage
Bulgaria	No coverage	State/Provincial/ Regional health plan	State/Provincial/ Regional health plan
Burkina Faso	No coverage	No coverage	No coverage
Cameroon	No coverage	No coverage	
Canada	No coverage	No coverage	No coverage
Chile	No coverage	No coverage	No coverage
China	No coverage	No coverage	No coverage
Colombia	No coverage	No coverage	No coverage
Congo	No coverage	No coverage	No coverage
Côte d'Ivoire	No coverage	No coverage	No coverage
Czechia	No coverage	No coverage	No coverage
El Salvador	No coverage	No coverage	No coverage
Finland	No coverage	No coverage	No coverage
France	National health plan	National health plan	National health plan
Georgia	No coverage	No coverage	No coverage
Germany	No coverage	No coverage	No coverage
Ghana	No coverage	No coverage	No coverage
Greece	No coverage	No coverage	No coverage
Guatemala	No coverage	No coverage	No coverage
Hong Kong (China*)	No coverage	No coverage	No coverage
Hungary	National health plan	National health plan	National health plan
Iceland	No coverage	No coverage	National health plan
India	No coverage	No coverage	No coverage
Ireland	Private insurance No coverage	No coverage	No coverage
Israel	No coverage	Private insurance	No coverage
Italy	No coverage	No coverage	
Jordan	No coverage	No coverage	No coverage
Kazakhstan	No coverage	No coverage	No coverage
Kenya	No coverage	No coverage	No coverage
Latvia	No coverage	No coverage	No coverage
Lithuania	No coverage	No coverage	No coverage
Mali	No coverage	No coverage	No coverage
Mexico	No coverage	No coverage	No coverage
Mongolia	No coverage	No coverage	No coverage
Montenegro	No coverage	No coverage	No coverage
Namibia	No coverage	No coverage	No coverage
Netherlands	No coverage	Private insurance	National health plan Private insurance
New Zealand	National health plan	National health plan	National health plan
Nicaragua	No coverage	No coverage	No coverage
Nigeria	No coverage	No coverage	No coverage
Norway	National health plan	No coverage	No coverage
Panama	No coverage	No coverage	No coverage
Paraguay	No coverage	No coverage	No coverage
Peru	No coverage		No coverage
Philippines	No coverage		No coverage
Poland	No coverage	No coverage	No coverage
Portugal	National health plan	National health plan	National health plan
Romania	No coverage	No coverage	No coverage
Russian Federation	No coverage	No coverage	No coverage
Senegal	Unknown	Unknown	Unknown
Serbia	No coverage	No coverage	No coverage
Singapore	No coverage	National health plan	National health plan
Slovenia	National health plan	National health plan	No coverage
South Africa	No coverage	No coverage	No coverage
The Republic of Korea	No coverage	No coverage	No coverage
Spain	National health plan State/Provincial/ Regional health plan Private insurance	National health plan State/Provincial/ Regional health plan Private insurance	No coverage
Sri Lanka	No coverage	No coverage	No coverage
Sweden	National health plan	National health plan	National health plan
Switzerland	No coverage	No coverage	No coverage
Taiwan (China*)	No coverage	No coverage	No coverage
Thailand	No coverage	No coverage	No coverage
Togo	No coverage	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage	No coverage
Tunisia	No coverage	No coverage	No coverage
Turkey	No coverage	No coverage	No coverage
Uganda	Unknown	Unknown	Unknown
United Arab Emirates	No coverage	No coverage	No coverage
UK	State/Provincial/ Regional health plan	State/Provincial/ Regional health plan	State/Provincial/ Regional health plan
USA	No coverage	No coverage	No coverage
Uruguay	National health plan	National health plan	National health plan
Venezuela	No coverage	No coverage	No coverage
Viet Nam	No coverage	No coverage	No coverage
Zimbabwe	No coverage	No coverage	No coverage

*Reporting separately for this report.

States of America and United Kingdom of Great Britain and Northern Ireland, to 2 years in Romania and 3 in Turkey (Chart 6).

In 40 reporting countries, 3 replies (8%) indicate that reimbursement for ART is contingent upon personal income: Japan, The Republic of Korea and the United Arab Emirates. The 2015 survey listed only 3 of 35 responding countries (9%) with this contingency: Canada, Italy, and The Republic of Korea.

In 40 reporting countries, 9 replies (22.5%) indicate that reimbursement for ART is contingent upon the number of embryos transferred. The 9 countries are Australia, Belgium, Canada, Czechia, Iceland, Israel, Netherlands, Turkey and The United States of America. The 2015 survey listed only 7 of 38 responding countries (18%) with this contingency: Belgium, Canada, Czechia, Israel, Netherlands, Turkey and The United States of America.

Chapter 3. Table 3f

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

Country	Traditional Surrogacy	Gestational Surrogacy Using Donated Ova and Commissioning Male's Sperm	Gestational Surrogacy Using Commissioning Couples' Ova and Sperm	Gestational Surrogacy Using Donated Ova and Donated Sperm
Argentina	No coverage	No coverage	No coverage	No coverage
Australia	No coverage	No coverage	No coverage	No coverage
Austria	No coverage	No coverage	No coverage	No coverage
Bangladesh	No coverage	No coverage	No coverage	No coverage
Belarus	No coverage	No coverage	No coverage	No coverage
Belgium	Unknown	Unknown	Unknown	Unknown
Bolivia	No coverage	No coverage	No coverage	No coverage
Botswana	No coverage	No coverage	No coverage	No coverage
Brazil	No coverage	No coverage	No coverage	No coverage
Bulgaria	No coverage	No coverage	No coverage	No coverage
Burkina Faso	No coverage	No coverage	No coverage	No coverage
Cameroon	No coverage	No coverage	No coverage	Private insurance
Canada	Unknown	Unknown	Unknown	Unknown
Chile	No coverage	No coverage	No coverage	No coverage
China	No coverage	No coverage	No coverage	No coverage
Colombia	No coverage	No coverage	No coverage	No coverage
Congo	No coverage	No coverage	No coverage	No coverage
Côte d'Ivoire	No coverage	No coverage	No coverage	No coverage
Czechia	No coverage	No coverage	No coverage	No coverage
El Salvador	No coverage	No coverage	No coverage	No coverage
Finland	No coverage	No coverage	No coverage	No coverage
France	No coverage	No coverage	No coverage	No coverage
Georgia	No coverage	No coverage	No coverage	No coverage
Germany	No coverage	No coverage	No coverage	No coverage
Ghana	No coverage	No coverage	No coverage	No coverage
Greece	No coverage	No coverage	No coverage	No coverage
Guatemala	No coverage	No coverage	No coverage	No coverage
Hong Kong (China*)	No coverage	No coverage	No coverage	No coverage
Hungary	No coverage	National health plan	No coverage	No coverage
Iceland	No coverage	No coverage	No coverage	No coverage
India	No coverage	No coverage	No coverage	No coverage
Ireland	No coverage	No coverage	No coverage	No coverage
Israel	No coverage	No coverage	No coverage	No coverage
Italy	No coverage	No coverage	No coverage	No coverage
Jordan	No coverage	No coverage	No coverage	National health plan No coverage
Kazakhstan	No coverage	No coverage	No coverage	No coverage
Kenya	No coverage	No coverage	No coverage	No coverage
Latvia	No coverage	No coverage	No coverage	No coverage
Lithuania	No coverage	No coverage	No coverage	No coverage
Mali	No coverage	No coverage	No coverage	No coverage
Mexico	No coverage	No coverage	No coverage	No coverage
Mongolia	No coverage	No coverage	No coverage	No coverage
Montenegro	No coverage	No coverage	No coverage	No coverage
Namibia	No coverage	No coverage	No coverage	No coverage
Netherlands	No coverage	No coverage	No coverage	No coverage
New Zealand	National health plan	National health plan	National health plan	National health plan
Nicaragua	No coverage	No coverage	No coverage	No coverage
Nigeria	No coverage	No coverage	No coverage	No coverage
Norway		No coverage	No coverage	No coverage

Chapter 3. Table 3f

(*Continued*)

Country	Traditional Surrogacy	Gestational Surrogacy Using Donated Ova and Commissioning Male's Sperm	Gestational Surrogacy Using Commissioning Couples' Ova and Sperm	Gestational Surrogacy Using Donated Ova and Donated Sperm
Panama	No coverage	No coverage	No coverage	No coverage
Paraguay	No coverage		No coverage	No coverage
Peru	No coverage	No coverage	No coverage	No coverage
Philippines	No coverage	No coverage	No coverage	No coverage
Poland	No coverage	No coverage	No coverage	No coverage
Portugal	National health plan	National health plan	National health plan	National health plan
Romania	No coverage	No coverage	No coverage	No coverage
Russian Federation	No coverage	No coverage	No coverage	No coverage
Senegal	Private insurance	Private insurance	Private insurance	No coverage
Serbia	No coverage	No coverage	No coverage	No coverage
Singapore	No coverage	No coverage	No coverage	No coverage
Slovenia	No coverage	No coverage		No coverage
South Africa	No coverage	No coverage	No coverage	No coverage
The Republic of Korea	No coverage	No coverage	No coverage	No coverage
Spain	No coverage	No coverage	No coverage	No coverage
Sri Lanka	No coverage	No coverage	No coverage	
Sweden	No coverage	No coverage	No coverage	No coverage
Switzerland	No coverage	No coverage	No coverage	No coverage
Taiwan (China*)	No coverage	No coverage	No coverage	No coverage
Thailand	No coverage	No coverage	No coverage	No coverage
Togo	No coverage	No coverage	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage	No coverage	No coverage
Tunisia	National health plan Private insurance	National health plan Private insurance	National health plan Private insurance	National health plan Private insurance
Turkey	No coverage	No coverage	No coverage	No coverage
Uganda	Unknown	Unknown	Unknown	Unknown
United Arab Emirates	No coverage	No coverage	No coverage	No coverage
UK	No coverage	No coverage	No coverage	No coverage
USA	No coverage	No coverage	No coverage	No coverage
Uruguay	National health plan	National health plan	National health plan	No coverage
Venezuela	No coverage	No coverage	No coverage	No coverage
Viet Nam	No coverage	No coverage	No coverage	No coverage
Zimbabwe	No coverage	No coverage	No coverage	No coverage

*Reporting separately for this report.

Regarding a limit on the number of cycles covered by insurance, out of 39 countries surveyed, 36 (92%) responded. Australia, Israel, and the Russian Federation do not limit the number of cycles for reimbursement. Canada, Chile, Kenya, New Zealand, Romania, Senegal, Tunisia, and United Arab Emirates

Chapter 3. Table 3g

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

	Cryopreservation for Fertility Preservation for Medical Indications				
Country	**Oocytes**	**Sperm**	**Embryos**	**Testicular Tissue**	**Ovarian Tissue**
Argentina	National health plan State/Provincial/ Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	No coverage
Australia	No coverage	No coverage	No coverage	National health plan Private insurance	National health plan Private insurance
Austria	No coverage	No coverage	No coverage	No coverage	No coverage
Bangladesh	No coverage	No coverage	No coverage	No coverage	No coverage
Barbados	No coverage	No coverage	No coverage	No coverage	No coverage
Belarus	No coverage	No coverage	No coverage	No coverage	No coverage
Belgium	Unknown	Unknown	Unknown	Unknown	Unknown
Bolivia	No coverage	No coverage	No coverage	No coverage	No coverage
Botswana	No coverage	No coverage	No coverage	No coverage	No coverage
Brazil	No coverage	No coverage	No coverage	No coverage	No coverage
Bulgaria	National health plan	No coverage	No coverage	No coverage	No coverage
Burkina Faso	No coverage	No coverage	No coverage	No coverage	No coverage
Cameroon	No coverage	No coverage	No coverage	No coverage	No coverage
Canada	National health plan	National health plan	National health plan	National health plan	Unknown
Chile	No coverage	No coverage	No coverage	No coverage	No coverage
China	No coverage	No coverage	No coverage	No coverage	No coverage
Colombia	No coverage	No coverage	No coverage	No coverage	No coverage
Congo	No coverage	No coverage	No coverage	No coverage	No coverage
Côte d'Ivoire	No coverage	No coverage	No coverage	No coverage	No coverage
Czechia	No coverage	National health plan	No coverage	No coverage	No coverage
El Salvador	No coverage	No coverage	No coverage	No coverage	No coverage
Finland	National health plan	National health plan	National health plan	National health plan	National health plan
France	National health plan	National health plan	National health plan	National health plan	National health plan
Georgia	No coverage	No coverage	No coverage	No coverage	No coverage
Germany	No coverage	No coverage	No coverage	No coverage	No coverage
Ghana	No coverage	No coverage	No coverage	No coverage	No coverage
Greece	No coverage	No coverage	No coverage	No coverage	No coverage
Guatemala	No coverage	No coverage	No coverage	No coverage	No coverage
Hong Kong (China*)	No coverage	No coverage	No coverage	No coverage	No coverage
Hungary	No coverage	No coverage	No coverage	No coverage	No coverage
Iceland	No coverage	No coverage	National health plan	No coverage	No coverage
India	No coverage	No coverage	No coverage	No coverage	No coverage
Ireland	Private insurance	Private insurance	National health plan Private insurance	No coverage	No coverage
Israel	National health plan	National health plan	National health plan	National health plan	National health plan
Italy	State/Provincial/Regional health plan	State/Provincial/Regional health plan	No coverage	No coverage	State/Provincial/Regional health plan
Jordan	No coverage	No coverage		No coverage	No coverage
Kazakhstan	No coverage	No coverage	No coverage	No coverage	No coverage
Kenya	No coverage	No coverage	No coverage	No coverage	No coverage
Latvia	No coverage	No coverage	No coverage	No coverage	No coverage
Lithuania	No coverage	No coverage	No coverage	No coverage	No coverage
Mali	No coverage	No coverage	No coverage	No coverage	No coverage
Mexico	No coverage	No coverage	No coverage	No coverage	No coverage
Mongolia	No coverage	No coverage	No coverage	No coverage	No coverage
Montenegro	No coverage	No coverage	No coverage	No coverage	No coverage
Namibia	No coverage	No coverage	No coverage	No coverage	No coverage
Netherlands	National health plan Private insurance	National health plan Private insurance	National health plan Private insurance	No coverage	No coverage
New Zealand	National health plan	National health plan	National health plan	National health plan	No coverage
Nicaragua	No coverage	No coverage	No coverage	No coverage	No coverage
Nigeria	No coverage	No coverage	No coverage	No coverage	No coverage
Norway	National health plan	National health plan	National health plan	Unknown	National health plan
Panama	No coverage	No coverage	No coverage	No coverage	No coverage
Paraguay	No coverage	No coverage	No coverage	No coverage	No coverage
Peru	No coverage	No coverage	No coverage	No coverage	No coverage
Philippines	No coverage	No coverage	No coverage	No coverage	No coverage

Chapter 3. Table 3g

(*Continued*)

	Cryopreservation for Fertility Preservation for Medical Indications				
Country	**Oocytes**	**Sperm**	**Embryos**	**Testicular Tissue**	**Ovarian Tissue**
Poland	No coverage	No coverage	No coverage	No coverage	No coverage
Portugal	National health plan	National health plan	National health plan	National health plan	National health plan
Romania	No coverage	No coverage	No coverage	No coverage	No coverage
Russian Federation	No coverage	No coverage	No coverage	No coverage	No coverage
Senegal	Unknown	Private insurance No coverage	Private insurance No coverage	Private insurance No coverage	Unknown
Serbia	No coverage	No coverage	No coverage	No coverage	No coverage
Singapore	No coverage	No coverage	National health plan	No coverage	No coverage
Slovenia	National health plan	National health plan	National health plan	National health plan	National health plan
South Africa	No coverage	No coverage	No coverage	No coverage	No coverage
The Republic of Korea	No coverage	No coverage	No coverage	No coverage	No coverage
Spain	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance	National health plan State/Provincial/Regional health plan Private insurance
Sri Lanka	No coverage	No coverage	No coverage	No coverage	No coverage
Sweden	National health plan	National health plan	National health plan	National health plan	National health plan
Switzerland	No coverage	No coverage	No coverage	No coverage	No coverage
Taiwan (China*)	No coverage	No coverage	No coverage	No coverage	No coverage
Thailand	No coverage	No coverage	No coverage	No coverage	No coverage
Togo	No coverage	No coverage	No coverage	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage	No coverage	No coverage	No coverage
Tunisia	No coverage	No coverage	No coverage	No coverage	No coverage
Turkey	National health plan	National health plan	National health plan	National health plan	National health plan
Uganda	Unknown	Unknown	Unknown	Unknown	Unknown
UAE	Private insurance	Private insurance	Private insurance	Private insurance	Private insurance
UK	State/Provincial/Regional health plan	State/Provincial/Regional health plan	State/Provincial/Regional health plan	No coverage	No coverage
USA	Private insurance	Private insurance	Private insurance	Private insurance	Private insurance
Uruguay	No coverage	No coverage	National health plan	National health plan	No coverage
Venezuela	No coverage	No coverage	No coverage	No coverage	No coverage
Viet Nam	No coverage	No coverage	No coverage	No coverage	No coverage
Zimbabwe	No coverage	No coverage	No coverage	No coverage	No coverage

*Reporting separately for this report.

Chapter 3. Table 3h

If there are programs for coverage or reimbursement of ART services, which of the following do they include?

	Cryopreservation for Fertility Preservation for Nonmedical Indications				
Country	**Oocytes**	**Sperm**	**Embryos**	**Testicular Tissue**	**Ovarian Tissue**
Argentina	No coverage	No coverage	No coverage	No coverage	No coverage
Australia	No coverage	No coverage	No coverage	No coverage	No coverage
Austria	No coverage	No coverage	No coverage	No coverage	No coverage
Bangladesh	No coverage	No coverage	No coverage	No coverage	No coverage
Barbados	No coverage	No coverage	No coverage	No coverage	No coverage
Belarus	No coverage	No coverage	No coverage	No coverage	No coverage
Belgium	Unknown	Unknown	Unknown	Unknown	Unknown
Bolivia	No coverage	No coverage	No coverage	No coverage	No coverage
Botswana	No coverage	No coverage	No coverage	No coverage	No coverage
Brazil	No coverage	No coverage	No coverage	No coverage	No coverage
Bulgaria	No coverage	No coverage	No coverage	No coverage	No coverage
Burkina Faso	No coverage	No coverage	No coverage	No coverage	No coverage
Cameroon	No coverage	No coverage	No coverage	No coverage	No coverage
Canada	Private insurance	Private insurance	Private insurance	Private insurance	Unknown
Chile	No coverage	No coverage	No coverage	No coverage	No coverage
China	No coverage	No coverage	No coverage	No coverage	No coverage
Colombia	No coverage	No coverage	No coverage	No coverage	No coverage

Chapter 3. Table 3h

(Continued)

	Cryopreservation for Fertility Preservation for Nonmedical Indications				
Country	**Oocytes**	**Sperm**	**Embryos**	**Testicular Tissue**	**Ovarian Tissue**
Congo	No coverage	No coverage	No coverage	No coverage	No coverage
Côte d'Ivoire	No coverage	No coverage	No coverage	No coverage	No coverage
Czechia	No coverage	No coverage	No coverage	No coverage	No coverage
El Salvador	No coverage	No coverage	No coverage	No coverage	No coverage
Finland	No coverage	No coverage	No coverage	No coverage	No coverage
France	No coverage	National health plan	No coverage	No coverage	No coverage
Georgia	No coverage	No coverage	No coverage	No coverage	No coverage
Germany	No coverage	No coverage	No coverage	No coverage	No coverage
Ghana	No coverage	No coverage	No coverage	No coverage	No coverage
Greece	No coverage	No coverage	No coverage	No coverage	No coverage
Guatemala	No coverage	No coverage	No coverage	No coverage	No coverage
Hong Kong (China*)	No coverage	No coverage	No coverage	No coverage	No coverage
Hungary	No coverage	No coverage	No coverage	No coverage	No coverage
Iceland	No coverage	No coverage	National health plan	No coverage	No coverage
India	No coverage	No coverage	No coverage	No coverage	No coverage
Ireland	Private insurance	Private insurance	Private insurance	No coverage	No coverage
Israel	Private insurance	Private insurance	Private insurance	Private insurance	Private insurance
Italy	No coverage	No coverage	No coverage	State/Provincial/Regional health plan	No coverage
Jordan	No coverage	No coverage	No coverage	No coverage	No coverage
Kazakhstan	No coverage	No coverage	No coverage	No coverage	No coverage
Kenya	No coverage	No coverage	No coverage	No coverage	
Latvia	No coverage	No coverage	No coverage	No coverage	No coverage
Lithuania	No coverage	No coverage	No coverage	No coverage	No coverage
Mali	No coverage	No coverage	No coverage	No coverage	No coverage
Mexico	No coverage	No coverage	No coverage	No coverage	No coverage
Mongolia	No coverage	No coverage	No coverage	No coverage	No coverage
Montenegro	No coverage	No coverage	No coverage	No coverage	No coverage
Namibia	No coverage	No coverage	No coverage	No coverage	No coverage
Netherlands	No coverage	No coverage	No coverage	No coverage	No coverage
New Zealand	No coverage	No coverage	No coverage	No coverage	No coverage
Nicaragua	No coverage	No coverage	No coverage	No coverage	No coverage
Nigeria	No coverage	No coverage	No coverage	No coverage	No coverage
Norway	No coverage	No coverage	No coverage	Unknown	No coverage
Panama	No coverage	No coverage	No coverage	No coverage	No coverage
Paraguay	No coverage	No coverage	No coverage	No coverage	No coverage
Peru	No coverage	No coverage	No coverage	No coverage	No coverage
Philippines	No coverage	No coverage	No coverage	No coverage	No coverage
Poland	No coverage	No coverage	No coverage	No coverage	No coverage
Portugal	Unknown	Unknown	Unknown	Unknown	Unknown
Romania	No coverage	No coverage	No coverage	No coverage	No coverage
Russian Federation	No coverage	No coverage	No coverage	No coverage	No coverage
Senegal	Unknown	Private insurance No coverage	Private insurance No coverage	Private insurance No coverage	Unknown
Serbia	No coverage	No coverage	No coverage	No coverage	No coverage
Singapore	No coverage	No coverage	No coverage	No coverage	No coverage
Slovenia	No coverage	No coverage	No coverage	National health plan	No coverage
South Africa	No coverage	No coverage	No coverage	No coverage	No coverage
The Republic of Korea	No coverage	No coverage	No coverage	No coverage	No coverage
Spain	No coverage	No coverage	No coverage	No coverage	No coverage
Sri Lanka	No coverage	No coverage	No coverage	No coverage	No coverage
Sweden	No coverage	No coverage	No coverage	No coverage	No coverage
Switzerland	No coverage	No coverage	No coverage	No coverage	No coverage
Taiwan (China*)	No coverage	No coverage	No coverage	No coverage	No coverage
Thailand	No coverage	No coverage	No coverage	No coverage	No coverage
Togo	No coverage	No coverage	No coverage	No coverage	No coverage
Trinidad and Tobago	No coverage	No coverage	No coverage	No coverage	No coverage
Tunisia	No coverage	No coverage	No coverage	No coverage	No coverage
Turkey	No coverage	No coverage	No coverage	No coverage	No coverage
Uganda	Unknown	Unknown	Unknown	Unknown	Unknown
United Arab Emirates	Unknown	Private insurance	Unknown	Private insurance	Unknown
UK	No coverage	No coverage	No coverage	No coverage	No coverage

Chapter 3. Table 3h

(Continued)

Country	Cryopreservation for Fertility Preservation for Nonmedical Indications				
	Oocytes	**Sperm**	**Embryos**	**Testicular Tissue**	**Ovarian Tissue**
USA	Private insurance	Private insurance	Private insurance	Private insurance	Private insurance
Uruguay	No coverage	No coverage	National health plan	No coverage	No coverage
Venezuela	No coverage	No coverage	No coverage	No coverage	No coverage
Viet Nam	No coverage	No coverage	No coverage	No coverage	No coverage
Zimbabwe	No coverage	No coverage	No coverage	No coverage	No coverage

*Reporting separately for this report.

reimbursed 1 cycle only; and Belgium, Japan, Singapore, and The United States of America provide up to 6 reimbursed treatments.

In 2015, no country reported reimbursement for cryopreservation of either oocyte or ovarian tissue for non-medical reasons. But in 2018, Canada, Ireland, Israel, and The United States of America reported private insurance covering oocyte cryopreservation. Israel and some American insurers covered ovarian tissue cryopreservation for non-medical indications. Of note, elective ("non-medically indicated") sperm cryopreservation is covered in Canada, France, Ireland, Israel, Senegal, United Arab Emirates; and support for non-medically indicated testicular tissue cryopreservation is offered in Canada, Israel, Senegal, Slovenia, The United States of America, and United Arab Emirates.

Discussion

In the 2018 questionnaire, 85 countries were surveyed about funding for infertility treatment; 40 (47%) replied that some funding was available. As the tables attest, considerable international variation exists in the level of support available and requirements for obtaining it.

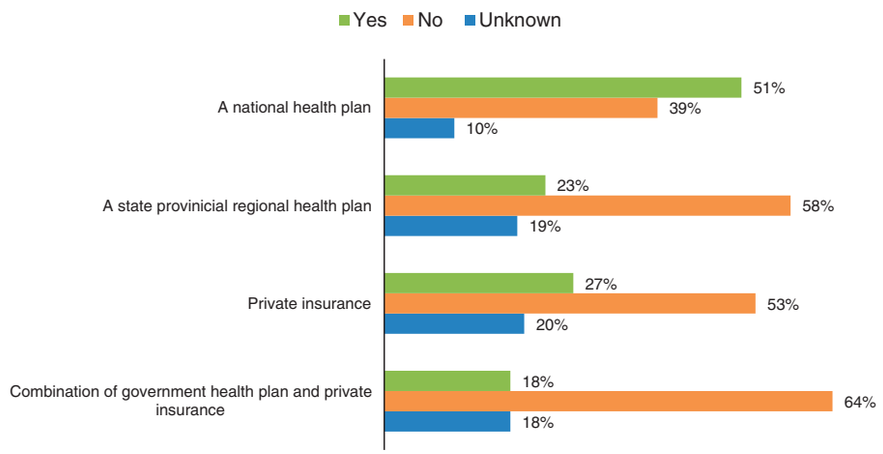
Minimal change was noted in the number of countries mandating single embryo transfer (eSET), or otherwise limiting the number of embryos transferred (see Chapter 5). The policy for ART reimbursement for the same policy increased 18% in 2015, and 23% in 2018. Multiple subsequent pregnancies resulting from transfer of an inappropriate number of embryos has long been recognized as the most significant complication of ART. The small number of positive responses to the question of multiple embryo transfer may, in part, reflect other mechanisms or sanctions already in place, addressing the problem. But it also suggests that the problem remains significant, and offers considerable room for improvement.

In contrast, support for genetic testing of embryos, both PGT-M and PGT-A, seems to have increased, but there has been little change in funding support for either (14 responses out of 83 for PGT-M [17%]; 5 responses out of 81 for PGT-A [6%]). Modest progress has been made for funding non-medical cryopreservation.

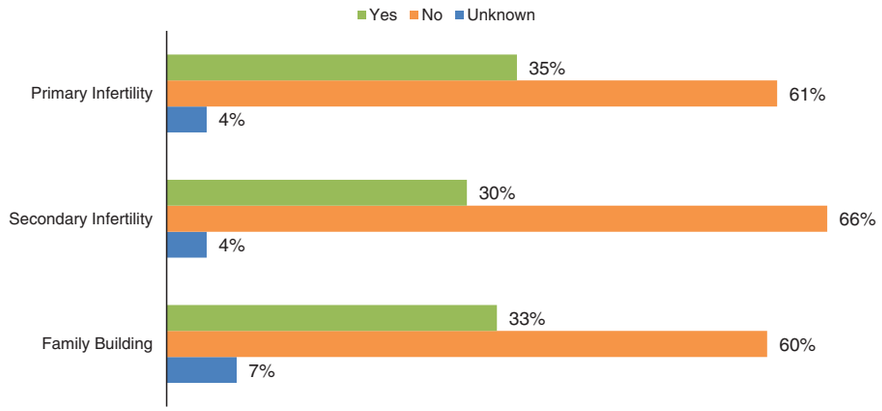
While current data may be more reliable, due to the familiarity and greater experience with the survey of many of the respondents, caution should be taken when interpreting the data. There are limitations in the completeness and accessibility of the data included.

Summary

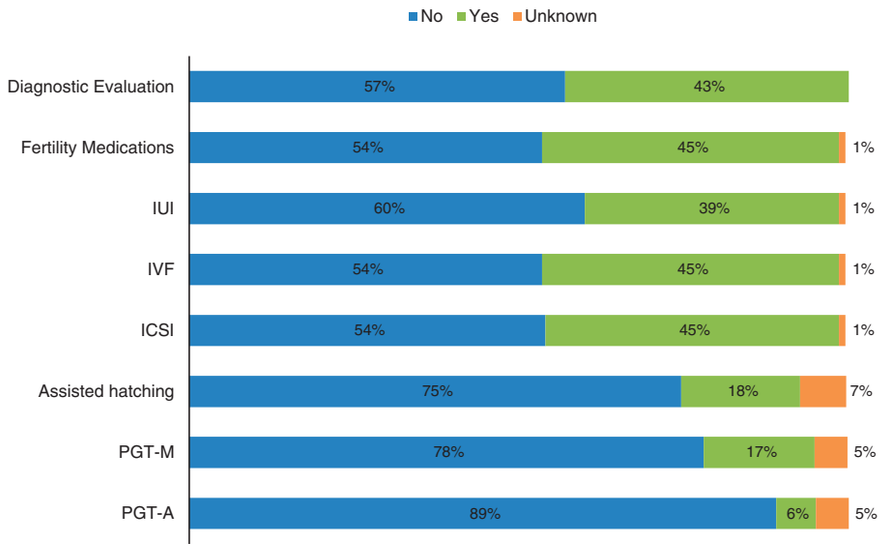
A minority of countries provide insurance coverage for ART. Only 47% give any support for infertility therapy. To date, genetic screening appears to have greater support, but no significant changes have occurred in the proportion of countries that tie reimbursement to number of embryos transferred.



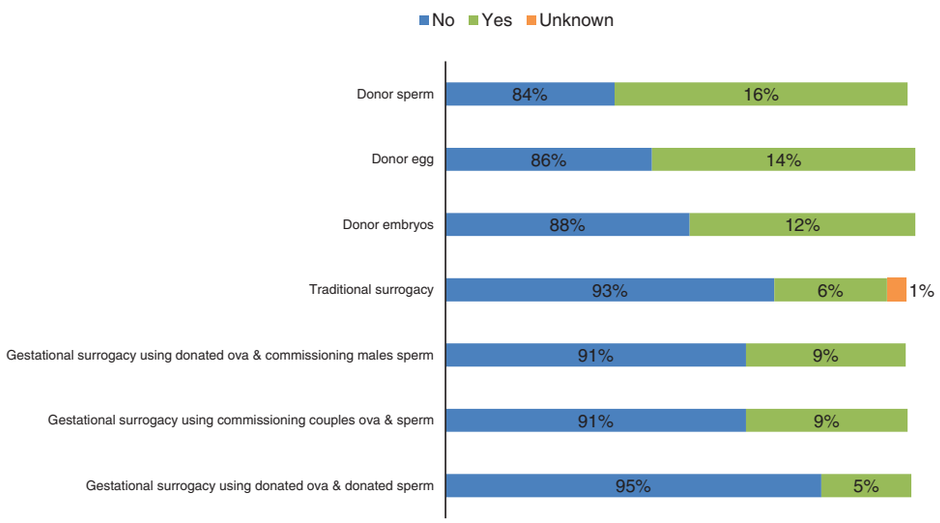
Chapter 3. Chart 1. What type of coverage or reimbursement?



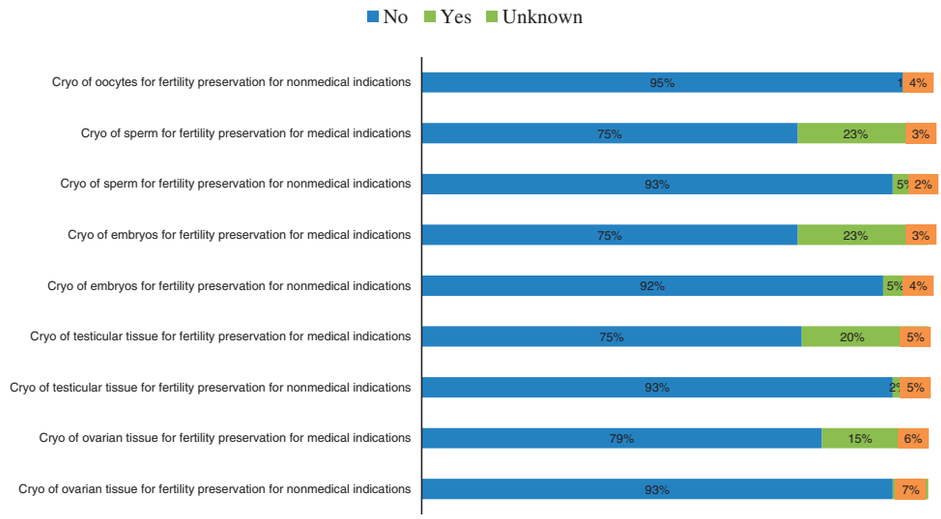
Chapter 3. Chart 2. What is coverage or reimbursement based on?



Chapter 3. Chart 3. What does insurance coverage or government funding cover?



Chapter 3. Chart 4. What does insurance coverage or government funding cover?



Chapter 3. Chart 5. What does insurance coverage or government funding cover?

Chapter 3. Table 4a

Does insurance coverage or government funding typically cover the following ART services?

Country	Diagnostic Evaluation	Fertility Medications	Intrauterine Insemination	IVF	ICSI	Assisted Hatching
Argentina	Yes	Yes	Yes	Yes	Yes	Yes
Armenia	No	No	No	No		No
Australia	Yes	Yes	Yes	Yes	Yes	Unknown
Austria	No	Yes	No	Yes	Yes	No
Bangladesh	No	No	No	No	No	No
Barbados	No	No	No	No	No	No
Belarus	Yes	No	No	No	No	No
Belgium	Yes	Yes	Yes	Yes	Yes	Unknown
Bolivia	No	No	No	No	No	No
Botswana	Yes	No	No	No	No	No
Brazil	Yes	No	No	No	No	No
Bulgaria	No	Yes	No	Yes	Yes	No
Burkina Faso	Yes	No	No	No	No	No
Cameroon	Yes	No	No	No	No	No
Canada	Yes	No	Yes	Yes	Yes	No
Chile	Yes	Yes	Yes	Yes	Yes	No
China	No	No	No	No	No	No
Colombia	No	No	No	No	No	No
Czechia	Yes	Yes	Yes	Yes	No	No
Congo	No	No	No	No	No	No
Ecuador	Yes	No	No	No	No	No
El Salvador	No	No	No	No	No	No
Finland	Yes	Yes	Yes	Yes	Yes	No
France	Yes	Yes	Yes	Yes	Yes	No
Georgia	No	No	No	No	No	No
Germany	Yes	Yes	Yes	Yes	Yes	No
Greece	No	No	No	No	No	No
Guatemala	No	No	No	No	No	No
Hong Kong (China*)	Yes	Yes	Yes	Yes	Yes	No
Hungary	Yes	Yes	Yes	Yes	Yes	Yes
Iceland	No	Yes	No	Yes	Yes	No
India	No	No	No	No	No	No
Ireland	Yes	Yes	Yes	Yes	Yes	Yes
Israel	Yes	Yes	Yes	Yes	Yes	Yes
Italy	Yes	Yes		No	No	No
Côte d'Ivoire	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
Japan	Yes	Yes	No	Yes	Yes	
Jordan	Yes	No	No	No	No	No

Chapter 3. Table 4a

(Continued)

Country	Diagnostic Evaluation	Fertility Medications	Intrauterine Insemination	IVF	ICSI	Assisted Hatching
Kazakhstan	No	No	No	No	No	No
Kenya	No	No	No	Yes	Yes	Unknown
Latvia	Yes	Yes	Yes	Yes	Yes	No
Lithuania	Yes	Yes	No	Yes	Yes	No
Mali	Yes	Yes	No	No	No	No
Mexico	No	No	No	No	No	No
Mongolia	No	No	No	No	No	No
Montenegro	Yes	Yes	No	Yes	Yes	No
Namibia	Yes	No	No	No	No	No
Netherlands	Yes	Yes	Yes	Yes	Yes	No
New Zealand	Yes	Yes	Yes	Yes	Yes	No
Nicaragua	No	No	No	No	No	No
Nigeria	No	No	No	No	No	No
Norway	Yes	Yes	Yes	Yes	Yes	Unknown
Panama	No	No	Yes	No	No	No
Paraguay	No	No	No	No	No	No
Peru	No	No	No	No	No	No
Philippines	No	No	No	No	No	No
Poland	No	No	No	No	No	No
Portugal	Yes	Yes	Yes	Yes	Yes	Yes
Romania	No	No	No	Yes	Yes	Yes
Russian Federation	Yes	Yes	No	Yes	Yes	Yes
Senegal	Yes	Yes	Yes	Yes	Yes	Unknown
Serbia	Yes	Yes	Yes	Yes	Yes	Yes
Singapore	No	No	Yes	Yes	Yes	Yes
Slovenia	Yes	Yes	Yes	Yes	Yes	No
South Africa	Yes	No	No	No	No	No
The Republic of Korea	Yes	Yes	Yes	Yes	Yes	Yes
Spain	Yes	Yes	Yes	Yes	Yes	Yes
Sri Lanka	No	No	No	No	No	No
Sweden	No	No	Yes	No	No	No
Switzerland	Yes	Yes	Yes	No	No	No
Taiwan (China*)	Yes	No	No	No	No	No
Thailand	No	No	No	No	No	No
Togo	No	No	No	No	No	No
Trinidad and Tobago	No	No	No	No	No	No
Tunisia	Yes	Yes	No	Yes	Yes	Yes
Turkey	Yes	Yes	Yes	Yes	Yes	Yes
Uganda	No	No	No	No	No	No
United Arab Emirates	Yes	Yes	Yes	Yes	Yes	Yes
UK	Yes	Yes	Yes	Yes	Yes	No
USA	Yes	No	No	No	No	No
Uruguay	Yes	Yes	Yes	Yes	Yes	Yes
Venezuela	No	No	No	No	No	No
Viet Nam	No	No	No	No	No	No
Zimbabwe	Yes	Yes	Yes	No	No	No

*Reporting separately for this report.

Chapter 3. Table 4b

Does insurance coverage or government funding typically cover the following ART services?

Country	Cryopreservation of Supernumerary Oocytes from an IVF Cycle	Cryopreservation of Supernumerary Embryos from an IVF Cycle	PGT-M	PGT-A
Argentina	Yes	Yes	No	No
Armenia	No	No	No	No
Australia	No	No	No	No
Austria	No	No	No	No
Bangladesh	No	No	No	No

Chapter 3. Table 4b

(*Continued*)

Country	Cryopreservation of Supernumerary Oocytes from an IVF Cycle	Cryopreservation of Supernumerary Embryos from an IVF Cycle	PGT-M	PGT-A
Barbados	No	No	No	No
Belarus	No	No	No	No
Belgium	Yes	Yes	Unknown	Unknown
Bolivia	No	No	No	No
Botswana	No	No	No	No
Brazil	No	No	No	No
Bulgaria	No	Yes	No	No
Burkina Faso	No	No	No	No
Cameroon	No	No	No	No
Canada	No		No	No
Chile	No	No	No	No
China	No	No	No	No
Colombia	No	No	No	No
Congo	No	No	No	No
Côte d'Ivoire	Unknown	Unknown	No	
Czechia	No	No	Yes	Yes
Ecuador	No	No	No	No
El Salvador	No	No	No	No
Finland	No	Yes	No	No
France	Yes	Yes	No	No
Georgia	No	No	No	No
Germany	No	No	No	No
Greece	No	No	No	No
Guatemala	No	No	No	No
Hong Kong (China*)	No	No	No	No
Hungary	Yes	Yes	No	No
Iceland	No	Yes	No	No
India	No	No	No	No
Ireland	Yes	Yes	Unknown	Unknown
Israel	Yes	Yes	Yes	No
Italy	No	No	No	No
Jordan	No	No	No	No
Kazakhstan	No	No	No	No
Kenya	Yes	Yes	Unknown	Unknown
Latvia	No	Yes	No	No
Lithuania	No	No	Yes	No
Mali	No	No	No	No
Mexico	No	No	No	No
Mongolia	No	No	No	No
Montenegro	No	No	No	No
Namibia	No	No	No	No
Netherlands	Yes	Yes	Yes	No
New Zealand	Yes	Yes	Yes	No
Nicaragua	No	No	No	No
Nigeria	No	No	No	No
Norway	Yes	Yes	Yes	No
Panama	No	No	No	No
Paraguay	No	No	No	No
Peru	No	No	No	No
Philippines	No	No	No	No
Poland	No	No	No	No
Portugal	Yes	Yes	Yes	Yes
Romania	No	No	No	No
Russian Federation	Yes	Yes	No	No
Senegal	Unknown	Unknown	Unknown	Unknown
Serbia	Yes	Yes	Yes	Yes
Singapore	Yes	Yes	Yes	Yes
Slovenia	Yes	Yes	Yes	No
South Africa	No	No	No	No
The Republic of Korea	No	No	No	No

Chapter 3. Table 4b

(*Continued*)

Country	Cryopreservation of Supernumerary Oocytes from an IVF Cycle	Cryopreservation of Supernumerary Embryos from an IVF Cycle	PGT-M	PGT-A
Spain	Yes	Yes	Yes	No
Sri Lanka	No	No	No	No
Sweden	No	No	No	No
Switzerland	No	No	No	No
Taiwan (China*)	No	No	No	No
Thailand	No	No	No	No
Togo	No	No	No	No
Trinidad and Tobago	No	No	No	No
Tunisia	No	No	No	
Turkey	No	Yes	Yes	No
Uganda	No	No	No	No
United Arab Emirates	Yes	Yes	Yes	Yes
UK	No	Yes	Yes	No
USA	No	No	No	No
Uruguay	No	Yes	No	No
Venezuela	No	No	No	No
Viet Nam	No	No	No	No
Zimbabwe	No	No	No	No

*Reporting separately for this report.

Chapter 3. Table 4c

Does insurance coverage or government funding typically cover the following ART services?

Country	Donor Sperm	Donor Egg	Donor Embryos	Traditional Surrogacy	Gestational Surrogacy Using Donated Ova and Commissioning Males' Sperm	Gestational Surrogacy Using Commissioning Couples' Ova and Sperm	Gestational Surrogacy Using Donated Ova and Donated Sperm
Argentina	Yes	Yes	Yes	No	No	No	No
Armenia	No	No	No	No	No	No	No
Australia	Yes	Yes	Yes	No	No	No	No
Austria	No	No	No	No	No	No	No
Bangladesh	No	No	No	No	No	No	No
Barbados	No	No	No	No	No	No	No
Belarus	No	No	No	No	No	No	No
Belgium	Yes	No	No	No	No	No	No
Bolivia	No	No	No	No	No	No	No
Botswana	No	No	No	No	No	No	No
Brazil	No	No	No	No	No	No	No
Bulgaria	No	No	No	No	No	No	No
Burkina Faso	No	No	No	No	No	No	No
Cameroon	No	No	No	No	No	No	No
Canada	No	No	No	Yes	Yes	Yes	Yes
Chile	No	No	No	No	No	No	No
China	No	No	No	No	No	No	No
Colombia	No	No	No	No	No	No	No
Congo	No	No	No	No	No	No	No
Côte d'Ivoire	No	No	No	No	No	No	No
Czechia	No	No	No	No	No	No	No
Ecuador	No	No	No	No	No	No	No
El Salvador	No	No	No	No	No	No	No
Finland	No	No	No	No	No	No	No
France	Yes	Yes	Yes	No	No	No	No
Georgia	No	No	No	No	No	No	No
Germany	No	No	No	No	No	No	No
Greece	No	No	No	No	No	No	No
Guatemala	No	No	No	No	No	No	No

Chapter 3. Table 4c

(*Continued*)

Country	Donor Sperm	Donor Egg	Donor Embryos	Traditional Surrogacy	Gestational Surrogacy Using Donated Ova and Commissioning Males' Sperm	Gestational Surrogacy Using Commissioning Couples' Ova and Sperm	Gestational Surrogacy Using Donated Ova and Donated Sperm
Hong Kong (China*)	No	No	No	No	No	No	No
Hungary	Yes	Yes	Yes	No	Yes	No	No
Iceland	No	No	No	No	No	No	No
India	No	No	No	No	No	No	No
Ireland	No	No	No	No	No	No	No
Israel	No	No	No		No	No	No
Italy	No	No	No	No	No	No	No
Jordan	No	No	No	No	No		No
Kazakhstan	No	No	No	No	No	No	No
Kenya	No	No	No	No	No	No	No
Latvia	No	No	No	No	No	No	No
Lithuania	No	No	No	No	No	No	No
Mali	No	No	No	No	No	No	No
Mexico	No	No	No	No	No	No	No
Mongolia	No	No	No	No	No	No	No
Montenegro	No	No	No				
Namibia	No	No	No	No	No	No	No
Netherlands	Yes	Yes	Yes	Unknown	No	Yes	No
New Zealand	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nicaragua	No	No	No	No	No	No	No
Nigeria	No	No	No	No	No	No	No
Norway	Yes	No	No	No	No	No	No
Panama	No	No	No	No	No	No	No
Paraguay	No	No	No	No	No	No	No
Peru	No	No	No	No	No	No	No
Philippines	No	No	No	No	No	No	No
Poland	No	No	No	No	No	No	No
Portugal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Romania	No	No	No	No	No	No	No
Russian Federation	No	No	No	No	No	No	No
Senegal	No	No	No	No	Yes	Yes	Yes
Serbia	No	No	No	No	No	No	No
Singapore	No	Yes	Yes	No	No	No	No
Slovenia	Yes	Yes	No	No	No	No	No
South Africa	No	No	No	No	No	No	No
The Republic of Korea	No	No	No	No	No	No	No
Spain	Yes	Yes	No	No	No	No	No
Sri Lanka	No	No	No	No	No	No	No
Sweden	No	No	No	No	No	No	No
Switzerland	No	No	No	No	No	No	No
Taiwan (China*)	No	No	No	No	No	No	No
Thailand	No	No	No	No	No	No	No
Togo	No	No	No	No	No	No	No
Trinidad and Tobago	No	No	No	No	No	No	No
Tunisia	No	No	No	Yes	Yes	Yes	No
Turkey	No	No	No	No	No	No	No
Uganda	No	No	No	No	No	No	No
United Arab Emirates	No	No	No	No	No	No	No
UK	Yes	Yes	Yes	No	No	No	No
USA	No	No	No	No	No	No	No
Uruguay	Yes	Yes	Yes	Yes	Yes	Yes	No
Venezuela	No	No	No	No	No	No	No
Viet Nam	No	No	No	No	No	No	No
Zimbabwe	No	No	No	No	No	No	No

*Reporting separately for this report.

Chapter 3. Table 4d

Does insurance coverage or government funding typically cover the following ART services?

	Cryopreservation for Fertility Preservation for Medical Indications					Cryopreservation for Fertility Preservation for Nonmedical Indications				
Country	Oocytes	Sperm	Embryos	Testicular Tissue	Ovarian Tissue	Oocytes	Sperm	Embryos	Testicular Tissue	Ovarian Tissue
Argentina	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Armenia	No	No	No	No	No	No	No	No	No	No
Australia	No	No	No	Yes	Yes	No	No	No	No	No
Austria	No	No	No	No	No	No	No	No	No	No
Bangladesh	No	No	No	No	No	No	No	No	No	No
Barbados	No	No	No	No	No	No	No	No	No	No
Belarus	No	No	No	No	No	No	No	No	No	No
Belgium	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Bolivia	No	No	No	No	No	No	No	No	No	No
Botswana	No	No	No	No	No	No	No	No	No	No
Brazil	No	No	No	No	No	No	No	No	No	No
Bulgaria	Yes	No	No	No	No	No	No	No	No	No
Burkina Faso	No	No	No	No	No	No	No	No	No	No
Cameroon	No	No	No	No	No	No	No	No	No	No
Canada	Yes	Yes	No	Yes	Unknown	No	No	No	No	Unknown
Chile	No	Yes	No	No	No	No	No	No	No	No
China	No	No	No	No	No	No	No	No	No	No
Colombia	No	No	No	No	No	No	No	No	No	No
Congo	No	No	No	No	No	No	No	No	No	No
Côte d'Ivoire	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Czechia	No	Yes	No	No	No	No	No	No	No	No
Ecuador	No	No	No	No	No	No	No	No	No	No
El Salvador	No	No	No	No	No	No	No	No	No	No
Finland	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
France	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No
Georgia	No	No	No	No	No	No	No	No	No	No
Germany	No	No	No	No	No	No	No	No	No	No
Greece	No	No	No	No	No	No	No	No	No	No
Guatemala	No	No	No	No	No	No	No	No	No	No
Hong Kong (China*)	No	No	No	No	No	No	No	No	No	No
Hungary	No	No	No	No	No	No	No	No	No	No
Iceland	No	No	Yes	Yes	Yes	No	No	Yes	No	No
India	No	No	No	No	No	No	No	No	No	No
Ireland	Yes	Yes	Yes	Unknown	Unknown	Yes	Yes	Yes	Unknown	Unknown
Israel	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Italy	No	No	No	No	No	No	No	No	No	No
Jordan	No	No	No	No	No	No	No	No	No	No
Kazakhstan	No	No	No	No	No	No	No	No	No	No
Kenya	No	No	No	No	No	No	No	No	No	No
Latvia	No	No	No	No	No	No	No	No	No	No
Lithuania	No	No	No	No	No	No	No	No	No	No
Mali	No	No	No	No	No	No	No	No	No	No
Mexico	No	No	No	No	No	No	No	No	No	
Mongolia	No	No	No	No	No	No	No	No	No	No
Montenegro	No	No	No	No	No	No	No	No	No	No
Namibia	No	No	No	No	No	No	No	No	No	No
Netherlands	Yes	Yes	Yes	No	No	No	No	No	No	No
New Zealand	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Nicaragua	No	No	No	No	No	No	No	No	No	No
Nigeria	no	No	no	no	no	no	no	no	no	no
Norway	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Panama	No	No	No	No	No	No	No	No	No	No
Paraguay	No	No	No	No	No	No	No	No	No	No
Peru	No	No	No	No	No	No	No	No	No	No
Philippines	No	No	No	No	No	No	No	No	No	No
Poland	No	No	No	No	No	No	No	No	No	No
Portugal	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Romania	No	No	No	No	No	No	No	No	No	No
Russian Federation	No	No	No	No	No	No	No	No	No	No
Senegal	Unknown	Yes	Yes	Yes	Unknown	Unknown	Yes	Yes	Yes	Unknown
Serbia	No	No	No	Unknown	No	No	No	No	Unknown	No
Singapore	No	No	Yes	No	No	No	No	No	No	No
Slovenia	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
South Africa	No	No	No	No	No	No	No	No	No	No
The Republic of Korea	No	No	No	No		No	No	No		
Spain	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Sri Lanka	No	No	No	No	No	No	No	No	No	No
Sweden	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Switzerland	No	No	No	No	No	No	No	No	No	No
Taiwan (China*)	No	No	No	No	No	No	No	No	No	No
Thailand	No	No	No	No	No	No	No	No	No	No
Togo	No	No	No	No	No	No	No	No	No	No
Trinidad and Tobago	No	No	No	No	No	No	No	No	No	No
Tunisia	No	No	No	No	No	No	No	No	No	No

Chapter 3. Table 4d

(*Continued*)

	Cryopreservation for Fertility Preservation for Medical Indications					Cryopreservation for Fertility Preservation for Nonmedical Indications				
Country	**Oocytes**	**Sperm**	**Embryos**	**Testicular Tissue**	**Ovarian Tissue**	**Oocytes**	**Sperm**	**Embryos**	**Testicular Tissue**	**Ovarian Tissue**
Turkey	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Uganda	No	No	No	No	No	No	No	No	No	No
United Arab Emirates	Yes	Yes	Yes	Yes	Yes		Yes	Unknown	Yes	Unknown
UK	Yes	Yes	Yes	No	No	No	No	No	No	No
USA	No	No	No	No	No	No	No	No	No	No
Uruguay	No	No	Yes	Yes	No	No	No	Yes	No	No
Venezuela	No	No	No	No	No	No	No	No	No	No
Viet Nam	No	No	No	No	No	No	No	No	No	No
Zimbabwe	No	No	No	No	No	No	No	No	No	No

*Reporting separately for this report.

Chapter 3. Table 5

Is insurance coverage or government funding based on fertility status?

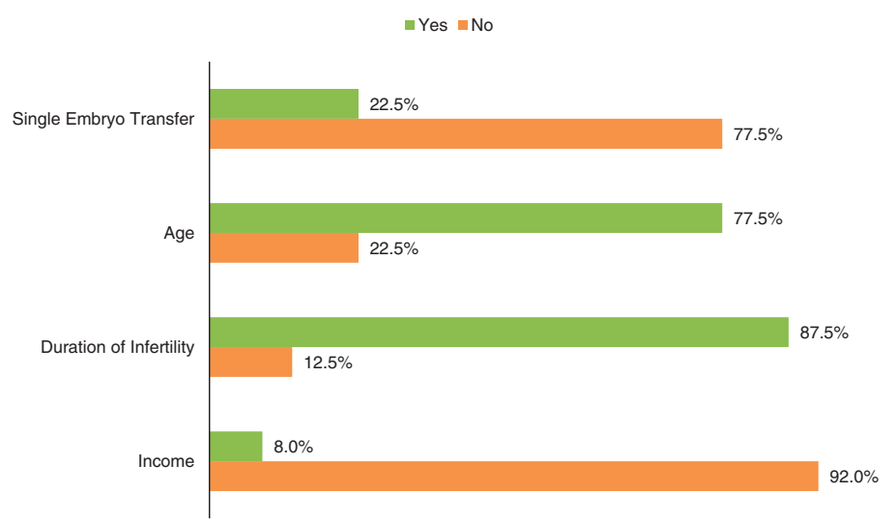
Country	Primary Infertility	Secondary Infertility	Family Building
Argentina	No	No	No
Armenia	No	No	No
Australia	Yes		
Austria	No	No	No
Bangladesh	No	No	No
Barbados	No	No	No
Belarus	No	No	No
Belgium	No	No	No
Bolivia	No	No	No
Brazil	No	No	No
Bulgaria	No	No	No
Burkina Faso	Unknown	Unknown	Unknown
Cameroon	No	No	No
Canada			Yes
Chile	Yes	Yes	Unknown
China	No	No	No
Colombia	No	No	No
Congo	No	No	No
Côte d'Ivoire	Unknown	Unknown	Unknown
Czechia	No	No	No
Ecuador	No	No	No
El Salvador	No	No	No
Finland	Yes	Yes	Yes
France	No	No	Yes
Georgia	No	No	No
Germany	Yes	Yes	Yes
Greece	No	No	No
Hong Kong (China*)	No	No	Yes
Hungary	Yes	Yes	Yes
Iceland	No	No	Yes
India	No	No	No
Ireland	Yes	Yes	Yes
Israel	Yes	Yes	No
Italy	No	No	
Japan	No	No	No
Jordan	No	No	No
Kazakhstan	Yes	Yes	Yes
Kenya	Yes	Yes	Yes
Latvia	Yes	Yes	Unknown
Lithuania	Yes	Yes	No
Mali	No	No	No
Mexico	No	No	No
Mongolia	No	No	No
Montenegro	Yes	Yes	Yes
Namibia	No	No	Yes

Chapter 3. Table 5

(Continued)

Country	Primary Infertility	Secondary Infertility	Family Building
Netherlands	No	No	No
New Zealand	Yes	Yes	Yes
Nicaragua	No	No	No
Nigeria	no	no	no
Norway	No	No	No
Panama	No	No	No
Paraguay	No	No	No
Peru	No	No	No
Philippines	Unknown	Unknown	Unknown
Poland	No	No	
Portugal	No	No	No
Romania	Yes	Yes	Yes
Russian Federation	Yes	Yes	Yes
Senegal	No	No	No
Serbia	Yes	No	Yes
Singapore	Yes	Yes	Yes
Slovenia	Yes	Yes	
South Africa	No	No	No
The Republic of Korea	Yes	Yes	Yes
Spain	Yes	Yes	Yes
Sweden	Yes		
Switzerland	Yes	No	No
Taiwan (China*)	Yes	Yes	Yes
Thailand	No	No	No
Togo	No	No	No
Tunisia	Yes	Yes	Yes
Turkey	Yes	No	No
Uganda	No	No	No
United Arab Emirates	Yes	Yes	Yes
UK	No	No	No
USA	No	No	Yes
Uruguay	Yes	Yes	Yes
Venezuela	No	No	No
Viet Nam	No	No	No
Zimbabwe	Yes	Yes	Yes

*Reporting separately for this report.



Chapter 3. Chart 6. What is coverage or reimbursement based on?

CHAPTER 4: MARITAL STATUS AND SAME SEX AND SINGLE PARENTING POLICY

Introduction

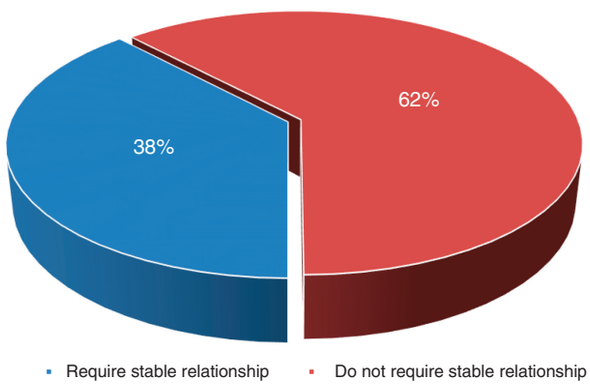
This chapter addresses the availability and governance of ART services as they relate to the marital status of a couple or a person seeking ART.

The survey questions were intended to determine if a requirement existed for a specific type of relationship status (i.e., stable, marital, or heterosexual) to access ART services, and within what kind of relationship these services would be available, if a restriction did exist. Respondents for the individual countries were queried about these issues, and about specific potential limitations for access to ART—limitations pertaining to gender and to male and female same-sex relationships. The survey also evaluated the access of single men, single women, and same-sex couples to specific diagnostic or therapeutic interventions, and assessed the status of a same-sex partner as a legal parent of a resulting child.

Analysis of the survey

Respondents from 84 countries answered—partially or completely—questions pertaining to this chapter. Regarding a requirement for a recognized or stable relationship in order to access ART services, 52 countries (62%) reported having no such requirement; 32 (38%) said that their country did have such a requirement (Chart 1). As for European countries, most responded that they did not require a recognized relationship for ART access; exceptions included Czechia, France, Greece, Hungary, Italy, Lithuania, Montenegro, Romania, Serbia, Slovenia, Sweden, Switzerland, and Turkey—countries with federal laws, statutes, or ordinances backing up the requirement. Other countries not requiring a stable relationship for ART access include Australia, Canada, India, New Zealand, The United States of America, and most Latin American countries.

Most Asian countries do require a stable relationship, and have laws, statutes, or oversight by professional organizations or government agencies with jurisdiction. These countries include China, Hong Kong [China, reporting separately for this report], Singapore, Taiwan [China, reporting separately for this report], Thailand, and Viet Nam. Countries where a stable relationship is mandated by professional organizations, cultural practice, or



Chapter 4. Chart 1. Requirement for a stable or recognized relationship to access ART.

Chapter 4. Table 1a

Access to diagnostic and therapeutic interventions.

Country	Diagnostic Evaluation	Intrauterine Insemination
Argentina	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Armenia	Single Women	Single Women
	Single Men	Single Men
Australia	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Austria	Single Women	Same Sex Female Married Couple
	Single Men	
	Same Sex Female Married Couple	
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Barbados	Single Women	Single Women, Single Men
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	
	Same Sex Male Married Couple	
Belarus	Single Women	Single Women
	Single Men	
Belgium	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	Same Sex Male Married Couple
	Same Sex Male Married Couple	
Bolivia	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Botswana	Single Women	Single Women
	Single Men	
Brazil	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Bulgaria	Single Women	Single Women

Chapter 4. Table 1a

(*Continued*)

Country	Diagnostic Evaluation	Intrauterine Insemination
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Hungary	Single Women	Single Women
Iceland	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	Transgender
	Transgender	Intersex Individuals
	Intersex Individuals	
India	Single Women	Single Women
	Single Men	Single Men
Ireland	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	
	Same Sex Male Married Couple	
Italy	Single Women	Single Women
Japan	Single Women	
	Single Men	
Kazakhstan	Single Women	Single Women
	Single Men	
Kenya	Single Women	Single Women
	Single Men	
Latvia	Single Women	Single Women
	Single Men	
Mali	Single Women	Single Women
	Single Men	
Mexico	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple
Montenegro	Single Women	Single Women
Netherlands	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple
New Zealand	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	Transgender
	Same Sex Male Married Couple	Intersex Individuals
	Transgender	
	Intersex Individuals	
Nigeria	Single Women	Single Women
Norway	Same Sex Female Married Couple	Same Sex Female Married Couple
Panama	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple
Paraguay	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Peru	Single Women	Single Women

Chapter 4. Table 1a

(*Continued*)

Country	Diagnostic Evaluation	Intrauterine Insemination
	Single Men	
Cameroon	Single Women	Single Women
	Single Men	
Canada	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
China	Single Women	
	Single Men	
Colombia	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Congo	Single Women	Intersex Individuals
	Intersex Individuals	
Côte d'Ivoire	Single Women	Single Women
	Single Men	Single Men
Czechia	Single Women	
	Single Men	
Ecuador	Single Women	Single Women
El Salvador	Single Women	Single Women
	Single Men	Single Men
Finland	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Intersex Individuals
	Intersex Individuals	
Georgia	Single Women	Single Women
Germany	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Transgender
	Transgender	Intersex Individuals
	Intersex Individuals	
Ghana	Single Women	
	Single Men	
Greece	Single Women	Single Women
	Single Men	
Guatemala	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Hong Kong (China*)	Single Women	
	Single Men	
	Same Sex Female Married Couple	

Chapter 4. Table 1a

(*Continued*)

Country	Diagnostic Evaluation	Intrauterine Insemination
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	
Philippines	Intersex Individuals	Intersex Individuals
Poland	Single Women	Single Women
	Single Men	
Portugal	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Romania	Single Women	Single Women
	Single Men	
Russian Federation	Single Women	Single Women
Serbia	Single Women	
	Single Men	
Singapore	Single Women	
	Single Men	
	Same Sex Female Married Couple	
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Slovenia	Single Women	
	Single Men	
South Africa	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
The Republic of Korea	Single Women	
	Single Men	
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Spain	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	Transgender
	Transgender	Intersex Individuals
	Intersex Individuals	
Sweden	Single Women	Same Sex Female Married Couple
	Single Men	Same Sex Male Married Couple
	Same Sex Female Married Couple	Transgender
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Switzerland	Single Women	
	Single Men	
Taiwan (China*)	Single Women	
	Single Men	
Togo	Intersex Individuals	Intersex Individuals
Trinidad and Tobago	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Turkey	Single Women	
	Single Men	
Uganda	Single Women	Single Women
	Single Men	Same Sex Female Married Couple
	Same Sex Female Married Couple	
United Arab Emirates	Single Women	
	Single Men	
UK	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
USA	Single Women	Single Women
	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender
	Intersex Individuals	Intersex Individuals
Uruguay	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple
	Transgender	Transgender
Viet Nam	Single Women	Single Women
	Single Men	
	Same Sex Female Married Couple	
	Same Sex Male Married Couple	
	Transgender	
	Intersex Individuals	
Zimbabwe	Single Women	Single Women
	Single Men	Single Men

*Reporting separately for this report.

religious decree, include Bangladesh, Cameroon, Egypt, Japan, the Philippines, Senegal, The Republic of Korea, and United Arab Emirates.

The 52 countries with no requirement for a stable heterosexual union for access to ART were surveyed as to whether services were available for all the categories listed: single men, single women, male and female same-sex couples, and transgender and intersex individuals. Thirteen countries reported access for all, including Argentina, Australia, Barbados, Bolivia, Brazil,

Chapter 4. Table 1b

Access to diagnostic and therapeutic interventions.

Country	IVF	PGT-M	PGT-A
Argentina	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals
Armenia	Single Women Single Men	Single Women Single Men	Single Women Single Men
Australia	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals
Austria	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
Barbados	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple
Belarus	Single Women	Single Women	Single Women
Belgium	Single Women, Same Sex Female Married Couple		
Bolivia	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals
Botswana	Single Women, Single Men	Single Women, Single Men	Single Women
Brazil	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals
Bulgaria	Single Women	Single Women	Single Women
Cameroon	Single Women		
Canada	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals
Colombia	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals
Congo	Intersex Individuals		
Côte d'Ivoire	Single Women, Single Men		
Ecuador	Single Women	Single Women	Single Women
El Salvador	Single Women, Single Men		Single Women, Single Men
Finland	Single Women, Same Sex Female Married Couple, Same Sex Male Married Couple	Single Women, Same Sex Female Married Couple, Same Sex Male Married Couple	Single Women, Same Sex Female Married Couple, Same Sex Male Married Couple
Georgia	Single Women	Single Women	Single Women
Germany	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals
Ghana	Single Women, Single Men	Single Women, Single Men	Single Women, Single Men
Greece	Single Women, Single Men	Single Women, Single Men	Single Women, Single Men
Guatemala	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple
Hungary	Single Women		
Iceland	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals
India	Single Women, Single Men	Single Women, Single Men	Single Women, Single Men
Ireland	Single Women, Same Sex Female Married Couple		
Italy	Intersex Individuals	Intersex Individuals	
Kazakhstan	Single Women	Single Women	Single Women
Kenya	Single Women	Single Women	Single Women
Latvia	Single Women	Single Women	Single Women
Mali	Single Women, Single Men		
Mexico	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple
Montenegro	Single Women	Single Women	Single Women
Netherlands	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple	

Chapter 4. Table 1b

(*Continued*)

Country	IVF	PGT-M	PGT-A
New Zealand	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Same Sex Female Married Couple, Transgender, Intersex Individuals
Nigeria	Single Women	Single Women	
Norway	Same Sex Female Married Couple	Same Sex Female Married Couple	
Panama	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple
Paraguay	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals
Peru	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple
Philippines	Intersex Individuals	Intersex Individuals	Intersex Individuals
Poland	Single Women, Single Men	Single Women	Single Women
Portugal	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple	Single Women, Same Sex Female Married Couple
Romania	Single Women		
Russian Federation	Single Women	Single Women	Single Women
South Africa	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals	Single Women, Single Men, Same Sex Female Married Couple, Same Sex Male Married Couple, Transgender, Intersex Individuals
Spain	Single Women Same Sex Female Married Couple Transgender Intersex Individuals	Single Women Same Sex Female Married Couple Transgender Intersex Individuals	Single Women Same Sex Female Married Couple Transgender Intersex Individuals
Sweden	Same Sex Female Married Couple Same Sex Male Married Couple Transgender	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	
Togo	Intersex Individuals		
Trinidad and Tobago	Single Women Same Sex Female Married Couple Transgender Intersex Individuals		
Uganda	Single Women Same Sex Female Married Couple	Single Women Same Sex Female Married Couple	Single Women Same Sex Female Married Couple
UK	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals
USA	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals	Single Women Single Men Same Sex Female Married Couple Same Sex Male Married Couple Transgender Intersex Individuals
Uruguay	Single Women Same Sex Female Married Couple Transgender	Single Women Same Sex Female Married Couple Transgender	Single Women Same Sex Female Married Couple Transgender
Viet Nam	Single Women	Single Women	Single Women
Zimbabwe	Single Women Single Men	Single Women Single Men	Single Women Single Men

*Reporting separately for this report.

Chapter 4. Table 1c

Access to diagnostic and therapeutic interventions.

Country	Donor Sperm	Donor Egg	Donor Embryos
Argentina	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Armenia	Single Women	Single Women	Single Women
		Single Men	
Australia	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Austria	Same Sex Female Married Couple	Same Sex Female Married Couple	
Barbados	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
		Same Sex Male Married Couple	
Belarus	Single Women	Single Women	Single Women
Belgium	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
Bolivia	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Botswana	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Brazil	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Bulgaria	Single Women	Single Women	Single Women
Canada	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Colombia	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Congo	Intersex Individuals	Intersex Individuals	Intersex Individuals
Côte d'Ivoire	Single Men	Single Women	Single Women, Single Men
Ecuador	Single Women	Single Women	Single Women
El Salvador	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Finland	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
Georgia	Single Women	Single Women	Single Women
Ghana	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Greece	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Guatemala	Single Women	Single Women	Single Women

Chapter 4. Table 1c

(*Continued*)

Country	Donor Sperm	Donor Egg	Donor Embryos
	Same Sex Female Married Couple	Single Men	Single Men
		Same Sex Female Married Couple	Same Sex Female Married Couple
		Same Sex Male Married Couple	Same Sex Male Married Couple
Hungary	Single Women		Single Women
Iceland	Single Women	Single Women	
	Same Sex Female Married Couple Transgender Intersex Individuals	Same Sex Female Married Couple Transgender Intersex Individuals	
India	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Ireland	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
Kazakhstan	Single Women	Single Women	Single Women
Kenya	Single Women	Single Women	Single Women
Latvia	Single Women	Single Women	Single Women
Mali	Single Women	Single Women	Single Women
Mexico	Single Women	Single Women	
	Same Sex Female Married Couple	Same Sex Female Married Couple	
Montenegro	Single Women	Single Women	
Netherlands	Single Women	Single Women	
	Same Sex Female Married Couple	Same Sex Female Married Couple	
New Zealand	Single Women	Single Women	Single Women
	Same Sex Female Married Couple Transgender Intersex Individuals	Single Men	Same Sex Female Married Couple Transgender Intersex Individuals
		Same Sex Female Married Couple	
		Same Sex Male Married Couple Transgender Intersex Individuals	
Nigeria	Single Women	Single Women	Single Women
Norway	Same Sex Female Married Couple		
Panama	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
Paraguay	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple Transgender Intersex Individuals	Same Sex Male Married Couple Transgender Intersex Individuals	Same Sex Male Married Couple Transgender Intersex Individuals
Peru	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
Philippines	Intersex Individuals	Intersex Individuals	Intersex Individuals
Poland	Single Women		
Portugal	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
Romania	Single Women		
Russian Federation	Single Women	Single Women	Single Women
South Africa	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple Transgender Intersex Individuals	Same Sex Male Married Couple Transgender Intersex Individuals	Same Sex Male Married Couple Transgender Intersex Individuals
Spain	Single Women	Single Women	Single Women
	Same Sex Female Married Couple Transgender Intersex Individuals	Same Sex Female Married Couple Transgender Intersex Individuals	Single Men
			Same Sex Female Married Couple Transgender Intersex Individuals
Togo	Intersex Individuals	Intersex Individuals	Intersex Individuals
Trinidad and Tobago	Single Women	Single Women	Single Women
	Same Sex Female Married Couple Transgender Intersex Individuals	Same Sex Female Married Couple Transgender Intersex Individuals	Same Sex Female Married Couple Transgender Intersex Individuals
Uganda	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
UK	Single Women	Single Women	Single Women

Chapter 4. Table 1c

(Continued)

Country	Donor Sperm	Donor Egg	Donor Embryos
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
USA	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Uruguay	Single Women	Single Women	Single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Transgender	Transgender	Transgender
Viet Nam	Single Women		
Zimbabwe	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men

*Reporting separately for this report.

Chapter 4. Table 1d

Access to diagnostic and therapeutic interventions.

Country	Traditional Surrogacy	Gestational Surrogacy Using Donated Ova and Commissioning Persons Sperm	Gestational Surrogacy Using Donated Ova and Donated Sperm
Argentina	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Armenia		Single Women	
		Single Men	
Australia	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Belarus			Single Women
Bolivia	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Botswana	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Brazil		Same Sex Male Married Couple	
Canada	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Colombia	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender

Chapter 4. Table 1d

(***Continued***)

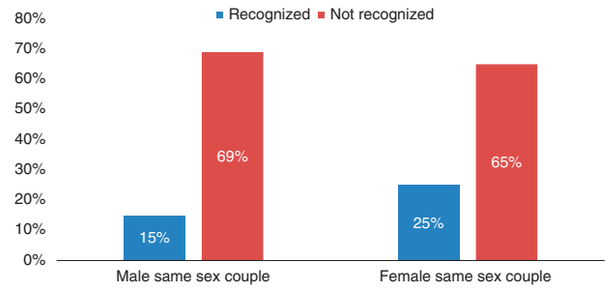
Country	Traditional Surrogacy	Gestational Surrogacy Using Donated Ova and Commissioning Persons Sperm	Gestational Surrogacy Using Donated Ova and Donated Sperm
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Ecuador	Single Women	Single Women	Single Women
El Salvador	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Ghana	Single Men	Single Women	Single Women
		Single Men	Single Men
Greece	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
Guatemala		Single Women	Single Women
		Single Men	Single Men
		Same Sex Female Married Couple	Same Sex Female Married Couple
		Same Sex Male Married Couple	Same Sex Male Married Couple
Kenya	Single Women	Single Women	Single Women
Netherlands	Same Sex Female Married Couple		
New Zealand	Single Men	Single Men	
	Same Sex Female Married Couple	Same Sex Male Married Couple	
	Same Sex Male Married Couple	Transgender	
	Transgender	Intersex Individuals	
	Intersex Individuals		
Nigeria	Single Women	Single Women	Single Women
Philippines	Intersex Individuals	Intersex Individuals	Intersex Individuals
Russian Federation		Single Women	Single Women
South Africa	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Uganda	Single Women, Same Sex Female Married Couple	Single Women	Single Women, Same Sex Female Married Couple
UK	Single Men	Single Men	Single Women
	Same Sex Male Married Couple	Same Sex Male Married Couple	Single Men
	Transgender	Transgender	Same Sex Female Married Couple
	Intersex Individuals	Intersex Individuals	Same Sex Male Married Couple
			Transgender
			Intersex Individuals
USA	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
	Same Sex Male Married Couple	Same Sex Male Married Couple	Same Sex Male Married Couple
	Transgender	Transgender	Transgender
	Intersex Individuals	Intersex Individuals	Intersex Individuals
Uruguay	Single Women	Single Women	single Women
	Same Sex Female Married Couple	Same Sex Female Married Couple	Same Sex Female Married Couple
Zimbabwe	Single Women	Single Women	Single Women
	Single Men	Single Men	Single Men

*Reporting separately for this report.

Canada, Guatemala, Mongolia, New Zealand, Paraguay, South Africa, The United States of America, and the United Kingdom of Great Britain and Northern Ireland. Several countries reported access to single individuals or same-sex couples, but responded "unknown" regarding transgender and intersex individuals; they were Colombia, Namibia, and Venezuela. Germany indicated "unknown" for all categories. Bulgaria, Finland, and the Netherlands responded that access to single men and male same-sex couples was "unknown."

Some countries reported access to ART services for single women or female same-sex couples, but no access for single men and same-sex male couples (Belgium, Ecuador, Iceland, Ireland, Mexico, Peru, Portugal, Trinidad and Tobago, and Uruguay). However, this dichotomy could apply to as many as 52 countries out of 76 (68%) for single males and 60 countries (79%) for male same-sex couples—if the "unknown" responses are included.

The following countries reported access to ART for single women only, and marked the rest of the categories as "no access", or "unknown": Belarus, Cameroon, Guatemala, Congo, Georgia, Hungary, Côte d'Ivoire, Kazakhstan, Kenya, Latvia, Montenegro, Nigeria, Russian Federation, Uganda, and Viet Nam. Finally, 22 countries reported "no access" for anyone not in stable, heterosexual relationships: Bangladesh, Burkina Faso, China, Czechia, Greece, Japan, Jordan, Lithuania, Nicaragua,



Chapter 4. Chart 2. Parenting legal status of the partner of a same sex couple.

Philippines, Romania, Senegal, Serbia, Slovenia, The Republic of Korea, Switzerland, Tunisia, Turkey, and United Arab Emirates.

Access for individuals and same-sex couples to various diagnostic and therapeutic interventions is depicted in Table 1. Nineteen out of 70 countries (27%) reported offering diagnostic evaluation in all categories surveyed (single women, single men, female same-sex couples, male same-sex couples, and intersex and transgender individuals), but only 7 of the 19 offering this service reported access to treatments in all categories. The other 12 of the 19 countries responding provided access to treatment primarily for single women or same-sex female couples; usually they excluded single men, male same-sex couples, and intersex and transgender individuals.

Forty-two countries reported limiting access to diagnostic or therapeutic interventions primarily to single women or female same-sex couples, excluding single men and intersex or transgender individuals. Nine reported access to diagnostic evaluation of single men or women, but no access to any treatment in the other categories described.

The legal parenting status of the partner of a same-sex couple was also surveyed. More than two-thirds of respondents did not recognize a same-sex partner as a legal parent. This was the case both in female same-sex couples, according to 57 of 85 respondents (65%) and in male same-sex couples, according to 58 of 84 respondents (69%). Twenty-one of 85 (25%) recognize the partner as a legal parent in female same-sex couples, but only 13 of 84 (15%) did so in male same-sex couples. Countries in this category include Argentina, Australia, Brazil, Germany, Guatemala, Italy, New Zealand, South Africa, Spain, Sweden, The United States of America, United Kingdom of Great Britain and Northern Ireland, and Uruguay. Another 6 countries responded "unknown" to the question regarding the legal status of the partner of a male same-sex couple: Armenia, Austria, Colombia, Iceland, Netherlands, and Norway. Seven additional countries reported "unknown" for both male and female same-sex couples (Chart 2).

Summary

Most respondents–62%–do not require couples or individuals to have a recognized or stable relationship in order to access ART services. Treatment of single women is more widely accepted and allowed than treatment of single men, according to 51 out of 75 respondents (68%). Treatment for female same-sex couples is better accepted than treatment services for men, according to 24 of 76 respondents, and better accepted than treatment of male same-sex couples, according to 16 out of 76 respondents (21%).

The situation is similar to that of the legal parenting status of the partner of a same-sex couple: it is not recognized in more than two-thirds of the countries surveyed.

CHAPTER 5: NUMBER OF EMBRYOS FOR TRANSFER IN ASSISTED REPRODUCTIVE TECHNOLOGY (ART)

Introduction

As ART professionals celebrated the 40th birthday of Louise Brown, during the summer of 2018, the question of how many embryos to transfer remained controversial. Louise Brown was created from a single retrieved and fertilized oocyte, followed by the first single blastocyst embryo transfer. As ART became more widespread and more accessible, clinicians began to transfer multiple embryos, increasing the chances of a successful pregnancy and delivery. Generally, the number of embryos that could be transferred increased with the woman's age, counteracting the age-related decline in fertility. And now, multiple births have plagued ART for three decades, and have resulted in unacceptably high rates of fetal and maternal complications[1,2]. Multiple pregnancies remain the single greatest risk associated with ART, despite great concern and efforts to reduce this risk, ever since the technique's inception.

The advent of blastocyst culture in the late 1990s allowed many IVF programmes to transfer fewer embryos, yet increase the rates of implantation and pregnancy. Using blastocyst culture and implantation, embryologists were better able to choose good-quality embryos, and to select for transfer a limited number that could generate high implantation rates[3]. Over the last two decades, numerous IVF centres have increased implantation rates for both selected and non-selected patient groups, using blastocyst-stage embryo transfer rather than day-3 embryo transfer. The centres have also reduced the number of high-order multiple pregnancies[4].

Following the success of reducing the incidence of high-order multiple pregnancies, the focus of ART has switched to reducing twin pregnancies. Single embryo transfer (SET) is still meeting some resistance, despite the fact that several countries have legislation or funding restrictions, and despite standard of care guidelines regarding the number of embryos to transfer[5].

Several countries have firm guidelines or regulations mandating SET for women under 40. With the increased utilization of pre-implantation genetic testing, aneuploidy screening in women over 37, and the data suggesting that transferring a single euploid embryo negates age-related infertility, SET has become the standard of care[6].

Analysis of the survey

Four questions were included in the 2018 survey to assess current practices regarding the number of embryos to transfer.

In response to the question: "Are the number of embryos transferred regulated in your country; if so, by what means", 85 responded—a result very similar to the 2016 result of 84 respondents (59%).

Of the 85, 48 countries (56%) confirmed the existence of guidelines or laws governing the number of embryos permitted for transfer. Of 84 responders, 37 (44%) indicated that the number of embryos for transfer was not regulated in their country (Table 1, Chart 1). The majority of the 48 countries that did have

Chapter 5. Table 1

Are the number of embryos transferred regulated in your country and is there a penalty for violation?

Country	Governance	Penalty
Argentina	Professional Organization Standards/Guidelines	No
Armenia	Not regulated	
Australia	Professional Organization Standards/Guidelines	No
Austria	Professional Organization Standards/Guidelines	No
Bangladesh	Not regulated	
Barbados	Not regulated	
Belarus	Federal/National Laws/Statutes/Ordinances	No
Belgium	Federal/National Laws/Statutes/Ordinances	Yes
Bolivia	Not regulated	No
Botswana	Not regulated	
Brazil	Professional Organization Standards/Guidelines	Yes
Bulgaria	Federal/National Laws/Statutes/Ordinances	Yes
Burkina Faso	Not regulated	
Cameroon	State/Provincial/Regional Laws/Statutes/Ordinances Professional Organization Standards/Guidelines	No
Canada	Not regulated	No
Chile	Not regulated	
China	Not regulated Professional Organization Standards/Guidelines Cultural practice	No
Colombia	Not regulated	No
Congo	Not regulated	No
Côte d'Ivoire	Not regulated	Unknown
Czechia	Professional Organization Standards/Guidelines	No
Ecuador	Not regulated	No
Egypt	Not regulated	No
El Salvador	Not regulated	No
Finland	Professional Organization Standards/Guidelines	No
France	Not regulated	No
Georgia	Not regulated	
Germany	Federal/National Laws/Statutes/Ordinances	Unknown
Ghana	Professional Organization Standards/Guidelines	No
Greece	Cultural practice	No
Guatemala	Not regulated	No
Hong Kong (China*)	Federal/National Laws/Statutes/Ordinances State/Provincial/Regional Laws/Statutes/Ordinances	Yes
Hungary	Federal/National Laws/Statutes/Ordinances Professional Organization Standards/Guidelines	Yes
Iceland	Federal/National Laws/Statutes/Ordinances	No
India	Not regulated	
Ireland	Not regulated	Unknown
Italy	Not regulated	No
Japan	Professional Organization Standards/Guidelines	No
Jordan	Not regulated	No
Kazakhstan	Cultural practice	No
Kenya	Not regulated	
Latvia	Federal/National Laws/Statutes/Ordinances	Unknown
Lithuania	Federal/National Laws/Statutes/Ordinances	No
Mali	Not regulated, Professional Organization Standards/Guidelines	No
Mexico	Professional Organization Standards/Guidelines	No
Mongolia	Not regulated	Unknown
Montenegro	Professional Organization Standards/Guidelines	No
Namibia	Professional Organization Standards/Guidelines	No
Netherlands	Federal/National Laws/Statutes/Ordinances Professional Organization Standards/Guidelines	No
New Zealand	Agency Regulations/Oversight Professional Organization Standards/Guidelines Cultural practice	No
Nicaragua	Federal/National Laws/Statutes/Ordinances	Unknown
Nigeria	Professional Organization Standards/Guidelines	Unknown
Norway	Not regulated	No
Panama	Not regulated	No
Paraguay	Not regulated	No
Peru	not regulated	no
Philippines	Not regulated	No
Poland	Professional Organization Standards/Guidelines	No
Portugal	Agency Regulations/Oversight Professional Organization Standards/Guidelines	Yes
Romania	Not regulated	No
Russian Federation	Federal/National Laws/Statutes/Ordinances Professional Organization Standards/Guidelines	Yes
Senegal	Not regulated	Unknown
Serbia	Federal/National Laws/Statutes/Ordinances	No
Singapore	Federal/National Laws/Statutes/Ordinances	Yes
Slovenia	Federal/National Laws/Statutes/Ordinances	Yes
South Africa	Federal/National Laws/Statutes/Ordinances Professional Organization Standards/Guidelines	Yes
The Republic of Korea	Federal/National Laws/Statutes/Ordinances	No
Spain	Federal/National Laws/Statutes/Ordinances	Yes
Sri Lanka	Agency Regulations/Oversight Professional Organization Standards/Guidelines	
Sweden	Federal/National Laws/Statutes/Ordinances	Yes
Switzerland	Federal/National Laws/Statutes/Ordinances	Yes
Taiwan (China*)	Federal/National Laws/Statutes/Ordinances	Yes
Thailand	Professional Organization Standards/Guidelines	No
Togo	Not regulated	No
Trinidad and Tobago	Not regulated	
Tunisia	Not regulated	No
Turkey	Federal/National Laws/Statutes/Ordinances	Yes
Uganda	Not regulated	
United Arab Emirates	Not regulated	
UK	Federal/National Laws/Statutes/Ordinances State/Provincial/Regional Laws/Statutes/Ordinances Agency Regulations/Oversight Professional Organization Standards/Guidelines Cultural practice	Yes
USA	Professional Organization Standards/Guidelines	No
Uruguay	Federal/National Laws/Statutes/Ordinances Agency Regulations/Oversight	Yes
Venezuela	Professional Organization Standards/Guidelines	No
Viet Nam	Not regulated	
Zimbabwe	Not regulated	No

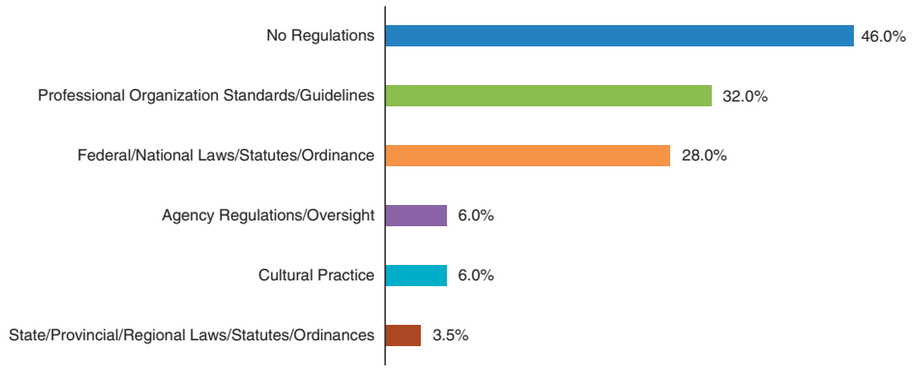
*Reporting separately for this report.

regulations or guidelines (70%) reported being regulated by federal or national laws, statutes, or ordinances (50%), or by the standards or guidelines of professional organizations (46%).

To the query, "If the number of embryos transferred is under governance in your country, is there a penalty for violation?" (Table 1), 49 responded. Seventeen of the 49 (35%) indicated there was a penalty; 26 of the 49 (53%) noted that no penalty existed; 4 (8%) responded "unknown", and one country did not answer.

To the question, "What is the maximum number of embryos allowed to be transferred?" (Table 1), 70 countries had complete answers from respondents, as follows:

- Oocyte age < 35: 7 countries = Limited to 1 embryo, 18 countries = 2 embryos, 15 countries = 3 embryos, 2 countries = 4 embryos, 20 countries = not addressed, and 8 countries responded "unknown";



Chapter 5. Chart 1. How are the number of embryos transferred in your country regulated? (More than one category may have been chosen per country).

Chapter 5. Table 2

What is the maximum number of embryos allowed to be transferred in your country?

Country	Oocyte Age < 35	Oocyte Age 35-39	Oocyte Age > = 40
Argentina	2	2	3
Australia	1	1	1
Austria	2	2	3
Bangladesh	2	Enter max number transferred	4
Belarus	2	3	3
Belgium	1	1	1
Bolivia	Not addressed	Not addressed	Not addressed
Botswana	Not addressed	Not addressed	Not addressed
Brazil	2	3	4
Bulgaria	3	3	4
Burkina Faso	Unknown	Unknown	Unknown
Cameroon	3	3	
Canada	1	1	2
China	2	2	3
Colombia	1	2	2
Congo	Unknown	Unknown	Unknown
Côte d'Ivoire	3	3	2
Czechia	Unknown	Unknown	Unknown
Ecuador	2	3	3
Finland	2	2	2
Georgia	Not addressed	Not addressed	Not addressed
Germany	Unknown	Unknown	Unknown
Ghana	Not addressed	Not addressed	Not addressed
Greece	4	4	4
Guatemala	Not addressed	Not addressed	Not addressed
Hong Kong (China*)	3	3	3
Hungary	3	3	4
Iceland	Not addressed	Not addressed	Not addressed
Italy	Not addressed	Not addressed	Not addressed
Japan	2	2	2
Jordan	Not addressed	Not addressed	Not addressed
Kenya	Not addressed	Not addressed	Not addressed
Latvia	3	3	3
Lithuania	3	3	3
Mali	3	3	3
Mexico	3	3	3

Chapter 5. Table 2

(Continued)

Country	Oocyte Age < 35	Oocyte Age 35-39	Oocyte Age > = 40
Mongolia	Not addressed	Not addressed	Not addressed
Montenegro	Unknown		
Namibia	2	3	3
Netherlands	1	1	2
New Zealand	2	2	3
Nicaragua	3	3	3
Nigeria	2	3	3
Panama	Not addressed	Not addressed	Not addressed
Peru	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Not addressed
Portugal	3	3	Not addressed
Romania	Not addressed	Not addressed	Not addressed
Russian Federation	Not addressed	Not addressed	Not addressed
Serbia	3	3	Unknown
Singapore	2	2	2
Slovenia	2	2	2
South Africa	3	3	3
The Republic of Korea	Unknown	Not addressed	Not addressed
Spain	3	3	3
Sweden	1	1	1
Switzerland	3	3	3
Taiwan (China*)	4	4	4
Thailand	2	2	3
Togo	Not addressed	Not addressed	Not addressed
Trinidad and Tobago	Not addressed	Not addressed	Not addressed
Tunisia	Not addressed	Not addressed	3
Turkey	1	2	2
United Arab Emirates	Not addressed	Not addressed	Not addressed
UK	2	2	3
USA	2	3	5
Uruguay	2	2	2
Venezuela	Not addressed	Not addressed	Not addressed
Viet Nam	Not addressed	Not addressed	Not addressed
Zimbabwe	Not addressed	Not addressed	Not addressed

*Reporting separately for this report.

Chapter 5. Table 3

What is the number of embryos to be transferred based on?

Country	Age of the Donor Recipient	Age of Oocyte Donor	Quality of the Embryos	Stage of the Embryos
Argentina	No	No	No	Yes
Armenia	Yes	Yes	Yes	Yes
Australia	No	No	No	No
Austria	Not addressed	Not addressed	Yes	Yes
Belarus	Yes	Not addressed	Not addressed	Not addressed
Belgium	No	No	No	No
Bolivia	Yes	Yes	Yes	Yes
Botswana	Not addressed	Not addressed	Not addressed	Not addressed
Brazil	No	Yes	Yes	Yes
Bulgaria	Yes	No	No	No
Burkina Faso	Unknown	Yes	Yes	No
Cameroon	Yes	No	Yes	Yes
Canada	No	Yes	No	Yes
China		Yes		
Colombia	Yes	No	Yes	Yes
Congo	Unknown	Unknown	Unknown	Unknown
Côte d'Ivoire	Yes	Yes	Yes	Yes
Czechia	No	No	No	No
Ecuador	Yes	Yes	Yes	Yes
El Salvador	Not addressed	Not addressed	Not addressed	Not addressed
Finland	Yes	No	Yes	Yes
Georgia	Not addressed	Not addressed	Not addressed	Not addressed
Germany	Unknown	Unknown	Unknown	Unknown
Ghana	Yes	Yes	Yes	Yes
Greece	Yes	Yes	Yes	Yes
Guatemala	Yes	Yes	Yes	Yes
Hong Kong (China*)	Not addressed	Not addressed	Not addressed	Not addressed
Hungary	Not addressed	Not addressed	Not addressed	Not addressed
Iceland	Yes	Yes	Yes	Yes
India	Not addressed	Not addressed	Not addressed	Not addressed
Ireland	Not addressed	Not addressed	Yes	Yes
Italy	Yes	Yes	Yes	Yes
Japan			Not addressed	Not addressed
Jordan	Not addressed	Not addressed	Yes	Yes
Kazakhstan	Yes	No	Yes	Yes
Kenya	Not addressed	Not addressed	Not addressed	Not addressed
Latvia	Yes	No	Yes	Yes
Lithuania	Yes	Not addressed	Yes	Yes
Mali	No	No	Yes	Yes
Mexico	No	Yes	Yes	Yes
Mongolia	Not addressed	Not addressed	Not addressed	Not addressed
Montenegro			Yes	Yes
Namibia	No	Yes	Yes	Yes
Netherlands	Yes	Yes	Yes	No
New Zealand	No	Yes	Yes	Yes
Nicaragua	Yes	Yes	Yes	Yes
Nigeria	Yes	Yes	Yes	Yes
Norway			Yes	Yes
Panama	Not addressed	Not addressed	Not addressed	Not addressed
Paraguay	No	Yes	Yes	Yes
Philippines	Yes	Yes	Yes	Yes
Poland	Unknown	Unknown	Unknown	Unknown
Portugal	Yes	Unknown	Yes	Yes
Romania	Yes	Yes	Yes	Yes
Russian Federation	Not addressed	Not addressed	Not addressed	Not addressed
Senegal	Not addressed	Not addressed	Yes	Yes
Serbia	Yes	Unknown	Yes	Yes
Singapore	Yes	No	No	Yes
Slovenia	No	Yes	Yes	Yes
South Africa	Not addressed	Not addressed	Not addressed	Not addressed
The Republic of Korea	Not addressed	Not addressed	No	Yes
Spain	Yes	No	Yes	Yes
Sri Lanka	No	No	No	No
Sweden	No	No	No	No
Switzerland	No	No	No	No
Taiwan (China*)	Not addressed	Not addressed	Not addressed	Not addressed
Thailand	No	No	Yes	Yes
Togo	Not addressed	Not addressed	Not addressed	Not addressed
Trinidad and Tobago	Not addressed	Not addressed	Not addressed	Not addressed
Tunisia	Not addressed	Not addressed	Yes	Yes
Turkey	No	No	No	No
Uganda	Yes	Yes	Yes	Yes
United Arab Emirates	Not addressed	Not addressed	Yes	Unknown
UK	No	Yes	Yes	Yes
USA	No	Yes	Yes	Yes
Uruguay	Yes	Yes	Yes	Yes
Venezuela	Not addressed	Not addressed	Not addressed	Not addressed
Viet Nam	Not addressed	Not addressed	Not addressed	Not addressed
Zimbabwe	Not addressed	Not addressed	Not addressed	Not addressed

*Reporting separately for this report.

- Oocyte age 35-39: 5 countries limited to 1 embryo, 13 countries = 2 embryos, 21 countries = 3 embryos, 2 countries = 4 embryos, 21 countries = not addressed, and 6 countries responded "unknown"; and
- Oocytes age >40: 3 countries limited to 1 embryo, 10 countries = 2 embryos, 20 countries = 3 embryos, 4 countries = 4 embryos, 1 country = 5 embryos, 2 countries = not addressed, and 6 countries responded "unknown".

To the question regarding existence of criteria for the number of embryos to be transferred for donor oocyte recipients, 75 countries responded, as follows: "yes", 28 countries (38%); "no", 19 countries (25%); "unknown", 4 countries (5%); and "not addressed", 24 (32%).

When considering the age of the donor, 76 countries provided responses: 27 countries (35.5%) answered "yes", 18 answered (24%) "no", 5 answered (6.5%) "unknown", and 26 answered (34%) "not addressed"

Regarding the quality of the embryos as a determinant, 78 countries provided responses: 44 countries answered (56%) "yes", 12 answered (15%) "no", 3 answered (5%) "unknown", and 19 answered (24%) "not addressed".

Regarding the stage of the embryo (cleavage or blastocyst stage), 78 countries provided responses: 45 countries answered (58%) "yes", 10 answered (13%) "no", 4 answered (5%) "unknown", and 19 answered (24%) "not addressed".

Table 3 lists the countries' individual policies regarding the number of embryos allowed for transfer.

Discussion

In 2010, Turkey introduced legislation that mandates, regardless of embryo quality, SET for the first one or two cycles in women under the age of 35[7]. Similarly, Belgium, Canada, and Sweden have comparable restrictions mandating SET in young women[8,9]. In 2013, in an effort to reduce the twin birth rate to 10%[10,11], guidelines were issued in the United Kingdom of Great Britain and Northern Ireland instructing clinicians to use SET for first cycles for women under 37 years of age, and also for second cycles, if a top-quality embryo is available. In Australia, Denmark, Finland, New Zealand, and Norway, the vast majority (85.2%) of embryo transfer cycles for women under 35 years of age are currently conducted as SET[12,13].

In The United States of America, the guidelines of the American Society for Reproductive Medicine (ASRM) state, for women at any age: transfer only one euploid embryo[14,15]. For good prognosis, patients under 35 years of age (first cycle of IVF, prior IVF success, or good morphology embryos), transfer should be limited to one embryo; patients between 35 to 37 years of age, SET should be strongly suggested. Despite the stricter ASRM guidelines, preliminary data from the 2016 Society for Assisted Reproductive Technologies Clinic Summary Report show that fewer than 40% of transfers performed in The United States of America were SET.[16]

Summary

The evidence from the 2018 IFFS Surveillance Survey shows no meaningful increase in the proportion of countries with legislation or clinical guidelines restricting the number of embryos permissible for transfer to women undergoing IVF/ART cycles: 59%, vs. 56% in 2015. More countries (35%, vs 24% in 2015) now report the presence of penalties for non-compliance regarding the number of embryos transferred.

Compared to 2016 data, progress in the actual reduction of the number of embryos transferred has been more gradual, with 10% of countries reporting mandatory SET for patients <35 years of age, 7% of the countries reporting mandatory SET for patients aged 35-39 years, and 6.5% of countries reporting mandatory SET for patients > 40 years old.

Recent advances in embryo culture systems, embryo selection methods, preimplantation genetic testing, and cryopreservation technology are leading to improved embryo implantation rates, but this putative advantage has not yet led to wider adoption of SET.

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CHAPTER 6: CRYOPRESERVATION

Introduction

Cryopreservation is one of the most significant recent advancements in assisted reproduction technology (ART). Although interest in human tissue cryopreservation has existed for more than 200 years, significant progress in reproductive applications has occurred only in the last two or three decades.

The development of slow-freezing techniques and vitrification technology, and expansion in various combinations of newer cryoprotectants, have considerably advanced the field of ART. Sperm, oocytes, and embryos can now be frozen at various stages of development, making treatment potentially safer and more effective[1].

Chapter 6. Table 1

How is cryopreservation for fertility treatment regulated?

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
Sperm for fertility treatment	Argentina		Yes				Yes		
	Armenia	Yes					Yes		
	Australia		Yes	Yes			Yes		
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus		Yes						
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes					Yes		
	Canada	Yes							
	Chile	Yes							
	China			Yes	Yes	Yes	Yes		
	Colombia	Yes							
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		
	El Salvador	Yes							
	Finland		Yes				Yes		
	Georgia	Yes							
	Germany		Yes						
	Ghana	Yes					Yes		
	Greece	Yes	Yes	Yes					
	Guatemala	Yes							
	Hong Kong [China, reporting separately for this report] (China*)		Yes	Yes					
	Hungary		Yes				Yes		
	Iceland		Yes						
	India	Yes							
	Ireland		Yes			Yes			
	Côte d'Ivoire					Yes	Yes		
	Japan	Yes							
	Jordan	Yes							
	Kazakhstan	Yes	Yes						
	Kenya	Yes							
	Latvia		Yes			Yes	Yes		
	Lithuania		Yes						
	Mali	Yes							
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes			Yes	Yes		
	Nicaragua		Yes						
	Nigeria	Yes					Yes		
	Norway		Yes						
	Panama	Yes							
	Paraguay	Yes							
	Peru	Yes							
	Philippines	Yes					Yes		
	Poland	Yes					Yes		

Chapter 6. Table 1

(*Continued*)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Portugal		Yes			Yes	Yes		
	Romania		Yes			Yes			
	Russian Federation		Yes						
	Senegal	Yes	Yes	Yes	Yes		Yes		
	Serbia		Yes						
	Singapore		Yes						
	Slovenia	Yes	Yes	Yes					
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sri Lanka					Yes			
	Sweden		Yes						
	Switzerland		Yes				Yes	Yes	
	Taiwan (China*)		Yes						
	Thailand		Yes						
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Turkey	Yes	Yes						
	Uganda	Yes							
	United Arab Emirates		Yes						
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam		Yes						
	Zimbabwe	Yes							
Oocytes for fertility treatment									
	Argentina		Yes				Yes		
	Australia		Yes	Yes			Yes		
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus		Yes						
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes					Yes		
	Canada	Yes							
	Chile	Yes							
	China			Yes	Yes	Yes	Yes		
	Colombia	Yes							
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		
	El Salvador	Yes							
	Finland		Yes				Yes		
	Georgia	Yes							
	Germany		Yes						
	Ghana	Yes					Yes		
	Greece	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Guatemala	Yes							
	Hong Kong (China*)		Yes	Yes					
	Hungary		Yes				Yes		

Chapter 6. Table 1

(***Continued***)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Iceland		Yes						
	India	Yes							
	Ireland		Yes			Yes			
	Côte d'Ivoire					Yes	Yes		
	Japan						Yes		
	Jordan	Yes							
	Kazakhstan		Yes						
	Kenya	Yes							
	Latvia		Yes			Yes	Yes		
	Lithuania		Yes						
	Mali	Yes							
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes			Yes	Yes		
	Nicaragua		Yes						
	Nigeria	Yes					Sperm		
	Norway		Yes						
	Panama	Yes							
	Paraguay	Yes							
	Peru	Yes							
	Philippines	Yes					Yes		
	Portugal		Yes			Yes	Yes		
	Romania		Yes			Yes			
	Russian Federation		Yes						
	Senegal	Yes		Yes	Yes				
	Serbia		Yes						
	Singapore		Yes						
	Slovenia	Yes	Yes	Yes					
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sri Lanka					Yes			
	Sweden		Yes						
	Switzerland		Yes				Yes	Yes	
	Taiwan (China*)		Yes						
	Thailand		Yes						
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Turkey	Yes	Yes						
	Uganda	Yes							
	United Arab Emirates		Yes						
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam		Yes						
	Zimbabwe	Yes							
Fertilized oocytes pre-zygotes to blastocysts for fertility treatment	Country								
	Argentina	Yes					Yes		
	Australia		Yes	Yes			Yes		
	Austria		Yes						

Chapter 6. Table 1

(*Continued*)

Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
Bangladesh	Yes							
Barbados	Yes							
Belarus		Yes						
Belgium		Yes						
Bolivia	Yes							
Botswana	Yes							
Brazil		Yes			Yes	Yes		
Bulgaria		Yes						
Burkina Faso	Yes							
Cameroon	Yes					Yes		
Canada	Yes							
Chile	Yes							
China			Yes	Yes	Yes	Yes		
Colombia	Yes							
Czechia	Yes							
Congo	Yes							
Ecuador						Yes		
Egypt	Yes					Yes		
El Salvador	Yes							
Finland		Yes				Yes		
Georgia	Yes							
Germany		Yes						
Ghana	Yes					Yes		
Greece	Yes	Yes	Yes					
Guatemala	Yes							
Hong Kong (China*)		Yes	Yes					
Hungary		Yes						
Iceland		Yes						
India	Yes							
Ireland		Yes			Yes			
Côte d'Ivoire					Yes	Yes		
Japan						Yes		
Jordan	Yes							
Kazakhstan		Yes						
Kenya	Yes							
Latvia		Yes			Yes	Yes		
Lithuania		Yes						
Mali	Yes							
Mexico						Yes		
Mongolia	Yes							
Montenegro		Yes						
Namibia			Yes					
Netherlands		Yes				Yes		
New Zealand		Yes			Yes	Yes		
Nigeria	Yes							
Norway		Yes						
Panama	Yes							
Paraguay	Yes							
Peru	Yes							
Philippines	Yes					Yes		
Poland								
Portugal		Yes			Yes	Yes		
Romania		Yes			Yes			
Russian Federation		Yes						
Senegal	Yes	Yes	Yes	Yes		Yes		
Singapore		Yes						
Slovenia	Yes	Yes	Yes					
South Africa		Yes						

Chapter 6. Table 1

(***Continued***)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	The Republic of Korea		Yes						
	Spain		Yes				Yes		
	Sri Lanka					Yes			
	Sweden		Yes						
	Switzerland		Yes				Yes	Yes	
	Taiwan (China*)		Yes						
	Thailand		Yes						
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Turkey	Yes	Yes						
	Uganda	Yes							
	United Arab Emirates		Yes						
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam		Yes						
	Zimbabwe	Yes							
Sperm for fertility preservation									
	Argentina		Yes				Yes		
	Armenia	Yes						Yes	
	Australia			Yes					
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil	Yes				Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes					Yes		
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		
	El Salvador	Yes							
	Georgia		Yes						
	Germany		Yes						
	Ghana						Yes		
	Guatemala	Yes							
	Hungary		Yes				Yes		
	Iceland		Yes						
	India	Yes							
	Ireland		Yes			Yes			
	Côte d'Ivoire					Yes	Yes		
	Japan	Yes							
	Jordan	Yes							
	Kazakhstan	Yes	Yes						
	Kenya	Yes							
	Latvia		Yes				Yes		
	Lithuania	Yes							
	Mali	Yes					Yes		

Chapter 6. Table 1

(*Continued*)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes				Yes		
	Nicaragua		Yes						
	Nigeria	Yes					Yes		
	Norway		Yes						
	Panama	Yes							
	Paraguay	Yes							
	Peru	Yes							
	Philippines	Yes					Yes		
	Poland	Yes					Yes		
	Portugal		Yes			Yes	Yes		
	Romania		Yes						
	Russian Federation	Yes							
	Senegal	Yes							
	Serbia	Yes							
	Singapore		Yes						
	Slovenia		Yes						
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sri Lanka					Yes			
	Sweden	Yes					Yes		
	Switzerland		Yes					Yes	
	Taiwan (China*)		Yes						
	Thailand		Yes						
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Uganda	Yes							
	United Arab Emirates	Yes							
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Oocytes for fertility preservation									
	Argentina		Yes				Yes		
	Armenia	Yes						Yes	
	Australia			Yes					
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil	Yes				Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes					Yes		

Chapter 6. Table 1

(***Continued***)

Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
Czechia	Yes							
Congo	Yes							
Ecuador						Yes		
Egypt	Yes					Yes		
El Salvador	Yes							
Georgia		Yes						
Germany		Yes						
Ghana						Yes		
Guatemala	Yes							
Hungary		Yes				Yes		
Iceland		Yes						
India	Yes							
Ireland		Yes			Yes			
Côte d'Ivoire					Yes	Yes		
Japan	Yes							
Jordan	Yes							
Kazakhstan	Yes	Yes						
Kenya	Yes							
Latvia		Yes				Yes		
Lithuania	Yes							
Mali	Yes					Yes		
Mexico		Yes				Yes		
Mongolia	Yes							
Montenegro		Yes						
Namibia			Yes					
Netherlands		Yes				Yes		
New Zealand		Yes				Yes		
Nicaragua		Yes						
Nigeria	Yes					Yes		
Norway		Yes						
Panama	Yes							
Paraguay	Yes							
Peru	Yes							
Philippines	Yes					Yes		
Poland	Yes					Yes		
Portugal		Yes			Yes	Yes		
Romania		Yes						
Russian Federation	Yes							
Senegal	Yes							
Serbia	Yes							
Singapore		Yes						
Slovenia		Yes						
South Africa		Yes						
The Republic of Korea	Yes							
Spain		Yes				Yes		
Sri Lanka					Yes			
Sweden	Yes					Yes		
Switzerland		Yes					Yes	
Taiwan (China*)		Yes						
Thailand		Yes						
Togo	Yes							
Trinidad and Tobago	Yes							
Uganda	Yes							
United Arab Emirates	Yes							
UK		Yes						
USA	Yes							
Uruguay		Yes			Yes			
Venezuela						Yes		

Chapter 6. Table 1

(*Continued*)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Viet Nam	Yes							
	Zimbabwe	Yes							
Pre-implantation embryos for fertility preservation									
	Argentina	Yes					Yes		
	Armenia								
	Australia								
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus		Yes						
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil	Yes				Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes					Yes		
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		
	El Salvador	Yes							
	Finland		Yes				Yes		
	Georgia		Yes						
	Germany		Yes						
	Ghana						Yes		
	Greece	Yes							
	Hungary		Yes				Yes		
	Iceland		Yes						
	Ireland		Yes			Yes			
	Japan	Yes							
	Jordan	Yes							
	Kazakhstan	Yes	Yes						
	Kenya	Yes							
	Latvia		Yes				Yes		
	Lithuania	Yes							
	Mali	Yes					Yes		
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes				Yes		
	Nigeria	Yes					Yes		
	Norway		Yes						
	Panama	Yes							
	Paraguay	Yes							
	Peru	Yes							
	Philippines	Yes					Yes		
	Romania		Yes						
	Russian Federation	Yes							
	Senegal	Yes							
	Serbia	Yes							

Chapter 6. Table 1

(***Continued***)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Singapore		Yes						
	Slovenia		Yes						
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sri Lanka					Yes			
	Sweden	Yes					Yes		
	Switzerland		Yes					Yes	
	Taiwan (China*)		Yes						
	Thailand		Yes						
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Uganda	Yes							
	United Arab Emirates	Yes							
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Testicular tissue for fertility preservation									
	Austria	Yes							
	Bangladesh	Yes							
	Barbados	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes					Yes		
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		
	Germany		Yes						
	Greece				Yes		Yes		
	Guatemala	Yes							
	Iceland	Yes							
	India	Yes							
	Ireland		Yes			Yes			
	Côte d'Ivoire					Yes	Yes		
	Japan	Yes							
	Kazakhstan	Yes	Yes						
	Kenya	Yes							
	Latvia		Yes						
	Lithuania	Yes							
	Mali	Yes							
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes				Yes		

Chapter 6. Table 1

(*Continued*)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Nicaragua		Yes						
	Nigeria	Yes							
	Norway		Yes						
	Panama	Yes							
	Paraguay	Yes							
	Peru	Yes							
	Philippines	Yes					Yes		
	Portugal		Yes			Yes	Yes		
	Russian Federation	Yes							
	Senegal	Yes							
	Serbia	Yes	Yes						
	Singapore		Yes						
	Slovenia		Yes						
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sri Lanka								
	Sweden	Yes					Yes		
	Switzerland							Yes	
	Thailand						Yes		
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Uganda	Yes							
	UK		Yes						
	USA	Yes							
	Uruguay								
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Ovarian tissue for fertility preservation									
	Austria	Yes							
	Bangladesh	Yes							
	Barbados	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Burkina Faso	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes					Yes		
	Czechia	Yes							
	Congo	Yes					Yes		
	Ecuador						Yes		
	Egypt	Yes					Yes		
	Germany		Yes						
	Guatemala	Yes							
	Iceland	Yes							
	India	Yes							
	Ireland		Yes			Yes			
	Côte d'Ivoire					Yes	Yes		
	Japan	Yes							
	Kazakhstan	Yes	Yes						
	Kenya	Yes							
	Latvia		Yes						
	Lithuania	Yes							

Chapter 6. Table 1

(***Continued***)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Mali	Yes							
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes				Yes		
	Nicaragua		Yes						
	Nigeria	Yes							
	Norway		Yes						
	Panama	Yes							
	Paraguay	Yes							
	Peru								
	Philippines	Yes					Yes		
	Portugal		Yes			Yes	Yes		
	Romania								
	Russian Federation	Yes							
	Senegal	Yes							
	Singapore		Yes						
	Slovenia		Yes						
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sweden	Yes					Yes		
	Switzerland		Yes					Yes	
	Thailand						Yes		
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Uganda	Yes							
	UK		Yes						
	USA	Yes							
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Sperm for medical indications									
	Argentina		Yes				Yes		
	Armenia						Yes		
	Australia			Yes					
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile	Yes							
	China								
	Colombia	Yes		Yes					
	Costa Rica								
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		

Chapter 6. Table 1

(*Continued*)

Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
Egypt	Yes					Yes		
El Salvador	Yes							
Estonia								
Finland		Yes						
France								
Georgia	Yes							
Germany		Yes						
Ghana						Yes		
Greece								Yes
Guatemala	Yes							
Hong Kong (China*)		Yes	Yes					
Hungary		Yes				Yes		
Iceland		Yes						
India	Yes							
Indonesia								
Ireland		Yes			Yes			
Israel								
Italy								
Côte d'Ivoire								
Japan	Yes							
Jordan	Yes							
Kazakhstan		Yes						
Kenya	Yes							
Latvia		Yes			Yes	Yes		
Lithuania		Yes						
Mali	Yes							
Mexico		Yes				Yes		
Mongolia	Yes							
Montenegro		Yes						
Namibia			Yes					
Netherlands		Yes				Yes		
New Zealand		Yes				Yes		
Nicaragua		Yes						
Nigeria	Yes							
Norway		Yes						
Panama	Yes							
Paraguay	Yes							
Peru	Yes							
Philippines								
Poland	Yes							
Portugal		Yes			Yes	Yes		
Romania		Yes						
Russian Federation		Yes						
Senegal	Yes							
Serbia	Yes							
Singapore		Yes						
Slovenia		Yes						
South Africa		Yes						
The Republic of Korea	Yes							
Spain		Yes				Yes		
Sri Lanka					Yes			
Sweden		Yes						
Switzerland		Yes					Yes	
Taiwan (China*)		Yes						
Thailand		Yes						
Togo	Yes							
Trinidad and Tobago	Yes							
Tunisia								

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(***Continued***)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Turkey		Yes						
	Uganda	Yes							
	United Arab Emirates		Yes	Yes					
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Oocytes for medical indications									
	Argentina						Yes		
	Australia			Yes					
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes		Yes					
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		
	El Salvador	Yes							
	Finland		Yes						
	Georgia	Yes							
	Germany		Yes						
	Ghana						Yes		
	Greece		Yes	Yes					
	Guatemala	Yes							
	Hong Kong (China*)		Yes	Yes					
	Hungary		Yes				Yes		
	Iceland		Yes						
	India	Yes							
	Ireland		Yes			Yes			
	Japan						Yes		
	Jordan	Yes							
	Kazakhstan		Yes						
	Kenya	Yes							
	Latvia		Yes			Yes	Yes		
	Lithuania		Yes						
	Mali	Yes							
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes				Yes		
	Nicaragua		Yes						

Chapter 6. Table 1

(*Continued*)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Nigeria	Yes							
	Norway		Yes						
	Panama	Yes							
	Paraguay	Yes							
	Peru	Yes							
	Portugal		Yes			Yes	Yes		
	Romania		Yes						
	Russian Federation		Yes						
	Senegal	Yes							
	Serbia	Yes							
	Singapore		Yes						
	Slovenia		Yes						
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sri Lanka					Yes			
	Sweden		Yes						
	Switzerland		Yes					Yes	
	Taiwan (China*)		Yes						
	Thailand		Yes						
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Turkey		Yes						
	Uganda	Yes							
	United Arab Emirates		Yes	Yes					
	UK		Yes						
	USA	Yes							
	Uruguay	Yes	Yes			Yes			
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Pre-implantation embryos for medical indications									
	Argentina	Yes					Yes		
	Armenia								
	Australia			Yes					
	Austria		Yes						
	Bangladesh	Yes							
	Barbados	Yes							
	Belarus		Yes						
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile								
	China								
	Colombia	Yes		Yes					
	Costa Rica								
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		

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(***Continued***)

Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
El Salvador	Yes							
Estonia								
Finland		Yes						
France								
Georgia	Yes							
Germany		Yes						
Ghana						Yes		
Greece								
Guatemala	Yes							
Hong Kong (China*)		Yes	Yes					
Hungary		Yes				Yes		
Iceland		Yes						
India	Yes							
Indonesia								
Ireland		Yes			Yes			
Israel								
Italy								
Côte d'Ivoire								
Japan						Yes		
Jordan	Yes							
Kazakhstan		Yes						
Kenya	Yes							
Latvia		Yes			Yes	Yes		
Lithuania		Yes						
Mali	Yes							
Mexico		Yes				Yes		
Mongolia	Yes							
Montenegro		Yes						
Namibia			Yes					
Netherlands		Yes				Yes		
New Zealand		Yes				Yes		
Nicaragua								
Nigeria	Yes							
Norway								
Panama	Yes							
Paraguay	Yes							
Peru	Yes							
Philippines								
Poland								
Portugal								
Romania		Yes						
Russian Federation		Yes						
Senegal	Yes							
Serbia	Yes							
Singapore		Yes						
Slovenia		Yes						
South Africa		Yes						
The Republic of Korea	Yes							
Spain		Yes				Yes		
Sri Lanka					Yes			
Sweden		Yes						
Switzerland		Yes					Yes	
Taiwan (China*)		Yes						
Thailand		Yes						
Togo	Yes							
Trinidad and Tobago	Yes							
Tunisia								
Turkey		Yes						

Chapter 6. Table 1

(Continued)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Uganda	Yes							
	United Arab Emirates		Yes	Yes					
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Testicular tissue for medical indications									
	Argentina						Yes		
	Australia			Yes					
	Austria	Yes							
	Bangladesh	Yes							
	Barbados	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Bulgaria		Yes						
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes		Yes					
	Costa Rica								
	Czechia	Yes							
	Congo								
	Ecuador						Yes		
	Egypt	Yes					Yes		
	Georgia	Yes							
	Germany		Yes						
	Greece	Yes			Yes		Yes	Yes	
	Guatemala	Yes							
	Hong Kong (China*)		Yes	Yes					
	Iceland	Yes							
	India	Yes							
	Ireland		Yes			Yes			
	Japan						Yes		
	Jordan	Yes							
	Kazakhstan		Yes						
	Kenya	Yes							
	Latvia		Yes			Yes			
	Lithuania		Yes						
	Mali	Yes							
	Mexico		Yes				Yes		
	Mongolia	Yes							
	Montenegro		Yes						
	Namibia			Yes					
	Netherlands		Yes				Yes		
	New Zealand		Yes				Yes		
	Nicaragua		Yes						
	Nigeria	Yes							
	Panama	Yes							
	Paraguay	Yes							
	Portugal		Yes			Yes	Yes		
	Russian Federation		Yes						

Chapter 6. Table 1

(***Continued***)

	Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
	Senegal	Yes							
	Serbia	Yes							
	Singapore		Yes						
	Slovenia		Yes						
	South Africa		Yes						
	The Republic of Korea	Yes							
	Spain		Yes				Yes		
	Sweden		Yes						
	Switzerland		Yes					Yes	
	Thailand						Yes		
	Togo	Yes							
	Trinidad and Tobago	Yes							
	Turkey		Yes						
	Uganda	Yes							
	UK		Yes						
	USA	Yes							
	Uruguay		Yes			Yes			
	Venezuela						Yes		
	Viet Nam	Yes							
	Zimbabwe	Yes							
Ovarian tissue for medical indications									
	Argentina						Yes		
	Australia			Yes					
	Austria	Yes							
	Bangladesh	Yes							
	Barbados	Yes							
	Belgium		Yes						
	Bolivia	Yes							
	Botswana	Yes							
	Brazil					Yes	Yes		
	Burkina Faso	Yes							
	Cameroon	Yes							
	Canada	Yes							
	Chile	Yes							
	Colombia	Yes		Yes					
	Czechia	Yes							
	Congo	Yes							
	Ecuador						Yes		
	Egypt	Yes					Yes		
	Georgia	Yes							
	Germany		Yes						
	Greece					Yes			
	Guatemala	Yes							
	Hong Kong (China*)		Yes	Yes					
	Iceland	Yes							
	India	Yes							
	Ireland		Yes			Yes			
	Japan						Yes		
	Jordan	Yes							
	Kazakhstan		Yes						
	Kenya	Yes							
	Latvia		Yes			Yes			
	Lithuania		Yes						
	Mali	Yes							
	Mexico		Yes				Yes		
	Mongolia	Yes							

Chapter 6. Table 1

(*Continued*)

Country	No Regulations	Federal/ National Laws/ Statutes/ Ordinances	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practices	Religious Decree
Montenegro		Yes						
Namibia			Yes					
Netherlands		Yes				Yes		
New Zealand		Yes				Yes		
Nicaragua		Yes						
Nigeria	Yes							
Norway		Yes						
Panama	Yes							
Paraguay	Yes							
Portugal		Yes			Yes	Yes		
Russian Federation		Yes						
Senegal	Yes							
Serbia	Yes							
Singapore		Yes						
Slovenia		Yes						
South Africa		Yes						
The Republic of Korea	Yes							
Spain		Yes				Yes		
Sweden		Yes						
Switzerland		Yes					Yes	
Thailand						Yes		
Togo	Yes							
Trinidad and Tobago	Yes							
Turkey		Yes						
Uganda	Yes							
UK		Yes						
USA	Yes							
Venezuela						Yes		
Viet Nam	Yes							
Zimbabwe	Yes							

*Reporting separately for this report.

The chief objectives of cryopreservation are to make gametes or embryos available for future use by individuals or couples undergoing infertility treatment, and to preserve future fertility options for individuals at risk of losing their reproductive potential. Cryopreservation also offers the opportunity to forestall pregnancy to a safer, more optimal time. This is important for patients who are at risk of ovarian hyperstimulation syndrome (OHSS), or who have poor endometrial receptivity.

Frozen embryo transfer (FET) is a procedure – a cycle – in which frozen embryos are thawed, then transferred to a uterus. The improved results of embryo cryopreservation have been an essential component of preimplantation genetic diagnosis and screening.

The improved results of embryo cryopreservation have been an essential component for preimplantation genetic diagnosis/ screening, using trophectoderm biopsy and array comparative genomic hybridization (CGH microarray) or Next Gen Sequencing (NGS). Blastocysts can be frozen, and genetic testing performed before the blastocysts are transferred[2]. Embryo cryopreservation offers a way to avoid repeated ovarian stimulation, optimizes achieving embryo-endometrial synchrony, and aids in single embryo transfer (SET)[3].

Analysis of the survey

Cryopreservation for fertility treatment

None of the respondent countries cited explicit prohibition of cryopreservation of sperm, oocytes, or pre-implantation embryos for fertility treatment. Cryopreservation for fertility treatment (Table 1) is expressly allowed or permitted for sperm in 71 of 83 (86%) of countries responding; for oocytes, in 68 of 82 (83%); and in all stages of pre-implantation embryos, in 66 out of 82 (80%). There are no regulations for cryopreservation for fertility treatment for sperm, according to 35 of 82 responders (43%); for oocytes, in 33 of 82 (40%); and all stages of pre-implantation embryos, in 32 of 82 (39%).

For countries that regulated cryopreservation for fertility treatment, the following were used to govern:

- Federal/national laws/statutes/ordinances were used for sperm in 39 of 82 (47.5%); to govern oocytes, only 3 of 82 (4%); and all stages of pre-implantation embryos, 36 of 82 (44%);
- State/provincial/regional laws/statutes/ordinances: sperm, oocytes, and all stages of pre-implantation embryos: 7 of 82 (8.5%);
- Municipal laws/statutes/ordinances: sperm and all stages of pre-implantation embryos: only 2 of 82 respondents (2%) and oocytes: only 3 of 82 (4%);

Chapter 6. Table 2a

What is the maximum duration of storage?

Country	Sperm for Cryopreservation for Fertility Treatment	Sperm Nonmedical Indications	Sperm Medical Indications	Testicular Tissue Nonmedical Indications	Testicular Tissue Medical Indications
Argentina	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Armenia	Unknown	Not addressed	Not addressed	Not addressed	Not addressed
Australia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Austria	No Limit	No Limit	No Limit	No Limit	No Limit
Bangladesh	No Limit		No Limit		No Limit
Belarus	No Limit	No Limit	No Limit	No Limit	No Limit
Belgium	Unknown	Unknown	Unknown	Unknown	Unknown
Bolivia	No Limit	Not addressed	No Limit	No Limit	No Limit
Botswana	Not addressed	Not addressed	Not addressed	Not addressed	Unknown
Brazil	No Limit	No Limit	No Limit	No Limit	No Limit
Bulgaria	5 y	5 y	5 y	5 y	5 y
Burkina Faso	No Limit	No Limit	No Limit	No Limit	No Limit
Cameroon	5 y				
Canada	No Limit	No Limit	No Limit	No Limit	No Limit
Chile	No Limit	No Limit	No Limit	No Limit	No Limit
China	No Limit		No Limit		No Limit
Colombia	No Limit	No Limit	No Limit	No Limit	No Limit
Czechia	Unknown	Unknown	Unknown	Unknown	Unknown
Congo	Not addressed	Not addressed	Not addressed	Not addressed	Unknown
Ecuador	No Limit	No Limit	No Limit	No Limit	No Limit
Egypt	No Limit	No Limit	No Limit	No Limit	No Limit
El Salvador	No Limit	No Limit	No Limit		
Finland	No Limit	No Limit	No Limit	No Limit	No Limit
Georgia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Germany	Unknown	Unknown	Unknown	Unknown	Unknown
Ghana	No Limit	No Limit	No Limit	No Limit	No Limit
Greece	25 y	25 y	No Limit	No Limit	No Limit
Guatemala	No Limit	No Limit	No Limit	Not addressed	Not addressed
Hong Kong (China*)	10 y	Not addressed	10 y	Not addressed	10 y
Hungary	Unknown	Not addressed	Not addressed	Not addressed	Not addressed
Iceland	10 y	10 y	10 y	10 y	10 y
India	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Ireland	10 y	10 y	10 y	Not addressed	Not addressed
Italy	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Côte d'Ivoire	No Limit	Not addressed	Not addressed	Not addressed	No Limit
Japan	No Limit	Not addressed	No Limit	Not addressed	Not addressed
Jordan	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Kazakhstan	No Limit	No Limit	No Limit	No Limit	No Limit
Kenya	Not addressed		Not addressed	Not addressed	Not addressed
Latvia	No Limit	No Limit	No Limit	No Limit	No Limit
Lithuania	No Limit	Not addressed	No Limit	Not addressed	Unknown
Mali	No Limit	Unknown	Unknown	Unknown	Unknown
Mexico	No Limit	No Limit	No Limit	Not addressed	Not addressed
Mongolia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Montenegro	No Limit	No Limit	No Limit	No Limit	No Limit
Namibia	No Limit	No Limit	No Limit	Not addressed	Not addressed
Netherlands	No Limit	No Limit	No Limit	No Limit	No Limit
New Zealand	10 y	10 y	10 y	10 y	10 y
Nicaragua	5 y	5 y	5 y	5 y	5 y
Nigeria	Unknown				
Norway	Not addressed		Not addressed		
Panama	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Paraguay	No Limit	No Limit	No Limit	No Limit	No Limit
Peru	Unknown	Unknown	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Unknown		
Portugal	5 y	5 y	5 y	5 y	5 y
Romania	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Russian Federation	No Limit	No Limit	No Limit	No Limit	No Limit
Senegal	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Serbia	2 y	2 y	Unknown	1 y	No Limit
Singapore	10 y	0 y	10 y	0 y	10 y

Chapter 6. Table 2a

(Continued)

Country	Sperm for Cryopreservation for Fertility Treatment	Sperm Nonmedical Indications	Sperm Medical Indications	Testicular Tissue Nonmedical Indications	Testicular Tissue Medical Indications
Slovenia	No Limit		No Limit		No Limit
South Africa	No Limit	No Limit	No Limit	No Limit	No Limit
The Republic of Korea	No Limit	No Limit	No Limit	No Limit	No Limit
Spain	No Limit	No Limit	No Limit	No Limit	No Limit
Switzerland	10 y	10 y	No Limit	10 y	No Limit
Taiwan (China*)	10 y	10 y	10 y	Not addressed	Not addressed
Thailand	No Limit	No Limit	No Limit	No Limit	No Limit
Togo	No Limit	Not addressed	No Limit	Not addressed	No Limit
Trinidad and Tobago	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Turkey	5 y		5 y		5 y
Uganda	10 y	10 y	10 y	Unknown	Unknown
United Arab Emirates	5 y	5 y	5 y	Unknown	Unknown
UK	55 y	10 y	55 y	No Limit	No Limit
USA	No Limit	No Limit	No Limit	No Limit	No Limit
Uruguay	No Limit	No Limit	No Limit	No Limit	No Limit
Venezuela	No Limit	No Limit	No Limit	No Limit	No Limit
Viet Nam	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Zimbabwe	No Limit	No Limit	No Limit	No Limit	No Limit

*Reporting separately for this report.

Chapter 6. Table 2b

What is the maximum duration of storage?

Country	Oocytes for Cryopreservation for Fertility Treatment	Oocytes Nonmedical Indications	Oocytes Medical Indications	Ovarian Tissue Nonmedical Indications	Ovarian Tissue Medical Indications
Argentina	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Armenia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Australia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Austria	No Limit	No Limit	No Limit	No Limit	No Limit
Bangladesh	No Limit		No Limit		No Limit
Belarus	No Limit	No Limit	No Limit	No Limit	No Limit
Belgium	Unknown	Unknown	Unknown	Unknown	Unknown
Bolivia	No Limit	No Limit	No Limit	No Limit	No Limit
Botswana	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Brazil	No Limit	No Limit	No Limit	No Limit	No Limit
Bulgaria	5 y	5 y	5 y	Not addressed	Not addressed
Burkina Faso	No Limit		No Limit	No Limit	Unknown
Canada	No Limit	No Limit	No Limit	No Limit	No Limit
Chile	No Limit	No Limit	No Limit	No Limit	No Limit
China	No Limit		No Limit		No Limit
Colombia	No Limit	No Limit	No Limit	No Limit	No Limit
Czechia	Unknown	Unknown	Unknown	Unknown	Unknown
Congo	Not addressed	Not addressed			Not addressed
Ecuador	No Limit	No Limit	No Limit	No Limit	No Limit
Egypt	No Limit	No Limit	No Limit	No Limit	No Limit
El Salvador	No Limit	No Limit	No Limit		
Finland	No Limit	No Limit	No Limit	No Limit	No Limit
Georgia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Germany	Unknown	Unknown	Unknown	Unknown	Unknown
Ghana	No Limit	No Limit	No Limit	No Limit	No Limit
Greece	25 y	No Limit	No Limit	No Limit	No Limit
Guatemala	No Limit	No Limit	No Limit	Not addressed	Not addressed
Hong Kong (China*)	10 y	Not addressed	10 y	Not addressed	10 y
Hungary	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Iceland	10 y	10 y	10 y	10 y	10 y
India	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Ireland	10 y	10 y	10 y	Not addressed	Not addressed
Italy	Not addressed	No Limit	No Limit	No Limit	Not addressed
Côte d'Ivoire	Unknown	Not addressed	Not addressed	Not addressed	Not addressed
Japan	No Limit	Not addressed	No Limit	Not addressed	No Limit

Chapter 6. Table 2b

(*Continued*)

Country	Oocytes for Cryopreservation for Fertility Treatment	Oocytes Nonmedical Indications	Oocytes Medical Indications	Ovarian Tissue Nonmedical Indications	Ovarian Tissue Medical Indications
Jordan	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Kazakhstan	No Limit	No Limit	No Limit	No Limit	No Limit
Kenya		Not addressed	Not addressed	Not addressed	Not addressed
Latvia	No Limit	No Limit	No Limit	No Limit	No Limit
Lithuania	No Limit	Not addressed	No Limit	No Limit	Unknown
Mali	5 y	Unknown	Unknown	Unknown	Unknown
Mexico	No Limit	No Limit	No Limit	Not addressed	Not addressed
Mongolia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Montenegro	No Limit	No Limit	No Limit	No Limit	No Limit
Namibia	No Limit	Not addressed	Not addressed	Not addressed	Not addressed
Netherlands	No Limit	No Limit	No Limit	No Limit	No Limit
New Zealand	10 y	10 y	10 y	10 y	10 y
Nicaragua		5 y	5 y	5 y	5 y
Nigeria	Unknown				
Norway	Not addressed	Not addressed	Not addressed	Unknown	Not addressed
Panama	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Paraguay	No Limit	No Limit	No Limit	Not addressed	Not addressed
Peru	Unknown	Unknown	Unknown	Unknown	Unknown
Portugal	5 y	5 y	5 y	5 y	5 y
Romania	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Russian Federation	No Limit	No Limit	No Limit	No Limit	No Limit
Senegal	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Serbia	2 y	Not addressed		Not addressed	Not addressed
Singapore	10 y	0 y	10 y	0 y	10 y
Slovenia	No Limit		No Limit		No Limit
South Africa	No Limit	No Limit	No Limit	No Limit	No Limit
The Republic of Korea	No Limit	No Limit	No Limit	No Limit	No Limit
Spain	No Limit	No Limit	No Limit	No Limit	No Limit
Switzerland	10 y	10 y	No Limit	10 y	
Taiwan (China*)	10 y	10 y	10 y	Not addressed	Not addressed
Thailand	No Limit	No Limit	No Limit	No Limit	No Limit
Togo	No Limit	Not addressed	No Limit	Not addressed	Not addressed
Trinidad and Tobago	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Turkey	5 y		5 y		5 y
Uganda	10 y	10 y	10 y	Unknown	Unknown
United Arab Emirates	5 y	Not addressed	5 y	Unknown	Unknown
United Kingdom of Great Britain and Northern Ireland	10 y	10 y	55 y	No Limit	No Limit
The United States of America	No Limit	No Limit	No Limit	No Limit	No Limit
Uruguay	No Limit	No Limit	No Limit	Not addressed	No Limit
Venezuela	No Limit	No Limit	No Limit	No Limit	No Limit
Viet Nam	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Zimbabwe	No Limit	No Limit	No Limit	No Limit	No Limit

*Reporting separately for this report.

- Agency regulations/oversight: sperm: 10 of 82 respondents (12%); all stages of pre-implantation embryos, and oocytes as well: 11 out of 82 (13%);
- Professional organization standards/guidelines: sperm, 24 of 82 respondents (29%); oocytes, 23 of 82 (28%); and all stages of pre-implantation embryos: 21 of 82 (26%);
- Cultural practices to govern sperm: only 1 of 82 (1%), and all stages of pre-implantation embryos and oocytes: 2 of 82 (2%); and
- Religious decree: oocytes: 1 out of 82 responders (1%).

Duration of storage for fertility treatment

Duration of storage for fertility treatment was not limited for sperm in 38 out of 79 (48%); for oocytes, 36 out of 75 (48%); and for all stages of pre-implantation embryos: 33 out of 76 (43%). The duration of storage was limited for sperm in 17 of 79 (22%); oocytes, 16 of 75 (21%); and all stages of pre-implantation embryos: 19 of 76 (25%). The duration of storage was not addressed for sperm in 16 of 79 (20%); for oocytes, in 17 of 75 (23%); and for all stages of pre-implantation embryos in 18 of 76 (24%). The duration of storage for sperm was unknown in 8 of 79 (10%); for oocytes, in 6 of 75 (8%); and in all stages of pre-implantation embryos, 6 of 76 responders (8%).

The following durations were reported:

- Sperm: 2 years (Serbia); 5 years (Bulgaria, Cameroon, Nicaragua, Portugal, Turkey, and United Arab Emirates); 10 years (Hong Kong [China, reporting separately for this report], Iceland, Ireland, New Zealand, Singapore,

Chapter 6. Table 2c

What is the maximum duration of storage?

Country	Fertilized Oocytes, Prezygotes to Blastocysts for Fertility Treatment	Preimplantation Embryos Nonmedical Indications	Preimplantation Embryos Medical Indications
Argentina	Not addressed	Not addressed	Not addressed
Armenia	Not addressed	Not addressed	Not addressed
Australia	10 y	Not addressed	Not addressed
Austria	10 y	Not addressed	10 y
Bangladesh	No Limit		No Limit
Belarus	No Limit	No Limit	No Limit
Belgium	Unknown	Unknown	Unknown
Bolivia	No Limit	No Limit	No Limit
Botswana		Not addressed	Not addressed
Brazil	No Limit	No Limit	No Limit
Bulgaria	5 y	5 y	5 y
Burkina Faso	No Limit	No Limit	
Cameroon	5 y		
Canada	No Limit	No Limit	No Limit
Chile	No Limit	No Limit	No Limit
China	No Limit		No Limit
Colombia	No Limit	No Limit	No Limit
Czechia	Unknown	Unknown	Unknown
Congo	Not addressed	Not addressed	Not addressed
Ecuador	No Limit		No Limit
Egypt	No Limit	No Limit	No Limit
El Salvador	No Limit		
Finland	No Limit	No Limit	No Limit
Georgia	Not addressed	Not addressed	Not addressed
Germany	Unknown	Unknown	Unknown
Ghana	No Limit	No Limit	No Limit
Greece	25 y	No Limit	No Limit
Guatemala	No Limit	No Limit	No Limit
Hong Kong (China*)	10 y	Not addressed	10 y
Hungary	10 y	Not addressed	10 y
Iceland	10 y	10 y	10 y
India	Not addressed	Not addressed	Not addressed
Ireland	10 y	10 y	10 y
Italy	Not addressed	No Limit	No Limit
Côte d'Ivoire	No Limit	Not addressed	Not addressed
Japan	No Limit	Not addressed	No Limit
Jordan	Not addressed	Not addressed	Not addressed
Kazakhstan	No Limit	No Limit	No Limit
Kenya	Not addressed	Not addressed	Not addressed
Latvia	No Limit	No Limit	No Limit
Lithuania	No Limit	Not addressed	No Limit
Mali	5 y	Unknown	Unknown
Mexico	Not addressed	Not addressed	Not addressed
Mongolia	Not addressed	Not addressed	Not addressed
Montenegro	No Limit	No Limit	No Limit
Namibia	No Limit	Not addressed	Not addressed
Netherlands	No Limit	No Limit	No Limit
New Zealand	10 y	10 y	10 y
Nicaragua	Unknown	Unknown	Unknown
Nigeria	Unknown		
Norway	5 y		5 y
Panama	Not addressed	Not addressed	Not addressed
Paraguay	No Limit	No Limit	No Limit
Peru	Unknown	Unknown	Unknown
Portugal	Not addressed	Not addressed	Unknown
Romania	Not addressed	Not addressed	Not addressed
Russian Federation	No Limit	No Limit	No Limit
Senegal	Not addressed	Not addressed	Not addressed
Serbia		Not addressed	Unknown
Singapore	10 y	0 y	10 y
Slovenia	10 y		No Limit
South Africa	No Limit	No Limit	No Limit
The Republic of Korea	5 y	5 y	5 y
Spain	No Limit	No Limit	No Limit
Switzerland	10 y	10 y	10 y
Taiwan (China*)	10 y	10 y	10 y
Thailand	No Limit	No Limit	No Limit
Togo	No Limit	Not addressed	Not addressed
Trinidad and Tobago	Not addressed	Not addressed	Not addressed
Turkey	Not addressed		Not addressed
Uganda	10 y	Unknown	Unknown
United Arab Emirates	Not addressed	Not addressed	Not addressed
UK	10 y	10 y	10 y
USA	No Limit	No Limit	No Limit
Uruguay	No Limit	No Limit	No Limit
Venezuela	No Limit	No Limit	No Limit
Viet Nam	Not addressed	Not addressed	Not addressed
Zimbabwe	No Limit	No Limit	No Limit

*Reporting separately for this report.

Switzerland, Taiwan [China, reporting separately for this report], and Uganda); 25 years (Greece); and 55 years (United Kingdom of Great Britain and Northern Ireland) (Table 2a).

- Oocytes: 2 years (Serbia); 5 years (Bulgaria, Mali, Portugal, Turkey, and United Arab Emirates); 10 years (Hong Kong [China, reporting separately for this report], Iceland, Ireland, New Zealand, Singapore, Switzerland, Taiwan [China, reporting separately for this report], Uganda, and United Kingdom of Great Britain and Northern Ireland); and 25 years (Greece) (Table 2b); and
- All stages of preimplantation embryos: 5 years (Bulgaria, Cameroon, Mali, Norway, and The Republic of Korea); 10 years (Australia, Austria, Hong Kong [China, reporting separately for this report], Hungary, Iceland, Ireland, New Zealand, Singapore, Slovenia, Switzerland, Taiwan [China, reporting separately for this report], Uganda, and the United Kingdom of Great Britain and Northern Ireland); and 25 years (Greece) (Table 2c).

Cryopreservation for fertility preservation, medical indications

None of the respondent countries cited explicit prohibition of cryopreservation of sperm, oocytes, or pre-implantation embryos for fertility preservation. Cryopreservation for fertility preservation for medical indications (Table 1) is expressly allowed/permitted for sperm in 68 of 81 (84%) of responding countries; for

oocytes, in 60 of 83 (82%); for pre-implantation embryos (all stages), in 62 of 82 (76%); for ovarian tissue, in 52 of 83 (65%); and for testicular tissue, in 53 of 82 (65%).

Countries reporting that cryopreservation to maintain fertility for medical indications is commonly performed for sperm in 28 of 439 countries (72%); for oocytes, in 18 out of 40 (45%); for all stages of pre-implantation embryos, in 19 of 42 (45%); for ovarian tissue, in 7 of 48 (14.5%); and for testicular tissue, 9 of 47 (19%).

Cryopreservation for fertility preservation, non-medical indications

According to responders, cryopreservation in non-medical indications is specifically allowed/permitted for sperm in 60 of 82 (73%); for oocytes, in 56 out of 81 (69%); for pre-implantation embryos (all stages), 51 of 82 (62%); for ovarian tissue, 44 of 82 (54%); and for testicular tissue, 45 of 83 (54%). Cryopreservation for fertility preservation in non-medical indications is frequently performed as follows: for sperm, 16 of 42 (38%); oocytes, 18 of 42 (43%); all stages of pre-implantation embryos, 8 of 43 (19%); ovarian tissue, 3 of 48 (6%); and testicular tissue, 4 of 49 (8%).

In 80 countries surveyed, 33 (41%) have no regulations for cryopreservation performed to preserve fertility for sperm and oocytes in all stages of pre-implantation embryos; 31 (39%); 30 (37.5%) have none for ovarian tissue; and 31 (39%) have none for testicular tissue.

Countries that regulated cryopreservation for fertility treatment provided responses, summarized below, indicating how uses were governed. (In all cases there were 80 responders):

- Federal/national laws/statutes/ordinances governed sperm and oocyte cryopreservation in 28 (35%); pre-implantation embryos, all stages, in 27 (34%); ovarian tissue, in 18 (23%); and testicular tissue, in 17 (21%);
- State/provincial/regional laws/statutes/ordinances governed sperm cryopreservation in 2 (3%); oocytes, in 3 (4%); and all stages of pre-implantation embryos, ovarian tissue, and testicular tissue, in 1 (1%);
- Municipal laws/statutes/ordinances were used to govern testicular tissue in 1 (1%);
- Agency regulations/oversight governed sperm in 6 (8%); oocytes in 3 (4%); and pre-implantation embryos (all stages), ovarian tissue, and testicular tissue in 4 (5%);
- Professional organization standards/guidelines were used to govern sperm in 20 (25%); oocytes, 19 (24%); pre-implantation embryos, all stages, 18 (23%); ovarian tissue, 14 (18%); and testicular, 15 (19%);
- Cultural practices governed sperm and oocytes in 2 (3%), and in pre-implantation embryos (all stages), ovarian tissue, and testicular tissue (1%); and
- Religious decree was used to govern ovarian tissue in 1 instance (1%).

Duration of storage for fertility treatment for medical indications

Listed below is the duration of storage for fertility preservation for medical indications. Storage duration was not limited for sperm in 38 of 77 (49%) countries; for oocytes, in 38 of 74 (51%) countries; for pre-implantation embryos (all stages), in 31 of 74 (42%), in ovarian tissue, in 30 of 74 (40%); and in testicular tissue, in 35 of 74 (47%).

The duration of storage was limited for sperm in 13 of 77 (17%) countries; for oocytes, in 13 of 74 (18%); all stages of pre-implantation embryos, in 18% of 74; for ovarian tissue, in 9% of 74, and for testicular tissue, in 11%. The duration of storage was not addressed for sperm in 19 of 77 (25%); for oocytes, in 18 of 74 (24%); all stages of pre-implantation embryos, 21 of 74 (28%); ovarian tissue, 28 of 74 (38%); and testicular tissue, 21 of 74 (28%). The duration of storage was unknown for sperm in 7 of 77 countries (9%); for oocytes, in 5 of 74 (7%); for all stages of pre-implantation embryos, in 9 of 74 (12%); for ovarian tissue, in 9 of 74 (12%); and for testicular tissue, in 10 in 74 (14%).

The following durations were reported:

- Sperm: 5 years (Bulgaria, Nicaragua, Portugal, Turkey, and United Arab Emirates); 10 years (Hong Kong [China, reporting separately for this report], Iceland, Ireland, New Zealand, Singapore, Taiwan [China, reporting separately for this report], and Uganda); and 55 years (United Kingdom of Great Britain and Northern Ireland);
- Oocytes: 5 years (Bulgaria, Nicaragua, Portugal, Turkey, and United Arab Emirates); 10 years (Hong Kong [China, reporting separately for this report], Iceland, Ireland, New Zealand, Singapore, Taiwan [China, reporting separately for this report], and Uganda); 55 years (United Kingdom of Great Britain and Northern Ireland);
- All Stages of preimplantation embryos: 5 years (Bulgaria, Norway, and The Republic of Korea); 10 years (Austria, Hong Kong [China, reporting separately for this report], Iceland, Ireland, New Zealand, Singapore, Switzerland, Taiwan [China, reporting separately for this report], and the United Kingdom of Great Britain and Northern Ireland);
- Ovarian Tissue: 5 years (Nicaragua, Portugal, and Turkey); 10 years (Hong Kong [China, reporting separately for this report], Iceland, New Zealand, and Singapore); and
- Testicular tissue: 5 years (Bulgaria, Nicaragua, Portugal, and Turkey); 10 years (Hong Kong [China, reporting separately for this report], Iceland, New Zealand, and Singapore).

Duration of storage for fertility treatment for non-medical indications

The duration of storage for fertility preservation for non-medical indications was not limited, as follows: for sperm, in 29 of 70 (41%); for oocytes, in 30 of 70 (43%); in all stages of pre-implantation embryos, in 26 of 68 (38%); in ovarian tissue, 28 of 69 (40%); and testicular tissue, in 28 of 69 (41%).

The duration of storage was limited, however, as follows: for sperm, in 13 of 70 (19%); for oocytes, in 10 of 70 (14%); in all stages of pre-implantation embryos, in 8 of 68 (12%); in ovarian tissue, in 5 of 69 (7%); and in testicular tissue, in 7 out of 69 (10%).

The duration of storage was not addressed, as follows: for sperm, in 22 of 70 (31%); for oocytes, in 25 of 70 (36%); all stages of pre-implantation embryos, in 27 of 68 (40%); ovarian tissue, 28 of 69 (40%); and testicular tissue in 27 of 69 (39%).

In some cases, the duration of storage was unknown. These include: for sperm, 6 of 70 (8%); for oocytes, 5 of 70 (7%); for all stages of pre-implantation embryos, 7 of 68 (10%); for ovarian tissue, 8 of 69 (12%); and for testicular tissue, 7 of 69 (10%).

The following durations for storage were reported:

- Sperm: 2 years (Serbia); 5 years (Bulgaria, Nicaragua, Portugal, and United Arab Emirates); 10 years (Iceland,

Chapter 6. Table 3a

Is cryopreservation for fertility treatment or fertility preservation allowed/permitted or practiced/performed in your country?

Country	Sperm Cryopreserved for Fertility Treatment	Sperm Nonmedical Indications	Sperm Medical Indications	Testicular Tissue Nonmedical Indications	Testicular Tissue Medical Indications
Argentina	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/Performed
Armenia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Australia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted
Austria	Allowed/Permitted Commonly Practiced/Performed	Never Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Bangladesh	Allowed/Permitted	Never Practiced/ Performed	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted
Barbados	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Infrequently Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Belarus	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Belgium	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Unknown	Unknown
Bolivia	Commonly Practiced/Performed	Commonly Practiced/ Performed	Commonly Practiced/ Performed	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
Botswana	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Brazil	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Bulgaria	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Burkina Faso	Commonly Practiced/Performed	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Cameroon	Allowed/Permitted Commonly Practiced/Performed	Never Practiced/ Performed	Allowed/Permitted Infrequently Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Canada	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Chile	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed
China	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Colombia	Allowed/Permitted	Allowed/Permitted		Allowed/Permitted	Allowed/Permitted
Czechia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
Congo	Allowed/Permitted	Unknown	Unknown	Never Practiced/Performed	
Ecuador	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Egypt	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Unknown	Allowed/Permitted
El Salvador	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Finland	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Georgia	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Never Practiced/Performed
Germany	Unknown	Unknown	Commonly Practiced/ Performed	Unknown	Unknown
Ghana	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted	Allowed/Permitted
Greece	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Guatemala	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted

Chapter 6. Table 3a

(*Continued*)

Country	Sperm Cryopreserved for Fertility Treatment	Sperm Nonmedical Indications	Sperm Medical Indications	Testicular Tissue Nonmedical Indications	Testicular Tissue Medical Indications
	Commonly Practiced/Performed	Commonly Practiced/ Performed	Commonly Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Hong Kong (China*)	Allowed/Permitted Commonly Practiced/Performed	Unknown	Allowed/Permitted Commonly Practiced/ Performed	Unknown	Allowed/Permitted Infrequently Practiced/ Performed
Hungary	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
Iceland	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Never Practiced/Performed
India	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Ireland	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Never Practiced/Performed
Italy	Allowed/Permitted	Allowed/Permitted		Allowed/Permitted	Allowed/Permitted
Côte d'Ivoire	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Unknown	Never Practiced/Performed, Unknown	Infrequently Practiced/ Performed
Japan	Allowed/Permitted	Infrequently Practiced/ Performed	Allowed/Permitted	Unknown	Unknown
Jordan	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted	Allowed/Permitted	Unknown	Unknown
Kazakhstan	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Kenya	Commonly Practiced/Performed	Commonly Practiced/ Performed	Infrequently Practiced/ Performed	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
Latvia	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/ Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted, Unknown	Allowed/Permitted, Unknown
Lithuania	Allowed/Permitted	Allowed/Permitted Never Practiced/ Performed	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted
Mali	Commonly Practiced/Performed	Never Practiced/ Performed	Never Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Mexico	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
Mongolia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Montenegro	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Namibia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Netherlands	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
New Zealand	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted, Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Nicaragua	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Nigeria	Infrequently Practiced/Performed	Commonly Practiced/ Performed	Allowed/Permitted	Unknown	Unknown
Norway	Allowed/Permitted Commonly Practiced/Performed		Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Panama	Commonly Practiced/Performed	Commonly Practiced/ Performed	Commonly Practiced/ Performed	Commonly Practiced/Performed	Commonly Practiced/Performed
Paraguay	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed
Peru	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Philippines	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
Poland	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Portugal	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted, Unknown	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted, Unknown	Allowed/Permitted Commonly Practiced/Performed
Romania	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted

Chapter 6. Table 3a

(***Continued***)

Country	Sperm Cryopreserved for Fertility Treatment	Sperm Nonmedical Indications	Sperm Medical Indications	Testicular Tissue Nonmedical Indications	Testicular Tissue Medical Indications
		Infrequently Practiced/ Performed	Infrequently Practiced/ Performed		Infrequently Practiced/ Performed
Russian Federation	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Senegal	Infrequently Practiced/Performed	Commonly Practiced/ Performed	Infrequently Practiced/ Performed	Never Practiced/Performed	Infrequently Practiced/ Performed
Serbia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/ Performed
Singapore	Allowed/Permitted Infrequently Practiced/Performed	Unknown	Allowed/Permitted Infrequently Practiced/ Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Slovenia	Commonly Practiced/Performed	Never Practiced/ Performed	Commonly Practiced/ Performed	Never Practiced/Performed	Commonly Practiced/Performed
South Africa	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
The Republic of Korea	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Spain	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Sri Lanka	Infrequently Practiced/Performed	Infrequently Practiced/ Performed	Infrequently Practiced/ Performed	Unknown	Unknown
Sweden	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed
Switzerland	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed
Taiwan (China*)	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Thailand	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Togo	Commonly Practiced/Performed	Never Practiced/ Performed	Commonly Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Trinidad and Tobago	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Turkey	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Uganda	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
UAE	Allowed/Permitted	Commonly Practiced/ Performed	Allowed/Permitted	Unknown	Allowed/Permitted
UK	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Never Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
USA	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Uruguay	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed
Venezuela	Commonly Practiced/Performed	Infrequently Practiced/ Performed	Commonly Practiced/ Performed	Never Practiced/Performed	Infrequently Practiced/ Performed
Viet Nam	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Zimbabwe	Allowed/Permitted	Infrequently Practiced/ Performed	Commonly Practiced/ Performed	Never Practiced/Performed	Infrequently Practiced/ Performed

*Reporting separately for this report.

Chapter 6. Table 3b

Is cryopreservation for fertility treatment or fertility preservation allowed/permitted or practiced/performed in your country?

Country	Oocytes Cryopreserved for Fertility Treatment	Oocytes Nonmedical Indications	Oocytes Medical Indications	Ovarian Tissue Nonmedical Indications	Ovarian Tissue Medical Indications
Argentina	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed
Armenia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Australia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted
Austria	Allowed/Permitted Commonly Practiced/Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed
Bangladesh	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted
Barbados	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed
Belarus	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed
Belgium	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Bolivia	Commonly Practiced/Performed	Commonly Practiced/Performed	Commonly Practiced/Performed	Infrequently Practiced/Performed	Infrequently Practiced/Performed
Botswana	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Brazil	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed
Bulgaria	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Unknown	Unknown
Burkina Faso	Commonly Practiced/Performed	Unknown	Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Cameroon	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Canada	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Chile	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed
China	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed
Colombia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Czechia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Commonly Practiced/Performed	Commonly Practiced/Performed
Congo	Allowed/Permitted	Unknown	Never Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed
Ecuador	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Egypt	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Unknown	Allowed/Permitted
El Salvador	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Finland	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Georgia	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Never Practiced/Performed
Germany	Unknown	Unknown	Allowed/Permitted	Unknown	Unknown
Ghana	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted	Allowed/Permitted
Greece	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Guatemala	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Never Practiced/Performed
Hong Kong (China*)	Allowed/Permitted Commonly Practiced/Performed	Unknown	Allowed/Permitted Commonly Practiced/Performed	Unknown	Allowed/Permitted Infrequently Practiced/Performed
Hungary	Allowed/Permitted		Infrequently Practiced/Performed		Infrequently Practiced/Performed

Chapter 6. Table 3b

(*Continued*)

Country	Oocytes Cryopreserved for Fertility Treatment	Oocytes Nonmedical Indications	Oocytes Medical Indications	Ovarian Tissue Nonmedical Indications	Ovarian Tissue Medical Indications
Iceland	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Never Practiced/Performed
India	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Ireland	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Never Practiced/Performed
Italy	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Côte d'Ivoire	Allowed/Permitted Infrequently Practiced/Performed		Unknown	Never Practiced/Performed, Unknown	Never Practiced/Performed, Unknown
Japan	Allowed/Permitted	Infrequently Practiced/Performed	Allowed/Permitted	Unknown	Allowed/Permitted
Jordan	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Unknown
Kazakhstan	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Kenya	Commonly Practiced/Performed	Commonly Practiced/Performed	Infrequently Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed
Latvia	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted, Unknown	Allowed/Permitted, Unknown
Lithuania	Allowed/Permitted	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted
Mali	Infrequently Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed
Mexico		Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/Performed	Infrequently Practiced/Performed
Mongolia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Montenegro	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Namibia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Netherlands	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
New Zealand	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed
Nicaragua	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Nigeria	Infrequently Practiced/Performed	infrequently Practiced/Performed	Allowed/Permitted	Unknown	Unknown
Norway	Allowed/Permitted Commonly Practiced/Performed	Never Practiced/Performed	Allowed/Permitted	Never Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed
Panama	Commonly Practiced/Performed	Commonly Practiced/Performed	Commonly Practiced/Performed	Never Practiced/Performed	Infrequently Practiced/Performed
Paraguay	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed
Peru	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Philippines	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/Performed	Infrequently Practiced/Performed
Poland	Unknown	Unknown	Unknown	Unknown	Unknown
Portugal	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted, Unknown	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted, Unknown	Allowed/Permitted Commonly Practiced/Performed
Romania	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed
Russian Federation	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/Performed
Senegal	Never Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed	Never Practiced/Performed

Chapter 6. Table 3b

(***Continued***)

Country	Oocytes Cryopreserved for Fertility Treatment	Oocytes Nonmedical Indications	Oocytes Medical Indications	Ovarian Tissue Nonmedical Indications	Ovarian Tissue Medical Indications
Serbia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Infrequently Practiced/ Performed
Singapore	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Slovenia	Allowed/Permitted	Never Practiced/Performed	Commonly Practiced/ Performed	Never Practiced/Performed	Commonly Practiced/ Performed
South Africa	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
The Republic of Korea	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Spain	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Sri Lanka	Infrequently Practiced/Performed	Unknown	Infrequently Practiced/ Performed	Unknown	Unknown
Sweden	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed
Switzerland	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed
Taiwan (China*)	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Never Practiced/Performed	Never Practiced/Performed
Thailand	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Togo	Infrequently Practiced/Performed	Never Practiced/Performed	Never Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Trinidad and Tobago	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Turkey	Allowed/Permitted Infrequently Practiced/Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Uganda	Infrequently Practiced/Performed	Infrequently Practiced/ Performed	Infrequently Practiced/ Performed	Infrequently Practiced/Performed	Infrequently Practiced/ Performed
UAE	Allowed/Permitted	Infrequently Practiced/ Performed	Allowed/Permitted	Never Practiced/Performed	Infrequently Practiced/ Performed
UK	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
USA	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Infrequently Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Uruguay	Allowed/Permitted Commonly Practiced/Performed	Allowed/Permitted Commonly Practiced/ Performed	Allowed/Permitted Infrequently Practiced/ Performed	Allowed/Permitted Never Practiced/Performed	Allowed/Permitted Infrequently Practiced/ Performed
Venezuela	Infrequently Practiced/Performed	Commonly Practiced/ Performed	Infrequently Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed
Viet Nam	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Zimbabwe	Infrequently Practiced/Performed	Infrequently Practiced/ Performed	Infrequently Practiced/ Performed	Never Practiced/Performed	Never Practiced/Performed

*Reporting separately for this report.

Ireland, New Zealand, Switzerland, Taiwan [China, reporting separately for this report], Uganda, and United Kingdom of Great Britain and Northern Ireland); and 25 years (Greece);

- Oocytes: 2 years (Serbia); 5 years (Bulgaria, Nicaragua, and Portugal); 10 years (Iceland, Ireland, New Zealand, Switzerland, Taiwan [China, reporting separately for this report], Uganda, and United Kingdom of Great Britain and Northern Ireland);
- All Stages of preimplantation embryos: 5 years (Bulgaria and The Republic of Korea); 10 years (Iceland, Ireland, New Zealand, Switzerland, Taiwan [China, reporting separately for this report], Uganda, and the United Kingdom of Great Britain and Northern Ireland);
- Ovarian Tissue: 5 years (Nicaragua and Portugal); 10 years (Iceland, New Zealand, and Switzerland); and
- Testicular tissue: 1 year (Serbia), 5 years (Bulgaria, Nicaragua, and Portugal); 10 years (Iceland, New Zealand, and Switzerland).

Chapter 6. Table 3c

Is cryopreservation for fertility treatment or fertility preservation allowed/permitted or practiced/performed in your country?

Country	Preimplantation Embryos Nonmedical Indications	Preimplantation Embryos Medical Indications
Argentina	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Armenia	Allowed/Permitted	Allowed/Permitted
Australia	Never Practiced/Performed	Allowed/Permitted
Austria	Never Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Bangladesh	Never Practiced/Performed	Allowed/Permitted
Barbados	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Belarus	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Belgium	Allowed/Permitted	Allowed/Permitted
Bolivia	Commonly Practiced/Performed	Commonly Practiced/Performed
Botswana	Allowed/Permitted	Allowed/Permitted
Brazil	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Bulgaria	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Burkina Faso	Unknown	Unknown
Cameroon	Never Practiced/Performed	Never Practiced/Performed
Canada	Allowed/Permitted	Allowed/Permitted
Chile	Allowed/Permitted	Allowed/Permitted, Commonly Practiced/Performed
China	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Colombia	Allowed/Permitted	Allowed/Permitted
Czechia	Allowed/Permitted	Allowed/Permitted
Congo	Unknown	Never Practiced/Performed
Ecuador	Allowed/Permitted	Allowed/Permitted
Egypt	Allowed/Permitted	Allowed/Permitted
El Salvador	Never Practiced/Performed	Never Practiced/Performed
Finland	Allowed/Permitted	Allowed/Permitted
Georgia	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Germany	Unknown	Unknown
Ghana	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Greece	Allowed/Permitted	Allowed/Permitted
Guatemala	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Hong Kong (China*)	Unknown	Allowed/Permitted, Commonly Practiced/Performed
Iceland	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
India	Allowed/Permitted	Allowed/Permitted
Ireland	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Italy	Allowed/Permitted	Allowed/Permitted
Côte d'Ivoire	Never Practiced/Performed, Unknown	Never Practiced/Performed, Unknown
Japan	Never Practiced/Performed	Allowed/Permitted
Jordan	Unknown	Allowed/Permitted
Kazakhstan	Allowed/Permitted	Allowed/Permitted
Kenya	Infrequently Practiced/Performed	Infrequently Practiced/Performed
Latvia	Allowed/Permitted, Infrequently Practiced/Performed, Unknown	Allowed/Permitted, Infrequently Practiced/Performed, Unknown
Lithuania	Allowed/Permitted, Never Practiced/Performed	Allowed/Permitted

Chapter 6. Table 3c

(*Continued*)

Country	Preimplantation Embryos Nonmedical Indications	Preimplantation Embryos Medical Indications
Mali	Never Practiced/Performed	Never Practiced/Performed
Mexico	Allowed/Permitted	Allowed/Permitted
Mongolia	Allowed/Permitted	Allowed/Permitted
Montenegro	Allowed/Permitted	Allowed/Permitted
Namibia	Allowed/Permitted	Allowed/Permitted
Netherlands	Allowed/Permitted	Allowed/Permitted
New Zealand	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Nicaragua	Unknown	Unknown
Nigeria	infrequently Practiced/Performed	Allowed/Permitted
Norway	Never Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Panama	Commonly Practiced/Performed	Commonly Practiced/Performed
Paraguay	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Peru	Allowed/Permitted	Allowed/Permitted
Philippines	Allowed/Permitted	Allowed/Permitted
Poland	Unknown	
Portugal	Unknown	Unknown
Romania	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Russian Federation	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Senegal	Never Practiced/Performed	Never Practiced/Performed
Serbia	Unknown	Unknown
Singapore	Never Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Slovenia	Never Practiced/Performed	Commonly Practiced/Performed
South Africa	Allowed/Permitted	Allowed/Permitted
The Republic of Korea	Allowed/Permitted	Allowed/Permitted
Spain	Allowed/Permitted	Allowed/Permitted
Sri Lanka	Unknown	Infrequently Practiced/Performed
Sweden	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Switzerland	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Taiwan (China*)	Allowed/Permitted	Allowed/Permitted
Thailand	Allowed/Permitted	Allowed/Permitted
Togo	Never Practiced/Performed	Never Practiced/Performed
Trinidad and Tobago	Allowed/Permitted	Allowed/Permitted
Turkey	Never Practiced/Performed	Allowed/Permitted, Infrequently Practiced/Performed
Uganda	Allowed/Permitted	Allowed/Permitted
United Arab Emirates	Never Practiced/Performed	Infrequently Practiced/Performed
UK	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
USA	Allowed/Permitted, Commonly Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Uruguay	Allowed/Permitted, Infrequently Practiced/Performed	Allowed/Permitted, Commonly Practiced/Performed
Venezuela	Infrequently Practiced/Performed	Commonly Practiced/Performed
Viet Nam	Allowed/Permitted	Allowed/Permitted
Zimbabwe	Infrequently Practiced/Performed	Commonly Practiced/Performed

*Reporting separately for this report.

Discussion

Sperm cryopreservation is an established procedure, a standard technique for donor insemination and for preservation of male fertility in men who have a malignancy. Attempts are being made to cryopreserve small numbers of sperm from men who are infertile, and men with reduced fertility. Cryopreservation may reduce the need for future surgical procedures or the use of donor sperm.

Sperm can now be frozen using the freeze-drying technique, lyophilization. This procedure can preserve sperm for longer periods and more economically than current methods, without affecting the integrity of sperm DNA[4]. Sperm banking is indicated for cancer patients facing gonadotoxic therapy. Testicular tissue has been obtained and preserved from prepubertal boys undergoing gonadotoxic treatment and those with cryptorchidism, but the procedure is experimental.

Some reviews have shown two procedures performed on oocytes – slow freezing and vitrification – have comparable rates when the oocytes are assessed for fertilization, pregnancy, and implantation, but vitrification is preferred because of its simplicity[5]. The limited available studies suggest that the technique of vitrification of oocytes yields higher pregnancy rates when compared to slow-freezing[6].

Preliminary data on the safety of oocyte cryopreservation are reassuring, and the procedure is no longer considered experimental. Good evidence indicates that fertilization and pregnancy rates are similar with fresh oocytes or frozen-thawed oocytes. No increases in chromosomal abnormalities, birth defects, or developmental deficits have been noted in the children born from cryopreserved oocytes. Oocyte freezing has developed substantially, finding wider applications and use. There are not yet sufficient data to recommend oocyte cryopreservation as a mainstream option to mitigate reproductive aging in healthy women[7].

Also, oocyte freezing has simplified the oocyte donation process. The advent of donor egg cryobanks with cryopreserved oocytes facilitates creation of greater numbers of potential donor oocytes and uncouples the donor stimulation process from the recipient endometrial preparation cycle, which eliminates the need for cycle synchronization[8]. Oocyte cryopreservation also allows for the quarantining of human immunodeficiency virus (HIV)-exposed oocytes[8,9]. Furthermore, it is a model for conserving potential fertility in women with malignancy or those who seek elective postponement of childbirth, potentially extending their reproductive lifespan in optimal circumstances[10].

Use of cryopreserved embryos appears to be increasing, and many centres are now switching to a "freeze all" protocol, in which all or almost all of the freshly created embryos are not transferred, but cryopreserved for subsequent transfer in a programmed cycle. A recent meta-analysis suggests that pregnancies after FET are associated with better clinical outcomes, including lower risks of placenta previa, placental abruption, low birth weight, very-low-birth-weight-very-pre-term birth, short-for-gestation age, and perinatal mortality, compared with fresh embryo transfer. Conversely, pregnancies following FET were associated with increased risks of pregnancy-induced hypertension, postpartum hemorrhage, and large-for-gestational-age fetuses compared to those produced with fresh embryo transfer[11].

Among the established methods for preserving fertility in women diagnosed with cancer, cryopreservation is the preferred option for the post-pubertal age group oocyte, and ovarian tissue cryopreservation is generally the only available option for prepubertal girls. Ovarian tissue cryopreservation before treatment for malignancy has been performed, and has led to a small number of live births following transplantation. The procedure of ovarian tissue cryopreservation has been found to be safe, relatively simple, and promising[12]. Cited advantages are that it may eliminate certain ethical, moral, and potentially legal obstacles to oocyte or embryo freezing in minors.

Ovarian tissue cryopreservation is still considered an experimental procedure. It is an option for patients requiring immediate gonadotoxic treatment who must forego oocyte or embryo freezing, and it is the only option available for prepubertal girls. Vitrification of ovarian tissue was found to be similar to slow freezing, and both preserved the morphologic integrity of the ovarian tissue[13]. Orthotopic transplantation of the cortical strips from the tissue has been successful, and live births have been reported[14]. In vitro-activated ovarian tissue cryopreservation and transplantation is a new method requiring more clinical research. This procedure involves stimulation of dormant follicles within the cryopreserved tissue graft prior to transplantation, in order to generate mature oocytes shortly after transplantation[15].

Summary

Advances in cryopreservation, most notably vitrification, have led to wide adoption and successful application of cryopreservation of sperm, oocytes, and embryos. The 2018 Surveillance questionnaire did not uncover any countries that expressly prohibit cryopreservation of gametes or pre-implantation embryos for fertility treatment or for fertility preservation performed for medical or other indications. Approximately 65% to 80% of respondent countries noted the existence of laws, regulations, agency oversight, or professional guidelines that provided governance. However, there is extensive variation among the country respondents in terms of which practices are regulated, and how they are regulated.

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CHAPTER 7: POSTHUMOUS REPRODUCTION

Introduction

Posthumous reproduction broaches a diverse scope of emotional, medical, legal, and ethical concerns that represent one of the more challenging and sensitive areas in reproductive medicine. There is still substantial debate over the ethics and legality of several aspects of posthumous reproduction, and the rights of the deceased person's parents, surviving partner, and any resulting offspring.

Posthumous reproduction utilizes cryopreserved gametes, or embryos created when the person was alive, but inseminated or transferred after the person's death. Posthumous reproduction can occur in two distinctly separate modes, referred to as (1) immediate posthumous reproduction and (2) posthumous reproduction. Immediate posthumous reproduction involves either the immediate harvesting of gametes from a person declared to be in a brain-dead state, on life support; or the extraction of gametes from a person declared dead within the previous 24 hours. Reports of sperm retrieval post 24 hours have been described[1]. Posthumous conception by artificial insemination using cryopreserved sperm has been practiced since the 1950s[2].

The acceptance, legality, and utilization of posthumous reproduction varies from country to country (Table 1). With the advent of more successful cryopreservation techniques, patients are cryopreserving gametes and embryos for a wider number of reasons, including onco-banking, elective fertility preservation, and delayed embryo transfer in in vitro fertilization (IVF), with or without pre-implantation genetic testing. The actual use of cryopreserved reproductive tissue after death depends on existing legislation, prior written legal agreements, and/or consent documentation. Most ART programmes now use consents that cover the deposition of gametes and embryos after death. When immediate posthumous reproduction is being considered, family input often is the only form of intent available to interpret the wishes of the deceased person. In some locales, gametes are considered an individual's property, and the gamete's subsequent ownership must be documented in a will. Otherwise, the burden to determine whether the person may have truly wished to procreate after death devolves to the courts to decide. This often precipitates the need for governments to update relevant legislation.

The first data regarding posthumous reproduction were reported in 2003, in the cryopreservation chapter. Surveillance reports from 2007 through 2013 included data regarding only the permissibility and utilization of posthumous insemination. The 2015 Surveillance questionnaire for the 2016 Surveillance report was expanded to include questions about posthumous reproduction involving insemination of frozen sperm or frozen ova, and implantation of frozen embryos from deceased persons. Questions were added regarding legislation and the frequency of use of posthumous reproduction. In 2018, responses regarding posthumous reproduction were received from 82 countries – a 23% increase from the 2015 survey.

Analysis of the Survey

Of the 97 countries participating in the survey, respondents from 82 countries (85%) addressed questions regarding posthumous reproduction governance. Fewer countries than in the 2016 Surveillance report said they had regulations that governed immediate posthumous reproduction: 16 of 82 (20%). The report broke down the governance data as follows: posthumous sperm insemination: 19 of 82 (23%), posthumous insemination of frozen ova: 19 of 82 (23%); and posthumous implantation of frozen embryos: 23 of 28 (28%). An additional 7 of 82 (9%) (Belgium, Côte d'Ivoire, Germany, Jordan, Mongolia, Namibia, and Netherlands) reported it was "unknown" whether any type of regulations existed to govern posthumous reproduction.

When regulations existed, posthumous reproduction procedures were reportedly largely covered by federal law (immediate posthumous reproduction, 13 of 19 (68%); insemination with frozen sperm, 16 of 19 (84%); insemination of frozen ova, 14 of 19 (74%); and implantation of frozen embryos, 17 of 19 (89%). Regulations were addressed by state, regional, or provincial laws, 5 of 39 (13%), municipal laws, 1 of 19 (5%); agency oversight, 4 of 60 (7%); a professional organization's standards and guidelines, 12 of 60 (20%); cultural practice, 1 of 17 (6%); and religious decree 5 of 60 (8%).

In addition, respondents were then asked questions about the permissibility and utilization of posthumous reproduction.

Immediate posthumous reproduction

Respondents from 41 countries reported data on immediate posthumous reproduction procedures in their country. In 28 (68%) of the respondent countries, it was "unknown" whether immediate posthumous reproduction was "allowed/permitted or practiced/performed". In 11 of 41 (27%), posthumous reproduction procedures were allowed/permitted, with 5 of 11 (45%) of these

Chapter 7. Table 1

What posthumous reproduction treatments are allowed/permitted or practised/performed in your country?

Country	Immediate Posthumous Collection of Sperm or Oocytes	Posthumous Sperm Insemination	Posthumous Insemination of Frozen Ova	Posthumous Transfer of Frozen Embryos
Argentina	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Unknown
Australia	Allowed/Permitted	Allowed/Permitted, Practiced/Performed	Allowed/Permitted	Allowed/Permitted Practiced/Performed
	Practiced/Performed		Practiced/Performed	
Bolivia	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Botswana	Unknown	Unknown	Unknown	Unknown
Bulgaria	Unknown	Unknown	Unknown	Unknown
Burkina Faso	Unknown	Unknown	Unknown	Unknown
Canada	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Chile	Unknown	Unknown	Unknown	Unknown
Colombia	Unknown	Unknown	Unknown	Unknown
Congo	Unknown	Unknown	Unknown	Unknown
Ecuador	Unknown	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
El Salvador	Unknown	Unknown	Unknown	Unknown
Georgia	Unknown	Unknown	Unknown	Practiced/Performed
Germany	Unknown	Unknown	Unknown	Unknown
Ghana	Unknown	Unknown	Unknown	Unknown
Greece	Practiced/Performed	Allowed/Permitted	Practiced/Performed	Allowed/Permitted
Guatemala	Unknown	Unknown	Unknown	Unknown
Hungary		Practiced/Performed		Practiced/Performed
India	Practiced/Performed	Practiced/Performed	Practiced/Performed	Practiced/Performed
Ireland	Unknown	Practiced/Performed	Practiced/Performed	Practiced/Performed
Italy	Unknown	Unknown	Unknown	Unknown
Côte d'Ivoire	Unknown	Unknown	Unknown	Unknown
Jordan	Unknown	Unknown	Unknown	Unknown
Kenya	Unknown	Unknown	Unknown	Unknown
Latvia	Allowed/Permitted	Allowed/Permitted, Practiced/Performed Unknown	Allowed/Permitted	Allowed/Permitted
	Practiced/Performed Unknown		Practiced/Performed Unknown	Practiced/Performed Unknown
Mongolia	Unknown	Unknown	Unknown	Unknown
Netherlands		Practiced/Performed	Practiced/Performed	Practiced/Performed
New Zealand		Allowed/Permitted Practiced/Performed	Allowed/Permitted	Allowed/Permitted Practiced/Performed
Nigeria		allowed/Permitted	allowed/Permitted	allowed/Permitted
Panama	Unknown	Unknown	Unknown	Unknown
Paraguay	Unknown	Unknown	Unknown	Unknown
Portugal	Unknown			Allowed/Permitted
Russian Federation	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Senegal	Unknown	Unknown	Unknown	Unknown
South Africa	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Spain	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Taiwan (China*)	Unknown	Unknown	Unknown	Unknown
Thailand				Allowed/Permitted
Trinidad and Tobago	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Uganda	Unknown	Unknown	Unknown	Unknown
United Arab Emirates	Unknown	Unknown	Unknown	Unknown
UK	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
	Practiced/Performed	Practiced/Performed	Practiced/Performed	Practiced/Performed
USA	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
	Practiced/Performed	Practiced/Performed	Practiced/Performed	Practiced/Performed
Uruguay	Unknown	Allowed/Permitted	Allowed/Permitted	Allowed/Permitted
Venezuela	Unknown	Unknown	Unknown	Unknown
Viet Nam	Unknown	Unknown	Unknown	Allowed/Permitted

*Reporting separately for this report.

countries practicing/performing immediate posthumous reproduction procedures, and another 1 of 5 (20%) reporting "unknown" if this procedure was actually being practiced/performed. Two countries did not report whether posthumous reproduction was allowed/permitted, but did note that the procedure was being practiced/performed in their country (Table 1).

Insemination with Frozen Sperm

Respondents from 44 countries reported data on insemination with frozen sperm in their country. In 24 of 44 (54.5%), it was "unknown" whether insemination with frozen sperm was allowed/permitted or practiced/performed. In 16 of 44 (36%), insemination with frozen sperm was allowed/permitted, with 4 of 16 (25%) of these countries practicing/performing insemination with frozen sperm and another 6%, 1 in 16, reporting "unknown" if this procedure was actually being practiced/performed. Four countries did not report if insemination with frozen sperm was allowed/permitted but reported that the procedure was being practiced/performed in their country.

Insemination of Frozen Ova

Respondents from 43 countries provided data on insemination of frozen ova in their country. In 24 of the 43 (56%), it was "unknown" whether insemination of frozen ova was allowed/permitted or practiced/performed. In 15 of the 43 (35%), insemination of frozen ova was allowed/permitted, with 3 of 15 (20%) practicing/performing insemination of frozen ova, and another 1 in 15 (7%) reporting "unknown" as to whether this procedure was actually being practiced/performed. Four countries did not report if insemination of frozen ova was allowed/permitted, but did report that the procedure was being practiced/performed in their country.

Implantation of Frozen Embryos

Respondents from 46 countries reported data on implantation of frozen embryos in their country. In 23 of the 46 (50%), it was "unknown" whether implantation of frozen embryos was allowed/permitted or practiced/performed. In 28 of the 46 (39%), implantation of frozen embryos was allowed/permitted, with 4 out of 18 (22%) of these countries practicing/performing implantation of frozen embryos, and another 1 out of 18 (6%) reporting "unknown" as to whether this procedure was actually being practiced/performed. Five countries did not report if frozen embryo implantation was allowed/permitted, but did report that the procedure was being practiced/performed in their country.

Summary

Compared to past Surveillance surveys, the use of any type of posthumous reproduction procedures has increased over the last 3 years. While scientific and medical advances allow the practitioner to retrieve and use gametes and embryos from deceased persons, complex issues remain unresolved, when it comes to clarifying who can decide when the retrieval and disposition of these reproductive tissues is appropriate, and under what circumstances.

In the 2016 Surveillance survey, more than a third of countries reported legislation in place to govern posthumous reproduction. In 2019, only about a quarter of the countries had governance. The 2019 Surveillance data illustrate the continued global need to address the controversial and complex issues of ethics and legalities associated with posthumous reproduction – especially now, when the procedure is being used more frequently, under what continues to be a limited extent of regulations and legislation.

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CHAPTER 8: DONATION AND ANONYMITY OF DONORS

Introduction

Assisted reproductive technology (ART) programmes around the world increasingly rely on male and female gamete donation in ART cycles. From a cultural perspective, social trends leading to progressive legislation have improved global access to ART and widened the spectrum of potential users. In previous Surveillance reports, changes in legislation pertaining to gamete donation, marital status, and same-sex parenting policies, were observed in about 23% of countries over a three-year interval[1]. Prospective parents seeking medical care now comprise not only infertility patients, carriers of genetic conditions, and HIV sero-discordant couples, but also single women, single men, same-sex couples, and transgender subjects. Enacting anti-discrimination policies favors access for these groups, and a current trend leans toward equal, inclusive, fair, safe, and efficient access to ART, most notably in Europe[2].

An additional driver, from a biological standpoint, has been the social phenomenon favoring delayed childhood in modern societies. This has shifted the "reproductive window" to an age in which ovarian follicular depletion impairs female fertility potential. As a result, use of donated oocytes has increased steadily over the last decades, a trend reflected in recently published global registry data (ICMART, 2017)[3]. Oocyte donation can also be performed with vitrified oocytes. Currently, more programmes are using egg banking for donation, as IVF results have been shown to be similar with the use of fresh and frozen oocytes[4].

Analysis of the survey

The vast majority of countries surveyed allowed gamete donation (Table 1, Charts 1 and 2). Sperm donation is allowed in 48 of 71 (68%), and is practiced in 41 of the 71 (58%). Oocyte donation is permitted in 43 of 69 (62%), but is performed in only 39 of 69 (56.5%). Donation of an embryo created by another couple in a previous IVF cycle is allowed in 31 of 53 (58%), but, surprisingly, is performed in 25 of 53 (47%).

Less commonly allowed is creating embryos purely for donation, "de novo" generation of embryos from donor gametes. Allowed in 21 of 50 countries (42%), it reportedly is practiced in 19 of 50 (38%). Overall, 49 of 71 (69%) reported "commonly using" sperm; oocyte, 44 of 71 (62%); embryo, 17 of 66 (26%). Less frequently allowed is cytoplasmic donation, 7 of 48 (14.5%), and gamete tissue donation—usage with either ovarian tissue 12 of 51 (23.5%) or testicular tissue, 11 of 50 (22%) permitted but

Chapter 8. Table 1

Percentage of countries surveyed allowing gamete and embryo donation practices.

Sperm Donation		Oocyte Donation		Embryo Donation from IVF		"de Novo" Embryo Donation	
Allowed	**Performed**	**Allowed**	**Performed**	**Allowed**	**Performed**	**Allowed**	**Performed**
64%	85%	57%	80%	41%	54%	24%	34%

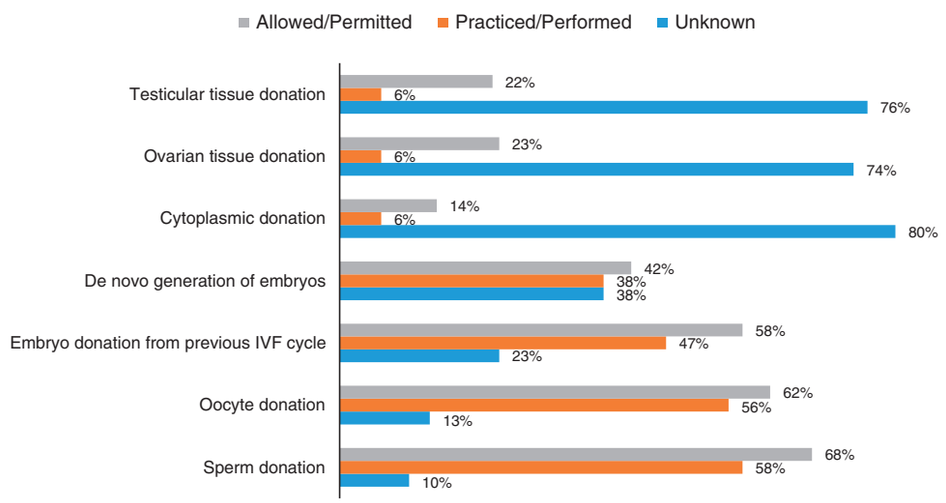
only performed cytoplasmic donation 3 of 48 (6%), ovarian tissue donation, 3 of 51 (6%); or testicular tissue donation, 3 of 50 (6%); six countries reported "never having used" sperm, oocyte, or embryo donation. The same six countries indicated they had never used cytoplasmic and gamete tissue donation (Botswana, Egypt, Jordan, Lithuania, Mali, and Senegal).

More than half the countries surveyed have regulations addressing oocyte donation, 40 of 73 (55%), and sperm donation, 43 of 74 (58%) (Table 2). Many countries have regulations pertaining to embryo donation, 29 of 69 (42%), including previous IVF; or de novo embryos, 26 of 68 (38%). 17% of countries, 11 of 65, have regulations for cytoplasmic donation (Australia, Canada, Finland, Greece, Kazakhstan, New Zealand, Nicaragua, Singapore, Thailand, United Kingdom of Great Britain and Northern Ireland, and The United States of America), and 20% have regulations regarding ovarian (13 of 65) and testicular tissue donation, 13 of 66. Fourteen countries out of 65 (22%) reported allowing agencies to recruit and match third party donors; including donors, recipients, surrogates and/or gestational carriers. These countries are Australia, Canada, Finland, Greece, India, Kazakhstan, Mexico, Nicaragua, Portugal, Singapore, Thailand, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, and Uruguay.

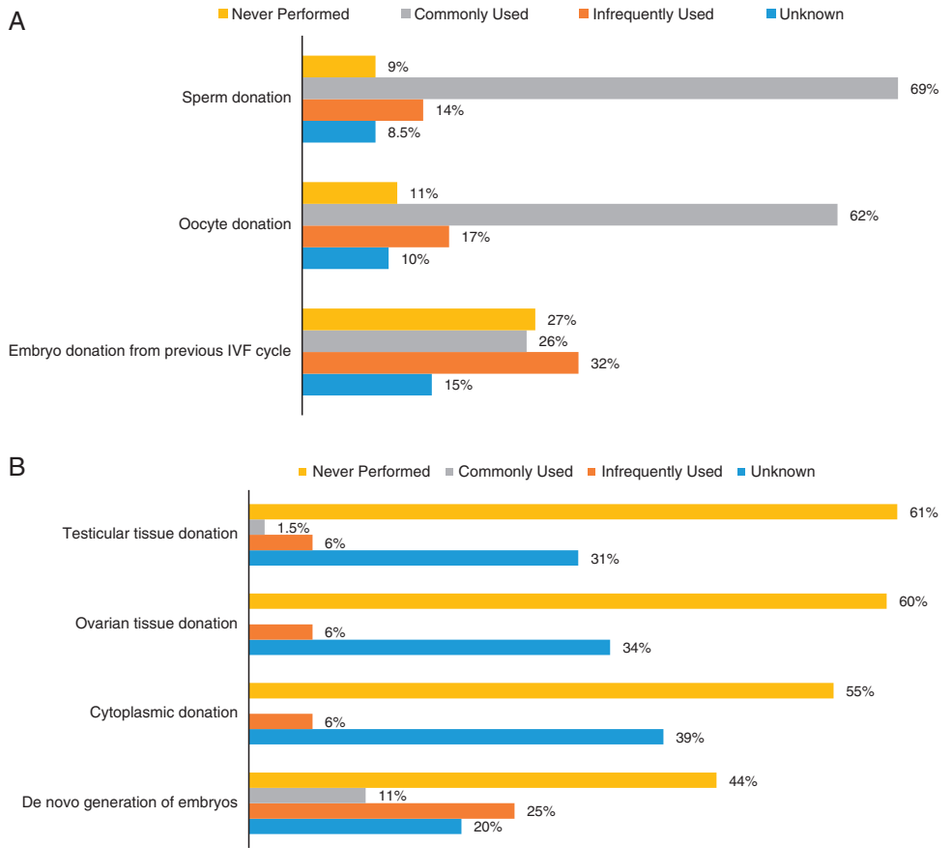
The majority of countries allowed compensation for sperm and oocyte donors; 67 responders (67%) vs 64 responders (72%) and embryo donors 26% (n = 54) of the countries surveyed permitting the practice (Chart 3). This includes reimbursement for donors' time and expenses only, as follows: for sperm, 54%; oocyte, 55%; and for embryo, 2%. Compensation beyond reimbursement occurred in 12% of sperm donors, 17% of oocyte donors, and 7% of embryo donors. The eleven countries that allowed compensation of oocyte donors beyond simple reimbursement include Argentina, Brazil, Bolivia, Colombia, Ecuador, Georgia, Greece, India, Russian Federation, The United States of America, and Venezuela. Embryo donation with reimbursement/compensation practices is permitted in Armenia, Australia, Bolivia, Brazil, Georgia, Greece, Hong Kong [China, reporting separately for this report], India, New Zealand, Nigeria, Sri Lanka, The United States of America, Uruguay, and Zimbabwe. Reimbursement for gamete tissue, and for cytoplasmic and testicular tissues, was reported in 3 of 43 (7%); and for ovarian tissues, 4 out of 44 (9%). Such reimbursement is rare, and reportedly occurred only in Australia, Colombia, Finland, and Greece.

When addressing a specific value paid in terms of compensation to donors, only a few countries reported minimum and maximum amounts for gamete donors. For oocyte donors, amounts ranged from US $ 700 to $ 2,000 in some countries (e.g., Ecuador, Guatemala, Latvia, Hong Kong [China, reporting separately for this report], and Spain) to $ 5,000 to $ 99,000 in others (Brazil, Namibia, South Africa, Taiwan [China, reporting separately for this report], and The United States of America). Some countries reported no minimum or maximum values established, including Argentina, Bulgaria, Chile, Hungary, India, Côte d'Ivoire, Mexico, Panama, and Uganda. Twenty-one out of 41 countries (51%) responded to the item as "not addressed" or "unknown").

When asked if subjects were required to meet medical, mental health, or lifestyle criteria to qualify as donors, 46 of 64 (72%)



Chapter 8. Chart 1. Is donation allowed/permitted or practiced/performed?



Chapter 8. Chart 2a. How often is third party reproduction? Chart 2b. How often is third party reproduction performed in your country?

Chapter 8. Table 2

Gamete donor anonymity regulation.

Country	No Practices or Regulations	Federal/National Laws/ Statutes/Ordinances/ Policies	State/Provincial/ Regional Laws/Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/Guidelines	Cultural Practice	Religious Decree
Argentina	No	No	No	No	No	Yes	No	No
Armenia	Yes							
Australia		Yes	Yes					
Austria	No	Yes	No	No	No	No	No	No
Bangladesh	Yes							
Barbados	Yes							
Belarus		Yes						
Belgium	No							
Bolivia	Yes							
Botswana	No	No	No	No	No	No	No	No
Brazil					Yes	Yes		
Bulgaria	Unknown	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Burkina Faso	No	No	No	No	No	No	No	No
Cameroon	Yes	No	No	No	No	Yes	Yes	No
Canada	Yes							
Chile	No							
China		Yes	Yes					
Colombia	Yes	No	No	No	No	No	Yes	No
Czechia	Yes	Yes		No	No	Unknown	No	No
Ecuador						Yes		
Egypt	Unknown	Unknown				Unknown	Yes	
El Salvador	No	No	No	No	No	No	No	No

Chapter 8. Table 2

(*Continued*)

Country	No Practices or Regulations	Federal/National Laws/ Statutes/Ordinances/ Policies	State/Provincial/ Regional Laws/Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/Guidelines	Cultural Practice	Religious Decree
Finland	No	Yes	No	No	No	No	No	No
Georgia	Yes	No	No	No	No	No	No	No
Germany	No	Yes	No	No	Yes	Yes	Yes	Yes
Ghana						Yes		
Greece	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Guatemala	Yes					Yes		
Hong Kong (China*)		Yes	Yes					
Hungary		Yes						
Iceland		Yes						
India	Unknown					Yes		
Ireland	Yes	Yes						
Italy	No	No	No	No	No	No	No	No
Côte d'Ivoire	Yes	Unknown	Unknown	Unknown	Yes	Yes	Unknown	Unknown
Japan	Yes					Yes		
Jordan	Yes							Yes
Kazakhstan	Yes	Yes	No	No	No	Yes	No	No
Kenya	Yes							
Latvia		Yes						
Lithuania	No	Yes	No	No	No	No	No	No
Mali	Yes	Unknown	Unknown	Unknown	Unknown	Yes	Unknown	Unknown
Mexico	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Mongolia	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Montenegro	Yes	Yes						
Namibia	Yes							
New Zealand	No	Yes				Yes		
Nicaragua	Unknown	Yes						
Nigeria	Unknown	yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Norway	Yes	Yes				Yes	No	No
Panama	No							
Paraguay	Yes							
Peru	no							
Philippines	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Poland	Yes	Yes				Yes		
Portugal	No	Yes	No	No	Yes	Yes	Unknown	No
Romania		Yes	No	No	No	No	No	No
Russian Federation		Yes						
Senegal	Yes	Yes	Yes	Yes	Yes	Yes	Unknown	Unknown
Serbia	No	Yes		No	Yes	Yes	No	No
Singapore		Yes						
Slovenia		Yes						
South Africa	yes	Yes						
The Republic of Korea						No		
Spain	No	Yes	No	No	No	Yes	No	No
Sri Lanka	No	No	No	No	Yes	No	No	No
Switzerland	No	Yes	No	No	No	Yes	Yes	No
Taiwan (China*)		Yes						
Thailand		Yes						
Togo	Unknown							
Trinidad and Tobago	No	No	No	No	No	No	No	No
Uganda	Yes	No	No	No	Yes	Yes	Unknown	Unknown
United Arab Emirates	Yes							
UK		Yes						
USA	No	No	No	No	No	No	No	No

Chapter 8. Table 2

(Continued)

Country	No Practices or Regulations	Federal/National Laws/ Statutes/Ordinances/ Policies	State/Provincial/ Regional Laws/Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/Guidelines	Cultural Practice	Religious Decree
Uruguay		Yes			Yes			
Venezuela						Yes		
Viet Nam		Yes						
Zimbabwe	No	No	No	No	No	No	No	No

*Reporting separately for this report.

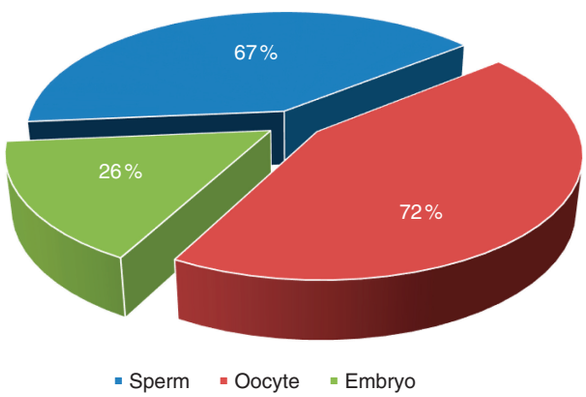
responded affirmatively for sperm donation, 47 of 63 (75%) for oocyte donation, and 28 out of 50 (56%) for embryo donation.

Anonymity

Ten of 78 countries (13%) reported having no regulations pertaining to the treatment of anonymity of donors; 37 of 65 (57%) of countries reported the existence of national or federal laws; 6 of 65 countries (9%) have municipal or regional laws; 10 of 65 (15%) countries reported the presence of governmental agency oversight, and 23 of 65 (35%) reported having professional organization oversight (Table 2). Seven countries, Cameroon, Colombia, Egypt, Germany, Greece, Jordan, and Switzerland, reported regulation of anonymity via "cultural practice or religious decree."

Disclosure of information about gamete donors to the offspring varied widely. Some countries, 22 of 46 (48%), allowed non-identifying data to be provided by the donor to the offspring. Another 14 of 43 (30%) allow identifying data to be disclosed, including Australia, Austria, Cameroon, Canada, Finland, Greece, Iceland, Kazakhstan, New Zealand, Nicaragua, Norway, Russian Federation, Switzerland, and The United States of America. Nonetheless, when queried if these practices were "customary" only 8 of the former 22 countries (36%) and 6 of the latter group of 14 (43%) responded affirmatively.

Disclosure of information from the offspring to the donor is less frequently allowed. In 17 of 43 (40%) of countries surveyed, non-identifying data from the offspring could be obtained by the donors. Those countries include Australia, Barbados, Bolivia, Colombia, Finland, Greece, Hungary, Iceland, Kazakhstan, New Zealand, Russian Federation, Sri Lanka, Switzerland, Thailand, The United States of America, United Kingdom of Great Britain and Northern Ireland, and Uruguay. Identifying information from the offspring, in contrast, was allowed to be obtained by donors in only 6 out of 41 (15%) of other countries: Australia, Cameroon, Kazakhstan, New Zealand, Russian Federation, and The United States of America. Regarding how often these disclosure practices were observed, only 9 of 17 (53%) in the first group—offspring to donor—and 2 out of 6 (33%) in the second group—donor to offspring—responded positively.



Chapter 8. Chart 3. Percentage of countries allowing compensation to gamete donors.

Summary

Gamete and embryo donation are well established ART practices, employed, if not sanctioned, by a large majority of the responding countries. These donation trends are likely to continue due to evolving social and cultural norms in developed and developing countries. Most of the European countries, as well as Australia, New Zealand, and some Asian countries, are extensively regulated by national or regional laws and statutes. Overall, about 50% to 60% of countries surveyed report using gamete or embryo donation, although "de novo" embryo donation is somewhat less commonly accepted (about 25% to 35% of countries). Cytoplasmic donation is infrequent, as is ovarian tissue and testicular tissue donation, and used for the most part in experimental environments.

References

[1] Ory S, Miller K, Horton M, et al. IFFS Surveillance 2016. Global Reprod Health 2016;1–144.

[2] "Access and diversity of medically assisted reproduction in Europe", organized by the European Society of Human Reproduction and Embryology, together with the Council of Europe Bioethics Committee, Strasbourg, France. Feb 22-23, 2018.

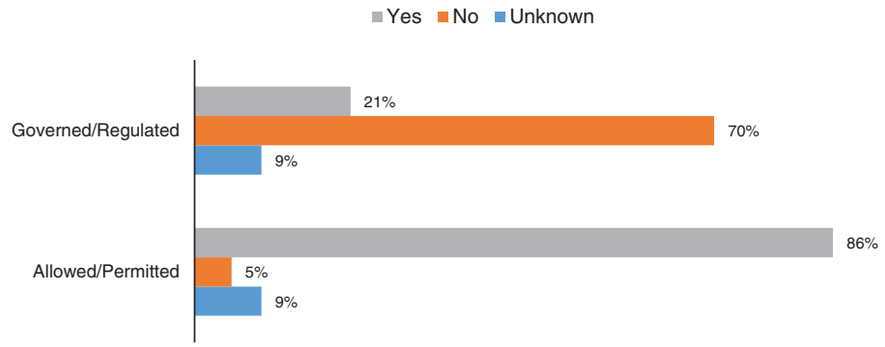
[3] Zegers-Hochschild F, Adamson GD, Dyer S, et al. The International Glossary on Infertility and Fertility Care, 2017. Hum Reprod 2017;32:(9):1786–1801.

[4] Laura Rienzi L, Romano S, Albricci L, et al. Embryo development of fresh "versus" vitrified metaphase II oocytes after ICSI: a prospective randomized sibling-oocyte study. Hum Reprod 2010;25:66–73.

CHAPTER 9. OOCYTE MATURATION

Introduction

Utilization of in-vitro maturation (IVM) following the recovery of immature oocytes was first suggested as a potential useful application for women undergoing ART in the 1990s. This



Chapter 9. Chart 1. Is oocyte maturation allowed/permitted or governed/regulated?

technology differs markedly from conventional in vitro fertilization (IVF) in that oocytes are retrieved without prior controlled ovarian hyperstimulation (COH), and the collected immature oocytes are then cultured in vitro in enhanced culture environments until maturation is completed, which occurs when metaphase II (MII) stage is achieved.

Several advantages of IVM over conventional IVF have been suggested. They include greater safety via elimination of COH, with less risk of ovarian hyperstimulation syndrome (OHSS), particularly with patients with polycystic ovarian syndrome (PCOS); and lower cost, by reducing the need for additional medications and monitoring. This advantage has an additional benefit for the patient: potentially less stress. But broad acceptance of IVM techniques has been slow in coming, due to perceived lower clinical success rates, and a relative dearth of data regarding safety issues. The safety issues of concern include the overall health of the resulting offspring, and the possibility of inducing permanent changes in the expression of imprinted genes[1].

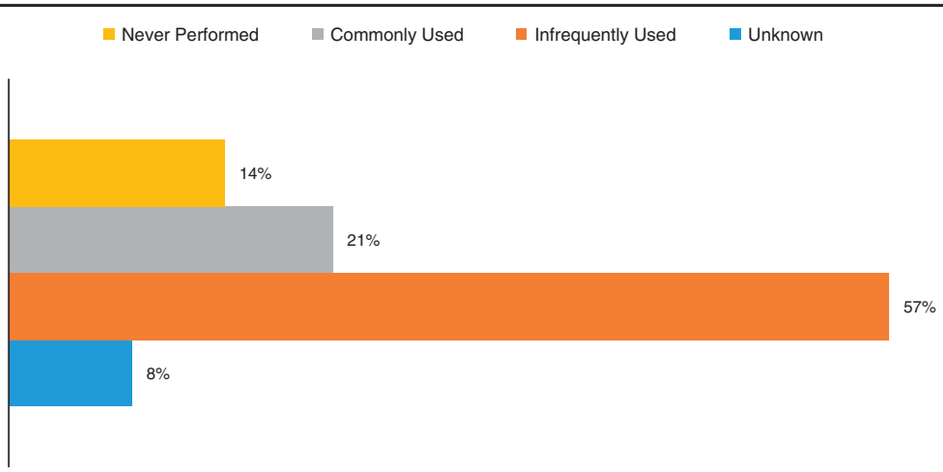
Analysis of the survey

The 2018 survey included responses from 75 countries. IVM was permitted in 64 of the 75 (86%), and was disallowed in only 4 countries (Bangladesh, Germany, Mali, and Nigeria). Seven countries (9%) stated that the status of IVM application in their country was "unknown" (Chart 1). The procedure was infrequently used in 41 of 72 countries (57%), and was commonly employed in only 15 of the 72 (21%). Reportedly, it was never performed in 10 of the 72 countries (14%) (Chart 2).

IVM is regulated in 16 of 77 countries responding (21%), and is unknown in 7 (9%) of the countries that responded. IVM is regulated in 15 countries of the 75 (20%) by federal statute (Belgium, Bulgaria, Egypt, Germany, Montenegro, New Zealand, Norway, Portugal, Serbia, Spain, Taiwan [China, reporting separately for this report], Togo, Turkey, United Kingdom of Great Britain and Northern Ireland, and Viet Nam); 2 of 75 (3%) by state or provincial statute (Australia and Uruguay); and 9 of 75 (12%) by professional guidelines or agency oversight (Ecuador, Ghana, Guatemala, India, and Côte d'Ivoire). Agency regulations were followed in Côte d'Ivoire and Portugal. Oocyte maturation was being held as a "cultural practice" in Switzerland. The status of the regulatory body was reported as "unknown" for Cameroon, Jordan, Panama, and United Arab Emirates (Table 1).

Discussion

Although there have been no significant discernible technical advances in IVM technology since the 2015 survey, there appears to be a continued trend favoring somewhat increased utilization



Chapter 9. Chart 2. How often is oocyte maturation performed?

Chapter 9. Table 1

Parameters for oocyte maturation.

Country	Is Oocyte Maturation Regulated in Your Country?	If Oocyte Maturation Regulated in Your Country, How is it Done?	Is Oocyte Maturation Allowed/Permitted in Your Country?	Is Oocyte Maturation Practiced/Performed in Your Country?
Argentina	Yes		Yes	Infrequently Used
Australia	Yes	State/Provincial/Regional Laws/Statutes/Ordinances	Unknown	Commonly Used
Austria	No		Yes	Infrequently Used
Bangladesh			No	
Barbados	No			Infrequently Used
Belarus	No		Yes	Never Performed
Belgium	Unknown	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Commonly Used
Bolivia	No		Yes	Commonly Used
Botswana	No		Yes	
Brazil	No		Yes	Infrequently Used
Bulgaria	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
Burkina Faso	No		Yes	Commonly Used
Cameroon	No	Unknown	Yes	Infrequently Used
Canada	No		Yes	Infrequently Used
Chile	No		Yes	Infrequently Used
China	Unknown		Yes	Infrequently Used
Colombia	No		Yes	Infrequently Used
Czechia	No		Yes	Infrequently Used
Ecuador	No	Professional Organization Standards/Guidelines	Yes	
Egypt	Yes	Federal/National Laws/Statutes/Ordinances/Policies, Professional Organization Standards/Guidelines	Yes	Infrequently Used
El Salvador	No		Yes	Never Performed
Finland	No		Yes	Infrequently Used
Georgia	No		Yes	Never Performed
Germany	Unknown	Federal/National Laws/Statutes/Ordinances/Policies	No	Unknown
Ghana	No	Professional Organization Standards/Guidelines	Yes	Infrequently Used
Greece	Yes		Yes	Commonly Used
Guatemala	No	Professional Organization Standards/Guidelines	Yes	Infrequently Used
Hong Kong (China*)	No		Yes	Infrequently Used
Hungary	No		Unknown	Infrequently Used
Iceland	No		Yes	Never Performed
India	Yes	Professional Organization Standards/Guidelines	Unknown	Infrequently Used
Ireland	No		Yes	Never Performed
Italy	No		Yes	Commonly Used
Côte d'Ivoire	Unknown	Agency Regulations/Oversight, Professional Organization Standards/Guidelines	Yes	Commonly Used
Japan	No		Yes	Infrequently Used
Jordan	No	Unknown	Yes	Infrequently Used
Kazakhstan	No		Yes	
Kenya	No		Yes	Infrequently Used
Latvia	No		Yes	Infrequently Used
Lithuania	No		Unknown	Never Performed
Mali	No		No	Never Performed
Mexico	No		Yes	Infrequently Used
Mongolia	No		Yes	Commonly Used
Montenegro	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
New Zealand	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
Nigeria	No		No	commonly Used
Norway	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
Panama	Unknown	Unknown	Yes	Infrequently Used
Paraguay	No		Yes	Never Performed
Peru	No		Yes	infrequently Used
Philippines	No		Yes	Infrequently Used
Poland	Unknown		Unknown	Unknown
Portugal	Yes	Federal/National Laws/Statutes/Ordinances/Policies, Agency Regulations/Oversight, Professional Organization Standards/Guidelines	Yes	Unknown
Romania	No		Yes	Never Performed
Russian Federation	No		Yes	Infrequently Used
Senegal	No		Unknown	Never Performed

Chapter 9. Table 1

(*Continued*)

Country	Is Oocyte Maturation Regulated in Your Country?	If Oocyte Maturation Regulated in Your Country, How is it Done?	Is Oocyte Maturation Allowed/Permitted in Your Country?	Is Oocyte Maturation Practiced/Performed in Your Country?
Serbia	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
Singapore	No		Yes	Infrequently Used
Slovenia	No		Yes	Infrequently Used
South Africa	No		Yes	Infrequently Used
The Republic of Korea	No		Yes	Commonly Used
Spain	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
Sri Lanka	Yes		Yes	Infrequently Used
Sweden	No		Yes	
Switzerland	No		Yes	Commonly Used
Taiwan (China*)	No	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
Thailand	Yes		Yes	Commonly Used
Togo	No	Federal/National Laws/Statutes/Ordinances/Policies, Professional Organization Standards/Guidelines		
Trinidad and Tobago	No		Yes	Infrequently Used
Turkey	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
Uganda	No		Yes	Commonly Used
United Arab Emirates	Unknown	Unknown	Unknown	Unknown
UK	Yes	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Infrequently Used
USA	No		Yes	Infrequently Used
Uruguay	No	State/Provincial/Regional Laws/Statutes/Ordinances		Unknown
Venezuela	No		Yes	Commonly Used
Viet Nam	No	Federal/National Laws/Statutes/Ordinances/Policies	Yes	Commonly Used
Zimbabwe	No		Yes	Unknown

*Reporting separately for this report.

of IVM since 2010. Despite having more countries participating in the 2018 survey, overall responses are similar to those received in 2015. Respondents appear to be more reticent to adopt IVM to the extent that other micromanipulation techniques have been applied in the absence of evidence suggesting comparable or superior results when compared to conventional IVF.

Summary

Oocyte maturation is a critical step for successful IVF, and it is essential that recovered oocytes be mature, competent, and viable, to achieve fertilization and ultimately produce a healthy offspring. It is a fundamental molecular and cellular process integral to IVF that largely occurs in vivo. Realizing the true clinical potential of IVM and opening new opportunities in ART awaits additional translational advances, likely to be accomplished with animal models for IVM [2,3]. Widespread clinical adoption will require considerable additional evidence regarding live birth rates, cumulative outcomes from frozen oocytes and embryos, and long-term follow up, to assess risk.

References

[1] Paulson RJ, Fauser BCJM, Vuong LTN, et al. Can we modify assisted reproductive technology practice to broaden reproductive care access? Fertil Steril 2016;105(5): 1138–1143.

[2] Abbara A, Clarke SA, Dhillo WS. Novel concepts for inducing final oocyte maturation in In vitro fertilization treatment. Endocr Rev 2018;39(5):593–628.

[3] Richani D, Gilchrist RB. The epidermal growth factor network: role in oocyte growth, maturation and developmental competence. Hum Reprod Update 2018; 24(1):1–14.

CHAPTER 10: MICROMANIPULATION

Introduction

Micromanipulation embraces several unrelated technologies routinely used in the successful application of assisted reproduction technology (ART). Some technologies are essential to the selective practice of ART; they include intracytoplasmic sperm injection (ICSI), embryo biopsy (polar body, cleavage stage, or trophectoderm), and, possibly, assisted hatching[1]. The introduction of ICSI, with the first successful pregnancy achieved in 1991, was a transformative event for ART, enabling many men who previously had no way to achieve biologic fatherhood, to produce offspring[2].

Embryo biopsy has also been employed for an array of preimplantation testing (PGT) applications, including selection of embryos without specific genetic diseases – a process known as preimplantation genetic testing for monogenic (single-gene) disorders (PGT-M). The first successful use of PGT-M was for selecting embryos unaffected by X-linked disease, reported in 1991[3]. PGT has also been used to identify and exclude embryos with structural rearrangements (PGT-SR). Its most challenging, but potentially most impactful application, has been for detecting and excluding aneuploid embryos (PGT-A) for embryo transfer. The latter use has been hampered by the protracted development of a robust, reliable platform for performing a complete karyotype on a limited number of cells extracted from a developing

Chapter 10. Table 1a

Are these laboratory techniques allowed/permitted and practiced/performed in your country?

	ICSI			Assisted Hatching	
		With Ejaculated Sperm	With Surgically Retrieved Sperm		
Country	Allowed/Permitted	Practiced/Performed	Practiced/ Performed	Allowed/Permitted	Practiced/Performed
Argentina	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Armenia	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
Australia	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Austria	Yes	Commonly Used	Infrequently Used	Yes	Commonly Used
Bangladesh	Yes	Commonly Used	Commonly Used	No	
Barbados	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Belarus	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Belgium	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Bolivia	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Botswana	Yes			Yes	
Brazil	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Bulgaria	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
Burkina Faso	Yes	Commonly Used	Commonly Used	Yes	
Cameroon	Yes	Commonly Used	Infrequently Used	Yes	Never Performed
Canada	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Chile	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
China	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Colombia	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Czechia	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Ecuador	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Egypt	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
El Salvador	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
Finland	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Georgia	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Germany	Yes	Commonly Used	Infrequently Used	Unknown	Unknown
Ghana	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Greece	No	Commonly Used	Infrequently Used	Yes	Infrequently Used
Guatemala	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Hong Kong (China*)	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Hungary	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Iceland	Yes	Commonly Used	Infrequently Used	Yes	Never Performed
India	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Ireland	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Italy	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Côte d'Ivoire	Yes	Commonly Used	Infrequently Used	Unknown	Unknown
Japan	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Jordan	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
Kazakhstan	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Kenya	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
Latvia	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Lithuania	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Mali	Yes	Commonly Used	Commonly Used	No	Never Performed
Mexico	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Mongolia	Yes	Commonly Used	Infrequently Used	Yes	Commonly Used
Montenegro	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
New Zealand	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Nicaragua	Yes	Commonly Used	Commonly Used		
Nigeria	Yes	Commonly Used	Infrequently Used	No	Unknown
Norway	Yes	Commonly Used	Commonly Used	No	Never Performed
Panama	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Paraguay	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Peru	Yes	commonly Used	infrequently Used	Yes	infrequently Used
Philippines	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Poland	Yes	Commonly Used	Commonly Used	Unknown	Unknown
Portugal	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Romania	Yes	Commonly Used	Infrequently Used	Yes	Commonly Used
Russian Federation	Yes	Commonly Used	Commonly Used	Yes	Commonly Used

Chapter 10. Table 1a

(*Continued*)

	ICSI				
		With Ejaculated Sperm	With Surgically Retrieved Sperm	Assisted Hatching	
Country	Allowed/Permitted	Practiced/Performed	Practiced/ Performed	Allowed/Permitted	Practiced/Performed
Senegal	Yes	Commonly Used	Infrequently Used	Unknown	Never Performed
Serbia	Yes	Commonly Used	Infrequently Used	Yes	Commonly Used
Singapore	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
Slovenia	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
South Africa	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
The Republic of Korea	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Spain	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Sri Lanka	Yes	Infrequently Used	Never Performed	Yes	Infrequently Used
Sweden	Yes			Yes	
Switzerland	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
Taiwan (China*)	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Thailand	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Togo	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Trinidad and Tobago	Yes	Commonly Used	Commonly Used	Yes	Never Performed
Turkey	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Uganda	Yes	Commonly Used	Commonly Used	Yes	Infrequently Used
United Arab Emirates	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
UK	Yes	Commonly Used	Infrequently Used	Yes	Infrequently Used
USA	Yes	Commonly Used	Infrequently Used	Yes	Commonly Used
Uruguay	Yes	commonly Used	commonly Used	Yes	infrequently Used
Venezuela	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Viet Nam	Yes	Commonly Used	Commonly Used	Yes	Commonly Used
Zimbabwe	Yes	Commonly Used	Commonly Used	Yes	Unknown

*Reporting separately for this report.

embryo. Recent progress in this area may lead to much greater implantation rates, with potentially much higher live birth rates. It could also provide a chance to greatly reduce the primary risk of ART, multiple pregnancy, if a single euploid embryo could be transferred for all age groups.

Micromanipulation may also be used for several investigative, more controversial applications. These include cytoplasmic transfer, mitochondrial transfer, and the recently described "gene editing" technology, CRISPR-Cas9. No reports of human application of the latter existed when the survey was completed (March 2018).

Analysis of the survey

Of the respondents representing the 97 countries that participated in the 2018 Surveillance questionnaire, more than 70% provided specific responses regarding micromanipulation. Techniques of micromanipulation queried in the survey included the performance and legal status of ICSI with ejaculated or surgically obtained sperm; PGT with polar body, blastomere, or trophectoderm biopsy; assisted hatching; and cytoplasmic transfer, mitochondrial transfer, and CRISPR-Cas9 technology.

ICSI was permitted in almost all countries that responded to the survey – 79 of 80 (99%) – but it was performed in all. ICSI with sperm recovered following ejaculation is a common procedure in 77 countries, but it is infrequent in Sri Lanka, and is never performed in that country on surgically recovered sperm.

Most countries commonly perform ICSI with surgically retrieved sperm, but the procedure is infrequent in 21 of 78 (27%) (Table 1a). There were no regulations for ICSI in most countries; it was regulated in 27 out of 79 (34%). In 30 countries out of 79 (38%), ICSI was regulated by federal or national laws. Regional/state laws were followed in 7 countries out of 79 (9%). In 16 out of 79 (20%), countries, professional organization standards/guidelines were followed, and in two countries (Italy and Senegal) municipal laws were the regulation authority. ICSI was held as a cultural practice in Switzerland, and also in Italy, where the application of ICSI was interdicted by religious decree. In 6 countries of 79 (7.5%), agencies were used for regulation. The regulating authority was reported as "unknown" in 4 countries of 79 (5%).

Polar body biopsy was permitted in 54 of 75 countries (72%), but was commonly used in only 5 out of 70 (41%); infrequently used in 29 out of 70 (41%), and never performed in 26 out of 70 (15%). Polar body biopsy was not permitted in 10 out of 75 countries (13%). Blastomere 61 out of 77 (79%) and trophectoderm biopsy 61 out of 76 (80%) were allowed in most countries, but were not permitted in 14%: 11 of 77, and 10 of 76, respectively. Blastomere biopsy was used commonly in 30 of 72

Chapter 10. Table 1b

Are these laboratory techniques allowed/permitted and practiced/performed in your country?

	Polar Body Biopsy		Blastomere Biopsy		Trophectoderm Biopsy	
Country	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/ Permitted**	**Practiced/ Performed**
Argentina	Yes	Unknown	Yes	Commonly Used	Yes	Commonly Used
Armenia			Yes		Yes	Infrequently Used
Australia	Unknown		Unknown		Unknown	
Austria	Yes	Commonly Used	Yes	Never Performed	Yes	Commonly Used
Bangladesh	No		No		No	
Barbados		Never Performed		Never Performed	Yes	Commonly Used
Belarus	No	Infrequently Used	Yes	Infrequently Used	Yes	Commonly Used
Belgium	Yes	Commonly Used	Yes	Commonly Used	Yes	Unknown
Bolivia	Yes		Yes	Commonly Used	Yes	Commonly Used
Botswana	Yes		Yes		Yes	
Brazil	Yes	Unknown	Yes	Commonly Used	Yes	Commonly Used
Bulgaria	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used
Burkina Faso	Yes		Yes			
Cameroon	Unknown	Never Performed	No	Never Performed	No	Never Performed
Canada	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Commonly Used
Chile	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
China	Yes	Never Performed	Yes	Commonly Used	Yes	Never Performed
Colombia	Unknown	Never Performed	Yes	Infrequently Used	Yes	Commonly Used
Czechia	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Egypt	Yes	Never Performed	Yes	Commonly Used	Yes	Commonly Used
El Salvador	No	Never Performed	No	Never Performed	No	Never Performed
Finland	Yes	Unknown	Yes	Commonly Used	Yes	Commonly Used
Georgia	Yes	Unknown	Yes	Commonly Used	Yes	Commonly Used
Germany	Yes	Infrequently Used	No	Unknown	No	Never Performed
Ghana	Yes	Never Performed	Yes	Unknown	Yes	Unknown
Greece	Yes	Infrequently Used	No	Commonly Used	Yes	Commonly Used
Guatemala	Yes	Never Performed	Yes	Commonly Used	Yes	Commonly Used
Hong Kong (China*)	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Hungary	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used
Iceland	Yes	Never Performed	Yes	Never Performed	Yes	Never Performed
India	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Ireland	Yes	Infrequently Used	Yes	Never Performed	Yes	Infrequently Used
Italy	Yes	Commonly Used	Yes	Commonly Used		Commonly Used
Côte d'Ivoire	No	Unknown	No	Unknown	No	Unknown
Japan	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Jordan	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used
Kazakhstan	Yes	Commonly Used	Yes		Yes	
Kenya	Unknown	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used
Latvia	Yes	Unknown	Yes	Commonly Used	Yes	Commonly Used
Lithuania	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used
Mali	No	Never Performed	No	Never Performed	No	Never Performed
Mexico	Unknown	Unknown	Yes	Commonly Used	Yes	Commonly Used
Mongolia	Yes	Never Performed	Yes	Never Performed	Yes	Never Performed
Montenegro	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used
New Zealand	Yes	Never Performed	Yes	Infrequently Used	Yes	Commonly Used
Nigeria	No	never Performed	No	never Performed	No	never Performed
Norway	No	Never Performed	No	Never Performed	No	Never Performed
Panama	Unknown	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Paraguay	Yes	Never Performed	Yes	Commonly Used	Yes	Commonly Used
Peru	Yes	never Performed	Yes	commonly Used	Yes	commonly Used
Philippines	Unknown		Yes	Unknown	Yes	Infrequently Used
Poland	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Portugal	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Romania	No	Never Performed	No	Never Performed	No	Never Performed
Russian Federation	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Senegal	Unknown	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Serbia	No	Never Performed	No	Never Performed	No	Never Performed
Singapore	No	Never Performed	Yes	Infrequently Used	Yes	Infrequently Used
Slovenia	Yes	Never Performed	Yes	Commonly Used	Yes	Infrequently Used
South Africa	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used

Chapter 10. Table 1b

(*Continued*)

	Polar Body Biopsy		Blastomere Biopsy		Trophectoderm Biopsy	
Country	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/ Permitted**	**Practiced/ Performed**
The Republic of Korea	Yes	Commonly Used	Yes	Commonly Used	Yes	Commonly Used
Spain	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Sri Lanka	Unknown	Infrequently Used	Unknown	Infrequently Used	Unknown	Unknown
Sweden	Yes		Yes		Yes	
Switzerland	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Commonly Used
Taiwan (China*)	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Commonly Used
Thailand	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Togo		Never Performed		Never Performed		Never Performed
Trinidad and Tobago	Yes	Never Performed	Yes	Never Performed	Yes	Never Performed
Turkey	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Uganda	Yes	Never Performed	Yes	Infrequently Used	Yes	Infrequently Used
United Arab Emirates	Yes	Never Performed	Yes	Infrequently Used	Yes	Commonly Used
UK	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Commonly Used
USA	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Commonly Used
Uruguay	Yes	infrequently Used	Yes	commonly Used	Yes	Unknown
Venezuela	Yes	Never Performed	Yes	Commonly Used	Yes	Commonly Used
Viet Nam	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Zimbabwe	Yes	Unknown	Yes	Unknown	Yes	Unknown

*Reporting separately for this report.

Chapter 10. Table 1c

Are these laboratory techniques allowed/permitted and practiced/performed in your country?

	Cytoplasmic Transfer		Mitochondrial Transfer		CRISPR	
Country	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**
Argentina	Yes	Unknown	Yes	Unknown	Yes	Unknown
Australia	No		No	Never Performed	No	Never Performed
Austria	Unknown	Never Performed	Unknown	Never Performed	No	Never Performed
Bangladesh	No		No		No	
Barbados		Never Performed		Never Performed		Never Performed
Belarus	No	Never Performed	No	Never Performed	No	Never Performed
Belgium	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Bolivia	Yes	Infrequently Used	Yes	Never Performed	Yes	Unknown
Botswana	Yes		Yes		Yes	
Brazil	No	Unknown	No	Unknown	Unknown	Unknown
Bulgaria	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Cameroon	Unknown	Never Performed	No	Never Performed	No	Never Performed
Canada	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Unknown
Chile	Unknown	Unknown	Unknown		Unknown	Unknown
China	Yes	Infrequently Used	Yes	Never Performed	Unknown	Never Performed
Colombia	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Infrequently Used
Czechia	No	Unknown	No	Never Performed	No	Never Performed
Egypt	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
El Salvador	No	Never Performed	No	Never Performed	Unknown	Never Performed
Finland	Unknown	Unknown	Unknown	Unknown	Yes	Infrequently Used
Georgia	Yes	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Germany	Unknown	Unknown	No	Unknown	No	Unknown
Ghana	Unknown	Never Performed	Unknown	Unknown	Unknown	Never Performed
Greece	Yes	Infrequently Used	Yes	Commonly Used	Yes	Commonly Used
Guatemala	Yes	Never Performed	Yes	Never Performed	Yes	Never Performed
Hong Kong (China*)	Unknown		Unknown		Unknown	
Hungary	No	Unknown	Unknown	Unknown	Unknown	Unknown
Iceland	Unknown	Never Performed	Unknown	Never Performed	Unknown	Never Performed
India	Unknown	Infrequently Used	Unknown	Never Performed	Unknown	Never Performed

Chapter 10. Table 1c

(Continued)

	Cytoplasmic Transfer		Mitochondrial Transfer		CRISPR	
Country	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**
Ireland	No	Never Performed	No	Never Performed	No	Never Performed
Italy	No	Commonly Used	No	Commonly Used	No	Commonly Used
Côte d'Ivoire	Unknown	Unknown	No	Unknown	Unknown	Unknown
Japan	Unknown	Infrequently Used	Unknown	Infrequently Used	Unknown	Never Performed
Jordan	No	Infrequently Used	Unknown	Unknown	Unknown	Unknown
Kazakhstan	Yes	Commonly Used	Yes		Yes	
Kenya	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Latvia	Unknown	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Lithuania	Unknown	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Mali	No	Never Performed	No	Never Performed	No	Never Performed
Mexico	Unknown	Unknown	Unknown	Infrequently Used	Unknown	Unknown
Mongolia	Yes	Never Performed	Yes	Never Performed	Yes	Never Performed
Montenegro		Never Performed		Never Performed		Never Performed
New Zealand	No	Never Performed	No	Never Performed	No	Never Performed
Nigeria	No	Unknown	No	Unknown	No	Unknown
Norway	No	Never Performed	No	Never Performed	No	Never Performed
Panama	Unknown	Infrequently Used	Unknown	Unknown	Unknown	Unknown
Paraguay	Unknown	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Peru	Unknown	Unknown		Unknown	Yes	Unknown
Philippines	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Portugal	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
Romania	No	Never Performed	No	Never Performed	No	Never Performed
Russian Federation	Yes	Unknown	Yes	Unknown	Yes	Unknown
Senegal	Unknown	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Serbia	No	Never Performed	No	Never Performed	No	Never Performed
Singapore	No	Never Performed	No	Never Performed	No	Never Performed
Slovenia	Unknown	Never Performed	Unknown	Never Performed	Unknown	Unknown
South Africa	No	Never Performed	No	Never Performed	No	Never Performed
The Republic of Korea	No	Commonly Used	No	Never Performed	No	Never Performed
Spain	Unknown	Unknown	No	Never Performed	No	Never Performed
Sri Lanka	Unknown	Unknown	No	Unknown	Unknown	Unknown
Sweden	No		No		Yes	
Switzerland	No	Never Performed	No	Unknown	No	Unknown
Taiwan (China*)	No	Never Performed	No	Never Performed	No	Never Performed
Thailand	Yes	Infrequently Used	Yes	Infrequently Used	Yes	Never Performed
Togo		Never Performed		Never Performed		Never Performed
Trinidad and Tobago	Unknown	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Turkey	No	Never Performed	Unknown	Never Performed	Unknown	Never Performed
Uganda	Yes	Never Performed	Unknown	Never Performed	Unknown	Unknown
United Arab Emirates	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
UK	No	Never Performed	Yes	Infrequently Used	No	Never Performed
USA	No	Never Performed	No	Never Performed	Yes	Infrequently Used
Uruguay	Unknown	Infrequently Used	Unknown	Unknown	No	Unknown
Venezuela	Yes	Never Performed	Yes	Never Performed	Unknown	Never Performed
Viet Nam	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Zimbabwe	Yes	Unknown	Yes	Unknown	Yes	Unknown

*Reporting separately for this report.

(42%) countries, infrequently used in 20 of 72 (28%), and never performed in 15 of 72 (21%). Trophectoderm biopsy was used in 38 of 73 (52%) countries. It was infrequently used in 13 of 73 (18%) of countries, and never performed in 14 of 73 (19%) (Table 1b).

Seventy-six countries responded to questions regarding the regulation of these techniques; 15 countries (20%) regulated polar body biopsy, 6 countries (21%) regulated blastomere biopsy, and 19 countries (25%) regulated trophectoderm biopsy. Biopsy procedures were regulated by federal or national laws in 19 of 35 (54%) countries, and state or regional laws in 3 of 8 (37.5%) of the reporting countries. Polar body biopsy is regulated by municipal rules, agencies, and religious decree in Greece. Brazil also had regulation of polar body biopsy, by agency regulations or oversight. Professional organization recommendations were used in 10 of 17 (59%) of reporting countries. Biopsy

procedures were addressed as a cultural practice in Switzerland. Respondents for 6 countries answered "unknown".

In 71 of 79 (90%) of countries reporting, assisted hatching was said to be allowed. Assisted hatching was commonly used in 40 of 75 (53%) of countries, and was infrequently done in another 24 (32%). Five countries (7%) reported "unknown", and said it was never performed in 6 countries (8%). Twenty-one countries - 78 - did report the existence of regulations for assisted hatching. The majority of countries – 21 (95%) – that cited regulation of assisted hatching noted the presence of federal or national law, and three (14%) were regulated by state/regional law. Only one country, Portugal, had agency regulation for assisted hatching. Professional organization standards or guidelines were used by 8 countries (38%). Assisted hatching was addressed as a cultural practice in Switzerland and Greece. The regulating body was reported as "unknown" by 4 countries.

Twenty five of 73 (34%) countries, but was allowed in 17 countries (23%). Cytoplasmic transfer was never performed in 33 of 71 (46%), and infrequently in 11 of 73 (15%). It was reported to be commonly used in three countries – Italy, Kazakhstan, and The Republic of Korea. Specific regulations for cytoplasmic transfer existed in 12 of 75 countries (16%). Cytoplasmic transfer was regulated by federal or national laws in 9 countries of 12 (75%). Portugal relied on agencies for regulation, and 6 countries followed professional organization standards or guidelines. The responsible regulatory body was reported as "unknown" for 6 countries (Table 1c).

Mitochondrial transfer was permitted in only 15 of 72 countries (21%). Mitochondrial transfer was never performed in 37 of 70 (53%), and infrequently in 6 countries (9%): Canada, Colombia, Japan, Mexico, Thailand, and United Kingdom of Great Britain and Northern Ireland. Mitochondrial transfer applications were regulated by federal or national legislation in Australia, Norway, Turkey, and United Kingdom of Great Britain and Northern Ireland. Professional organization standards or guidelines were observed in 4 countries. The regulation authority was "unknown" in seven countries (Table 1c).

CRISPR-Cas9 technology was permitted in 16 of 73 (22%). CRISPR-Cas9 technology was reported to be commonly used in Greece and Italy, according to 71 responders (3%), and infrequently used (4%) in Colombia, Finland, and The United States of America. Regulations existed in 8 of 74 countries (11%) for mitochondrial transfer, and in 6 of 75 (8%) countries for CRISPR-Cas9 technology. Federal or national laws regulated CRISPR-Cas9 technology in Australia, Norway, Singapore, Turkey, and United Kingdom of Great Britain and Northern Ireland. Professional organization standards or guidelines as existing recommendations were followed in Guatemala, Thailand, and The United States of America. Six countries replied "unknown" (Table 1c).

Discussion

While all these technologies are micromanipulation techniques, they have a much different status in the successful deployment of ART. ICSI is an indispensable tool, widely embraced after validation and successful global application. It is almost universally accepted, performed successfully, and used with minimal regulatory oversight. This has been the case for many years, and the current survey has not revealed any significant changes.

PGT is a promising technology with successful, validated applications for PGT-M and PGT-SR. After an earlier problematic launch with a less successful technology, PGT-A may now be poised to be the next great breakthrough. However, after previous false starts, it is particularly critical that it be validated with successful widespread application before it can be universally recommended. Assisted hatching has been practiced for over 25 years, and has been shown to improve embryo implantation rates in certain circumstances by certain labs. The lack of clearly defined indications and the variable experience among ART labs has precluded its universal application, thus far. PGT is addressed in more detail in Chapter 13.

Cytoplasmic and mitochondrial transfer, and CRISPR-Cas9 are investigative technologies that hold great promise for addressing some of the most challenging clinical problems. But all are fraught with potential greater risks, and pose unique ethical dilemmas. None appears to be ready for broad clinical application at this time, as reflected by their limited use and acceptance. The 2018 questionnaire did not identify any emerging trends regarding these three technologies.

Summary

The ability to perform micromanipulation procedures on gametes and embryos has vastly expanded the scope of ART, but the various procedures are at different stages of development. ICSI is a universally available procedure, performed in all responding countries, but not officially sanctioned in one (Greece). Micromanipulation procedures, including ICSI and PGT-M, are now essential technologies; they are widely available in comprehensive ART centres. PGT-A and assisted hatching, shown to be useful adjuncts in certain circumstances, are still being defined in terms of their specific indications and overall value. The preliminary experiences with cytoplasmic transfer, mitochondrial transfer, and CRISPR-Cas9 technology have been promising, but these applications remain investigative; an accurate assessment of their true potential, limitations, and risks is awaited.

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CHAPTER 11: WELFARE OF THE CHILD AND IDENTITY RIGHTS

Introduction

Safety, particularly for the offspring, has been of the utmost concern since the advent of ART. As early as 1985[1], publications have suggested that the risk of obstetrical and neonatal morbidity might be increased after ART. Reports were many; they included matched and non-matched studies of singletons and twins, and, more recently, reviews and meta-analyses[2] comparing outcomes of spontaneous pregnancies after various procedures. The procedures include intracytoplasmic sperm injection (ICSI), elective

Chapter 11. Table 1

Regulations that address welfare of the child.

Country	No Regulations	Federal/National Laws/ Statutes/Ordinances/ Policies	State/Provincial/ Regional Laws/Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/Guidelines	Cultural Practice	Religious Decree
Argentina	No	No	No	No	No	Yes	No	No
Australia		Yes	Yes					
Austria	No	Yes	No	No	No	No	Yes	Yes
Bangladesh	Yes							
Barbados	Yes							
Belarus		Unknown						
Belgium	Unknown							
Bolivia	No							
Botswana	No	Yes	Unknown	Unknown	Yes	Yes	Yes	No
Brazil					Yes	Yes		
Bulgaria		Yes						
Burkina Faso	Yes							
Cameroon	Yes		Yes		Yes		Yes	
Canada	No	Yes						
Chile	Yes							
China	Yes							
Colombia	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Czechia	Yes							
Ecuador						Yes		
Egypt	Yes	No						
El Salvador	No	No	No	No	No	No	No	No
Finland	No	Yes	No	No	No	Yes	No	No
Georgia		Yes						
Germany	No	Yes						Yes
Ghana		Yes					Yes	
Greece	No	Yes	Yes	No	Yes	No	Yes	Yes
Guatemala	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Hong Kong (China*)		Yes	Yes					
Hungary		Yes						
Iceland		Yes						
India						Yes		
Ireland	No							
Italy	No	No	No	No	No	No	No	No
Côte d'Ivoire	Unknown	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Japan						Yes		
Jordan	Yes							
Kazakhstan	Yes							
Kenya	Yes							
Latvia		Yes	No	No	Yes	No		
Lithuania	No	Yes	No	No	No	Yes	No	No
Mali	No							
Mexico	No	No	No	No	No	No	No	No
Mongolia	Yes	No	No	No	No	No	No	No
Montenegro	No	Yes						
New Zealand		Yes				Yes		
Nicaragua		Yes						
Nigeria	Yes	Yes	Yes					
Norway	Yes	Yes	No	No	No	No	No	No
Panama	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
Paraguay	No	Yes	No	No	Yes	Yes	Yes	Yes
Peru	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Philippines		Yes	Yes			Yes	Yes	Yes
Poland	Yes	Yes	Yes	Yes	Unknown	Yes	Yes	Yes
Portugal	No	Yes	No	No	Yes	Yes	Unknown	Unknown
Romania	Yes	No	No	No	No	No	No	No
Russian Federation		Yes	Yes	Yes				
Senegal	Yes							
Serbia		Yes						

Chapter 11. Table 1

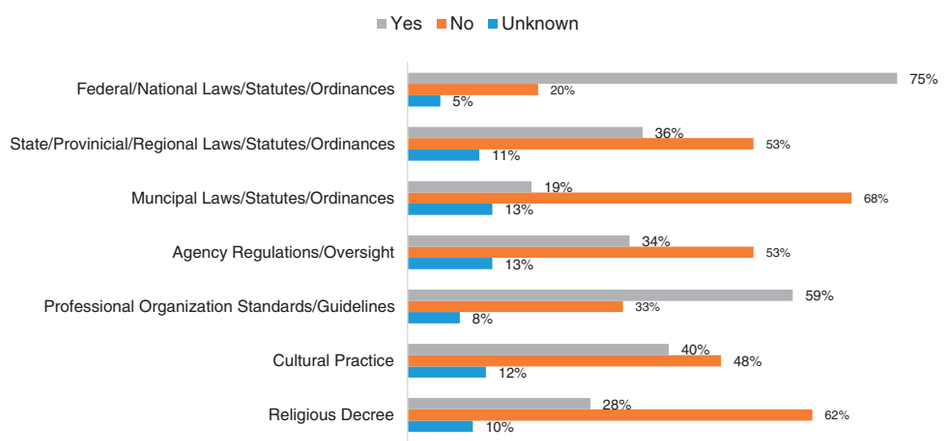
(Continued)

Country	No Regulations	Federal/National Laws/ Statutes/Ordinances/ Policies	State/Provincial/ Regional Laws/Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/Guidelines	Cultural Practice	Religious Decree
Singapore		Yes						
Slovenia	Yes							
South Africa		Yes						
The Republic of Korea	Yes							
Spain	Yes	Yes		No	No	Yes	No	No
Sri Lanka	Yes							
Switzerland	No	Yes	No	No	No	Yes	Yes	No
Taiwan (China*)	No	Yes						
Thailand		Yes						
Togo	Unknown							
Trinidad and Tobago	No	No	No	No	No	No	No	No
Turkey	Yes	Yes						
Uganda	Yes	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
United Arab Emirates		Yes	Yes				Yes	
UK	No	Yes	No	No	No	No	No	No
USA	No	No	No	No	No	Yes	No	No
Uruguay	No	Yes	No	No	No	No	No	No
Venezuela	No	No	No	No	No	Yes	No	No
Viet Nam	Unknown	No						
Zimbabwe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

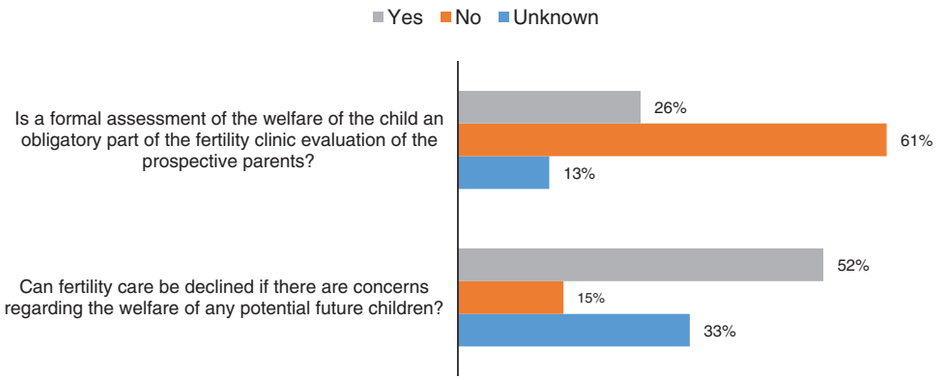
*Reporting separately for this report.

single embryo transfer (eSET), frozen embryo transfer (FET), and blastocyst transfers. A marked increase in cases of antepartum hemorrhage, hypertensive disorders, prematurity, low birth weight, and perinatal mortality has occurred in the latter groups. Many current ART practices and techniques have the potential to harm the embryo; these include extended culture beyond the cleavage stage; invasive genetic testing; vitrification and warming procedures; and expanded applications for ICSI. These unresolved concerns make careful follow-up of newborns and children born from ART cycles, of paramount importance.

Much more recently, concern for the child's welfare has been expanded to include an assessment of social factors pertaining to the prospective parents' ability to provide a suitable home environment, before embarking on treatment. A model for best practice was enshrined in the Human Fertilisation and Embryology Authority's (HFEA's) code of practice of the United Kingdom of Great Britain and Northern Ireland. The model provides guidance parameters for assessing, obtaining further information, and refusing treatment[5]. These measures have been adopted by many other countries, as well.



Chapter 11. Chart 1. Are there practices or regulations that address the welfare of the child in your country?



Chapter 11. Chart 2. Formal assessment of the welfare of a child.

Chapter 11. Table 2

Welfare of the child, are prospective parents asked about the following?

Country	Previous Convictions Related to Harming a Child	Contact With Social Services Regarding Care of Other Children	A History of Violence or Serious Discord within The Family	Drug or Alcohol Abuse	The existence of Serious Mental or Physical Conditions	Risk to The Child of a Serious Medical Condition
Argentina	No	No	No	Yes	Yes	Yes
Australia	Yes	Yes	Yes	Yes	Yes	Yes
Austria	No	No	No	Yes	Yes	No
Belarus	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Bolivia	Yes	Yes	Yes	Yes	Yes	
Botswana	No	Yes	No	No	Yes	No
Brazil	No	No	No	Yes	Yes	Yes
Bulgaria	Unknown	Unknown	Unknown	Yes	Yes	Yes
Burkina Faso	No	No	No	No	No	No
Cameroon	No	No	Yes	Yes	No	Yes
Canada	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Chile	No	No	No	No	No	No
China	No	No	No	No		No
Colombia	No	No	No	Yes	Yes	Yes
Czechia	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Ecuador	No	No	No		Yes	Yes
Egypt	No	No	No	No	No	No
El Salvador	Unknown	Unknown	Unknown	Yes	Yes	Yes
Finland	Unknown	Unknown	Yes	Yes	Yes	Yes
Georgia	No	No	No	Yes	Unknown	Yes
Germany	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Ghana	No	No	No	Yes	Yes	Yes
Greece	No	Yes	Yes	Yes	Yes	Yes
Guatemala	No	No	No	No	No	Yes
Hong Kong (China*)	Yes	Yes	Yes	Yes	Yes	Yes
Hungary	No	No	No	Yes	Yes	Yes
Iceland	No	Yes	No	Yes	Yes	Yes
India	No	No	No	No	No	
Ireland	No	No	No	Yes	Yes	Yes
Italy	Yes	Yes	Yes	Yes	Yes	Yes
Côte d'Ivoire	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Japan	No	No	No	Yes	Yes	Yes
Jordan	Unknown	No	Unknown	Yes	Unknown	Unknown
Kazakhstan	Yes	No	No	No	No	No
Kenya	No	No	No	Yes	Yes	Yes

Chapter 11. Table 2

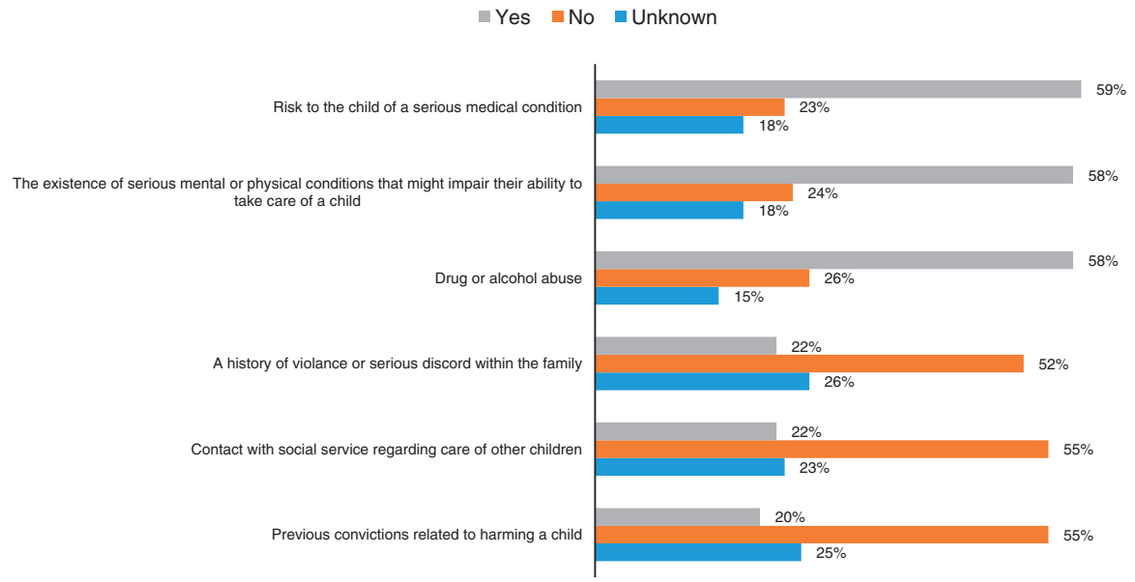
(*Continued*)

Country	Previous Convictions Related to Harming a Child	Contact With Social Services Regarding Care of Other Children	A History of Violence or Serious Discord within The Family	Drug or Alcohol Abuse	The existence of Serious Mental or Physical Conditions	Risk to The Child of a Serious Medical Condition
Latvia	No	No	No	Yes	No	Yes
Lithuania	No	No	No	Yes	Yes	Yes
Mali	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Mexico	No	No	No	No	No	No
Mongolia	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Montenegro					Yes	Yes
New Zealand	Yes	Yes	Yes	No	Yes	Yes
Nigeria	No	No	No	No	No	No
Norway	Yes	Yes	Yes	Yes		Yes
Panama	No	No	No	No	No	No
Paraguay	No	No	No	No	No	No
Peru	Unknown	Unknown	Unknown	Yes	Yes	Yes
Philippines	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Portugal	Unknown	Yes	Unknown	Yes	Yes	Yes
Romania	No	No	No	No	No	No
Russian Yes	Federation	No	No	No	Yes	Yes
Senegal	No	No	No	No	No	No
Serbia	Yes	Yes	Yes	Yes	Yes	Yes
Singapore	No	No	No	Yes	Yes	Yes
Slovenia	Yes	Yes	Yes	Yes	Yes	Yes
South Africa	No	No	No	Yes	Yes	Yes
The Republic of Korea	Unknown	Unknown	Unknown	Yes	Yes	
Spain	No	No	No	No	Yes	Yes
Sri Lanka	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Switzerland	No	No	Yes	Yes	Yes	Yes
Taiwan (China*)	Yes	Yes	Yes	Yes	Yes	Yes
Thailand	Yes	No	No	Yes	Yes	Yes
Togo	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Trinidad and Tobago	Yes	Yes	Yes	Yes	Yes	Yes
Turkey	No	No	No	No	No	No
Uganda	No	No	No	No	No	No
United Arab Emirates	No	No	No	Yes	Yes	Yes
UK	Yes	Yes	Yes	Yes	Yes	Yes
USA	No	No	No	Yes	Yes	Yes
Uruguay	Yes	Unknown	Unknown	Yes	Yes	Unknown
Venezuela	No	No	Unknown	Yes	Yes	Yes
Viet Nam	Yes	Yes	Yes	Yes	Yes	Yes
Zimbabwe	No	No	No	No	No	No

*Reporting separately for this report.

Analysis of the survey

Respondents representing 78 countries provided data for the 2018 questionnaire about measures in place to address the welfare of the child. Of this number, 41 of 55 (74.5%) noted the existence of federal laws or statutes dealing with the welfare of the child. This situation was prevalent in most of the European countries and in the United Kingdom of Great Britain and Northern Ireland; Australia, Botswana, Canada, Côte d'Ivoire, Ghana, Hong Kong [China, reporting separately for this report], New Zealand, Nigeria, Philippines, Russian Federation, Singapore, South Africa, Taiwan [China, reporting separately for this report], Thailand, Uganda, United Arab Emirates, and



Chapter 11. Chart 3. Are prospective parents asked about the following information?

Zimbabwe; also, several countries in South America: Colombia, Nicaragua, Paraguay, Peru, and Uruguay. Some countries, 13 of 36 (36%), also had state or provincial laws in place. Twenty-seven of 56 (48%) did not have any regulation regarding this issue, and 17% (6/36) reported having only professional organization. These included Argentina, Ecuador, India, Japan, The United States of America, and Venezuela. Two countries, Belarus and Belgium, responded "unknown" (Table 1, Chart 1).

Formal assessment of the potential welfare of the child was either not an obligatory part of the fertility clinic evaluation of prospective parents, or the issue was "unknown" for the majority, 74%, of responding countries (53 of 72). Nineteen countries (26%) responded that a formal assessment of the welfare of the child was a requirement, including Austria, Bolivia, Botswana, Ecuador, El Salvador, Finland, Ghana, Greece, Hong Kong [China, reporting separately for this report], Hungary, Norway, Portugal, Serbia, Slovenia, Spain, Switzerland, Trinidad and Tobago , Turkey, and the United Kingdom of Great Britain and Northern Ireland (Chart 2).

Fertility care could be denied in 38 of 73 countries (52%) if concerns about the welfare of a potential future child existed. Eleven responders (15%) reported that they could not deny treatment for this reason, and the status was "unknown" for 24 (33%).

Additional questions surveyed prior background evaluations of prospective parents' clinical, psychiatric, and derelictive histories (Table 2). Nine of 73 (12%) report asking about any previous convictions related to any of the following: harming a child, history of family violence, social services contacts regarding care of other children, alcohol or drug abuse, serious mental or physical illness that could impair child care, or counseling about the child's risk of a serious medical condition. These countries include Australia, Hong Kong [China, reporting separately for this report], Italy, Serbia, Slovenia, Taiwan [China, reporting separately for this report], Trinidad and Tobago, United Kingdom of Great Britain and Northern Ireland, and Viet Nam. Another 12 of 73 (16%) declared prospective parents were not asked about any of these issues. Spain and Ecuador reported assessing the child's risk of a serious medical condition, and the existence of a serious mental or physical condition in prospective parents that could impair child care. Botswana reported assessing the existence of a serious mental or physical condition, and asking social services for contacts regarding care of other children (Chart 3).

Discussion

Although a sizeable majority of countries have no requirements for formally assessing the potential welfare of the child, some countries that do the assessment have considerably expanded their concerns. Increasingly, their assessment includes a rigorous pre-conception evaluation of social risk factors, along with a postnatal surveillance of neonatal and ongoing childhood development, something that has long been in place in many countries. While these pre-treatment measures now encompass more, and include sanctions to deny care in some countries, their impact has not been determined. In contrast, many of these countries have comprehensive registries evaluating the subsequent progress of ART children. And a clearer picture of the risks of ART is beginning to emerge.

Congenital anomalies have reportedly increased in newborns, after ART cycles[3]. After adjusting for parental factors, a relative risk of 1.07 exists (95% CI, 0.90 to 1.26) for IVF and 1.57 (95% CI, 1.30 to 1.90) for ICSI. In newborns conceived with ICSI, but not with conventional IVF, an increase in de-novo sex chromosome anomalies and structural autonomic anomalies has been reported, probably inherited through the paternal pathway[4].

A variety of possible factors may have contributed to this putative increase in morbidity. These factors include parental background unrelated to the ART process, clinical interventions such as ovarian stimulation and endometrial preparation, and technical issues involving manipulation of the early developing embryo. While more recent reports have provided some reassurance regarding safety with a much higher proportion of

singleton pregnancies than earlier reports, potential advantages of programmed over fresh cycle transfers and more reliable strategies to prevent ovarian hyperstimulation, a contemporary estimate of neonatal and maternal risk is still forthcoming.

Summary

The results of the survey reflect a very heterogeneous scenario in the importance given to the welfare of the child and the attention given to the welfare, although it shows a trend towards more attention paid to the correct assessment at time of prospective parent assessment and consultation. Welfare of the child is addressed mostly by federal or local laws/statutes, and, in countries without a law in place, professional organizations offer guidelines and standards to properly assess prospective parents. Sometimes these organizations also provide reporting mechanisms for monitoring newborn and child welfare.

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CHAPTER 12: FETAL REDUCTION AND SEX SELECTION

Introduction

Historically, ART has been associated with an unacceptably high multiple-pregnancy rate. This is a direct consequence of the practice of transferring more than one embryo. Many countries mandated the practice of single-embryo transfer more than fifteen years ago, and recent advances in embryo culture and embryo selection have further reduced the need for multiple transfer.

There has been a dramatic reduction in multiple-pregnancy rates in many countries, but the reduction has not been universal. Multiple pregnancies, especially those of high order, confer a considerable risk of inherent complications and sequelae. Fetal reduction is an established method to reduce the number of fetuses, improve the live-birth rate, and reduce risks to the surviving fetuses – risks of prematurity and other complications associated with multiple pregnancy.

In many ART centres, with preimplantation genetic screening for aneuploidy (PGT-A), has greatly improved the embryo selection process, routinely offering a greater than 50% chance of implanting a single euploid embryo. While these screening tools have great benefits in distinguishing normal from abnormal

Chapter 12. Table 1

Is selective fetal reduction allowed permitted and practiced/performed in your country?

Country	Allowed/Permitted	Practiced/Performed	Frequency?
Argentina	Not allowed	Yes	Infrequently used
Australia	Allowed	Yes	Infrequently used
Austria	Allowed	Yes	Infrequently used
Bangladesh	Not Addressed	Yes	Infrequently used
Barbados	Not Addressed	No	
Belarus	Allowed	Yes	Infrequently used
Belgium	Allowed	Yes	Frequently used
Bolivia	Not allowed	Unknown	
Botswana	Allowed	Yes	Infrequently used
Brazil	Allowed with conditions	Yes	Infrequently used
Bulgaria	Allowed	Yes	Frequently used
Burkina Faso	Unknown	Yes	Infrequently used
Cameroon	Allowed	Yes	Infrequently used
Canada	Allowed	Yes	Infrequently used
Chile	Not allowed	No	
China	Allowed with conditions	Yes	Infrequently used
Colombia	Allowed	Yes	Infrequently used
Czechia	Allowed with conditions	Yes	Frequently used
Ecuador	Allowed with conditions	Yes	Infrequently used
Egypt	Allowed with conditions	Yes	Infrequently used
El Salvador	Not allowed	No	
Finland	Allowed	Yes	Infrequently used
Georgia	Allowed with conditions	Yes	Infrequently used
Germany	Not allowed	No	
Ghana	Allowed	Yes	Infrequently used
Greece	Allowed with conditions	Yes	Frequently used
Guatemala	Not Addressed	Unknown	
Hong Kong (China*)	Allowed	Yes	Infrequently used
Hungary	Allowed with conditions	Yes	Infrequently used
Iceland	Allowed	No	
India	Allowed	Yes	Infrequently used
Ireland	Not allowed	No	
Italy	Allowed	Yes	Infrequently used
Côte d'Ivoire	Unknown	Unknown	
Japan	Not Addressed	Yes	Infrequently used
Jordan	Allowed	Yes	Infrequently used
Kazakhstan	Allowed	Yes	Infrequently used
Kenya	Not Addressed	Unknown	
Latvia	Allowed	Yes	Infrequently used
Lithuania	Not allowed	No	
Mali	Not Addressed	No	
Mexico	Not allowed	No	
Mongolia	Not Addressed	Unknown	
Montenegro	Allowed	Yes	Infrequently used
New Zealand	Allowed with conditions	Yes	Infrequently used
Nicaragua		No	
Nigeria	Unknown	No	
Norway	Allowed	Yes	Infrequently used
Panama	Not allowed	Unknown	
Paraguay	Not allowed	No	
Peru	Not allowed	No	

Chapter 12. Table 1

(Continued)

Country	Allowed/Permitted	Practiced/ Performed	Frequency?
Philippines	Not allowed	No	
Poland	Allowed with conditions	Yes	Infrequently used
Portugal	Allowed with conditions	Yes	Infrequently used
Romania	Allowed with conditions	Yes	Infrequently used
Russian Federation	Allowed	Yes	Infrequently used
Senegal	Allowed with conditions	Yes	Infrequently used
Serbia	Allowed with conditions	Yes	Infrequently used
Singapore	Allowed with conditions	Yes	Infrequently used
Slovenia	Allowed	Yes	Infrequently used
South Africa	Allowed	Yes	Infrequently used
The Republic of Korea	Allowed	Yes	Infrequently used
Spain	Allowed	Yes	Infrequently used
Sri Lanka	Not allowed	No	
Switzerland	Allowed	Yes	Infrequently used
Taiwan (China*)	Allowed	Yes	Infrequently used
Thailand	Not allowed	Unknown	
Togo	Unknown	Unknown	
Trinidad and Tobago	Not allowed	No	
Turkey	Allowed with conditions	Yes	Infrequently used
Uganda	Unknown	Yes	Infrequently used
United Arab Emirates	Not allowed	No	
UK	Allowed	Yes	Infrequently used
USA	Allowed	Yes	Infrequently used
Uruguay	Allowed with conditions	Yes	Infrequently used
Venezuela	Not allowed	Yes	Infrequently used
Viet Nam	Allowed	Yes	Infrequently used
Zimbabwe	Unknown	No	

*Reporting separately for this report.

embryos, a potentially unanticipated or undesired result is the disclosure of the gender of the embryo. This application has become the most reliable method of selecting fetal gender, and has been extensively used for this purpose in some countries, with its attendant moral and ethical controversies.

Analysis of the survey

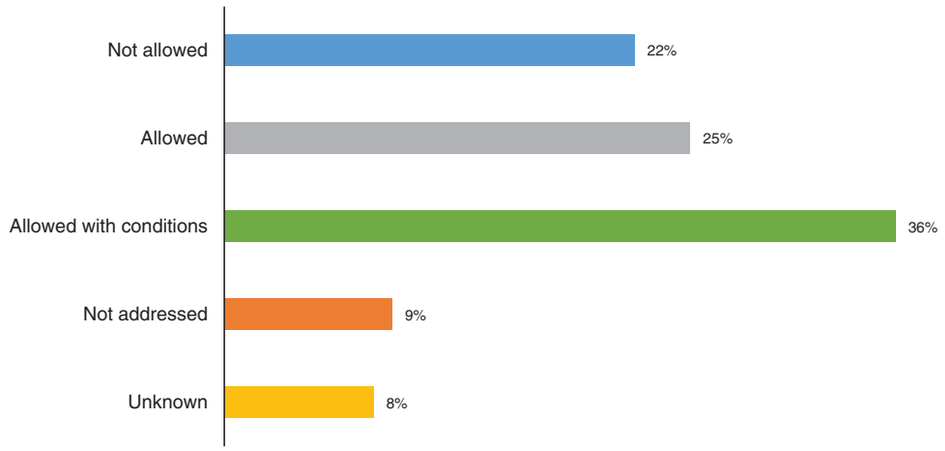
Regarding whether selective fetal reduction (SFR) was permitted, 47 of 77 countries (61%) responded positively, compared to 21 countries in the 2015 survey (Table 1, Chart 1). Of note, China and Czechia acknowledged that their status had changed from "allowed," in the previous survey, to "allowed with conditions" in 2018.

The majority allowing SFR are in Europe. Another 17 (22%) of the countries do not allow SFR at all, and, as noted in 2016, most are in South America. Venezuela and the United Arab Emirates are new additions. The issue has not been addressed in 7 (9%) of the countries. The status of SFR in the remaining 6 out of 77 (8%) of countries is "unknown". Seventeen of the 47 permitting countries (36%) allow SFR, with conditions applied.

SFR is performed in 52 of 78 countries (67%), but it is used infrequently in most – 48 of 68 (62%), Exceptions include Belgium, Bulgaria, Czechia, and Greece, where SFR is employed "frequently". This trend toward SFR use has carried forward since the last survey. Italy responded in the last survey that SFR was not used, but in 2018 noted that it is used, but infrequently. Venezuela was the only country that responded in 2018 that SFR is not allowed – but is performed.

Fifty-five percent n = Twenty-six of 47 countries responding (55%) have federal or national regulations governing the practice of SFR. Of these 26, 2 also have state laws and ordinances; Bolivia has municipal laws, as well. One country (2%) has agency regulations, and 16 countries (34%) have professional organizational guidelines for SFR. Of these 16 with guidelines, 7 (44%) have no federal or state requirements, only professional organizational guidelines. Four countries have cultural and religious policies addressing SFR, in addition to other governances.

Only 19 of 66 surveyed (29%) consistently monitor or document SFR outcomes. That group includes several European



Chapter 12. Chart 1. Is selective reduction allowed/permitted?

countries, New Zealand, and Singapore. Nine countries of 66 (14%) conduct partial or inconsistent monitoring, while 25 countries (38%) do not monitor at all. Remarkably, several countries – including China, India, Russian Federation, and The United States of America – conducted regular monitoring and documentation in 2015, but reported "inconsistent" documenting and monitoring in 2018.

Twenty one of 48 (44%) permit sex selection with PGT-A. Another 6 countries (12.5%), Chile, Ecuador, Guatemala, Mexico, Panama, and Peru, perform PGT-A, although the survey did not address whether using it for sex selection is legally permissible. Twenty-one of 50 countries (42%) also allow sex selection via sperm sorting; 4 countries (8%) actually use it.

Thirteen countries out of 52 (25%) have regulations covering PGT-A use, 10 countries out of 55 (18%), for sperm sorting, and 15 countries out of 55 (59%) for SFR. Only 5 countries, Bulgaria, Hong Kong [China, reporting separately for this report], New Zealand, Singapore, and South Africa have regulations for all 3 categories (Table 2, Chart 2).

For PGT-A, 8 countries of 13 (61.5%) reported having governance regulated by federal or national statutes, ordinances or policies: 2 (15%) by state or provincial policies or legislation, 1 (8%) by municipal laws, statutes or ordinances, 2 (15%) by professional organizations standards or guidelines, one (8%) by existing cultural practices, and one (8%) by religious decrees. For sperm sorting, 8 countries (n = 13) reported having governance regulated by federal or national statutes, ordinances or policies, and 1 (8%) by state or provincial policies or legislation. For SFR, 15 responders in 15 countries (100%) reported having governance regulated by federal or national statutes, ordinances or policies, 2 (21%), by state or provincial policies or legislation, 1 (7%) by municipal laws, statutes or ordinances, 2 (21%) by agency regulation or oversight, 2 (21%) by professional organizations standards or guidelines, and one (8%) by existing cultural practices.

Regarding centres where sex selection techniques were allowed, there was no significant difference in the type of clinic reporting. This applied to sole practitioners, small and large private clinics, public hospitals, and university hospitals. China was the only country that did not allow sex selection or fetal reduction procedures to be conducted in private clinics; a hospital or university setting was required.

Only two countries in the survey, Australia and Kazakhstan, reported that all three procedures are considered established medical practice. In Greece and The Republic of Korea, (2 of 58 or 3%) considered PGT-A an experimental method of sex selection; four countries of 52 (8%) considered sperm sorting to be experimental, and only Greece (1 of 56 or 2%) considered SFR to be experimental. Twenty-five of 58 countries (43%) thought of PGT-A as established medical practice, and 25 of 56 (44%) held that opinion of SFR. Only 9 of 52 (17%) considered sperm sorting to be established medical practice.

Regarding sex selection: 24 out of 64 (38%) conducted sex selection only during IVF/ICSI procedures; 8 out of 60 (13%) conducted it with IUI, and only 5 of 58 (9%) did it with SFR.

Discussion

Sex selection has historically been used in many countries for non-medical reasons, such as "family balancing" and patient preference. Sex selection is a contentious issue, but it is culturally endorsed and offered in several countries. The practice of sex selection with ART has steadily increased with the reliability and availability of PGT-A.

A recent survey[1] noted that 92% of 493 clinics in The United States of America offered PGT-A. Of these clinics, 94% offered sex selection for family balancing; 82% for elective reasons, such as patient preference; and 84% for patients without pre-existing infertility. Recent literature attests to greater acceptance and performance of sex selection for a variety of cultural and economic reasons. This is true in countries as diverse as The Republic of Korea, Ukraine, and Viet Nam. Essentially, a two-fold increase has occurred over the past decade, primarily favoring selection of males[2–4].

These trends may have profound demographic and cultural implications, yet to be addressed. Since 1990, the number of calculated "missing females" has risen by 43 percent (38 million) to 126 million in 2010[4]. According to Bongaarts and Guilmoto[4], this trend is expected to peak in 2035, with a further increase of 24 million to 150 million, before declining slightly in 2050 to 142 million.

This study also outlines the 3 factors that are essential for prenatal sex selection to reach significant levels in any country:

- Strong preference for a son
- Easy access to prenatal diagnosis
- Low fertility

SFR has evolved over the past few years from a rarely used procedure, to avoid higher-order multiple births, to a more commonly performed practice in some countries for patients undergoing ART. In other countries, such as The United States of America, its availability has become more restricted as multiple pregnancy rates have fallen. In still others it is not permitted at all, although occasionally performed nevertheless by some practitioners.

PGT-A is performed primarily to identify euploid embryos, but gender is determined during the procedure, and this information injects gender selection into the decision options for many couples pursuing ART. Evans et al[5] found that although in the late 80's and early 90's there was a definite son preference among individuals in The United States of America, the trend has now been declining steadily, with as many patients now preferring females to males.

Over the past 25 years, fetal reduction has been granted greater acceptance as a safe and preferred procedure in some societies. While reduction of pregnancies of triplets and higher order, to reduce fetal morbidity, has been widely accepted as an essential goal over the past two decades, now, even reduction of twins to singletons is gaining medical and social acceptance.

Summary

SFR remained a very contentious issue in 2018, with 39% of 77 responding countries permitting it outright. An additional 22% allowed SFR conditionally, and 22% banned it. The status of SFR was reported by 17% of responding countries as not addressed or "unknown". While there has been some change in access in a few countries, no significant new trend over the past three years was discernible.

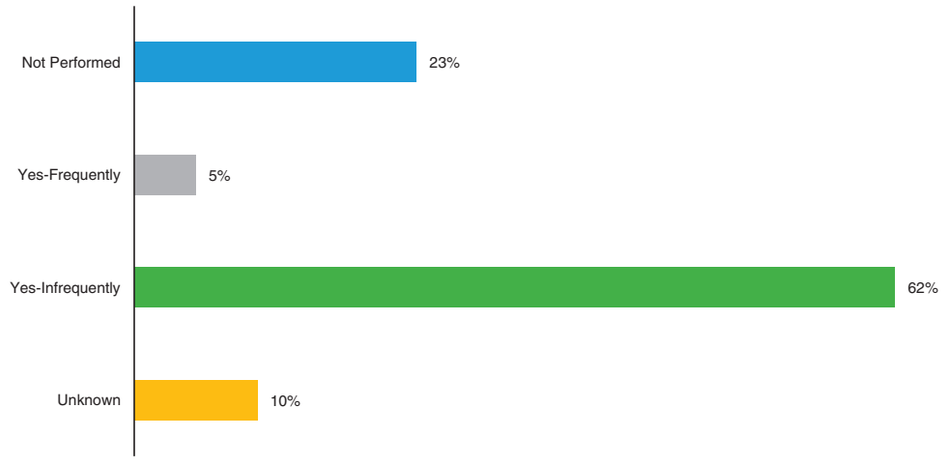
Recent literature suggests that sex selection, particularly with PGT-A, has become much more widely performed, and is almost universally available. Despite this trend, the minority of reporting countries (44%) expressly permit PGT-A for sex selection; even fewer (25%) have regulations restricting it. Sperm sorting and SFR, while available in a few countries, are infrequently practiced.

Chapter 12. Table 2

Is sex selection allowed permitted and practiced/performed in your country?

	PGT-A Sex Selection		Sperm Sorting		Selective Fetal Reduction	
Country	**Allowed/Permitted**	**Practiced Performed**	**Allowed/Permitted**	**Practiced Performed**	**Allowed/Permitted**	**Practiced Performed**
Argentina	Allowed/Permitted		Allowed/Permitted	Unknown		
Austria					Allowed/Permitted	
Bangladesh						Practiced/Performed
Barbados	Allowed/Permitted					
Belarus		Practiced/Performed				
Belgium	Unknown		Unknown		Unknown	
Bolivia	Allowed/Permitted		Allowed/Permitted		Unknown	
Botswana	Allowed/Permitted		Allowed/Permitted		Allowed/Permitted	
Brazil					Allowed/Permitted	Practiced/Performed
Bulgaria	Unknown		Unknown		Unknown	
Burkina Faso	Unknown		Unknown		Unknown	
Chile		Practiced/Performed	Unknown			
China	Unknown		Unknown		Unknown	
Colombia	Allowed/Permitted			Practiced/Performed		Practiced/Performed
Ecuador		Practiced/Performed				Practiced/Performed
Egypt	Allowed/Permitted	Practiced/Performed	Allowed/Permitted		Allowed/Permitted	Practiced/Performed
El Salvador	Unknown		Unknown		Unknown	
Finland	Allowed/Permitted		Unknown		Allowed/Permitted	Practiced/Performed
Germany	Unknown		Unknown		Unknown	
Ghana	Allowed/Permitted		Allowed/Permitted		Allowed/Permitted	
Greece	Allowed/Permitted		Allowed/Permitted		Allowed/Permitted	
Guatemala		Practiced/Performed		Practiced/Performed	Unknown	
Hong Kong (China*)	Allowed/Permitted	Practiced/Performed	Allowed/Permitted		Allowed/Permitted	
Hungary			Allowed/Permitted			
Iceland	Allowed/Permitted		Allowed/Permitted		Allowed/Permitted	
Italy	Unknown		Unknown		Unknown	
Côte d'Ivoire	Unknown		Allowed/Permitted		Unknown	
Japan	Unknown		Unknown			Practiced/Performed
Jordan	Allowed/Permitted	Practiced/Performed	Unknown		Unknown	
Kazakhstan	Unknown		Allowed/Permitted		Allowed/Permitted	
Kenya	Unknown		Unknown		Unknown	
Latvia			Unknown			
Mexico		Practiced/Performed	Unknown		Unknown	
Mongolia	Allowed/Permitted		Allowed/Permitted		Allowed/Permitted	
New Zealand					Allowed/Permitted	Practiced/Performed
Nigeria	Allowed/Permitted		allowed/Permitted		Unknown	
Norway	Unknown		Unknown		Unknown	
Panama		Practiced/Performed		Practiced/Performed	Unknown	
Paraguay	Allowed/Permitted		Unknown		Unknown	
Peru		Practiced/Performed	Unknown		Unknown	
Philippines	Unknown		Unknown		Unknown	
Poland	Unknown		Unknown		Unknown	
Portugal	Unknown		Unknown		Allowed/Permitted	
Romania	Unknown		Allowed/Permitted			Practiced/Performed
Russian Federation			Allowed/Permitted			
Senegal	Unknown		Unknown		Allowed/Permitted	
Singapore					Allowed/Permitted	Practiced/Performed
Slovenia	Unknown		Unknown		Unknown	
South Africa	Allowed/Permitted		Allowed/Permitted		Allowed/Permitted	
Spain			Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Switzerland			Unknown		Allowed/Permitted	Practiced/Performed
Taiwan (China*)					Allowed/Permitted	
Trinidad and Tobago	Allowed/Permitted		Allowed/Permitted			
Uganda	Unknown		Unknown		Unknown	
United Arab Emirates	Allowed/Permitted		Allowed/Permitted			
UK					Allowed/Permitted	Practiced/Performed
USA	Allowed/Permitted	Practiced/Performed	Allowed/Permitted		Allowed/Permitted	Practiced/Performed
Venezuela	Allowed/Permitted		Allowed/Permitted		Unknown	
Viet Nam	Unknown		Unknown		Allowed/Permitted	Practiced/Performed
Zimbabwe	Unknown		Unknown		Unknown	

*Reporting separately for this report.



Chapter 12. Chart 2. Is selective reduction performed/practised?

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CHAPTER 13: PREIMPLANTATION GENETIC TESTING

Introduction

Preimplantation genetic testing (PGT) was introduced as a method for embryonic diagnosis of molecular genetic defects linked to specific inherited diseases. Non-affected embryos were selected and transferred to the patient, with the expectation of producing a child free of that disease[1]. Early in the history of PGT, other applications emerged. For example, PGT was used to produce a child selected by HLA haplotyping as a "savior sibling" for a family member afflicted with an incurable disease. Other non-traditional social and medical paradigms have been reported[1]. Currently, PGT is used most commonly to identify a vast number of autosomal single-gene disorders (preimplantation genetic testing for monogenic/single gene disorders, PGT-M), for aneuploidy (preimplantation genetic testing for aneuploidy, PGT-A), and for structural rearrangements (PGT-SR).

PGT-A has been promoted as an adjunct to improve IVF implantation and birth rates, and to reduce risk of miscarriage[2–6]. It is used to identify structural or numerical chromosomal abnormalities[2–6], because euploid blastocysts are presumed to be optimal for transfer, by increasing implantation and live-birth rates per embryo transferred. As such, PGT-A could play an essential role in selecting embryos for single-embryo transfers (SET), and for avoiding multiple pregnancy[2].

Initially, PGT involved removal of one or two blastomeres from the embryo at the cleavage stage, typically on day three of in vitro development[2–6]. ART centres performing PGT today have for the most part abandoned day three biopsies, and now perform trophectoderm biopsy at the blastocyst stage. Removal of five to ten of the more than 150 cells normally available at this stage is far more than was possible with cleavage-stage embryos[2–6].

Other advantages of blastocyst biopsy include improved survival after biopsy; the need for fewer procedures, because day-five embryos have survived some of the natural selection process; and less mosaicism, because earlier mosaic embryos seem to have the potential to self-correct with advancing embryonic maturity. Biopsied blastocysts are usually cryopreserved with vitrification, with the intent of later replacement after the result of the molecular analysis is received. Molecular methods have evolved substantially over the past three years.

Molecular diagnosis is now performed on 24 chromosomes, using an array of advanced technologies. These include fluorescent in situ hybridization (FISH), polymerase chain reaction (PCR), array comparative genome hybridization (aCGH), single nucleotide polymorphism arrays (SNP arrays), next-generation sequencing technology (NGS), and preimplantation genetic haplotyping (PGH)[2–10]. Unaffected (normal) blastocysts are transferred after thaw. Because embryos with genetic abnormalities are disposed of, PGT allows couples to discard affected or abnormal embryos, rather than having to consider terminating an established pregnancy[2–10].

Earlier versions of PGT-A that relied solely on FISH limited analysis to smaller subsets of chromosomes – typically five to ten, rather than the 24 chromosomes analyzed with newer molecular technology. But clinical outcomes were disappointing. When 24-chromosome technology emerged, and three early randomized clinical trials using either qPCR-based CCS or rapid aCGH described higher birth rates, and single-pregnancy rates with single embryo transfer, the outcomes have not been reproducible

in a larger clinical patient population. Although the 2018 Surveillance questionnaire reflects increasing global interest and application of PGT-A, evidence of improved outcomes is lacking, except in small series and selected cohorts, even with increasingly sophisticated molecular technology. Nevertheless, world-wide PGT-A utilization is again expanding, although it has not yet been confirmed to be an effective adjunct for IVF[2].

PGT is now typically performed for nine indications:

1. Autosomal single gene disorders[8,14] (PGT-M)
2. Some chromosomal rearrangements[2,4] (PGT-SR)
3. X-linked diseases
4. Human leukocyte antigen (HLA) typing
5. Cancer predisposition genes[15]
6. Mitochondrial DNA disorders
7. Preimplantation genetic testing for aneuploidy (PGT-A)
8. Adult onset disorders[8,15]
9. Non-medical sex selection

Analysis of the survey

Fifty-three of 70 responders (76%) indicated that PGT-M (Table 1) is expressly allowed, by statutes, laws, and guidelines. The status of PGT-M was not addressed in 17 of the 70 (24%); its status is indicated "unknown" in 16% – but PGT-M is not known to be specifically prohibited in any of the countries that responded.

When PGT-M is allowed, 24 of 53 countries responding (45%) have guidelines governing its use; use is not regulated in 26 countries responding (49%); and the procedure has a "not-known" status in three countries (6%). PGT-M for single gene disorders is commonly performed as a clinical service in 47 of 67 countries (70%), performed only experimentally in three countries (4%), and not addressed, or unknown, in 17 (25%) of the countries (Table 2, Charts 1 and 2).

PGT-M for single gene disorders is considered acceptable for preventing disease in offspring produced with ART – that is the opinion of 46 of 68 responders (68%). Twenty-one of 65 consider it acceptable to allow the disease in the offspring produced with ART. That was the response chosen in 18 of 64 (28%). Twenty-one of 65 (32%) say that it is permitted for helping to generate an embryo for any immunologically donor-matched diseased child, but it is prohibited in 17 (26%) of the countries. Twenty-three of 65 (35%) say it is considered acceptable in helping to generate a child for any immunologically donor-matched diseased child. It is also allowed for assisting in generating an embryo on behalf of a diseased sibling in 24 of 66 (36%) of the countries and for generating a child on behalf of a deceased sibling in 26 of 66 responders (39%). It is permitted to generate an embryo with a specific disease for research or experimentation, according to 5 in 65 responders (8%), but that is prohibited in 37 of 65 responding countries (57%).

PGT-A is expressly allowed by statutes, laws, and guidelines in 48 of 67 (72%) responding to that question; the status was not addressed or was marked "unknown" in 19 of the 67 (28%). When allowed, it is regulated by guidelines that govern its use in 20 of 48 countries responding (42%), not regulated in 24 of the 48 (50%); its status is not known in 1 of the 48 (2%).

PGT-A for single gene disorders is commonly performed as a clinical service in 42 of 65 countries (65%), performed only experimentally in 4 countries (6%), and is not addressed, or unknown, in 19 of the countries (29%). PGT-A is commonly performed in tandem with PGT-M in 38 of 62 countries (61%).

Regulatory bodies with oversight for PGT-M and PGT-A range from none to combinations of federal, provincial and municipal statutes; various government agencies; and guidelines from professional organizations (Chart 3).

For PGT-M, 100% of 24 responders reported having governance by federal or national statutes, ordinances or policies; in 4 (17%), this was accomplished by state or provincial policies or legislation; in 2 (8%), by municipal laws, statutes or ordinances; in another 2 (8%), by agency regulations or oversight; in 12, (50%) by professional organizations standards or guidelines; in 2 (8%), by existing cultural practices; and in another 2 (8%) by religious decrees.

For PGT-A, all of 20 responders (100%) reported having governance by federal or national statutes, ordinances or policies; 3 (15%) accomplished this by state, regional or provincial policies or legislation; 1 (5%) by municipal laws, statutes or ordinances; 1 (5%) by agency regulations or oversight, 11 (55%) by standards or guidelines professional organization; 1 (5%), by existing cultural practices; and 1 (5%) by religious decrees.

Centres providing PGT-M and PGT-A services, respectively, include sole practitioners in private clinics, 19 responders (95% and 100%); 26 responders, (92% and 88%), small private physician clinics; large multiple practitioner clinics, 27 responders (96% and 93%); hospital based clinics, 22 responders (86% and 100%); university clinics, 28 (93% and 82%); and public hospitals, 19, (95% for both responding countries.

Discussion

Compared to the 2015 Surveillance questionnaire, PGT-M now comprises an increasing percentage of ART services throughout the world. Its application is often regulated or restricted by statute or local clinical tradition. It is allowed in all countries surveyed. PGT-M was commonly performed in 43% of the 90 responding countries in 2018, compared to 34% of 67 countries in 2015. It is now a well-established and reliable procedure with a low error rate. Drawbacks remain the high cost and inefficiency of IVF as a requisite platform, requirements for extended culture to the blastocyst stage, and relatively reduced birth rates even among fertile women because of the more limited number of embryos available for transfer.

In the United States of America, PGT is frequently deemed experimental by insurance carriers and is usually not covered except for single gene disorders and selected chromosomal defects. Demand for PGT-M in The United States of America, European Union, and Middle East, however, is expanding to include couples that are not infertile but are carriers at risk for transmission of genetic disorders to their progeny. Many of these couples have previously had affected offspring and were reluctant to consider additional pregnancies without PGT-M and others were unwilling to attempt pregnancy at all without some assurance of reduced risk. PGT-M also offers the opportunity to identify embryos carrying relatively common genetic conditions including oncogenes with high penetrance, such as BRCA, that pose risk for devastating diseases later in life. The availability of new molecular genetic tests, public initiatives surrounding specific genetic diseases, and increasing internet marketing of tests and identification of carriers are expected to increased demand for PGT-M worldwide[4,6].

Chapter 13. Table 1

Is preimplantation genetic testing allowed/permitted and practiced/performed?

	PGT-M		PGT-A	
Country	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**
Argentina	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Australia	Allowed/Permitted		Allowed/Permitted	
Austria	Allowed/Permitted		Allowed/Permitted	
Bangladesh	Unknown			
Barbados	Allowed/Permitted		Allowed/Permitted	
Belarus	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Belgium	Allowed/Permitted		Allowed/Permitted	
Bolivia	Allowed/Permitted		Allowed/Permitted	
Botswana	Allowed/Permitted		Allowed/Permitted	
Brazil			Allowed/Permitted	Practiced/Performed
Bulgaria	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Burkina Faso	Unknown		Unknown	
Canada	Allowed/Permitted		Allowed/Permitted	
Chile		Practiced/Performed		Practiced/Performed
China	Allowed/Permitted		Allowed/Permitted	
Colombia	Allowed/Permitted		Allowed/Permitted	
Czechia	Allowed/Permitted		Allowed/Permitted	Practiced/Performed
Ecuador		Practiced/Performed		Practiced/Performed
Egypt	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
El Salvador	Unknown		Unknown	
Finland	Allowed/Permitted		Allowed/Permitted	
Georgia	Allowed/Permitted		Allowed/Permitted	
Germany	Allowed/Permitted		Allowed/Permitted	
Ghana	Allowed/Permitted		Allowed/Permitted	
Greece		Practiced/Performed	Allowed/Permitted	
Guatemala		Practiced/Performed		Practiced/Performed
Hong Kong (China*)	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Hungary	Allowed/Permitted			
Iceland	Allowed/Permitted		Allowed/Permitted	
India	Allowed/Permitted		Allowed/Permitted	
Ireland	Allowed/Permitted	Practiced/Performed		
Italy	Allowed/Permitted		Allowed/Permitted	Unknown
Côte d'Ivoire	Unknown		Unknown	
Japan	Allowed/Permitted	Practiced/Performed		Practiced/Performed
Jordan	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Kazakhstan	Allowed/Permitted		Allowed/Permitted	
Kenya	Unknown		Unknown	
Latvia	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Lithuania	Allowed/Permitted	Practiced/Performed		
Mexico	Allowed/Permitted		Allowed/Permitted	
Mongolia	Allowed/Permitted		Allowed/Permitted	
Montenegro	Allowed/Permitted		Allowed/Permitted	
New Zealand	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Nigeria	Allowed/Permitted		Allowed/Permitted	
Norway	Allowed/Permitted		Unknown	
Panama		Practiced/Performed		Practiced/Performed
Paraguay	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Peru		Practiced/Performed		Practiced/Performed
Philippines	Unknown		Unknown	
Poland	Unknown		Unknown	
Portugal	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Romania	Unknown		Unknown	
Russian Federation	Allowed/Permitted			
Senegal	Unknown		Unknown	
Serbia	Allowed/Permitted		Unknown	
Singapore	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Slovenia	Allowed/Permitted		Unknown	
South Africa	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
The Republic of Korea				
Spain	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Switzerland	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed

Chapter 13. Table 1

(Continued)

	PGT-M		PGT-A	
Country	**Allowed/Permitted**	**Practiced/Performed**	**Allowed/Permitted**	**Practiced/Performed**
Taiwan (China*)	Allowed/Permitted		Allowed/Permitted	
Thailand			Allowed/Permitted	
Trinidad and Tobago	Allowed/Permitted		Allowed/Permitted	
Turkey	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Uganda	Unknown		Unknown	
United Arab Emirates	Allowed/Permitted		Allowed/Permitted	
UK	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
USA	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Uruguay	Allowed/Permitted		Allowed/Permitted	
Venezuela	Allowed/Permitted		Allowed/Permitted	
Viet Nam	Allowed/Permitted	Practiced/Performed	Allowed/Permitted	Practiced/Performed
Zimbabwe	Unknown		Unknown	

*Reporting separately for this report.

Chapter 13. Table 2

Are these techniques considered experimental or part of established medical practice?

Country	PGT-M	PGT-A	PGT-M with PGT-A
Argentina	Established medical practice	Established medical practice	Established medical practice
Australia	Established medical practice	Established medical practice	Established medical practice
Austria	Established medical practice	Established medical practice	Established medical practice
Belarus	Established medical practice	Established medical practice	Established medical practice
Bolivia	Established medical practice	Established medical practice	Established medical practice
Botswana	Not addressed	Not addressed	Not addressed
Brazil	Established medical practice	Established medical practice	Established medical practice
Bulgaria	Established medical practice	Established medical practice	Established medical practice
Burkina Faso	Unknown	Unknown	Unknown
Cameroon	Not addressed	Not addressed	Not addressed
Canada	Established medical practice	Established medical practice	Established medical practice
Chile	Established medical practice	Established medical practice	Established medical practice
China	Established medical practice	Established medical practice	Established medical practice
Colombia	Established medical practice	Established medical practice	Established medical practice
Ecuador	Established medical practice	Established medical practice	Established medical practice
Egypt	Established medical practice	Established medical practice	Established medical practice
Finland	Established medical practice	Established medical practice	Established medical practice
Georgia	Not addressed	Not addressed	Not addressed
Germany	Established medical practice	Established medical practice	Established medical practice
Ghana	Established medical practice	Established medical practice	Established medical practice
Greece	Experimental	Experimental	Experimental
Guatemala	Not addressed	Not addressed	Not addressed
Hong Kong (China*)	Established medical practice	Established medical practice	Established medical practice
Hungary	Established medical practice	Experimental	Experimental
Iceland	Not addressed	Not addressed	Not addressed
India	Established medical practice	Established medical practice	Established medical practice
Ireland	Established medical practice		
Côte d'Ivoire	Not addressed	Not addressed	Not addressed
Japan	Experimental		
Jordan	Established medical practice	Established medical practice	Established medical practice
Kazakhstan	Established medical practice	Established medical practice	Established medical practice
Latvia	Established medical practice	Established medical practice	Established medical practice
Lithuania	Experimental	Not addressed	Not addressed
Mexico	Unknown	Established medical practice	Established medical practice
Mongolia	Not addressed	Not addressed	Not addressed
Montenegro	Established medical practice	Established medical practice	Established medical practice
New Zealand	Established medical practice	Established medical practice	Established medical practice
Nigeria	Unknown	Unknown	Unknown
Norway	Established medical practice	Unknown	Unknown
Panama	Established medical practice	Established medical practice	Established medical practice

Chapter 13. Table 2

(*Continued*)

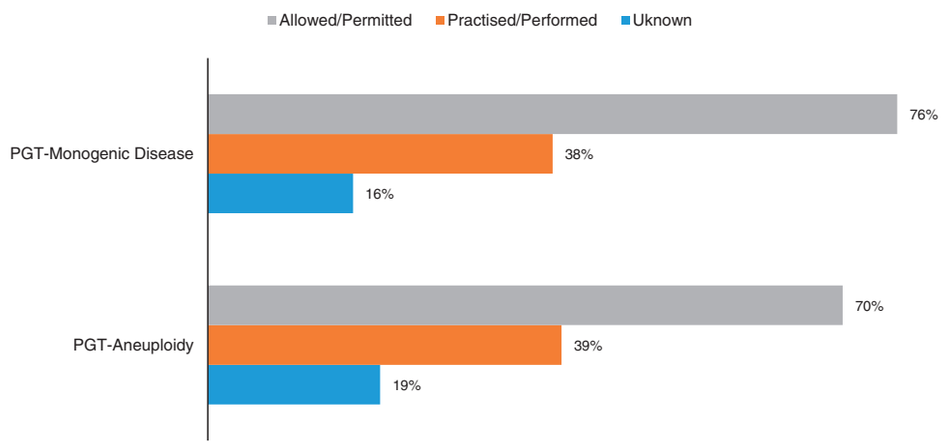
Country	PGT-M	PGT-A	PGT-M with PGT-A
Paraguay	Established medical practice	Established medical practice	Established medical practice
Peru	established medical practice	established medical practice	established medical practice
Philippines	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Unknown
Portugal	Established medical practice	Established medical practice	
Russian Federation	Established medical practice	Established medical practice	Established medical practice
Senegal	Not addressed	Not addressed	Not addressed
Singapore	Established medical practice	Experimental	
Slovenia	Established medical practice	Not addressed	Not addressed
South Africa	Established medical practice	Established medical practice	Established medical practice
The Republic of Korea	Established medical practice	Established medical practice	Experimental
Spain	Established medical practice	Established medical practice	Established medical practice
Sri Lanka	Established medical practice	Established medical practice	Established medical practice
Switzerland	Established medical practice	Established medical practice	Established medical practice
Taiwan (China*)	Established medical practice	Established medical practice	Not addressed
Thailand	Established medical practice	Established medical practice	Established medical practice
Togo	Not addressed	Not addressed	
Trinidad and Tobago	Established medical practice	Established medical practice	Established medical practice
Turkey	Established medical practice	Established medical practice	Unknown
Uganda	Unknown	Unknown	Unknown
United Arab Emirates	Established medical practice	Established medical practice	Established medical practice
UK	Established medical practice	Experimental	Experimental
USA	Established medical practice	Established medical practice	Established medical practice
Uruguay	Established medical practice	Established medical practice	Established medical practice
Venezuela	Established medical practice	Established medical practice	Established medical practice
Viet Nam	Unknown	Unknown	Unknown
Zimbabwe	Not addressed	Not addressed	Not addressed

*Reporting separately for this report.

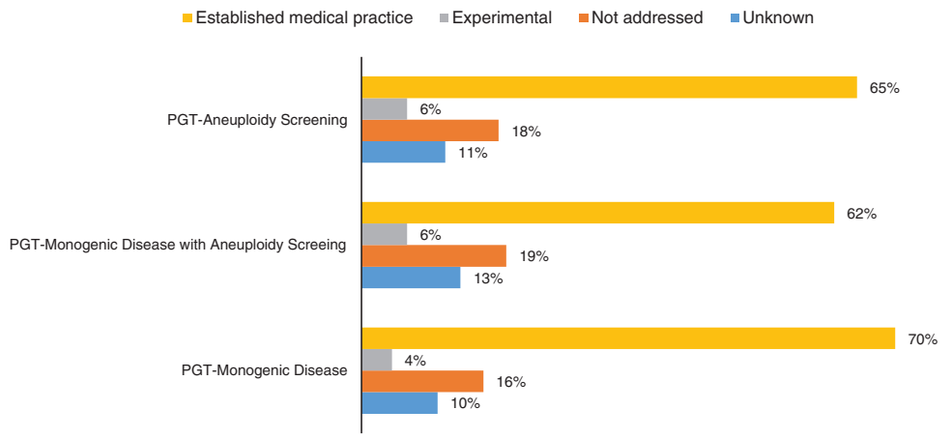
PGT-A appears to be universally available in all 90 countries participating in the questionnaire but is commonly performed in only 50% (Table 1). In 2015, it was commonly performed in 38% of countries. If the newer technologies are proven to truly improve implantation rates, application is likely to be vastly expanded, as was the case with ICSI. However, available current data, while offering preliminary encouragement, are too inadequate and inconclusive to justify broader use.

Summary

Surveillance 2019 confirms an ongoing trend of increased accessibility and use of PGT-M and PGT-A worldwide. PGT, and especially PGT-M, provide proven benefits. Both are generally considered safe, and are associated with a low frequency of errors. PGT-M largely prevents women from delivering offspring with serious genetic disorders, avoids the potential need for pregnancy termination, and provides critical reassurance



Chapter 13. Chart 1. Is PGT allowed/permitted or practised/performed?



Chapter 13. Chart 2. Are PGT techniques considered experimental or established medical practice?

to fearful couples who otherwise would not choose to have children.

Since Surveillance 2016 was published, advances have occurred in the discovery of genetic linkages to common diseases. Examples include many cancers, diabetes, cardiovascular disease, degenerative disorders of old age, some mental illnesses, and even autism spectrum disorders. It seems likely that there will be expanded indications and greater use of PGT-M for some of these common disorders.

PGT-A, more widely used in embryo selection now than in 2016, remains controversial. Although it is claimed to be a valuable tool for embryo selection, and many ART centres have attributed improved clinical success to its use, results have not been widely replicated in appropriately designed clinical trials.

The potential value and role of PGT-A will likely become clearer during the next triennial.

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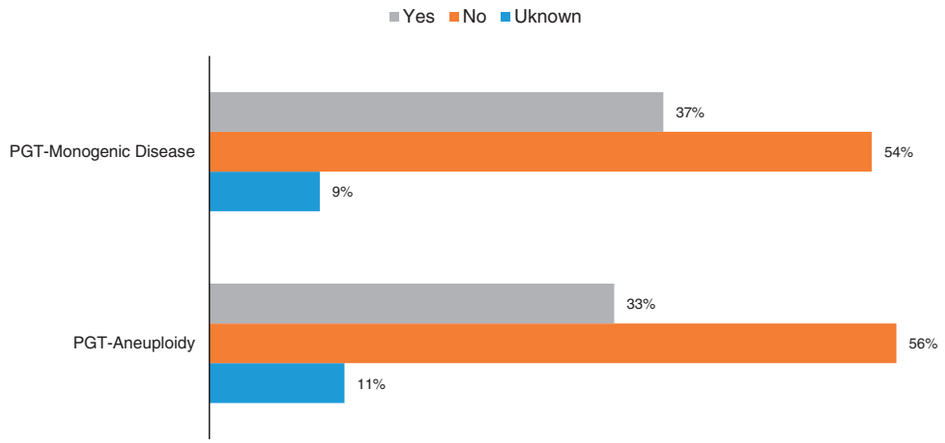

Chapter 13. Chart 3. Are there regulations that govern PGT?

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CHAPTER 14: SURROGACY

Introduction

Surrogacy is an arrangement in which a woman (the surrogate) becomes pregnant, then carries and gives birth to a child or children, with the intention of giving the child to another person or couple (the intended parent or parents), who will rear the child. The 2018 IFFS Surveillance questionnaire considered "gestational" and "traditional" surrogacy.

Gestational surrogacy, sometimes referred to as full surrogacy, or "IVF surrogacy", the gametes of both intended parents, or of one intended parent and a donor egg and/or sperm, are used to create the embryo. Alternatively, a donated embryo created from unrelated gametes is used. The surrogate is genetically unrelated to the offspring intended to be produced by this arrangement.

Traditional surrogacy, sometimes termed natural surrogacy, or partial surrogacy, the surrogate is inseminated with the semen of an intended parent, and the surrogate's own oocyte is fertilized

Chapter 14. Table 1

Are there regulations that govern gestational carriers in your country?

Country	Gestational Surrogacy	Traditional Surrogacy
Argentina	No	No
Armenia	Yes	Yes
Australia	Yes	Yes
Barbados	No	No
Belarus	Yes	No
Bolivia	No	No
Botswana	No	No
Brazil	Yes	Yes
Bulgaria	Yes	Yes
Burkina Faso	No	No
Cameroon	No	No
Canada	Yes	Yes
Chile	Yes	Yes
China	No	No
Colombia	No	No
Czechia	No	Yes
Ecuador	No	No
El Salvador	No	No
Finland	Yes	Yes
Georgia	Yes	No
Germany	Unknown	Unknown
Ghana	No	No
Greece	Yes	No
Guatemala	No	No
Hong Kong (China*)	Yes	Yes
Hungary	No	No
Iceland	Yes	Yes
India	Yes	Yes
Ireland	No	No
Italy	No	No
Côte d'Ivoire	Unknown	Unknown
Japan	Yes	
Jordan	No	No
Kazakhstan	Yes	No
Kenya	No	No
Latvia	No	No
Lithuania	No	No
Mali	No	No
Mexico	Yes	Yes
Mongolia	Unknown	Unknown
Namibia	Unknown	Unknown
New Zealand	Yes	Yes
Nicaragua	Yes	Yes
Nigeria	Unknown	no
Panama	No	No
Paraguay	No	No
Peru	no	no
Philippines	Yes	Yes
Poland	No	No
Portugal	Yes	Yes
Romania	No	No
Russian Federation	Yes	
Senegal	No	No
Singapore	Yes	Yes
Slovenia	No	No
South Africa	Yes	
South Korea	Yes	
Spain	Yes	No
Sri Lanka	No	No
Switzerland	No	No
Taiwan (China*)	No	No
Thailand	Yes	Yes
Togo	No	No
Trinidad and Tobago	No	No
Uganda	No	No
United Arab Emirates	Yes	Yes
UK	Yes	Yes
USA	Yes	Yes
Uruguay	Yes	Yes
Venezuela	Unknown	Unknown
Viet Nam	Yes	Unknown
Zimbabwe	No	No

*Reporting separately for this report.

Chapter 14. Table 2

If surrogacy is regulated, how is it done?

	Country	Federal/National Laws/Statutes/ Ordinances/policies	State/Provincial/ Regional Laws/ Statutes/Ordinances	Municipal Laws/Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practice	Religious Decree	Unknown
Gestational Surrogacy	Argentina					Yes			
	Armenia	Yes							
	Australia		Yes						
	Belarus	Yes							
	Brazil					Yes			
	Canada	Yes							
	Chile	Yes							
	Colombia								Yes
	Czechia								Yes
	Ecuador					Yes			
	Finland	Yes							
	Georgia	Yes							
	Ghana					Yes			
	Greece	Yes			Yes	Yes			Yes
	Guatemala					Yes			
	Hong Kong (China*)	Yes	Yes						
	Iceland	Yes							
	India					Yes			
	Côte d'Ivoire								Yes
	Japan					Yes			
	Kazakhstan	Yes							
	Mexico	Yes	Yes			Yes			
	Mongolia								Yes
	New Zealand	Yes				Yes			
	Panama								Yes
	Paraguay								Yes
	Philippines					Yes			
	Portugal	Yes			Yes	Yes			
	Romania								Yes
	Russian Federation	Yes							
	Senegal	Yes	Yes	Yes	Yes	Yes			
	Singapore	Yes							
	South Africa	Yes							
	South Korea					Yes			
	Sri Lanka					Yes			
	Switzerland	Yes							
	Thailand	Yes				Yes			
	Uganda								Yes
	UK	Yes							
	USA		Yes						
	Uruguay	Yes	Yes		Yes				
	Venezuela								Yes
	Viet Nam	Yes							
Traditional surrogacy									
	Australia		Yes						
	Brazil					Yes			
	Canada	Yes							
	Chile	Yes							
	Colombia								Yes
	Finland	Yes							
	Ghana					Yes			
	Greece		Yes	Yes			Yes	Yes	
	Guatemala					Yes			
	Hong Kong (China*)	Yes	Yes						
	Iceland	Yes							

Chapter 14. Table 2

(*Continued*)

Country	Federal/National Laws/Statutes/ Ordinances/policies	State/Provincial/ Regional Laws/ Statutes/Ordinances	Municipal Laws/Statutes/ Ordinances	Agency Regulations/ Oversight	Professional Organization Standards/ Guidelines	Cultural Practice	Religious Decree	Unknown
India					Yes			
Côte d'Ivoire								Yes
Mexico	Yes	Yes			Yes			
Mongolia								Yes
New Zealand	Yes				Yes			
Panama								Yes
Paraguay								Yes
Philippines					Yes			
Portugal	Yes			Yes	Yes			
Romania								Yes
Singapore	Yes							
Sri Lanka					Yes			
Switzerland	Yes							
Thailand	Yes				Yes			
Uganda								Yes
UK	Yes							
USA		Yes						
Venezuela								Yes

*Reporting separately for this report.

in vivo. This may involve reproductive assistance, most often in the form of artificial or intrauterine insemination performed at a fertility clinic. Usually, however, the procedure is performed at home. The resulting child or children are genetically related to the surrogate, as her oocytes are used.

The laws that govern IVF surrogacy are complex, and vary among jurisdictions. Determining the local legal status is the usual first step. Full and informed legal advice from someone familiar with the laws of the country where the treatment will occur, or, if different, the country of domicile of the couple, is mandatory. Also essential is careful medical assessment and thorough counseling of all parties involved in an IVF surrogacy arrangement.

The principal reasons people enter into surrogacy arrangements are:

[1] Medical reasons in which the female intended parent:
   (a) Is without a uterus but has one or both ovaries functioning. This may include women with congenital absence of the uterus, and women who have had a hysterectomy for carcinoma or other reasons;
   (b) has had repeated miscarriages, and the potential for carrying a baby to term is remote. This may include women who have repeatedly failed to become pregnant after IVF treatment;
   (c) has a medical condition that may make pregnancy life threatening, but whose long-term health prospects are good.

[2] Non-medical or social reasons, such as same-sex coupling, or ongoing single status. This is permitted in only some jurisdictions.

Analysis of the survey

In the 2018 IFFS surveillance of the 89 participating countries, 73 countries (82%) sent responses to at least one question pertaining to surrogacy. This is in comparison to 65 countries in 2016, and 62 countries in 2013.

Differential responding to questions may have reflected the respondents' knowledge of surrogacy regulation and/or practices in their countries. For example, some respondents knew whether or not there were laws, but did not know whether surrogacy was practiced in their country.

Of the countries that responded to the question "*are there regulations that govern IVF surrogacy in your country*", in relation to gestational surrogacy, answers were: yes, 31 out of 72 (43%); no, 35 (49%) and "Unknown", 6 (8%). In relation to traditional surrogacy: yes, 22 of 68 (32%) no, 40 (59%), and "Unknown," 6 (9%) (Table 1).[1]

Twenty-seven countries specified the type or types of regulation used for gestational surrogacy, as follows: 13 respondents (48%), only federal laws; 2 (7%), only state laws; and 5 (19%), only professional standards/guidelines. Seven (26%) of these countries reported a combination of these regulatory instruments (Table 2).

Seventeen countries specified the type or types of regulation used for traditional surrogacy: six (35%) reported having only federal laws; 3 (18%) reported having only state laws, and another 3 (18%) said they had only professional standards/ guidelines. Five (29%) of these countries reported a combination of these regulatory instruments.

Regarding the question "*is surrogacy permitted or practiced in your country*", 53 countries responded regarding gestational surrogacy, and 45 countries responded regarding traditional surrogacy (Table 3).

To the topic of gestational surrogacy, 24 countries (45%) reported that it was allowed/permitted; 22 (41.5%) reported it was practiced/performed, and 16 (30%) reported "unknown". For traditional surrogacy, sixteen countries (36%) reported that

Chapter 14. Table 3

Is surrogacy allowed/permitted and practiced/performed in your country?

Country	Gestational Surrogacy	Traditional Surrogacy
Argentina	Allowed/Permitted	Allowed/Permitted
Armenia	Allowed/Permitted	
Australia	Allowed/Permitted, Practiced/Performed	Allowed/Permitted, Practiced/Performed
Belarus	Allowed/Permitted, Practiced/Performed	
Bolivia	Allowed/Permitted	Allowed/Permitted
Botswana	Allowed/Permitted	Allowed/Permitted
Brazil	Allowed/Permitted, Practiced/Performed	Allowed/Permitted, Practiced/Performed
Bulgaria	Unknown	Unknown
Burkina Faso	Unknown	Unknown
Cameroon	Unknown	Unknown
Canada	Allowed/Permitted	Allowed/Permitted
China	Unknown	Unknown
Colombia	Practiced/Performed	Practiced/Performed
Czechia	Practiced/Performed	
Ecuador	Practiced/Performed	Unknown
El Salvador	Practiced/Performed	Practiced/Performed
Georgia	Allowed/Permitted	Unknown
Germany	Unknown	Unknown
Ghana	Allowed/Permitted	Allowed/Permitted
Greece	Practiced/Performed	Allowed/Permitted
Guatemala	Practiced/Performed	Practiced/Performed
Hong Kong (China*)	Allowed/Permitted	Allowed/Permitted
India	Allowed/Permitted	
Ireland	Unknown	Unknown
Italy	Unknown	Unknown
Côte d'Ivoire	Unknown	Unknown
Jordan	Unknown	Unknown
Kazakhstan	Allowed/Permitted	Unknown
Kenya	Practiced/Performed	Practiced/Performed
Lithuania	Allowed/Permitted	
Mexico	Allowed/Permitted	Allowed/Permitted
Mongolia	Allowed/Permitted	Allowed/Permitted
Namibia	Unknown	Unknown
New Zealand	Allowed/Permitted, Practiced/Performed	Allowed/Permitted, Practiced/Performed
Nigeria	Practiced/Performed	Practiced/Performed
Panama	Unknown	Unknown
Paraguay	Unknown	Unknown
Peru	Unknown	Unknown
Philippines		Unknown
Poland	Unknown	Unknown
Portugal	Allowed/Permitted	Allowed/Permitted
Romania	Practiced/Performed	
Russian Federation	Allowed/Permitted, Practiced/Performed	
Senegal	Unknown	Unknown
South Africa	Allowed/Permitted, Practiced/Performed	
South Korea	Practiced/Performed	
Sri Lanka	Practiced/Performed	Practiced/Performed
Uganda	Practiced/Performed	Practiced/Performed
UK	Allowed/Permitted, Practiced/Performed	Allowed/Permitted, Practiced/Performed
USA	Allowed/Permitted, Practiced/Performed	Allowed/Permitted, Practiced/Performed
Uruguay	Allowed/Permitted, Practiced/Performed	Allowed/Permitted
Venezuela	Unknown	Unknown

Chapter 14. Table 3

(*Continued*)

Country	Gestational Surrogacy	Traditional Surrogacy
Viet Nam	Allowed/Permitted	Unknown
Zimbabwe	Practiced/Performed	Unknown

*Reporting separately for this report.

Chapter 14. Table 4

How often is surrogacy performed in programmes within your country?

Country	Gestational Surrogacy	Traditional Surrogacy
Argentina	Infrequently Used	Infrequently Used
Armenia	Infrequently Used	Never Performed
Australia	Commonly Used	Infrequently Used
Austria	Never Performed	Never Performed
Barbados	Never Performed	Never Performed
Belarus	Infrequently Used	Never Performed
Bolivia	Infrequently Used	Infrequently Used
Botswana	Never Performed	Never Performed
Brazil	Infrequently Used	Infrequently Used
Bulgaria	Never Performed	Never Performed
Cameroon	Never Performed	Never Performed
Canada	Commonly Used	Infrequently Used
Chile	Never Performed	Never Performed
China	Never Performed	Never Performed
Colombia		Infrequently Used
Czechia	Infrequently Used	Never Performed
Ecuador	Commonly Used	Infrequently Used
Egypt	Never Performed	Never Performed
El Salvador	Unknown	Unknown
Finland	Never Performed	Never Performed
Georgia	Commonly Used	Never Performed
Germany	Unknown	Unknown
Ghana	Commonly Used	Infrequently Used
Greece	Commonly Used	Commonly Used
Guatemala	Commonly Used	Commonly Used
Hong Kong (China*)	Never Performed	Never Performed
Hungary	Never Performed	Never Performed
Iceland	Never Performed	Never Performed
India	Commonly Used	Never Performed
Ireland	Never Performed	Never Performed
Italy	Unknown	Unknown
Côte d'Ivoire	Unknown	Unknown
Japan	Never Performed	Never Performed
Jordan	Never Performed	Never Performed
Kazakhstan	Commonly Used	Unknown
Kenya	Unknown	Unknown
Lithuania	Never Performed	Never Performed
Mali	Never Performed	Never Performed
Mexico	Infrequently Used	Infrequently Used
Mongolia	Unknown	Unknown
Namibia	Unknown	Unknown
New Zealand	Commonly Used	Infrequently Used
Nicaragua	Never Performed	Never Performed
Nigeria	commonly Used	commonly Used
Panama	Unknown	Unknown
Paraguay	Never Performed	Never Performed
Philippines	Infrequently Used	Infrequently Used
Portugal	Infrequently Used	Infrequently Used
Romania	Unknown	Unknown

Chapter 14. Table 4

(Continued)

Country	Gestational Surrogacy	Traditional Surrogacy
Russian Federation	Commonly Used	Never Performed
Senegal	Never Performed	Never Performed
Singapore	Never Performed	Never Performed
Slovenia	Never Performed	Never Performed
South Africa	Infrequently Used	Never Performed
South Korea	Infrequently Used	
Spain	Never Performed	Never Performed
Sri Lanka	Infrequently Used	Infrequently Used
Switzerland	Never Performed	Never Performed
Taiwan (China*)	Never Performed	Never Performed
Thailand	Infrequently Used	Never Performed
Togo	Never Performed	Never Performed
Trinidad and Tobago	Never Performed	Never Performed
Uganda	Commonly Used	Infrequently Used
UK	Infrequently Used	Infrequently Used
USA	Commonly Used	Infrequently Used
Uruguay	Infrequently Used	Infrequently Used
Venezuela	Unknown	Unknown
Viet Nam	Infrequently Used	Unknown
Zimbabwe	Infrequently Used	Infrequently Used

*Reporting separately for this report.

it was allowed/permitted; 12 (27%) said, practiced/performed; and 22 (49%) reported "unknown".

Sixty-eight countries participated in the survey regarding the frequency of usage of gestational and traditional surrogacy, 14 (20%) reported that gestational surrogacy was commonly used, 17 (25%) said it was infrequently used; 27 (40%) indicated it was never performed, and 10 (15%) reported "unknown". As for traditional surrogacy, 3 (4%) said that it was commonly used, 18 (26%) it was infrequently used, 35 (51%) that it was never performed, and 12 (19%) reported "unknown" (Table 4, Chart 1).

In response to the question, "*if surrogacy is allowed in your country, are surrogates compensated*", was asked in two ways: for gestational surrogacy and for traditional surrogacy (Table 5).

For gestational surrogacy compensation, 48 responses were received (as opposed to 61 in 2016). Of these responses, 9 countries (19%) reported that compensation beyond reimbursement was permitted; 14 countries (29%) reported that no compensation was allowed; 14 countries (29%) reported reimbursement was allowed for time and expenses only; and 11 countries (23%) responded "unknown".

As for "traditional surrogacy", 44 responses were received; 4 countries (9%) reported that compensation beyond reimbursement was permitted; 15 countries (34%) indicated no compensation was allowed; 12 countries (27%) said reimbursement for time and expense was permitted; and 13 countries (30%) responded "unknown".

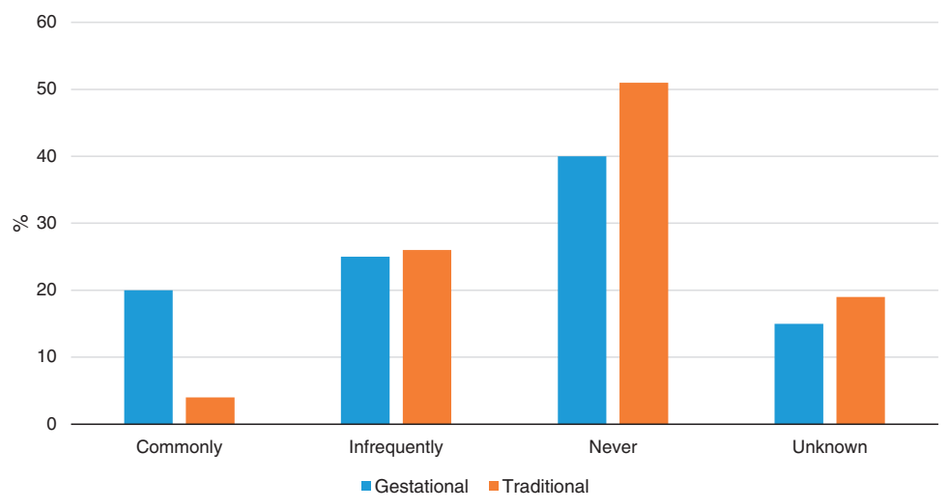
In relation to limits on compensation existed, and if so, the range; respondents replied with only limited data. Regarding gestational surrogacy, 33 countries responded. Three countries (9%) replied yes, 4 countries (12%) responded that there was no minimum or maximum amount for compensation, 17 countries (52%) responded that compensation was not addressed, and 9 countries (27%) responded "unknown".

With regards to traditional surrogacy, 30 countries responded. One country (3%) replied yes, 2 countries (7%) indicated there was no minimum or maximum amount for compensation, 19 countries (63%) responded that compensation was not addressed, and 8 countries (27%) responded "unknown".

Regarding the topic, "if third party reproduction is permitted in your country, are the qualifications to be a surrogate, based upon medical and/or any lifestyle criteria", 26 countries (51%) replied yes for gestational surrogacy, and 17 of 45 countries (38%) for traditional surrogacy.

Discussion

Surrogacy remains a contentious issue worldwide. Respondents from the countries that replied to the current survey reported that neither gestational nor traditional surrogacy were commonly used. When surrogacy was used, gestational surrogacy was used slightly more frequently than traditional surrogacy. Approximately one-third of respondents noted that gestational surrogacy was commonly or infrequently performed in their countries. In many



Chapter 14. Chart 1. Are there regulations that govern PGT?

countries, neither gestational nor traditional surrogacy are used at all. As discussed in Chapter 15 (Cross Border Reproduction), some countries will treat intended parent(s) from other countries that prohibit or do not offer surrogacy, or that provide surrogacy, but at high costs.

Both gestational and traditional surrogacy are fraught with multiple potential conflicts when the interests of the various stakeholders clash. These issues are further exacerbated when conducted in an international arena, as several highly publicized cases have demonstrated.

Payment of surrogates continues to be an issue that provokes much debate. Many countries prohibit any form of compensation as a way to prevent the commodification or exploitation of children or reproductive capabilities. In countries where payment is not allowed, surrogates are usually relatives or personal friends of the intended parent(s), and may be permitted to receive reimbursement for "reasonable expenses". Where there are no laws, practices may occur that are of particular concern, particularly in less developed countries with greater potential for exploitation.

Some limited studies have offered reassurance regarding the psychological and physical well-being of children produced with gestational surrogacy, the surrogate mothers, and the intended parents[1,2]. In most countries, the "birth mother" has always been the legal mother of a child. This issue has been resolved in many countries or states by legislation enabling the genetic parents to become legal parents at the birth of the child. Most surrogacy cases reportedly proceeded without problems, and provided a positive and successful treatment option for a small group of women who otherwise would be unable to have their own genetic children.

Both the European Society of Human Reproduction and Embryology (ESHRE)[3] and the American Society of Reproductive Medicine (ASRM) have published ethical and clinical guidelines pertaining to surrogacy[4,5], advocating thorough evaluation and provisions for managing the small group of women who need this specialized treatment.

Summary

IVF or gestational surrogacy is a useful and effective treatment option for women who have no uterus or are otherwise unable to bear children. It allows the commissioning (genetic) couple to have their own children. Gestational surrogacy is practiced in 42% of responding countries; fewer perform traditional surrogacy, a procedure that remains controversial and is permitted in relatively few countries, usually with significant limitations, particularly regarding compensation. The topic engenders considerable international debate about indications for its application, and the potential for exploiting its participants.

References

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CHAPTER 15: CROSS BORDER REPRODUCTIVE CARE

Introduction

The term cross-border reproduction (CBR) pertains to ART or related services sought by citizens of one country from within another country. When this situation arises, it usually means that ART procedures are unavailable or encumbered by legal or economic barriers in one country, but not in the other.

CBR is a contentious, largely unregulated area, making data collection particularly challenging. Some topics pertaining to CBR were covered in the 2018 Surveillance questionnaire; the purpose was to find out if people traveled to or from the respondent's country to engage in ART, and, if they did so, the motive was to seek lower cost services, higher quality services, or services not available in their home country. Some queries sought information about egg, embryo, and sperm donation, and gestational and traditional surrogacy. Some of the information gathered explored whether any regulations applied to inbound and outbound travelers wishing to engage in CBR; other information regarded the importation and exportation of gametes and embryos.

Analysis of the survey

Seventy-five respondents replied to some or all the questions about CBR. The following analysis includes data from the country respondents who provided at least one relevant answer to the issues mentioned.

Do people visit your country to seek cross-border reproduction? (Table 1, Charts 1–3)

Incoming for lower cost ART services

Fifty-six of the 75 countries (75%) responding to this question reported that people traveled to their country to seek lower cost ART services. Austria, Botswana, Ireland, Japan, New Zealand, Norway, Serbia, Singapore, the United Arab Emirates, and The United States of America (13%) reported that people do not travel to their country for lower cost services. In Australia, Chile, Mali, Nigeria, Poland, Switzerland, and Venezuela, the respondents answered "unknown" (9%). Two countries, Finland and Portugal (3%), provided responses to other questions on cross-border reproduction, but said this issue was "not addressed" in their country.

Incoming for higher quality ART services

Fifty-six of the 71 respondent countries (79%) reported that people travel to their country for higher quality services. Nigeria, Botswana, Ireland, Norway, Serbia, El Salvador, Greece, Mexico, Trinidad and Tobago (13%) responded that people do not travel

Chapter 14. Table 5

Are gestational carriers compensated?

Country	Gestational Surrogacy	Traditional Surrogacy
Argentina	Unknown	Unknown
Armenia		Reimbursement for time and expenses
Australia	Reimbursement for time and expenses	Reimbursement for time and expenses
Belarus	Compensated Beyond Reimbursement	
Bolivia	Compensated Beyond Reimbursement	Compensated Beyond Reimbursement
Brazil	Reimbursement for time and expenses	Reimbursement for time and expenses
Bulgaria	No	No
Cameroon	No	No
Canada	No	No
Colombia	Compensated Beyond Reimbursement	Compensated Beyond Reimbursement
Czechia	Reimbursement for time and expenses	No
Ecuador	Compensated Beyond Reimbursement	Unknown
El Salvador	Unknown	Unknown
Finland	No	No
Georgia	Compensated Beyond Reimbursement	No
Germany	Unknown	Unknown
Ghana	Reimbursement for time and expenses	Reimbursement for time and expenses
Greece	Reimbursement for time and expenses	Reimbursement for time and expenses
Guatemala	Reimbursement for time and expenses	Reimbursement for time and expenses
Hong Kong (China*)	No	No
India	Compensated Beyond Reimbursement	Unknown
Italy	Unknown	
Côte d'Ivoire	No	No
Jordan	No	No
Kazakhstan	No	No
Kenya	Unknown	Unknown
Mali	No	
Mexico	Reimbursement for time and expenses	Reimbursement for time and expenses
Mongolia	Unknown	Unknown
Namibia	Unknown	Unknown
New Zealand	Reimbursement for time and expenses	Reimbursement for time and expenses
Panama	Unknown	Unknown
Paraguay	No	No
Philippines	Unknown	Unknown
Portugal	Reimbursement for time and expenses	Reimbursement for time and expenses
Russian Federation	Compensated Beyond Reimbursement	No
Senegal	Unknown	Unknown
South Africa	Reimbursement for time and expenses	
South Korea	Reimbursement for time and expenses	
Spain	No	No
Sri Lanka	Reimbursement for time and expenses	Reimbursement for time and expenses
Thailand	No	No
Uganda	Compensated Beyond Reimbursement	Compensated Beyond Reimbursement
UK	Reimbursement for time and expenses	Reimbursement for time and expenses
USA	Compensated Beyond Reimbursement	Compensated Beyond Reimbursement
Uruguay	No	No
Venezuela	Unknown	Unknown
Viet Nam	No	Unknown
Zimbabwe	Reimbursement for time and expenses	Reimbursement for time and expenses

*Reporting separately for this report.

to their country for higher quality services. In Australia, Poland, Lithuania, Venezuela, and the Philippines, the response was "unknown" (7%). One country, Portugal, reported that this was "not addressed" (1%).

Incoming for ART services unavailable in their home country

Forty-eight of the 72 respondents (66%) that answered questions about CBR reported that people travel to their country to access services that are not available in their home country. Fifteen countries (21%) reported that people do not engage in CBR and come to their country for these purposes. One country, Mongolia, answered that this was "not addressed" (1%); and eight countries (11%) replied "unknown".

Incoming for egg donation

Thirty-four respondents out of 72 (47%) reported that people travel to their country to access egg donation. Twenty-three respondents (32%) reported that potential recipients from other countries do not travel to their country for egg donation. Eleven countries (15%) reported "unknown". Four countries (5.5%) selected "not addressed".

Incoming for embryo donation

Twenty-six of 70 respondents (37%) that answered questions concerning CBR reported that people travel to their country to access embryo donation; 27 (39%) reported that people from other countries do not travel to their country to seek embryo donation; 6 (9%) selected that this was "not addressed" in their country; and 11 (16%) reported that the status of this practice was "unknown".

Incoming for sperm donation

Thirty-six of 71 who responded to this question (51%) reported that people travel to their country to access sperm donation; 21 (29%) said that people from other countries do not travel to their country to receive sperm donation; 12 (17%) reported this as "unknown", and 2 (3%) selected the answer "not addressed".

Incoming for gestational surrogacy

Respondents were asked if people travelled to their country to engage in gestational surrogacy. Twenty of the 71 respondents answering questions on cross-border surrogacy (28%) answered

Chapter 15. Table 1

Do people visit your country to seek assisted reproduction?

Country	Lower Cost ART Services	Higher Quality ART Services	ART Services Unavailable in Their Home Country	Egg Donation	Embryo Donation	Sperm Donation	Gestational Surrogacy	Traditional Surrogacy
Argentina	Yes	Yes	No	Yes	Yes	Yes	Unknown	Unknown
Australia	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	No	No
Austria	No	Yes	Yes	Yes	No	Yes	No	No
Bangladesh	Yes							
Barbados	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Belarus	Yes	Yes	Yes	No		Yes	Yes	No
Belgium	Yes		Yes	No		Unknown	Unknown	
Bolivia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Botswana	No	No	No	No	No	No	No	No
Brazil	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Bulgaria	Yes	Yes	Yes	Yes	Not addressed	Yes	No	No
Burkina Faso	Yes	Yes	Yes	Yes	No	Yes	No	No
Cameroon	Yes	Yes	Yes	Yes	No	Yes	No	Unknown
Canada	Yes	Yes	Yes	No	No	No	Unknown	Unknown
Chile	Unknown	Yes	Yes	Yes	Yes	Yes	No	No
China	Yes							
Colombia	Yes	Yes	Yes	Yes	Not addressed	No	Yes	Yes
Czechia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Ecuador	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Egypt	Yes	Yes	Yes	No	No	No	No	No
El Salvador	Yes	No	Yes	No	No	No	Yes	Yes
Finland	Not addressed	Yes	Yes	Yes	Yes	Yes	No	No
Georgia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Germany	Yes	Yes	Yes	Not addressed	Not addressed	Unknown	Unknown	Unknown
Greece	Yes	No	Yes	Yes	Yes	Yes	No	No
Guatemala	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hong Kong (China*)		Yes	Yes	Yes	Yes	Yes	No	No
Hungary	Yes	Yes	No	Not addressed	Not addressed	Unknown	Not addressed	Not addressed
India	Yes		Yes	Yes	Yes	Yes	Yes	
Ireland	No	No	No	No	No	No	No	No
Italy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Côte d'Ivoire	Yes	Yes	Unknown	Yes	Yes	Yes	No	No
Japan	No	Yes	No	No	No	No	No	No
Jordan	Yes	Yes	Yes	No	No	No	No	No
Kazakhstan	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Kenya	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Latvia	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Lithuania	Yes	Unknown	Unknown	No	No	No	No	No
Mali	Unknown	Yes	Yes	Unknown	No	No	Not addressed	Not addressed
Mexico	Yes	No	No	Yes	Unknown	Yes	Yes	Yes
Mongolia	Yes	Yes	Not addressed	Yes	Yes	Yes	Yes	Yes
Montenegro	Yes							
New Zealand	No	Yes	Yes	No	No	Yes	No	No
Nicaragua	Yes	Yes	Yes					
Nigeria	Unknown	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Norway	No	No	No	No	No	No	No	No
Panama	Yes	Yes	Yes	Yes	Yes	Yes	Unknown	Unknown
Paraguay	Yes	Yes	No	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Peru	Yes	Yes	Yes	Unknown	Unknown	Unknown		
Philippines	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	No	No
Portugal	Not addressed	Not addressed	Yes	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Romania	Yes	Yes	Unknown	No	No	No	No	No
Russian Federation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

Chapter 15. Table 1

(Continued)

Country	Lower Cost ART Services	Higher Quality ART Services	ART Services Unavailable in Their Home Country	Egg Donation	Embryo Donation	Sperm Donation	Gestational Surrogacy	Traditional Surrogacy
Senegal	Yes	Yes	Yes	No	No	No	No	No
Serbia	No	No	No	No	No	No	No	No
Singapore	No	Yes	No	No	No	No	No	No
Slovenia	Yes	Yes	Yes	No	No	No	No	No
South Africa	Yes	Yes	Yes	Yes	No	Yes	No	No
South Korea	Yes	Yes		Unknown	Unknown		Yes	Unknown
Spain	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Sri Lanka	Yes	Yes	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
Switzerland	Unknown	Yes	No	No	No	Yes	No	No
Taiwan (China*)	Yes	Yes	Yes	Yes	No	Yes	No	No
Thailand	Yes	Yes	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
Togo	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Trinidad and Tobago	Yes	No	Yes	Yes	No	Yes	No	No
Turkey	Yes	Yes	Yes	No	No	No	No	No
Uganda	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
United Arab Emirates	No	Yes	Yes	No	No	No	No	No
UK	Yes	Yes	Yes	No	No	No	Yes	Yes
USA	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Uruguay	Yes	Yes	No	Yes	Yes	Yes	No	No
Venezuela	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Viet Nam	Yes	Yes	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
Zimbabwe	Yes	Yes	No	No	No	No	No	No

*Reporting separately for this report.

in the affirmative; thirty-six countries (51%) answered "no"; eleven respondents (15%) said that the status was "unknown"; and four (6%) selected the answer "not addressed".

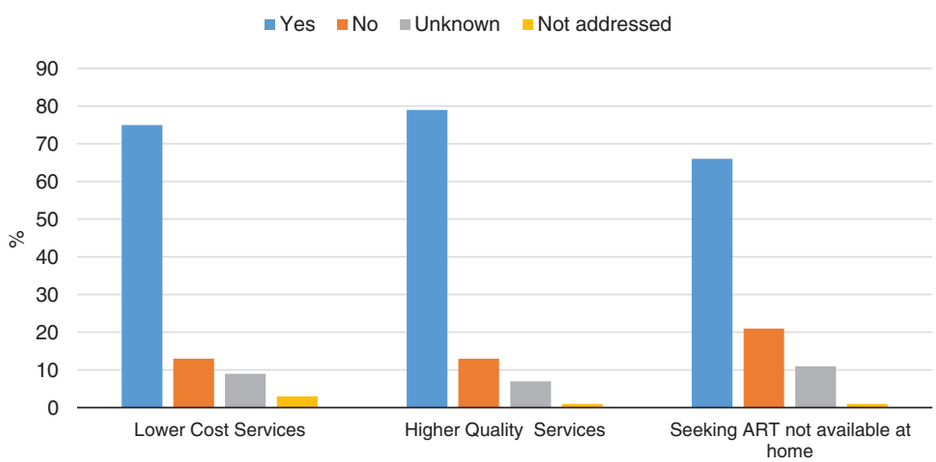
Incoming for traditional surrogacy

Respondents were asked if people travelled to their countries to engage in traditional surrogacy. Of the 68 who answered, 13 (19%) replied in the affirmative; 39 countries (57%) answered "no"; 12 respondents (18%) answered "unknown"; and 4 (6%) selected the answer "not addressed".

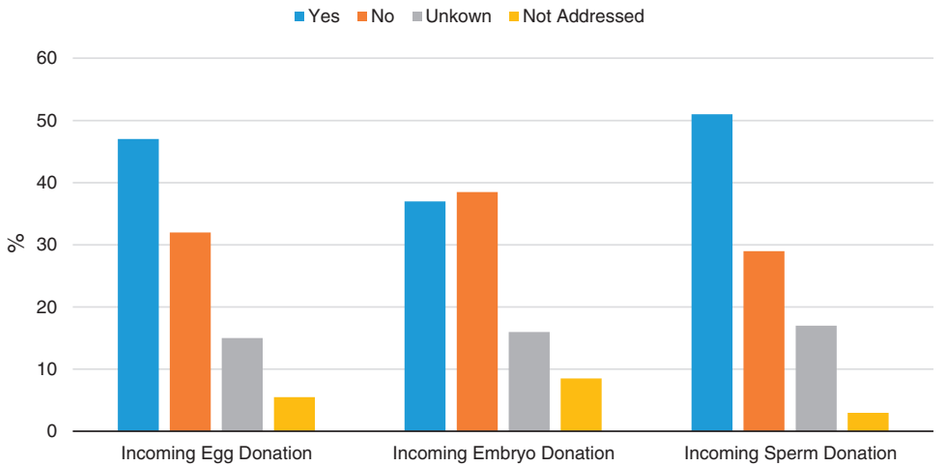
Do people travel from your country to another country to seek cross-border reproduction? (Table 2, Charts 4–6)

Outgoing for lower cost ART services

Of the 29 countries that responded, (43%) reported that people traveled from their country to seek lower cost ART services; twenty-one (31%) indicated that people do not travel from their



Chapter 15. Chart 1. Incoming for services.



Chapter 15. Chart 2. Incoming for donor gametes/embryos.

country for lower cost services; and 14 (21%) chose the answer "unknown". Three countries (5%) responded "not addressed".

Outgoing for higher quality ART services

of 72 respondents (60%) affirmed that people travel from their country for higher quality services; 12 (17%) responded that people do not travel from their country for higher quality services;14 respondents (19%) chose "unknown", and three (4%), "not addressed".

Outgoing for ART services unavailable in their home country

Forty-two of the 69 respondents (61%) that answered questions pertaining to CBR reported that people travel from their country to access services that are not available in their home country; 16 country respondents (23%) said that people do not travel from their country to engage in CBR elsewhere; 4 (6%) answered that this was "not addressed"; and 7 respondents (10%) replied "unknown".

Outgoing for egg donation

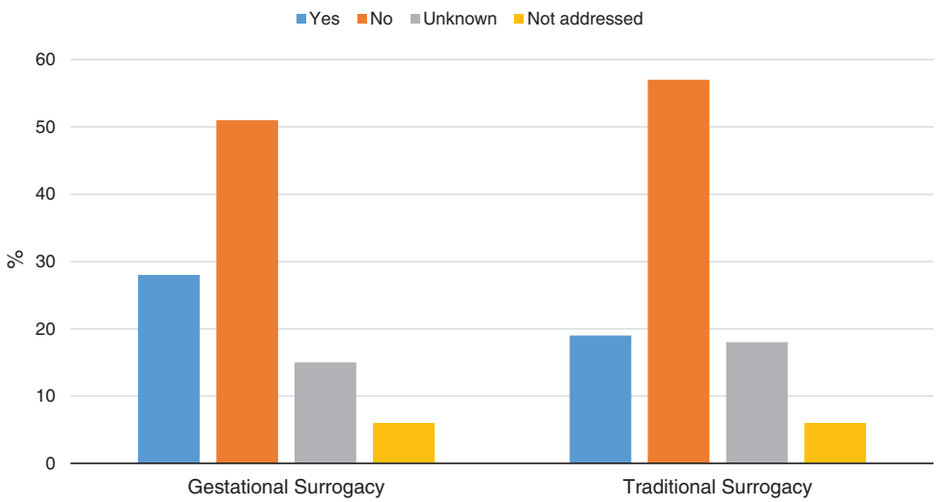
Forty-six of 71 responding countries, 46 (65%) reported that people travel from their country to another country to access egg donation; 12 (16%) indicated that people from their countries do not travel to other countries to seek egg donation; 11 (16%) said that this was "unknown"; and 2 countries (3%) responding to questions on CBR selected "not addressed".

Outgoing for embryo donation

Thirty-six of 69 responding (52%) reported that people travel from their country to another country to access embryo donation; 12 respondents (17%) said that people from their country do not travel to other countries for embryo donation; 19 (27%) said that the status was "unknown"; and 2 respondents (3%) selected "not addressed".

Outgoing for sperm donation

Thirty-six of 70 country respondents (51%) reported that people travel from their country to another country to access sperm



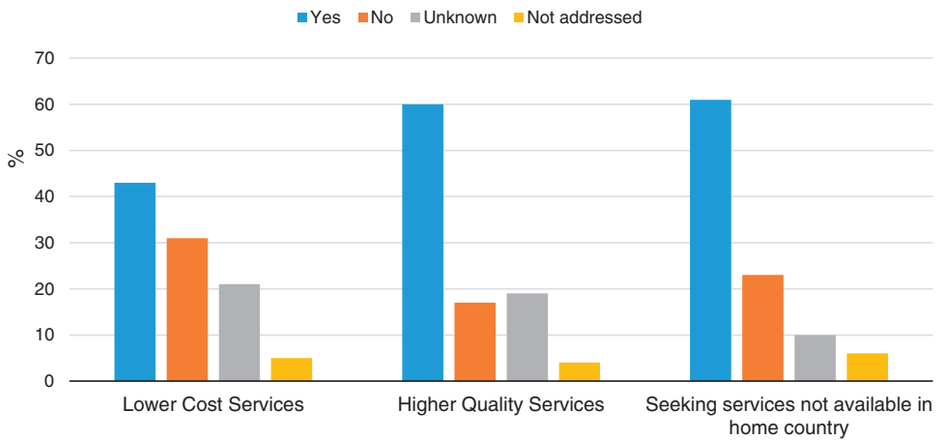
Chapter 15. Chart 3. Incoming for surrogacy.

Chapter 15. Table 2

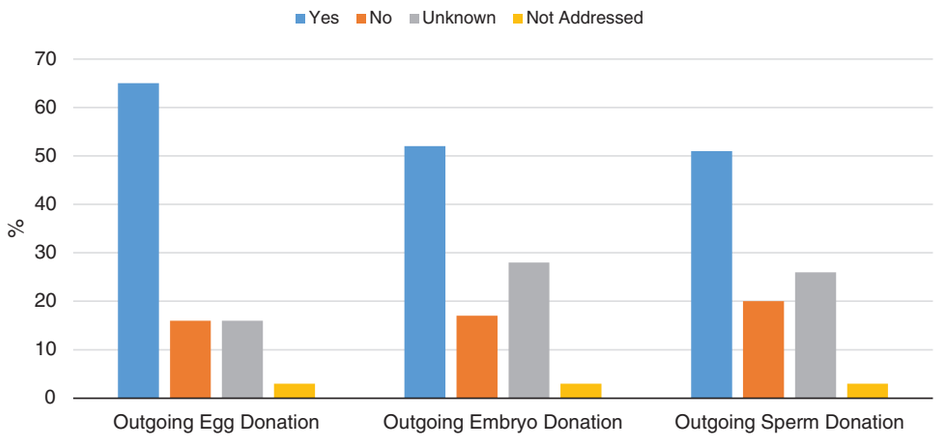
Do people travel from your country to seek assisted reproduction?

Country	Lower Cost ART Services	Higher Quality ART Services	ART Services Unavailable in their Home Country	Egg Donation	Embryo Donation	Sperm Donation	Gestational Surrogacy	Traditional Surrogacy
Argentina	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Australia	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Austria	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Bangladesh		Yes		Yes	Yes	Yes	Yes	
Barbados	Unknown	Unknown					Yes	Yes
Belarus		Yes	Yes	Yes	Yes		No	Unknown
Belgium	Unknown	Unknown	Yes	Yes	Unknown	Unknown	Yes	Unknown
Bolivia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Botswana	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brazil	No	Yes	Yes	Yes	No	No	Yes	No
Bulgaria		No	No	No	Unknown	No	Yes	Yes
Burkina Faso	Yes	Yes		No	Yes	No	Yes	Yes
Cameroon	Not addressed	Yes	Yes	Yes	Yes	Yes	Unknown	Unknown
Canada	Yes	Unknown	No	Yes	Yes	Unknown	Yes	Unknown
Chile	Unknown	No	Yes	No	No	No	Yes	Yes
China	Unknown	Yes	Yes	Yes	Yes	Unknown	Yes	Yes
Colombia	No	Yes	Yes	No	No	No	Yes	Yes
Czechia	No	Unknown	Unknown	No	Unknown	Unknown	No	Yes
Ecuador	Yes	Yes	Yes	Yes	Yes	Yes		
Egypt	No	Yes	No	Unknown	Unknown	Unknown	Unknown	Unknown
El Salvador	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Finland	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Georgia	No	Unknown	No	Unknown	Unknown	Unknown	No	Unknown
Germany	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Greece	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Guatemala	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hong Kong (China*)	Yes	Yes	Yes	Yes	Unknown	Yes	Yes	Unknown
Hungary	No	Unknown	No	Yes	Yes	Unknown	Yes	Yes
India		Yes	Yes					
Ireland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Italy	Yes	Yes	Yes	Yes	Yes	Yes	Not addressed	Not addressed
Côte d'Ivoire	Yes	Yes	Unknown	Yes	Yes	Yes	No	No
Japan	No		Yes	Yes	No	No	Yes	No
Jordan	No	Yes	No	No	No	No		No
Kazakhstan	No	Yes	Yes	No	No	Yes	Yes	
Kenya	Unknown	Yes	Unknown	Yes	Yes	Yes	Unknown	Unknown
Latvia	Unknown	Unknown	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
Lithuania	Yes	Yes	Yes	Yes	Unknown	Yes	Unknown	Unknown
Mali	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Mexico		Yes		Yes	Unknown	Yes	Unknown	Unknown
Mongolia	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Montenegro	No	No	No	Yes	Yes	Yes	Yes	Yes
New Zealand	No	No	Yes	Yes	No	Yes	Yes	No
Nigeria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Norway	Unknown	Unknown	Yes	Yes	Yes	Yes	Yes	Yes
Panama	No	Yes	No	No	No	No	Unknown	Unknown
Paraguay	Yes	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed	Not addressed
Philippines	Yes	Yes	Not addressed	Unknown	Unknown	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Portugal	Not addressed	Not addressed	Yes	Yes	Not addressed	Yes	Not addressed	Not addressed
Romania		Yes	No	Yes	Yes	No	No	No
Russian Federation	Yes	Yes	No	No	No	No	No	No
Senegal	Yes	Yes	No	No	No	No	No	No
Serbia	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Singapore	Yes	No	Yes	Yes	Yes	Unknown	Yes	Unknown
Slovenia	Unknown	No	Yes	Yes	Unknown	No	No	No
South Africa	Yes	Yes	Yes	Yes	No	Yes	No	No
South Korea	No	Yes	Yes	Unknown	Unknown	Unknown	Unknown	Unknown
Spain	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Sri Lanka	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Switzerland	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Taiwan (China*)	Unknown	Unknown	Yes	Yes	Yes	Yes	Yes	Yes
Togo	Unknown	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Trinidad and Tobago	No	Yes	No	Yes	Unknown	Unknown	Yes	Yes
Turkey	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Uganda	No	Yes	Not addressed	Unknown	Unknown	Unknown	Unknown	Unknown
United Arab Emirates	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
UK	Yes	Unknown	Yes	Yes	Yes	Yes	Yes	Yes
USA	Yes	No	No	No	No	No	No	No
Uruguay	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Venezuela	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Viet Nam	Unknown	Yes	Yes	Unknown	Unknown	Unknown	Yes	Yes
Zimbabwe	No	Yes	No	Yes	Yes	Yes	Yes	Yes

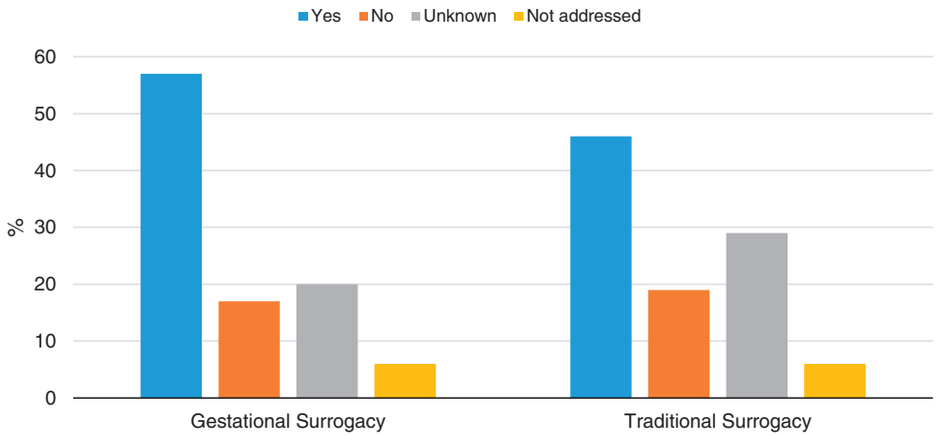
*Reporting separately for this report.



Chapter 15. Chart 4. Outgoing for services.



Chapter 15. Chart 5. Travel from country for donor gametes/embryos.



Chapter 15. Chart 6. Outgoing for surrogacy.

Chapter 15. Table 3

Are there regulations that govern cross border reproduction in your country?

	Country	No Regulations	Federal/National Laws/Statutes/ Ordinances/ Policies	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations Oversight	Professional Organization Standards/ Guidelines	Cultural Practice	Religious Decree	Unknown
Patients that visit your country seeking treatment	Argentina	Yes								
	Australia			Yes						
	Austria		Yes							
	Bangladesh	Yes								
	Barbados	Yes								
	Belarus	Yes								
	Bolivia	Yes								
	Botswana	Yes								
	Brazil	Yes								
	Bulgaria	Yes								
	Burkina Faso	Yes								
	Cameroon	Yes								
	Canada	Yes								
	Chile	Yes								
	China	Yes								
	Colombia	Yes						Yes		
	Czechia	Yes								
	Ecuador	Yes					Yes			
	Egypt	Yes								
	El Salvador	Yes								
	Georgia	Yes								
	Germany		Yes							
	Greece	Yes		Yes	Yes				Yes	Yes
	Guatemala	Yes					Yes			
	Hong Kong (China*)	Yes								
	Hungary	Yes								
	India						Yes			
	Ireland	Yes								
	Côte d'Ivoire					Yes	Yes			
	Japan	Yes								
	Jordan	Yes								
	Kazakhstan	Yes	Yes							
	Kenya	Yes								
	Latvia	Yes								
	Lithuania	Yes								
	Mali	Yes								
	Mexico		Yes	Yes						
	Mongolia	Yes								
	Montenegro	Yes								
	New Zealand	Yes								
	Nigeria	Yes								Yes
	Norway	Yes								
	Panama	Yes								
	Paraguay	Yes								
	Philippines	Yes								Yes
	Portugal						Yes			
	Romania	Yes								
	Russian Federation	Yes								
	Senegal	Yes						Yes		
	Singapore		Yes							
	Slovenia	Yes								
	South Africa		Yes							
	South Korea									Yes
	Spain		Yes				Yes			
	Sri Lanka	Yes								
	Switzerland		Yes							

Chapter 15. Table 3

(*Continued*)

	Country	No Regulations	Federal/National Laws/Statutes/ Ordinances/ Policies	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations Oversight	Professional Organization Standards/ Guidelines	Cultural Practice	Religious Decree	Unknown
	Taiwan (China*)	Yes								
	Thailand		Yes				Yes			
	Togo	Yes								
	Trinidad and Tobago	Yes								
	Turkey	Yes								
	Uganda	Yes								
	United Arab Emirates	Yes								
	UK		Yes							
	USA	Yes								
	Uruguay	Yes								
	Venezuela									Yes
	Viet Nam	Yes								
	Zimbabwe	Yes								
Citizens that visit other countries seeking treatment										
	Argentina	Yes								
	Australia			Yes						
	Austria	Yes								
	Bangladesh	Yes								
	Barbados	Yes								
	Belarus	Yes								
	Bolivia	Yes								
	Botswana	Yes								
	Brazil	Yes								
	Burkina Faso	Yes								
	Cameroon	Yes								
	Canada	Yes								
	Chile	Yes								
	China	Yes								
	Colombia	Yes						Yes		
	Czechia	Yes								
	Ecuador						Yes			
	Egypt	Yes								
	El Salvador	Yes								
	Georgia	Yes								
	Germany		Yes							
	Greece		Yes			Yes	Yes	Yes		
	Guatemala	Yes								
	Hong Kong (China*)	Yes								
	Hungary	Yes								
	Ireland	Yes								
	Italy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Côte d'Ivoire									Yes
	Japan	Yes								
	Jordan	Yes								
	Kazakhstan	Yes	Yes							
	Kenya	Yes								
	Latvia	Yes								
	Lithuania	Yes								
	Mali	Yes								
	Mongolia	Yes								
	Montenegro	Yes								
	New Zealand	Yes								
	Nigeria	Yes								

Chapter 15. Table 3

(*Continued*)

Country	No Regulations	Federal/National Laws/Statutes/ Ordinances/ Policies	State/Provincial/ Regional Laws/ Statutes/ Ordinances	Municipal Laws/ Statutes/ Ordinances	Agency Regulations Oversight	Professional Organization Standards/ Guidelines	Cultural Practice	Religious Decree	Unknown
Norway	Yes								
Panama	Yes								
Paraguay	Yes								
Philippines	Yes								Yes
Portugal						Yes			
Russian Federation	Yes								
Senegal	Yes						Yes		
South Korea									Yes
Spain	Yes								
Sri Lanka	Yes								
Switzerland		Yes							
Taiwan (China*)	Yes								
Togo	Yes								
Trinidad and Tobago	Yes								
Turkey	Yes								
Uganda	Yes								
United Arab Emirates	Yes								
UK	Yes								
USA	Yes								
Uruguay	Yes								
Venezuela									Yes
Viet Nam	Yes								

*Reporting separately for this report.

donation; 14 respondents (20%) said that people from other countries do not travel to their country to engage with sperm donation; 18 respondents (26%) reported status "unknown"; and 2 (3%) selected "not addressed".

Outgoing for gestational surrogacy

Of 70 countries, forty respondent countries (57%) answered "yes"; 12 (17%), "no"; 14 (20%), "unknown"; 4 (6%), "not addressed".

Outgoing for traditional surrogacy

Of 69 countries, 32 (46%) responded in the affirmative ("yes"); 13 (19%), "no"; 20 (29%) said status was "unknown"; and 4 respondents (6%) selected "not addressed".

Regulation of cross-border reproduction (Table 3)

Respondents were asked if their country had regulations that governed cross-border surrogacy. Specifically, they were asked about regulations governing citizens that visit other countries seeking treatment, and people visiting their home country seeking treatment (Table 3).

Four respondents (6%) (Austria, Italy, Spain, and the United Kingdom of Great Britain and Northern Ireland) answered that they did not have regulations governing people who *travel to other countries* to access assisted reproduction. Four respondents (6%) (Bulgaria, Romania, Slovenia, and Zimbabwe) said that they do not have regulations governing people *coming to their countries for ART*. Forty-two respondents (60%) reported that they had neither.

Five respondents (6%) reported having laws that govern only inbound people, not outbound people seeking ART; 1 country, Italy, said it had laws governing only outbound people; 9 respondents (13%) reported having laws that governed both inbound and outbound people seeking treatment. Of these countries there was a mixture between federal laws, state/municipal laws, or both. In general, people travelling to a country to access ART are governed by the laws and regulations of that country.

Columbia and Senegal reported that cultural practices were relevant, and Greece and Italy reported that cultural practices and/or religious decrees were relevant for CBR.

Regulation of the import and export of tissue (Table 4 and 5)

Import

Ova: Thirty-four out of 73 respondents (47%) said that regulations covered the importing of oocytes into their countries, while 20 (27%) reported no regulations; 12 (16%) claimed an "unknown" status, and 7 (10%) selected "not addressed".

Thirty five out of 73 (48%) said that regulations applied to the importing of spermatozoa into their countries; 19 respondent

Chapter 15. Table 4

Are there regulations regarding the import of reproductive tissue into your country?

Country	Ova	Spermatozoa	Zygotes
Argentina	Yes	Yes	Yes
Australia	Yes	Yes	Yes
Austria	Unknown	Unknown	Unknown
Bangladesh	Not addressed	Not addressed	Not addressed
Barbados	No	No	No
Belarus	No	No	No
Belgium	Unknown	Unknown	Unknown
Bolivia	Yes	Yes	Yes
Botswana	No	No	No
Brazil	Yes	Yes	Yes
Bulgaria	Yes	Yes	Yes
Burkina Faso	No	No	No
Cameroon	No	No	No
Canada	No	Yes	Unknown
Chile	No	No	No
China	Unknown	Unknown	Unknown
Colombia	Yes	Yes	
Czechia	Yes	Yes	Yes
Ecuador	Yes	Yes	Yes
Egypt	Not addressed	Not addressed	Not addressed
El Salvador	No	No	No
Finland	Yes	Yes	Yes
Georgia	No	No	No
Germany	Unknown	Unknown	Unknown
Greece	Yes	No	Yes
Guatemala	Yes	Yes	Yes
Hong Kong (China*)	Yes	Yes	Yes
Hungary	Unknown	Unknown	Not addressed
India	Yes	Yes	Yes
Ireland	Yes	Yes	Yes
Italy	Yes	Yes	Yes
Côte d'Ivoire	Unknown	Unknown	Unknown
Japan	No	No	No
Jordan	Not addressed	Not addressed	Not addressed
Kenya	No	No	No
Latvia	Yes	Yes	Yes
Lithuania	Yes	Yes	Yes
Mali	No	No	No
Mexico	Yes	Yes	Yes
Mongolia	Not addressed	Not addressed	Not addressed
Montenegro	No	No	No
New Zealand	Yes	Yes	Yes
Nigeria	Yes	Yes	Yes
Norway	Yes	Yes	Yes
Panama	Yes	Yes	Yes
Paraguay	Not addressed	Not addressed	Not addressed
Peru	No	No	No
Philippines	Unknown	Unknown	
Poland	Unknown	Unknown	Unknown
Portugal	Yes	Yes	Yes
Romania	No	Yes	No
Russian Federation	Yes	Yes	Yes
Senegal	No	No	No
Serbia	No	No	No
Singapore	Yes	Yes	Yes
Slovenia	Not addressed	Not addressed	Not addressed
South Africa	Yes	Yes	Yes
South Korea	Not addressed	Not addressed	Not addressed
Spain	Yes	Yes	Yes
Sri Lanka	No	No	No
Switzerland	Yes	Yes	Yes

Chapter 15. Table 4

(*Continued*)

Country	Ova	Spermatozoa	Zygotes
Taiwan (China*)	Yes	Yes	Yes
Togo	Unknown	Unknown	Unknown
Trinidad and Tobago	Yes	Yes	Unknown
Turkey	Unknown	Unknown	Unknown
Uganda	No	No	No
United Arab Emirates	Yes	Yes	Yes
UK	Yes	Yes	Yes
USA	Yes	Yes	Yes
Uruguay	No	No	No
Venezuela	Unknown	Unknown	Unknown
Viet Nam	Unknown	Unknown	Unknown
Zimbabwe	Yes	Yes	Yes

*Reporting separately for this report.

Chapter 15. Table 5

Are there regulations regarding the export of reproductive tissue from your country?

Country	Ova	Spermatozoa	Zygotes
Argentina	Yes	Yes	Yes
Australia	Yes	Yes	Yes
Austria	Unknown	Unknown	Unknown
Bangladesh	Not addressed	Not addressed	Not addressed
Barbados	No	No	No
Belarus	No	No	No
Belgium	Unknown	Unknown	Unknown
Bolivia	Yes	Yes	Yes
Botswana	No	No	No
Brazil	Yes	Yes	Yes
Bulgaria	Yes	Yes	Yes
Burkina Faso	No	No	No
Cameroon	No	No	No
Canada	No	No	No
Chile	No	No	No
China	Unknown	Unknown	Unknown
Colombia	Yes	Yes	Yes
Czechia	Yes	Yes	Yes
Ecuador	Yes	Yes	Yes
Egypt	Not addressed	Not addressed	Not addressed
El Salvador	No	No	No
Finland	Yes	Yes	Yes
Georgia	No	No	No
Germany	Unknown	Unknown	Unknown
Greece	Yes	Yes	Yes
Guatemala	Yes	Yes	Yes
Hong Kong (China*)	Yes	Yes	Yes
Hungary	Unknown	Unknown	Unknown
India	Yes	Yes	Yes
Ireland	Yes	Yes	Yes
Italy	Yes	Yes	Yes
Côte d'Ivoire	Unknown	Unknown	Unknown
Japan	No	No	No
Jordan	Not addressed	Not addressed	Not addressed
Kenya	No	No	No
Latvia	Yes	Yes	Yes
Lithuania	Yes	Yes	Yes
Mali	No	No	No
Mexico	Yes	Yes	Yes
Mongolia	Not addressed	Not addressed	Not addressed

Chapter 15. Table 5

(*Continued*)

Country	Ova	Spermatozoa	Zygotes
Montenegro	No	No	No
New Zealand	No	No	No
Nigeria	Yes	Yes	Unknown
Norway	Yes	Yes	Yes
Panama	Yes	Yes	Yes
Paraguay	Not addressed	Not addressed	Not addressed
Peru	Not addressed	Not addressed	Not addressed
Philippines	Unknown	Unknown	Unknown
Poland	Unknown	Unknown	Unknown
Portugal	Yes	Yes	Yes
Romania	No	No	No
Russian Federation	Yes	Yes	Yes
Senegal	No	No	No
Serbia	No	No	No
Singapore	Yes	Yes	Yes
Slovenia	Not addressed	Not addressed	Not addressed
South Africa	Yes	Yes	Yes
South Korea	Not addressed	Not addressed	Not addressed
Spain	Yes	Yes	Yes
Sri Lanka	No	No	No
Switzerland	No	No	No
Taiwan (China*)	Yes	Yes	Yes
Thailand	Yes	Yes	Yes
Togo	No	No	No
Trinidad and Tobago	Yes	Yes	Unknown
Turkey	Unknown	Unknown	Unknown
Uganda	No	No	No
United Arab Emirates	Yes	Yes	Yes
UK	Yes	Yes	Yes
USA	Yes	Yes	Yes
Uruguay	No	No	No
Venezuela	Unknown	Unknown	Unknown
Viet Nam	Unknown	Unknown	Unknown
Zimbabwe	Yes	Yes	Yes

*Reporting separately for this report.

countries (26%) reported no regulations; 12 (16%) claimed "unknown" status, and 7 respondents (10%) selected "not addressed".

Zygotes: 32 respondents of 71 (45%) said there were regulations for importing zygotes into their countries; 19 countries (27%) reported no regulations; 12 (17%) reported the status as "unknown"; and eight respondents (11%) selected "not addressed".

Export

Ova: Of 74 respondents, 33 (44%) said there were regulations addressing the exportation of ova from their countries; and 22 (30%) countries reported the absence of regulations. Eleven respondents (15%) answered "unknown"; and eight (11%) selected the response "not addressed".

Spermatozoa: 33 of 74 respondents (44%) said there were regulations for the exportation of spermatozoa from their countries; 22 (30%) reported no regulations; 11 respondents (15%) answered "unknown"; and 8 (11%) selected the response "not addressed".

Zygotes: 31 of 74 respondents (42%) affirmed the existence of regulations pertaining to export of ova from their countries; 22 (30%) reported no regulations; 13 respondents (17%) answered "unknown"; 8 (11%) selected the response "not addressed".

Discussion

Overall, a rather large proportion of respondents reported that individuals and couples were travelling *to* the respondents' home country to seek treatments that were lower cost (75%), or of higher quality (79%) than those in their own home country, or not available there (66%). Fewer respondents reported people travelling to their country to donate tissue (egg, 47%; embryo, 37%, or sperm, 51%); and even fewer for gestational surrogacy (28%) or traditional surrogacy (19%). These data confirm the existence of these practices, but provide no data about the extent or volume of such services.

A smaller proportion of respondents reported people travelling *from* their home country to seek treatment that was lower cost (65%), of higher quality (51%), or services not available at home (51%). Figures for seeking egg, embryo and sperm donation were higher for outbound for egg and embryos than inbound, (47% vs, 65%, 37% vs, 52% respectively) and equal for spermatozoa (51%). Rates for outbound people seeking surrogacy were higher than inbound figures, with 57% vs. 28%of respondents reporting people travelling out of the country for gestational surrogacy, and 46% vs. 19% reporting people travelling out of the country for traditional surrogacy. This reflects the desire of individuals to seek services that are otherwise unavailable to them in their own countries.

In regard to regulation, despite a perception of significantly higher levels of movement across borders, the responses indicated that there was little regulation of people travelling to or from other countries to seek ART treatment. Regulation of the import and export of tissue appeared more prevalent; however, several respondents reported no regulation or did not know if regulation existed.

The lack of regulation and lack of knowledge about regulation, may be relevant to egg, embryo and sperm donation, and surrogacy stakeholders. This would likely come about when children born as a result may seek information about their donors or surrogate mothers in the future. This is occurring more frequently all over the world. Tracking and reporting of treatments and treatment outcomes may also become difficult. Patient follow up across borders is considerably more challenging.

Summary

CBR appears to be increasingly prevalent; most country respondents noted that individuals traveled to their country seeking ART services that were less expensive, perceived to be of higher quality, or unavailable in their home country. A much smaller group noted patients seeking CBR for sperm, egg, or embryo donation, and even fewer for any type of surrogacy. A relatively smaller proportion reported patients traveling from their country for any of these services. Almost two-thirds (64%) of responding countries reported the absence of regulations for patients either coming to or leaving a country to seek CBR services. These data suggest that a substantial amount of CBR care is being provided, but no data are available regarding the actual volume, and oversight is limited.

CHAPTER 16: HUMAN PRE-IMPLANTATION EMBRYO RESEARCH

Introduction

In the United States of America, pre-implantation embryos that are not intended for pregnancy are protected by federal mandates of the "Common Rule" at a level surpassing that of surgically removed organs and tissues. Adaptations and interpretations from "Common Rule" governance appear to have been adapted by local and national regulatory bodies as templates for regulation of embryo research internationally, and are reflected in the responses included in the 2018 Surveillance survey.

"Common Rule" regulations emerged after the introduction of IVF. The two major US bodies charged with oversight are the Office of Human Research Protections (OHRP) and the Food and Drug Administration (FDA). Additionally, the National Institutes of Health (NIH), a primary source of funding for research, has regulations and policies that are followed to the extent that a research project (or institution) is funded by the NIH. Subpart A of the regulations, known as the "Common Rule," has been adopted and separately codified by fourteen agencies other than Health and Human Services (HHS). Its tenants are well known to researchers working in western Europe and in The United States of America, and are likely followed by most of the survey respondents, some of whom trained in these regions.

The questions posed by the *Surveillance 2018* questionnaire to the respondents of the 90 countries are based on Common Rule standards. The questions were expected to highlight embryo research as practiced internationally and influenced by federal and regional customs, and interpreted by governments, municipalities, and scholarly committees.

Analysis of the survey

Is experimentation/research on the pre-implantation embryo allowed/permitted in your country?

Research involving donated, unused pre-implantation embryos is allowed in 29 countries out of 74 (39%), and not allowed in 30 countries (41%); its status was marked "unknown" in 15 countries (20%). Research on donated, unused pre-implantation embryos for stem cell research is allowed in 25 of 72 countries (35%), and not allowed in 32 countries (44%); its status was "unknown" in 15 countries (21%). Reproductive cloning generating a human clone is allowed in 2 of 72 countries (3%), and not allowed in 59 (82%); its status was "unknown" in 11 countries (15%). Therapeutic cloning is allowed in in 8 of 72 countries (11%), and not allowed in 51 countries (71%); its status was "unknown" in 13 countries (18%). Embryonic stem cell research is allowed in 13 of 72 countries (18%), and not allowed in 45 (63%); its status was "unknown" in 14 countries (19%) (Table 1, Chart 1).

Is there a requirement for specific approval of experimentation/research proposals? If the answer is yes, is the following allowed or not allowed?

Research involving donated, unused pre-implantation embryos is allowed with specific approval in 26 of 36 countries (72%) not allowed in 5 countries (14%); the status was marked "unknown" in 5 countries (14%). Research on donated, unused pre-implantation embryos for stem cell research is allowed, with specific approval, in 28 countries out of 37 (76%); not allowed in 5 countries (13%); and the status was "unknown" in 4 countries (11%). Reproductive cloning generating a human clone is allowed, with specific approval, in 6 of 18 countries (33%), not allowed in 7, (39%); the status was marked "unknown" in 5 countries (28%) (Chart 2).

In 2015, a single country, Uruguay, responded that human cloning was permitted. Therapeutic cloning is allowed with specific approval in 8 of 21 countries (38%), not allowed in 7 (33%), and the status was "unknown" in 6 countries (29%). Embryonic stem cell research is allowed, with specific approval, in 11 of 24 countries (46%), not allowed in 4 (17%); and the status was "unknown" in 9 countries (37%), compared to five countries responding affirmatively in the 2015 survey.

What body or agency approves experimentation/research?

Research involving donated, unused pre-implantation embryos was reviewed for specific approval by a local or national institutional review board in 14 of 48 countries (29%), by a national ethics or oversight panel in 24 countries (50%), and by an ethics panel in 12 countries (25%); the status was marked "unknown" in 11 countries (23%). Research on donated, unused pre-implantation embryos for stem cell research is reviewed for specific approval by a local or national institutional review board in 14 countries out of 46 (30%), by national ethics or oversight panels in 25 countries (54%); by ethics panels in 12 countries (26%); and the status was marked "unknown" in 10 countries (22%). Reproductive cloning intended to generate a human clone was reviewed for specific approval by a local or national institutional review board in 1 country of 25 (4%); by national ethics or oversight panels in 12 countries (48%); and by ethics panels in 2 countries (8%). The status was "unknown" in 12 countries (48%), and 1 country reported "other" without additional description. Therapeutic cloning is reviewed for specific approval by a local or national institutional review board in 3 countries out of 27 (11%), by national ethics or oversight panels in 10 countries (37%), and by ethics panels in 5 countries (18.5%). The status was marked "unknown" in 12 countries (44%), and 1 country reported "other" as federal regulations. Embryonic stem cell research is reviewed for specific approval by local or national oversight panels in 6 of 33 countries (18%), by national ethics or oversight panels in 14 countries (42%), and by ethics panel in 6 countries (18%). The status was marked "unknown" in 11 countries (33%), and 2 countries responded "other".

In your country up to what age development in days can experimentation be performed on a developing non-implanted embryo?

There were 20 responses to this question. The full range of responses was 0 to 45 days, with a median of 23 days.

Is experimentation/research on the pre-implantation embryo performed in your country?

Research involving donated unused pre-implantation embryos is underway in 24 countries out of 65 responders (37%). In comparison, 6 countries cited ongoing stem cell research from donated pre-embryos in 2015. Research on donated, unused pre-implantation embryos for stem cell research was performed in 21 of 63 countries (33%). Reproductive cloning generating a human clone was reportedly performed in 2 countries out of 60 (3%). Therapeutic cloning was performed in 7 of 61 countries (11%). Embryonic stem cell research was performed in 12 of 60 countries (20%).

Chapter 16. Table 1

Is Research or experimentation on the embryo allowed/permitted and practiced/performed?

	Research On									
	Donated Unused Embryos		Donated Unused Embryos for Stem Cell Research		Reproductive Cloning Generating a Human Clone		Therapeutic Cloning		Embryonic Stem Cell Research	
Country	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed
Argentina	Yes	Unknown	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Yes	Unknown
Australia	Yes	Yes, with restrictions	Yes	Yes, with restrictions	No	No	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions
Austria	No	No	No	No	No	No	No	No	Yes, with restrictions	Yes, with restrictions
Barbados	Unknown		Unknown							
Belarus	Yes, with restrictions	Yes, with restrictions	No		No		No		No	
Belgium	Unknown		Yes		Unknown		Unknown		Unknown	
Bolivia	No	No	No	No	No	No	No	No	No	No
Botswana	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Brazil	No	No	Yes, with restrictions	Yes	No	No	Yes	No	No	No
Bulgaria	Yes, with restrictions	Yes, with restrictions	No	No	No	No	No	No	No	No
Burkina Faso	No	Unknown	No	Unknown	No	Unknown	No	Unknown	No	Unknown
Cameroon	No		No		No		No		No	
Canada	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes
Chile	No	No	No	No	No	No	No	No	No	
China	Yes, with restrictions	Yes, with restrictions	Unknown	Yes, with restrictions	No		Unknown		Unknown	
Colombia	Unknown	No	Unknown	No	No	No	No	No	Unknown	No
Czechia	No	No	Yes	Yes	No	No	No	No	No	No
Ecuador	No		No		No		No		No	
Egypt	Yes	Yes, with restrictions	Yes	Yes, with restrictions	No	No	Yes	Yes, with restrictions	Unknown	Yes, with restrictions
El Salvador	No	No	No	No	No	No	No	No	No	No
Finland	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Georgia	Unknown	No	Unknown	No	No	No	No	No	No	No
Germany	No	No	No	No	No	No	No		No	No
Ghana	Yes	Yes	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
Greece	Yes, with restrictions	Unknown	Yes	Yes, with restrictions	Yes	Yes	Yes	Yes	Yes, with restrictions	Yes
Guatemala	No	No	No	No	No	No	No	No	No	No
Hong Kong (China*)	Yes	Yes, with restrictions	Yes	Yes, with restrictions	No	No	Unknown	No	No	No
Hungary	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	No	No	No	No	Yes, with restrictions	Yes, with restrictions
India	Yes, with restrictions	No	Yes, with restrictions	No	No	No	No	No	No	No
Ireland	No	No	No	No	No	No	No	No	No	No
Italy	Unknown	No	Unknown	No	Unknown	No	Unknown	No	Unknown	Unknown
Côte d'Ivoire	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Japan	Yes	Yes, with restrictions	Yes	Yes, with restrictions	No	No	No	No	Yes	Yes, with restrictions
Jordan	No	No	No	No	No	No	No	No	No	No
Kazakhstan	No	No	No	No	No		No	No	No	No
Kenya										
Latvia	Yes	Yes	Unknown	Unknown	No	No	No	No	No	No
Lithuania	No	No	No	No	No	No	No	No	No	No
Mali	No	No	No	No	No	No	No	No	No	No
Mexico	No	No	No	No	No	No	No	No	No	No
Mongolia	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions
Montenegro	Yes, with restrictions	No	Yes, with restrictions	No	No	No	No	No	No	No
New Zealand	No		No		No		No		No	

Chapter 16. Table 1

(*Continued*)

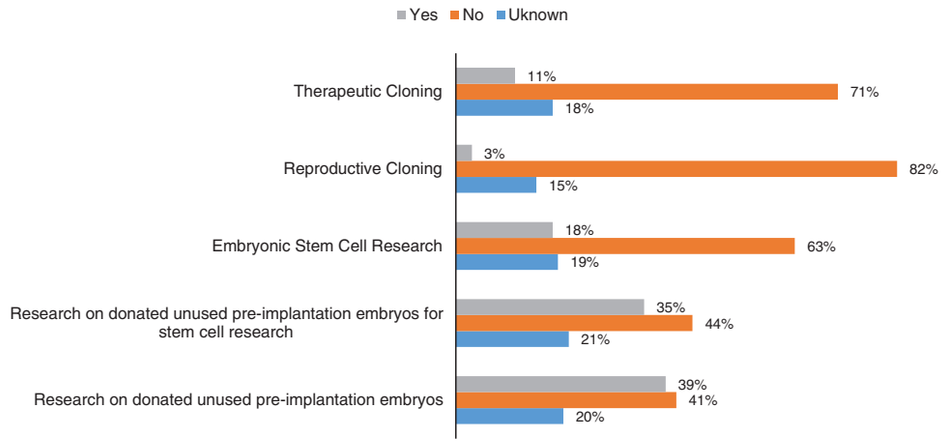
	Research On									
	Donated Unused Embryos		Donated Unused Embryos for Stem Cell Research		Reproductive Cloning Generating a Human Clone		Therapeutic Cloning		Embryonic Stem Cell Research	
Country	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed	Allowed/ Permitted	Practiced/ Performed
Nigeria	Yes, with restrictions	Unknown	No	Unknown	No		No		No	Unknown
Norway	Yes	Yes, with restrictions	No	No	No	No	No	No	Yes	No
Panama	No	No	No	No	No	No	No	No	Yes, with restrictions	
Paraguay	Unknown	No	Unknown	No	Unknown	No	Unknown	No	Unknown	No
Peru	No	No	No	No	No	No	No	No	No	No
Philippines	No	No	No	No	No	No	No	No	No	No
Poland	No	No	No	No	No	No	No	No	No	No
Portugal	Yes	Yes, with restrictions	Yes	Yes, with restrictions	No	No	No	No	No	No
Romania	No	No	No		No	No	No	No	No	No
Russian Federation	Unknown	Unknown	Unknown	Unknown	No	Unknown	No	Unknown	Unknown	Unknown
Senegal	No		No		No		No		No	
Serbia	No		No		No		No		No	
Singapore	Yes, with restrictions	Yes	Yes, with restrictions	Yes	No	No	No	No	Yes, with restrictions	Yes
Slovenia	Yes, with restrictions	Yes, with restrictions		Yes, with restrictions	No	No	No	No	No	No
South Africa	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	No	No	Yes, with restrictions	Yes, with restrictions	No	No
South Korea	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	No	No	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions
Spain	Yes, with restrictions	Unknown	Yes, with restrictions	Unknown	No	No	No	No	No	No
Sri Lanka	No		No		No		No		No	
Switzerland	No	No	No	No	No	No	No	No	No	No
Taiwan (China*)	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	No	No	No	No	Yes, with restrictions	Yes, with restrictions
Thailand	Yes	Yes	Yes	Yes, with restrictions	No	No	No	No	No	No
Togo	Unknown	Unknown								
Trinidad and Tobago	Unknown	No	Unknown	No	Unknown	No	Unknown	No	Unknown	No
Turkey	No	No	No	No	No	No	No	No	No	No
Uganda	Unknown	No	Unknown	No	Unknown	No	Unknown	No	Unknown	No
UAE	No	No	No	No	No		No	No	No	No
UK	Yes	Yes, with restrictions	Yes	Yes, with restrictions	No	No	No	No	No	No
USA	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	No	No	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions	Yes, with restrictions
Uruguay	No		No	No	No	No	No	No	No	No
Venezuela	Unknown	No	Unknown	No	No	No	No	No	No	No
Viet Nam	Unknown	Yes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Zimbabwe	Unknown	No	Unknown	No	Unknown	No	Unknown	No	Unknown	No

*Reporting separately for this report.

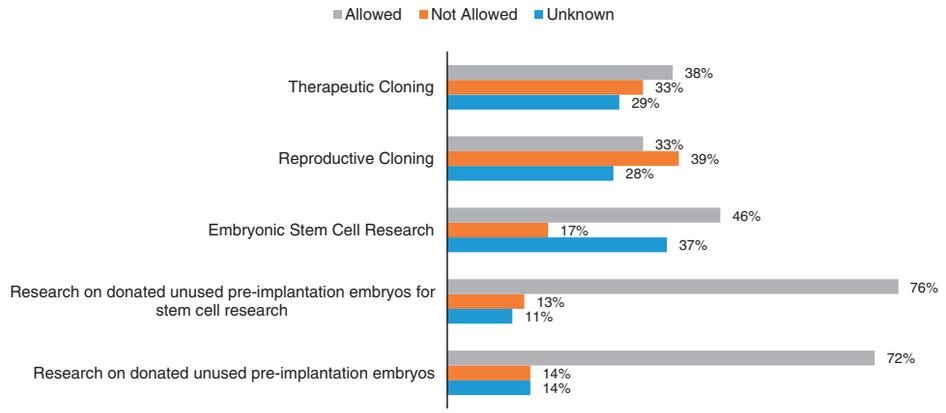
Are there regulations that address experimentation on the pre-implantation embryo in your country?

Research involving donated, unused pre-implantation embryos was regulated in 34 of 66 countries (52%). Reproductive cloning generating a human clone was regulated in 41 of 68 countries (60%). Therapeutic cloning was regulated 40 of 61 countries (61%). Embryonic stem cell research was regulated in 33 of 63 countries (52%).

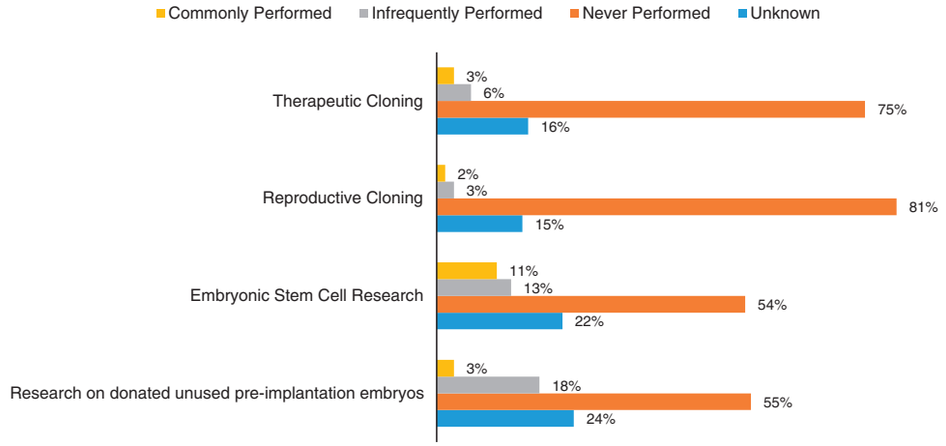
Countries that regulated research involving donated, unused preimplantation embryos reported having federal or national laws,



Chapter 16. Chart 1. Is experimentation on the pre-implantation embryo allowed/permitted?



Chapter 16. Chart 2. Is there a requirement for specific approval of experimentation/research proposals?



Chapter 16. Chart 3. How frequently is experimentation performed?

statutes, ordinances, or policies in 19 out of 34 (56%); state, provincial, or regional laws, statutes, or ordinances in 2 (6%); agency regulations or oversight in 2 (6%); professional organization standards and guidelines in 5 (15%); cultural practices in 1 (3%); and religious decrees in 1 (3%). Countries that regulated embryonic stem cell research reported having federal or national laws, statutes, ordinances, or policies in 18 of 33 (55%); state, provincial, or regional laws, statutes or ordinances in 2 (6%); municipal laws, statutes, or ordinances in 1 (3%); agency regulations or oversight in 1 (3%); and professional organization standards and guidelines in 4 (12%). Countries that regulated therapeutic cloning reported having federal or national laws, statutes, ordinances, or policies in 16 out of 40 (40%); state, provincial, or regional laws, statutes, or ordinances in 2 (5%); and professional organization standards and guidelines in 2 (5%). Countries that regulated reproductive cloning reported having federal or national laws, statutes, ordinances, or policies in 15 out of 41 (37%); state, provincial or regional laws, statutes, or ordinances in 2 (5%); professional organization standards and guidelines in 2 (5%); cultural practice in 1 (2%); and religious decrees in 1 (2%).

Are clinical research programmes in your country performing experimentation on the pre-implantation embryo?

Research on donated, unused pre-implantation embryos for stem cell research is commonly performed in only 2 countries out of 66 reporting (3%), infrequently performed in 12 countries (18%), and never performed in 36 countries (55%); the status was marked "unknown" in 16 countries (24%) (Table 1).

Reproductive cloning generating a human clone is commonly performed in only 1 country out of 67 (2%), infrequently performed in 2 countries (3%), and never performed in 54 countries (81%); the status was marked "unknown" in 10 countries (15%). Therapeutic cloning is commonly performed in only 2 countries of 65 (3%), infrequently performed in 4 (6%), and never performed in 49 countries (75%); the status was marked "unknown" in 10 countries (16%). Embryonic stem cell research is commonly performed in only 7 of 67 countries (11%), infrequently performed in 9 countries (13%), and never performed in 36 countries (54%); the status was "unknown" in 15 countries (22%) (Chart 3).

Discussion

The United Nations Declaration on Human Cloning, which prohibits all forms of human cloning, was passed in 2005 with 84-member nations voting in support, 34 in opposition, and 37 abstaining. No global consensus emerged because there were concerns expressed regarding its interpretation and potential application to various types of cloning. The 2018 Surveillance survey was intended to assess, in part, the extent of observance of the United Nations resolution 13 years later, and not to seek responses regarding specific research initiatives. As expected, nations that had prior experience with Common Rule tended to have the most strenuous infrastructures for managing research funds, legislation, publication, and enforcement standards. The majority of responding countries now have some form of oversight for research in place.

The 2018 survey reflects an increased amount of investigative activity with donated, unused embryos, usually with restrictions in place and a still small but growing number of countries actively involved in embryonic stem cell research. Most of the countries involved in this research have existing oversight that has evolved, in part, from the Common Rule. Surprisingly, one country, Greece, reported ongoing research pertaining to human reproductive cloning.

In November 2018, the U.S. National Academy of Sciences, including the U.S. National Academy of Medicine, the Royal Society of the United Kingdom of Great Britain and Northern Ireland, and the Academy of Sciences of Hong Kong, convened an international summit to address human genome editing and other aspects of embryo research. More than 500 researchers, ethicists, policymakers, patient group representatives, and others from around the world took part. The potential benefits and risks of human genome editing, ethical and cultural perspectives, regulatory and policy considerations, and public outreach and engagement efforts were considered, and their recommendations were recently published[1].

Summary

Human pre-implantation embryo research remains a contentious topic, with a small minority of countries actively involved in its investigation. With recent advances in clinical application of stem cell research, a small but growing number of countries are conducting studies using embryonic stem cells provided by donated, unused embryos, with restrictions. Human reproductive cloning remains almost universally prohibited[1].

Reference

[1] Available at: https://www.nap.edu/catalog/25343/second-international-summit-on-human-genome-editing-continuing-the-global-discussion. Accessed January 26, 2019.

CHAPTER 17: STATUS OF THE EMBRYO

Introduction

One of the first issues to be addressed with the inception of life created outside of the mother's body was the status to be accorded the embryo. Determining when life begins is a topic that has preoccupied theologians, biologists, and legal scholars for millennia, but no one had anticipated the advent of in vitro fertilization. Universal moral and ethical principles govern the treatment of individuals, and are embraced by governments and societies, but ART poses unique potential conflicts of interest for prospective mother and child when their mutual welfare does not overlap. These moral dilemmas are not easily resolved by classical ethical tenets. These issues revolve around the question of whether there is a point in embryonic or fetal development when personhood is conveyed, with its inherent legal rights, before which time a person is not considered to exist. The striking differences in how various countries reconcile these dilemmas highlight some of the most significant issues in the international governance of ART.

In the 2018 questionnaire, the following questions were posed:

1. "Is there a recognized point in time during human development in which a human exists and thus provided human rights?"
2. "Through which governing bodies or agencies is this time of human existence determined?"
3. "Is there a recognized point in time during human development before which a human person is considered not to exist and thus not provided human rights?"

Chapter 17. Table 1

Is there a recognized point in time during human development at which a human exists and thus provided human rights?

Country	Response	If Yes, What is the Recognized Time of Existence? (d)
Argentina	No	0
Australia	Yes	0
Austria	Yes	91
Bangladesh	No	
Belarus	No	
Belgium	Unknown	
Bolivia	Yes	1
Botswana	No	
Brazil	Yes	1
Bulgaria	No	
Burkina Faso	Unknown	
Cameroon	No	
Canada	Unknown	
Chile	No	
China	No	
Colombia	Unknown	
Czechia	Unknown	
Ecuador	Yes	1
Egypt	Yes	42
El Salvador	Yes	1
Finland	No	
Georgia	Yes	84
Germany	Yes	98
Greece	Yes	0
Guatemala	Yes	1
Hong Kong (China*)	Unknown	
Hungary	Yes	2
India	Unknown	
Ireland	Yes	0
Italy	No	
Côte d'Ivoire	Unknown	
Japan	No	
Jordan	Yes	126
Kazakhstan	Yes	42
Kenya	Unknown	
Latvia	Unknown	
Lithuania	No	
Mali	Unknown	
Mexico	Yes	1
Mongolia	No	
Montenegro	No	
New Zealand	No	
Nigeria	Yes	1
Norway	Yes	84
Panama	No	
Paraguay	No	
Peru	Yes	1
Philippines	Yes	1
Poland	Yes	1
Portugal	Yes	1
Romania	Unknown	
Russian Federation	Yes	280
Senegal	Yes	1
Serbia	Yes	40
Singapore	Unknown	
Slovenia	No	
South Africa	No	
South Korea	Unknown	
Spain	Yes	0
Sri Lanka	No	
Switzerland	No	
Taiwan (China*)	No	
Thailand	Yes	280
Togo	Unknown	
Trinidad and Tobago	Unknown	
Turkey	Unknown	
Uganda	Unknown	
United Arab Emirates	No	
UK	Yes	281
USA	Yes	280
Uruguay	Yes	0
Venezuela	Unknown	
Viet Nam	Unknown	
Zimbabwe	Yes	1

*Reporting separately for this report.

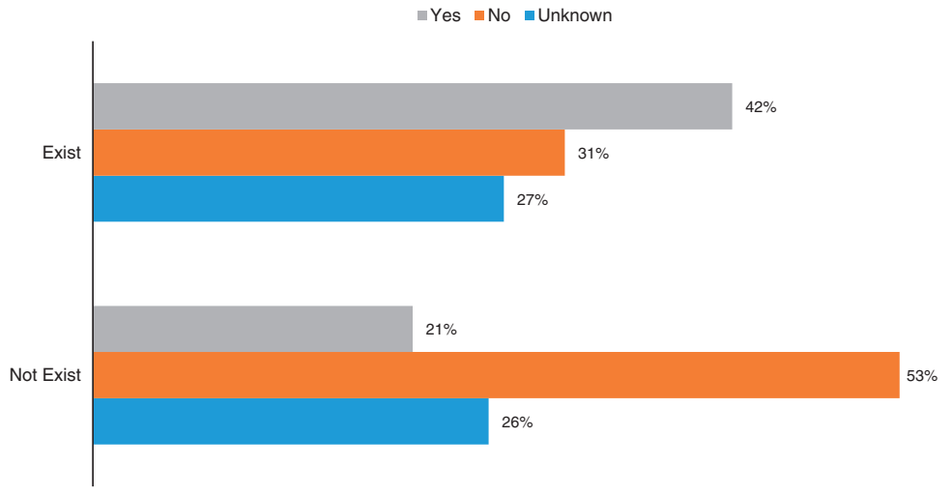
4. "Through which governing bodies or agencies is this time of human non-existence determined?"

Analysis of the survey

Representatives of 74 countries responded to the first question. Thirty-one (42%) noted that such a point existed (Table 1). It was day "0" (pre-fertilization), stated five nations (7%): Australia, Greece, Ireland, Spain, and Uruguay. Day "1" (post-fertilization) was the choice of 13 countries (18%): Bolivia, Brazil, Ecuador, El Salvador, Guatemala, Mexico, Nigeria, Peru, Philippines, Poland, Portugal, Senegal, and Zimbabwe. A time between day 2 and 126, said 9 countries (12%). The Russian Federation, Thailand, and The United States of America (4%) chose 280 days, and United Kingdom of Great Britain and Northern Ireland (1%) specified 281 days as the point at which human rights are conveyed (Chart 1).

Of the 31 countries that have chosen a point at which a human is recognized to exist, the majority of countries – 28 of them – (90%) back up their decision with federal or national statutes, ordinances, or policies, and 7 (23%) do so by state or provincial policies or legislation. Only 3 (10%) rely on municipal laws, statutes, or ordinances. Eight (26%) use professional organizations' standards or guidelines, 9 (29%), existing cultural practices; and thirteen (42%), religious decrees.

Regarding question 3, responses were received from 66 countries; responders from 14 countries (21%) acknowledged a specific point before which a person was not considered to exist. Thirty-five respondents (53%) did not recognize such a point or time, and 17 (26%) reported "unknown" (Table 2). Among countries that did recognize such a point, it was day 0 for Ecuador, Ireland, and Senegal; day 1 for Argentina; and 280 days for Canada, Finland, The United States of America, and the United Kingdom of Great Britain and Northern Ireland. For Egypt, Kazakhstan, Georgia, Norway, Austria, and Germany, the time ranged from 41 to 97 days (Chart 1). The point was determined in most countries (13 out of 14; 93%) by federal or national statutes, laws, or ordinances.



Chapter 17. Chart 1. Is there a recognized point in time during human development at which a human person is considered to exist or not exist?

Chapter 17. Table 2

Is there a recognized point in time during human development before which a human person is considered not to exist and thus not provided human rights?

Country	Response	If Yes, What is the Recognized Time of Non-Existence? (d)
Argentina	Yes	1
Austria	Yes	90
Bangladesh	No	
Belarus	No	
Belgium	Unknown	
Bolivia	No	
Bulgaria	No	
Burkina Faso	Unknown	
Cameroon	No	
Canada	Yes	280
Chile	No	
China	No	
Colombia	No	
Czechia	No	
Ecuador	Yes	0
Egypt	Yes	41
El Salvador	No	
Finland	Yes	280
Georgia	Yes	83
Germany	Yes	97
Greece	No	
Guatemala	No	
Hong Kong (China*)	Unknown	
Hungary	No	
India	Unknown	
Ireland	Yes	0
Italy	No	
Jordan	Unknown	
Kazakhstan	Yes	41
Kenya	Unknown	
Latvia	Unknown	
Lithuania	No	
Mali	Unknown	

Chapter 17. Table 2

(*Continued*)

Country	Response	If Yes, What is the Recognized Time of Non-Existence? (d)
Mexico	No	
Mongolia	No	
Montenegro	No	
New Zealand	No	
Nigeria	Unknown	
Norway	Yes	83
Panama	Unknown	
Paraguay	No	
Peru	No	
Philippines	Unknown	
Poland	No	
Portugal	No	
Romania	Unknown	
Russian Federation	No	
Senegal	Yes	0
Serbia	No	
Singapore	Unknown	
Slovenia	No	
South Africa	No	
Spain	No	
Sri Lanka	No	
Switzerland	No	
Taiwan (China*)	No	
Thailand	No	
Trinidad and Tobago	Unknown	
Turkey	Unknown	
Uganda	Unknown	
United Arab Emirates	No	
UK	Yes	280
USA	Yes	280
Uruguay	No	
Venezuela	Unknown	
Zimbabwe	No	

*Reporting separately for this report.

Discussion

In the 2018 survey, 10 more countries responded to the first question than had done so 3 years earlier (74 versus 64 responses). Considerably more countries now recognize a point at which personhood is acknowledged (42% vs 28%). There was less difference in the response rate to question 2 (66 vs 64 responses) and this time only 21% acknowledged that there was a point before which a person was not considered to exist. In 2015, the figure was 33%. The response "unknown" was given for question 1 by 20 responders (27%) and for question 3 by 17 responders (26%); in 2015, the responses for the same questions were 30% and 17%, respectively. The results suggest a greater emphasis currently on determining a time personhood is reached, but they still show great variability in when that time is recognized.

Since the original ruling of the Inter-American Court of Human Rights (IACHR) in Costa Rica, granting the rights of 18 plaintiffs to access ART, was upheld in February 2016. Since that time, Costa Rica has established two ART centres and participated in this most recent survey. No countries are currently known to continue to pose statutory obstacles to access of ART.

Summary

IVF now appears to be universally available, but marked differences exist among countries regarding the status and protection given to the embryo. An increasing proportion of countries now recognize a point at which an embryo or fetus reaches personhood, with attendant legal rights; and fewer countries are defining a point before which a person is said to not exist. Considerable variation continues among nations as to when these points are defined, and there does not seem to be a trend towards consensus.

CHAPTER 18: CONCLUSIONS

The 2018 questionnaire used to produce the *International Federation of Fertility Societies' Surveillance (IFFS) 2019: Global Trends in Reproductive Policy and Practice, 8th Edition,* succeeded in engaging respondents from 97 countries to complete all or a portion of the 94 questions in the survey. With 22 more countries responding than was the case with the 2015 project, the 8th edition offers a more complete depiction of the international status of the practice of ART. But the opportunity to make meaningful comparisons over the three years is limited, because the two editions include some different participating countries.

The data collected suggest that several countries, primarily in Africa, have recently started their inaugural ART programmes; that overall the number of new ART centres around the world has leveled off, with most countries recording modest increases in the number of centres; and that several nations now have fewer centres than in 2015. If the latter finding is validated, uncovering the contributing factors will be a query for the next triennial review.

The proportion of countries that have some regulatory oversight continues to increase. More than 86% of respondents now cite a regulatory oversight system, including national or federal legislation, provincial or municipal statutes, agency inspections, and professional guidelines. New regulatory efforts have addressed anonymous donation, cross-border reproduction, IVF surrogacy, pre-implantation genetic diagnosis, and experimentation on embryos, and cover issues such as marital status, micromanipulation, and same-sex parenting. Additional licensing and monitoring requirements have been imposed, and certification and examination processes expanded. What has not taken place is a marked increase in the proportion of countries with legislation or clinical guidelines that restrict the number of embryos permissible for transfer to women undergoing IVF/ART cycles (currently 59%, vs. 56% in 2015). More countries (35% vs. 24% in 2015) now report penalties for non-compliance regarding the number of embryos transferred.

Insurance coverage for ART is offered by a minority of countries, with only 47% providing support for any infertility therapy. There are significant regional variations for eligibility and the extent of coverage offered. Greater support does seem to be provided for genetic screening. No significant changes were identified in the proportion of countries that tie reimbursement to the number of embryos transferred.

The majority of countries (62%) do not require couples or individuals to be in a recognized or stable relationship to access ART services. Countries accepting single women (68%) and female same-sex couples (45%) for provision of ART services is more prevalent than those extending the same access to men (32%) or male same-sex couples (21%).

Technologic advances in ART have been broadly adopted. ICSI is widely accepted and universally available. PGT-M is expressly permitted in about 75% of respondent countries, not prohibited by any, and performed in about half. PGT-A and assisted hatching have been shown to be valuable adjuncts for some types of patients, but their indications and overall value are still being defined. PGT-A for aneuploidy was available in all responding countries, but is actively performed in 50% (45 of 90), compared to 42% in 2015.

Considerable ongoing interest remains for IVM, but there has been no recent significant clinical progress, and clinical adoption awaits translational investigations and clinical validation. The same is true for cytoplasmic transfer, mitochondrial transfer, and CRISPR-Cas9 technology – for which there is ongoing research; but all are considered investigative. Human preimplantation embryo research remains controversial; relatively few countries are participants. This number is likely to increase, however, with recent advances in stem cell research. A growing number of countries use embryonic stem cells provided by donated, unused embryos, with restrictions. Human reproductive cloning remains almost universally prohibited.

Gamete and embryo donation are well established ART practices, and are employed, if not sanctioned, by a large majority of the responding countries. Overall, about 50% to 60% of countries surveyed report using gamete or embryo donation, although "de novo" embryo donation is used less often, accepted in around 25% to 35% of countries. The vast majority of country respondents (71%) noted acceptance and successful application of cryopreservation of sperm, oocytes, and embryos. However, extensive variation continues among the country respondents in terms of which practices are regulated and how they are regulated. Gamete and embryo donation have been well established ART practices, and are used by a large majority of countries. Overall, 50% to 60% of countries offer gamete or embryo donation. In contrast, "de novo" embryo donation is less commonly accepted, and available only in 25% to 35% of countries.

The 2018 Surveillance questionnaire reaffirmed the controversial aspects of several ART practices, including gestational surrogacy, posthumous reproduction, cross-border reproduction (CBR), and selective fetal reduction (SFR). About one-third of

countries practice gestational surrogacy; fewer, traditional surrogacy. Most have measures in place prohibiting or sharply curtailing the practice.

Surveillance 2019 notes an increased application of all types of posthumous reproduction, including insemination of cryopreserved sperm and oocytes, and transfer of cryopreserved embryos – despite the apparent decline in the number of countries that have legislation or other measures in place pertaining to posthumous reproduction.

CBR has become increasingly prevalent. Most country respondents noted that individuals have traveled to their country for ART services that were less costly, perceived to be of better quality, or unavailable at home. About two thirds (64%) of respondents cited the absence of regulations for patients seeking CBR services entering or leaving a country. Only a third of the 89 responding countries permit SFR outright; another 19% allow it conditionally, and 19% ban it completely. Sex selection, usually performed with PGT-A, is being applied more frequently, and is almost universally available. Despite this, relatively few countries (24%) expressly permit PGT-A for sex selection; even fewer have regulations restricting it. Sperm sorting and SFR, while available in a few countries, is infrequently practiced.

There has been ongoing interest and legislative activity have addressed several social, legal, and non-technical aspects of ART. While possibly less contentious, they have widely different applications. Some countries have enacted extensive measures to ensure the welfare of the child; a discernible trend has been directed towards more intensive assessment of the prospective parents before treatment begins. Yet 74% of countries require no formal assessment. At a later stage in the ART process, an increasing proportion of countries are recognizing a point in embryo development at which personhood is achieved and specific legal rights are assigned. These points vary widely among countries, and there does not appear to be an identifiable trend towards consensus.

The International Federation of Fertility Societies' Surveillance (IFFS) 2019: Global Trends in Reproductive Policy and Practice, 8th Edition, provides a more complete rendering of the global status of ART. It captures more data from a greater number of respondents, and makes the first effort to define the extent of the ART frontier by listing countries not thought to be engaged in the practice of ART. The publication provides a vast amount of data for a variety of stakeholders – including clinicians, researchers, patients, policy makers, and health ministers. It depicts considerable progress in technical application, access to ART services, and consensus around issues pertaining to safety and social justice, but also highlights some inconsistencies between intent and actual application of some ART policy. It attests to the dynamic aspects of a still rapidly evolving transformative field.

APPENDIX

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