Advisory Committee on Assisted Reproductive Technology

Assisted Reproductive Technology in New Zealand 2016

July 2020

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Advisory Committee on Assisted Reproductive Technology

Foreword

On behalf of the Advisory Committee on Assisted Reproductive Technology (ACART), I am pleased to present this report, Assisted Reproductive Technology in New Zealand 2016, the eighth New Zealand-specific report based on the Australian and New Zealand Assisted Reproduction Database (ANZARD). The report provides a quantitative summary of the numbers, types and outcomes of assisted reproductive technology (ART) in New Zealand.

One of ACART's functions is to monitor the application and health outcomes of ARTs. The Ethics Committee on Assisted Reproductive Technology provides an annual report that includes data about procedures that require ethical approval. District health boards hold information about publicly funded procedures. However, New Zealand lacks one collated source of comprehensive data looking at the full spectrum of procedures carried out, regardless of how they are funded or categorised in New Zealand's regulatory framework.

The well-established ANZARD report in most cases aggregates data from Australia and New Zealand. This means that the report, while valuable and comprehensive, lacks New Zealand-specific detail. There are significant variations in the regulatory frameworks and funding arrangements for ART in each country, and in patterns of usage. For these reasons, ACART decided in 2010 to commission New Zealand-specific reports from the ANZARD data.

We acknowledge that ethnicity data is missing from the report as this data is not collected by ANZARD. Ethnicity data is important in New Zealand as the current government, health agencies and the public are interested in equity issues, and because it allows us to have a more comprehensive and complete understanding of people's health experiences and outcomes. ACART is investigating the possibility of obtaining and reporting on ethnicity data for privately funded fertility treatment.

We hope that the report will be useful to consumers, fertility service providers and others with an interest in how New Zealanders are using ART. With successive annual reports, we have begun to build a picture of use and trends over time.

I acknowledge the Ministry of Health for supporting ACART to obtain this report. I would also like to thank the National Perinatal Epidemiology and Statistics Unit at the University of New South Wales for collaborating with ACART to develop the report.

Dr Kathleen Logan
Chair, Advisory Committee on Assisted Reproductive Technology
July 2020

Acknowledgements

The Australian and New Zealand Assisted Reproduction Database (ANZARD), funded by the Fertility Society of Australia (FSA), is a collaboration between the National Perinatal Epidemiology and Statistics Unit (NPESU) and fertility centres in Australia and New Zealand. The NPESU is a unit within the Centre for Big Data Research in Health and the School of Women's and Children's Health of UNSW Sydney (University of New South Wales).

We would like to thank all staff in the fertility centres for their efforts in compiling the data and providing additional information when requested. A list of all contributing fertility clinics can be found in Appendix A.

Abbreviations

ANZARD	Australian and New Zealand Assisted Reproduction Database
ART	assisted reproductive technology
DET	double embryo transfer
DI	donor sperm insemination
FSA	Fertility Society of Australia
FSH	follicle stimulating hormone
GIFT	gamete intrafallopian transfer
ICSI	intracytoplasmic sperm injection
IVF	in vitro fertilisation
NPESU	National Perinatal Epidemiology and Statistics Unit
OPU	oocyte pick-up
PGD	preimplantation genetic diagnosis
PGT	preimplantation genetic testing
SD	standard deviation
SET	single embryo transfer
UNSW	University of New South Wales

Symbols

–	not applicable

Contents

List of tables

Summary

Use of ART treatment cycles

There were 6,705 assisted reproductive technology (ART) treatment cycles reported from New Zealand fertility clinics in 2016. This represented 7 cycles per 1,000 women of reproductive age (15–44 years) in New Zealand. Women used their own oocytes/embryos (autologous) in 90.7% of treatments and 41.7% of autologous cycles involved frozen/thawed embryos.

Treatment outcomes and number of babies

Of all the ART treatments in 2016, 28.7% (1,924) resulted in a clinical pregnancy, 23.4% (1,571) resulted in a delivery and 23.2% (1,556) in a live delivery. There were 1,587 liveborn babies, 84.4% (1,339) were singletons at term (gestational age of 37–41 weeks) with normal birthweight (≥2,500 grams).

Women's age and parity

The average age of women undertaking autologous and oocyte/embryo recipient cycles was 35.7 years. For women undergoing oocyte/embryo recipient cycles, the mean age was 40.0 years, five years older than for autologous cycles (mean 35.4 years). Of all autologous and oocyte/embryo recipient cycles, one in five (22.3%) was undertaken by women aged 40 years or older. Where parity was recorded, 73.9% of autologous cycles were undertaken by nulliparous women compared with 81.3% for oocyte/embryo recipient cycles.

Autologous fresh cycles

The overall live delivery rate per autologous fresh embryo transfer cycle was 31.4%. The highest live delivery rate per autologous fresh embryo transfer cycle was in women aged less than 30 years (44.8%) and declined with an increase in women's age. Overall, 93.1% of autologous fresh embryo transfer cycles were single embryo transfer (SET) cycles, 6.9% were double embryo transfer (DET) cycles and only one cycle involved the transfer of three or more embryos. The rates of clinical pregnancy and live delivery were higher in blastocyst transfer cycles than in cleavage stage embryo transfer cycles regardless of a woman's age.

Autologous thaw cycles

The overall live delivery rate per autologous thaw embryo transfer cycle was 32.0%. The highest live delivery rate per embryo transfer cycle was in women aged between 30–34 years (39.6%). Of the 2,456 frozen/thawed embryo transfer cycles 98.2% were SET cycles and 1.8% were DET cycles. The rates of clinical pregnancy and live delivery were higher in blastocyst transfer cycles than in cleavage stage embryo transfer cycles for women aged under 40 years.

Deliveries by plurality and maternal age

Of the 1,562 deliveries following autologous and recipient cycles in 2016, 2.0% were multiple gestation deliveries. The proportion of multiple gestation deliveries was similar across age groups.

Cumulative live birth rates

ANZARD includes data items which make it possible to follow a woman from her first fresh ART treatment cycle through subsequent fresh and thaw cycles. There were 1,591 women identified as having their first fresh autologous cycle in 2014. These women were followed through their subsequent fresh and thaw cycles until 31 December 2016 or until they achieved a live delivery. For women identified in this cohort, the cumulative live delivery rate was 25.2% after the first cycle, increasing to 37.9% after two cycles, 44.4% after three cycles, 48.5% after four cycles and 50.7% after five cycles.

1 Introduction

It is estimated that around 15% of couples at any given time experience infertility, representing the source of much personal suffering to millions around the world (World Health Organization 2010). The common medical definition of 'infertility' is the failure to achieve a clinical pregnancy after 12 or more months of regular unprotected sexual intercourse (Zegers-Hochschild et al 2017). Infertility is increasingly being overcome through advancements in fertility treatment, such as assisted reproductive technologies (ARTs). ARTs have evolved over the last three decades into a suite of mainstream medical interventions that have resulted in the birth of more than 6 million children worldwide (ESHRE 2015).

The purpose of this annual report is to inform clinicians, researchers, government and the community about ART treatment and the resulting pregnancy and birth outcomes; to provide ongoing monitoring of ART treatment practices, success rates and perinatal outcomes; and to facilitate national and international comparisons.

The Fertility Society of Australia (FSA), in collaboration with the University of New South Wales (UNSW), is committed to providing informative annual statistics on ART treatments and is pleased to present the annual report on the use of ART in New Zealand in 2016.

1.1 Treatments covered in this report

ART is a group of procedures that involve the *in vitro* (outside of body) handling of human oocytes (eggs) and sperm or embryos for the purposes of establishing a pregnancy (Zegers-Hochschild et al 2009). A typical fresh in vitro fertilisation (IVF) cycle involves the following five steps:

1. controlled ovarian hyperstimulation during which an ovarian stimulation regimen, typically using follicle stimulating hormone (FSH), is administered to a woman over a number of days to induce the maturation of multiple oocytes
2. oocyte pick-up (OPU) where mature oocytes are aspirated from ovarian follicles
3. fertilisation of the collected oocytes by incubating them with sperm (from the woman's partner or donor) over a few hours in the laboratory
4. embryo maturation during which a fertilised oocyte is cultured for 2–3 days to form a cleavage stage embryo (6–8 cells) or 5–6 days to create a blastocyst (60–100 cells)
5. transfer of one or more fresh embryos into the uterus in order to achieve pregnancy.

Treatment may be discontinued at any stage during a treatment cycle due to various reasons including inadequate response of ovaries to medication, excessive ovarian stimulation, failure to obtain oocytes, failure of oocyte fertilisation, inadequate embryo growth or patient choice.

Over the last three decades, ART has evolved to encompass complex ovarian hyperstimulation protocols and numerous variations to the typical fresh IVF treatment cycle described above. Some of these variations include:

- intracytoplasmic sperm injection (ICSI) – when a single sperm is injected directly into the oocyte
- assisted hatching – when the outer layer of the embryo, the zona pellucida, is either thinned or perforated in the laboratory to aid 'hatching' of the embryo
- gamete intrafallopian transfer (GIFT) – when mature oocytes and sperm are placed directly into a woman's fallopian tubes so that fertilisation may take place *in vivo* (inside the body). While once popular, this procedure now accounts for only a very small percentage of ART cycles
- preimplantation genetic diagnosis (PGD) – when one or more cells are removed from the embryo and analysed for chromosomal disorders or genetic diseases
- oocyte donation – when a woman donates her oocytes to others
- oocyte/embryo recipient – when a woman receives oocytes or embryos from another woman
- cryopreservation and storage of embryos that are not transferred in the initial fresh treatment cycle. Once thawed or warmed, the embryos can be transferred in subsequent treatment cycles. Cryopreservation techniques include both the traditional slow freezing method and a newer technique called 'vitrification'. Vitrification can be used to cryopreserve gametes and embryos, and uses an ultra-rapid temperature change with exposure to higher concentrations of cryoprotectants
- cryopreservation and storage of oocytes and embryos for fertility preservation
- surrogacy arrangement – where a woman, known as the 'gestational carrier', agrees to carry a child for another person or couple, known as the 'intended parent(s)', with the intention that the child will be raised by the intended parent(s).

Along with ART, there are other fertility treatments that are undertaken in New Zealand. Artificial insemination is one such treatment by which sperm are placed into the female genital tract (for example, intracervical or intrauterine), and can be used with controlled ovarian hyperstimulation or in natural cycles. Artificial insemination can be undertaken using a partner's sperm, or donated sperm, also known as 'donor sperm insemination' (DI).

1.2 Data used in this report

This report provides information on ART and DI treatments and the resulting pregnancy and birth outcomes. The data presented in this report were supplied by eight fertility centres and compiled into ANZARD.

As a joint initiative of the NPESU and FSA, the Australian and New Zealand Assisted Reproduction Database (ANZARD) was upgraded in 2009 to accommodate new ART treatment types and to transform ANZARD from a cycle-based data collection to a woman-based data collection (ANZARD 2.0). A more detailed description of ANZARD 2.0 can be found in Appendix B.

1.3 Structure of this report

This report has eight chapters, including this introductory chapter (Chapter 1).

- Chapter 2 – 'Overview of ART treatment in 2016', provides an outline of the numbers and outcomes of all ART treatments undertaken in New Zealand.
- Chapter 3 – 'Autologous and donation/recipient cycles in 2016', presents data on women undergoing treatment, cycle types, and the outcomes of treatment.
- Chapter 4 – 'Pregnancy and birth outcomes following embryo transfer cycles in 2016', presents data on the outcomes of clinical pregnancies and deliveries following autologous and recipient cycles including a description of perinatal outcomes.
- Chapter 5 – 'Preimplantation genetic diagnosis', includes information on the numbers of embryos that had cells removed and analysed for chromosomal disorders or genetic diseases before transfer.
- Chapter 6 – 'Donor sperm insemination cycles in 2016', presents data on DI cycles and their outcomes, including a description of pregnancy and perinatal outcomes.
- Chapter 7 – 'Trends in ART treatment and outcomes 2012–2016', presents trends in ART treatment over the last five years of data collection in New Zealand.
- Chapter 8 – 'Cumulative success rates for women undertaking autologous treatment 2014–2016', presents information on all women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014.
- Appendices – Appendix A lists the contributing fertility clinics. Appendix B provides an overview of the ANZARD 2.0 data collection that was used to prepare this report.

2 Overview of ART treatment in 2016

There were 6,705 assisted reproductive technology (ART) treatment cycles reported from New Zealand clinics in 2016. This represented 7 cycles per 1,000 women of reproductive age (15–44 years) in New Zealand (Statistics New Zealand, 2016). Of these, 90.7% of cycles were autologous cycles (where a woman used or intended to use her own oocytes or embryos).

There were, 6,083 autologous cycles in 2016. Of these, 3,545 (58.2%) were fresh cycles and 2,538 (41.7%) were thaw cycles. Other treatment cycles accounted for a small proportion of cycles comprising 5.4% oocyte recipient cycles, 0.5% embryo recipient cycles, 2.6% oocyte donation cycles and 0.9% surrogacy cycles.

Of all the ART cycles in 2016 in New Zealand, 1,924 (28.7%) resulted in a clinical pregnancy, 1,571 (23.4%) resulted in a delivery and 1,556 (23.2%) resulted in a live delivery. Of the 1,587 liveborn babies, 1,339 (84.4%) were singletons at term (gestational age of 37–41 weeks) with normal birthweight (≥ 2,500 grams).

Table 1: Number of initiated ART treatment cycles by treatment type, New Zealand, 2016

Treatment type	Number of initiated ART cycles	Percent of treatment types	Number of clinical pregnancies	Number of live deliveries	Number of liveborn babies	Number of liveborn singletons at term with normal birthweight
Autologous	6,083	90.7	1,805	1,452	1,481	1,249
Fresh	*3,545*	*52.9*	*834*	*666*	*680*	*567*
Thaw	*2,538*	*37.9*	*971*	*786*	*801*	*682*
Oocyte recipient	361	5.4	103	88	89	75
Embryo recipient	31	0.5	8	8	8	8
Oocyte donation	171	2.6	0	0	0	0
Surrogacy arrangement cycles	59	0.9	8	8	9	7
Commissioning cycles	*10*	*0.1*	*0*	*0*	*0*	*0*
Gestational carrier cycles	*49*	*0.7*	*8*	*8*	*9*	*7*
Total	**6,705**	**100.0**	**1,924**	**1,556**	**1,587**	**1,339**

(a) A variety of cycle types undertaken as part of surrogacy arrangements, eg, cycles undertaken by intended parents or women donating their oocytes or embryos for use by the gestational carrier.

(b) A cycle undertaken by a woman who carries, or intends to carry, a pregnancy on behalf of the intended parents with an agreement that the child will be raised by the intended parent(s).

3 Autologous and donation/recipient cycles in 2016

This chapter presents data on initiated autologous cycles, oocyte donation cycles and oocyte/embryo recipient cycles.

An 'autologous cycle' is defined as an ART treatment cycle in which a woman uses or intends to use her own oocytes.

A 'donation cycle' is defined as an ART treatment cycle in which a woman donates or intends to donate her oocytes or embryos to others. The use of donor sperm does not influence the donor status of the cycle.

A 'recipient cycle' is defined as an ART treatment cycle in which a woman receives oocytes or embryos from another woman.

Autologous and donor/recipient cycles can involve the use of, or intended use of, either fresh or frozen/thawed embryos.

3.1 Overview of autologous and recipient cycles

Age of women and their partners

The average age of women undertaking autologous and oocyte/embryo recipient cycles was 35.7 years (SD 4.7). For women undergoing oocyte/embryo recipient cycles, the mean age was 40.0 years (SD 5.0); an average five years older than women undertaking autologous cycles (mean 35.4 years). Of all autologous and oocyte/embryo recipient cycles, one in five (22.3%) was undertaken by women aged 40 years or older (Table 2). The average age of partners was 38.3 years (SD 6.9), with over one-third (34.9%) aged 40 years or older (Table 3).

Table 2: Number of autologous and recipient cycles by women's age group and treatment type, New Zealand, 2016

Age group (years)[(a)]	Autologous				Oocyte/embryo recipient		All	
	Fresh		Thaw					
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
< 30	380	10.7	273	10.8	11	2.8	664	10.3
30–34	1,031	29.1	800	31.5	43	11.0	1,874	28.9
35–39	1,411	39.8	979	38.6	104	26.5	2,494	38.5
40–44	694	19.6	474	18.7	181	46.2	1,349	20.8
≥ 45	29	0.8	12	0.5	53	13.5	94	1.5
Total	**3,545**	**100.0**	**2,538**	**100.0**	**392**	**100.0**	**6,475**	**100.0**

(a) Age at start of treatment cycle.

Note: Data are collected for each treatment cycle. Therefore, some individuals may be counted more than once.

Table 3: Number of autologous and recipient cycles by partners' age group and treatment type, New Zealand, 2016

Age group (years)[(a)]	Autologous							
	Fresh		Thaw		Oocyte/embryo recipient		All	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
< 30	232	6.5	160	6.3	4	1.0	396	6.1
30–34	770	21.7	558	22.0	36	9.2	1,364	21.1
35–39	1,059	29.9	844	33.3	109	27.8	2,012	31.1
40–44	744	21.0	556	21.9	98	25.0	1,398	21.6
≥ 45	452	12.8	314	12.4	98	25.0	864	13.3
Not stated	288	8.1	106	4.2	47	12.0	441	6.8
Total	**3,545**	**100.0**	**2,538**	**100.0**	**392**	**100.0**	**6,475**	**100.0**

(a) Age at start of treatment cycle.

Note: Data are collected for each treatment cycle. Therefore, some individuals may be counted more than once.

Parity

Parity is the number of previous pregnancies of 20 weeks or more gestation experienced by a woman. A woman who has had no previous pregnancies of 20 or more weeks gestation is called nulliparous. A woman who has had at least one previous pregnancy of 20 weeks or more gestation is described as parous. Where parity was recorded, 73.9% of autologous cycles compared with 81.3% of oocyte/embryo recipient cycles, were undertaken by nulliparous women (Table 4).

Table 4: Number of autologous and recipient cycles by parity and treatment type, New Zealand, 2016

Parity	Autologous							
	Fresh		Thaw		Oocyte/embryo recipient		All	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Nulliparous	1,113	31.4	643	25.3	87	22.2	1,843	28.5
Parous	299	8.4	321	12.6	20	5.1	640	9.9
Not stated	2,133	60.2	1,574	62.0	285	72.7	3,992	61.7
Total	**3,545**	**100.0**	**2,538**	**100.0**	**392**	**100.0**	**6,475**	**100.0**

Note: Data are collected for each treatment cycle. Therefore, some individuals may be counted more than once.

Intracytoplasmic sperm injection procedures (ICSI)

Of the 3,096 autologous fresh cycles where fertilisation was attempted, 2,044 (66.0%) used ICSI procedures and 1,052 (34.0%) used IVF procedures.

Table 5: Number of autologous and recipient cycles with fertilisation attempted by treatment type and procedure, New Zealand, 2016

	Autologous				Oocyte/embryo recipient			
	Fresh[a]		Thaw[b]		Fresh[a]		Thaw[b]	
Procedure	Number	Percent	Number	Percent	Number	Percent	Number	Percent
IVF	1,052	34.0	643	26.2	59	38.8	58	25.0
ICSI[c]	2,044	66.0	852	34.7	93	61.2	107	46.1
Not stated	0	0.0	961	39.1	0	0.0	67	28.9
Total	**3,096**	**100.0**	**2,456**	**100.0**	**152**	**100.0**	**232**	**100.0**

(a) Fresh cycles where fertilisation was attempted.

(b) Thaw cycles where embryos were transferred.

(c) Mixed IVF/ICSI cycles were classed as ICSI cycles.

Number of embryos transferred

Of the 4,852 fresh and thawed autologous embryo transfer cycles, 96% were single embryo transfer (SET) cycles and 4.0% were double embryo transfer (DET) cycles. In women aged under 35, 98.6% of embryo transfer cycles were SET cycles and 1.4% were DET cycles. In women aged 35 or older, 94.3% of cycles were SET cycles and 5.7% were DET cycles (Table 6).

Table 6: Number of embryo transfer cycles by number of embryos transferred per cycle and women's age group, New Zealand, 2016

Age group (years)[a]	Number of embryos transferred							
	One		Two		Three or more		All	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<30	482	99.4	3	0.6	0	0.0	485	100.0
30–34	1,424	98.3	25	1.7	0	0.0	1,449	100.0
35–39	1,798	96.4	67	3.6	0	0.0	1,865	100.0
40–44	897	90.2	97	9.7	0	0.0	994	100.0
≥ 45	55	93.2	3	5.0	1	1.7	59	100.0
Total	**4,656**	**96.0**	**195**	**4.0**	**1**	**0.0**	**4,852**	**100.0**

(a) Age at start of a treatment cycle.

Stage of embryo development

Of the 4,852 embryo transfer cycles, 75.6% involved the transfer of blastocysts (day 5–6 embryos) with the remaining transfers involving cleavage stage embryos (day 2–3 embryos). Of autologous cycles, blastocyst transfers made up 95.8% of thaw cycles compared with 50.4% of fresh cycles (Table 7).

Table 7: Number of embryo transfer cycles by treatment type and stage of embryo development, New Zealand, 2016

Type and procedure	Autologous				Oocyte/embryo recipient			
	Fresh		Thaw		Fresh		Thaw	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Cleavage embryo	1,052	49.6	103	4.2	19	43.2	12	5.2
Blastocyst	1,068	50.4	2,353	95.8	25	56.8	220	94.8
Total	**2,120**	**100.0**	**2,456**	**100.0**	**44**	**100.0**	**232**	**100.0**

Transfer of cryopreserved embryos

Embryos created in a fresh cycle can be cryopreserved by either slow freezing or ultra-rapid cryopreservation (vitrification) methods. Slow frozen and vitrified embryos can be thawed/warmed and then transferred in subsequent cycles. Of the 2,688 frozen/thawed embryo transfer cycles, 54.0% involved the transfer of vitrified embryos.

Table 8: Number of embryo transfer cycles by freezing method and stage of embryo development, New Zealand, 2016

Type and procedure	Autologous				Oocyte/embryo recipient			
	Cleavage embryo		Blastocyst		Cleavage embryo		Blastocyst	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Slow frozen embryo	95	92.2	1,044	44.4	10	83.3	88	40.0
Vitrified embryo[(a)]	8	7.8	1,309	55.6	2	16.7	132	60.0
Total	**103**	**100.0**	**2,353**	**100.0**	**12**	**100.0**	**220**	**100.0**

(a) Ultra-rapid cryopreservation.

3.2 Autologous fresh cycles

Clinical pregnancies and live deliveries from autologous fresh cycles by women's age

The overall live delivery rate per autologous fresh embryo transfer cycle was 31.4%. The highest live delivery rate per embryo transfer cycle was in women aged less than 30 years (44.8%). This rate steadily declined with advancing women's age (Table 9).

Table 9: Outcomes of autologous fresh cycles by women's age group, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]					
	< 30	30–34	35–39	40–44	≥ 45	All
Initiated cycles	380	1,031	1,411	694	29	3,545
Freeze-all cycles	123	244	302	96	1	766
Cycles with OPU	358	968	1,286	600	20	3,232
Embryo transfers	210	639	856	401	14	2,120
Clinical pregnancies	104	316	321	93	0	834
Live deliveries	94	269	251	52	0	666
Live deliveries per initiated cycle (%)	*24.7*	*26.1*	*17.8*	*7.5*	*0.0*	*18.8*
Live deliveries per initiated cycle (excluding freeze-all) (%)	*36.6*	*34.2*	*22.6*	*8.7*	*0.0*	*24.0*
Live deliveries per embryo transfer cycle (%)	*44.8*	*42.1*	*29.3*	*13.0*	*0.0*	*31.4*
Live deliveries per clinical pregnancy (%)	*90.4*	*85.1*	*78.2*	*55.9*	–	*79.9*

(a) Age at start of a treatment cycle.

(b) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

Clinical pregnancies and live deliveries by number of embryos transferred from autologous fresh cycles

Overall, 93.1% of autologous fresh embryo transfer cycles were SET cycles and 6.9% were DET cycles. Three or more embryos were transferred in only one cycle. Overall, the live delivery rate per embryo transfer cycle was 32.1% for SET cycles and 22.6% for DET cycles (Table 10).

Table 10: Outcomes of autologous fresh embryo transfer cycles by women's age and number of embryos transferred, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]							
	<35		35–39		≥ 40		All	
	SET[b]	DET[c]	SET[b]	DET[c]	SET[b]	DET[c]	SET[b]	DET[c]
Embryo transfer cycles	836	13	806	50	331	83	1,973	146
Clinical pregnancies	414	6	301	20	74	19	789	45
Live deliveries	357	6	234	17	42	10	633	33
Clinical pregnancies per embryo transfer cycle (%)	*49.5*	*46.2*	*37.3*	*40.0*	*22.4*	*22.9*	*40.0*	*30.8*
Live deliveries per embryo transfer cycle (%)	*42.7*	*46.2*	*29.0*	*34.0*	*12.7*	*12.0*	*32.1*	*22.6*

(a) Age at start of a treatment cycle.

(b) SET: single embryo transfer.

(c) DET: double embryo transfer.

Note: Of embryo transfer cycles in women aged 40 and over, 5 cycles involved the transfer of three or more embryos resulting in 1 clinical pregnancy and 1 live delivery.

Clinical pregnancies and live deliveries by stage of embryo development from autologous fresh cycles

The rates of clinical pregnancy and live delivery were higher in blastocyst transfer cycles than in cleavage stage embryo transfer cycles regardless of a woman's age (Table 11). Overall, the live delivery rate for blastocyst transfer cycles (42.5%) was 22 percentage points higher than for cleavage stage embryo transfer cycles (20.2%).

Table 11: Outcomes of autologous fresh embryo transfer cycles by women's age and stage of embryo development, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]							
	<35		35–39		≥ 40		All	
	CL[b]	BL[c]	CL[b]	BL[c]	CL[b]	BL[c]	CL[b]	BL[c]
Embryo transfer cycles	337	512	458	398	257	158	1,052	1,068
Clinical pregnancies	123	297	120	201	37	56	280	554
Live deliveries	104	259	90	161	18	34	212	454
Clinical pregnancies per embryo transfer cycle (%)	*36.5*	*58.0*	*26.2*	*50.5*	*14.4*	*35.4*	*26.6*	*51.9*
Live deliveries per embryo transfer cycle (%)	*30.9*	*50.6*	*19.7*	*40.5*	*7.0*	*21.5*	*20.2*	*42.5*

(a) Age at start of a treatment cycle.

(b) CL: cleavage stage embryo.

(c) BL: blastocyst.

3.3 Autologous thaw cycles

Clinical pregnancies and live deliveries from autologous thaw cycles by women's age

The overall live delivery rate per autologous thaw embryo transfer cycle was 32.0%. The highest live delivery rate per embryo transfer cycle (39.6%) and the highest live delivery rate per clinical pregnancy (84.4%) was in women aged between 30 and 34 years (Table 12). It is important to note that embryos thawed during a thaw cycle were created during an earlier initiated fresh cycle, therefore a women's age at the start of a thaw cycle is older than her age at the start of the initiated fresh cycle.

Table 12: Outcomes of autologous thaw cycles by women's age group, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]					
	< 30	30–34	35–39	40–44	≥ 45	All
Initiated cycles	273	800	979	474	12	2,538
Embryo transfers	267	781	941	456	11	2,456
Clinical pregnancies	129	366	336	136	4	971
Live deliveries	103	309	270	101	3	786
Live deliveries per initiated cycle (%)	*37.7*	*38.6*	*27.6*	*21.3*	*25.0*	*31.0*
Live deliveries per embryo transfer cycle (%)	*38.6*	*39.6*	*28.7*	*22.1*	*27.3*	*32.0*
Live deliveries per clinical pregnancy (%)	*79.8*	*84.4*	*80.4*	*74.3*	*75.0*	*80.9*

(a) Age at start of a treatment cycle.

Clinical pregnancies and live deliveries by number of embryos transferred from autologous thaw cycles

Of the 2,456 autologous thaw embryo transfer cycles, 98.2% were SET cycles and 1.8% were DET cycles. In total, there were 971 clinical pregnancies and 786 live deliveries. DET cycles had a higher percentage of live deliveries per embryo transfer cycle (34.1%) than SET cycles (32.0%) (Table 13).

Table 13: Outcomes of autologous thaw embryo transfer cycles by women's age and number of embryos transferred, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]							
	<35		35–39		≥ 40		All	
	SET[b]	DET[c]	SET[b]	DET[c]	SET[b]	DET[c]	SET[b]	DET[c]
Embryo transfer cycles	1,034	14	925	16	453	14	2,412	44
Clinical pregnancies	484	11	331	5	136	4	951	20
Live deliveries	404	8	265	5	102	2	771	15
Clinical pregnancies per embryo transfer cycle (%)	*46.8*	*78.6*	*35.8*	*31.3*	*30.0*	*28.6*	*39.4*	*45.5*
Live deliveries per embryo transfer cycle (%)	*39.1*	*57.1*	*28.6*	*31.3*	*22.5*	*14.3*	*32.0*	*34.1*

(a) Age at start of a treatment cycle.

(b) SET: single embryo transfer.

(c) DET: double embryo transfer.

Clinical pregnancies and live deliveries by stage of embryo development from autologous thaw cycles

The rates of clinical pregnancy and live delivery were higher for blastocyst transfer cycles than for cleavage stage embryo transfer cycles, for women aged under 40 years. The rate of live delivery for blastocyst transfer cycles (32.4%) was 10 percentage points higher than for cleavage stage embryo transfer cycles (22.3%) (Table 14).

Table 14: Outcomes of autologous thaw embryo transfer cycles by women's age and stage of embryo development, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]							
	<35		35–39		≥ 40		All	
	CL[b]	BL[c]	CL[b]	BL[c]	CL[b]	BL[c]	CL[b]	BL[c]
Embryo transfer cycles	49	999	36	905	18	449	103	2,353
Clinical pregnancies	13	482	8	328	6	134	27	944
Live deliveries	12	400	5	265	6	98	23	763
Clinical pregnancies per embryo transfer cycle (%)	*26.5*	*48.2*	*22.2*	*36.2*	*33.3*	*29.8*	*26.2*	*40.1*
Live deliveries per embryo transfer cycle (%)	*24.5*	*40.0*	*13.9*	*29.3*	*33.3*	*21.8*	*22.3*	*32.4*

(a) Age at start of a treatment cycle.

(b) CL: cleavage stage embryo.

(c) BL: blastocyst.

3.4 Donation and recipient cycles

Oocyte donation cycles

Of the 171 cycles where the intention was to donate oocytes to a recipient, all but five cycles proceeded to OPU with 158 (95.2%) of these cycles resulting in oocytes being donated. The average age of women donating oocytes was 32.4 years with 36.3% of oocyte donation cycles undertaken by women aged 35 or older (Table 15).

Table 15: Number of oocyte donation cycles by donor's age group, New Zealand, 2016

Age group (years)[(a)]	Initiated cycles (number)	Cycles with OPU performed (number)	Cycles with OPU performed (percent)	Cycles with oocyte donated (number)	Cycles with oocyte donated (percent)
< 30	35	34	97.1	34	97.1
30–34	74	72	97.3	68	91.9
35–39	58	57	98.3	53	91.4
≥ 40	4	3	75.0	3	75.0
Total	**171**	**166**	**97.1**	**158**	**92.4**

(a) Age at start of a treatment cycle.

Clinical pregnancies and live deliveries from oocyte/embryo recipient cycles by type of recipient cycle

There were 392 oocyte/embryo recipient cycles in 2016, the majority of which were oocyte recipient cycles (92.1%). Of the 361 cycles where embryos were derived from donated oocytes, 57.9% were thaw cycles (Table 16). Of the 44 fresh oocyte recipient cycles that proceeded to embryo transfer, 31.8% resulted in a live delivery, nearly 5 percentage points lower than the live delivery rate per embryo transfer for thaw oocyte recipient cycles (36.6%). The live delivery rate for embryo recipient cycles was 25.8%.

Table 16: Outcomes of oocyte/embryo recipient cycles by treatment type, New Zealand, 2016

Stage/outcome of treatment	Oocyte recipient		Embryo recipient	All
	Fresh	Thaw		
Initiated cycles	152	209	31	392
Embryo transfers	44	202	30	276
Clinical pregnancies	16	87	8	111
Live deliveries	14	74	8	96
Live deliveries per initiated cycle (%)	*9.2*	*35.4*	*25.8*	*24.5*
Live deliveries per embryo transfer cycle (%)	*31.8*	*36.6*	*26.7*	*34.8*
Live deliveries per clinical pregnancy (%)	*87.5*	*85.1*	*100.0*	*86.5*

Clinical pregnancies and live deliveries from oocyte/embryo recipient cycles by recipient's age

The clinical pregnancy and live delivery rates of recipient cycles varied by recipient's age group. The overall live delivery rate per initiated cycle was 24.5%. Across the five age categories, live delivery rates per initiated cycle ranged between 21.2% and 28.3% (Table 17). Recipients aged 45 and over had the highest live delivery rate per oocyte/embryo recipient cycle. This rate compares to live delivery rates from autologous fresh and thaw cycles for women of the same age group of 0.0% and 25.0% respectively (Tables 9 and Table 12).

Table 17: Outcomes of oocyte/embryo recipient cycles by recipient's age group, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]					
	< 30	30–34	35–39	40–44	≥ 45	All
Initiated cycles	11	43	104	181	53	392
Embryo transfers	8	29	68	137	34	276
Clinical pregnancies	3	13	23	55	17	111
Live deliveries	3	10	22	46	15	96
Live deliveries per initiated cycle (%)	*27.3*	*23.3*	*21.2*	*25.4*	*28.3*	*24.5*
Live deliveries per embryo transfer cycle (%)	*37.5*	*34.5*	*32.4*	*33.6*	*44.1*	*34.8*
Live deliveries per clinical pregnancy (%)	*100.0*	*76.9*	*95.7*	*83.6*	*88.2*	*86.5*

(a) Age at start of a treatment cycle.

Clinical pregnancies and live deliveries from oocyte/embryo recipient cycles by donor's age

The overall live delivery rate per embryo transfer cycle was 24.5%. Across the four age categories, the live delivery rate per initiated cycle ranged between 17.9% and 28.6% with the highest live delivery rate in the less than 30 years age group (Table 18).

Table 18: Outcomes of oocyte/embryo recipient cycles by donor's age group, New Zealand, 2016

Stage/outcome of treatment	Age group (years)[a]				
	< 30	30–34	35–39	≥ 40	All[b]
Initiated cycles	91	167	123	11	392
Embryo transfers	67	111	90	8	276
Clinical pregnancies	30	51	27	3	111
Live deliveries	26	46	22	2	96
Live deliveries per initiated cycle (%)	*28.6*	*27.5*	*17.9*	*18.2*	*24.5*
Live deliveries per embryo transfer cycle (%)	*38.8*	*41.4*	*24.4*	*25.0*	*34.8*
Live deliveries per clinical pregnancy (%)	*86.7*	*90.2*	*81.5*	*66.7*	*86.5*

(a) Age at start of treatment cycle.

(b) Includes cycles where donor's age was not stated.

4 Pregnancy and birth outcomes following autologous and recipient cycles in 2016

There were 1,916 clinical pregnancies following autologous and recipient embryo transfer cycles in 2016. Four out of five clinical pregnancies (81.5%) resulted in a delivery and 18% resulted in early pregnancy loss (less than 20 weeks gestation or less than 400 grams birthweight). The outcomes of 0.5% clinical pregnancies were not known because women could not be followed up or contacted by fertility centres.

4.1 Early pregnancy loss

Of the 344 early pregnancy losses, 81.4% were miscarriages, 14.2% were due to termination of pregnancy, and 4.4% were ectopic/heterotopic pregnancies. Pregnancies following SET resulted in a lower rate of early pregnancy loss (18.7%) than pregnancies following DET (24.2%).

Table 19: Early pregnancy losses by pregnancy outcome and treatment type, New Zealand, 2016

	Autologous				Oocyte/embryo recipient		All	
	Fresh		Thaw					
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Early pregnancy loss	154	18.5	175	18.0	15	13.5	344	18.0
Miscarriage	*128*	*15.3*	*142*	*14.6*	*10*	*9.0*	*280*	*14.6*
Termination	*18*	*2.2*	*27*	*2.8*	*4*	*3.6*	*49*	*2.6*
Ectopic or heterotopic pregnancy	*8*	*1.0*	*6*	*0.6*	*1*	*0.9*	*15*	*0.8*
Delivery	672	80.6	794	81.8	96	86.5	1562	81.5
Not stated	8	1.0	2	0.2	0	0.0	10	0.5
Total	**834**	**100.0**	**971**	**100.0**	**111**	**100.0**	**1916**	**100.0**

4.2 Delivery outcomes and treatment type

There were 1,562 women who gave birth to at least one baby of 20 weeks or more gestation or at least 400 grams birthweight following embryo transfer cycles. Of these, 99.5% (1,548) gave birth to at least one liveborn baby (live delivery) (Table 20).

Table 20: Deliveries by delivery outcome and treatment type, New Zealand, 2016

	Autologous				Oocyte/embryo recipient		All	
	Fresh		Thaw					
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Live delivery	666	99.1	786	99.0	96	100.0	1,548	99.1
< 37 weeks	*75*	*11.2*	*67*	*8.4*	*9*	*9.4*	*151*	*9.7*
≥ 37 weeks	*591*	*87.9*	*717*	*90.3*	*87*	*90.6*	*1,395*	*89.3*
Gestational age unknown	*0*	*0.0*	*2*	*0.3*	*0*	*0.0*	*2*	*0.1*
Fetal death (stillbirth)[(a)]	3	0.4	5	0.6	0	0.0	8	0.5
Not stated	3	0.4	3	0.4	0	0.0	6	0.4
Total	**672**	**100.0**	**794**	**100.0**	**96**	**100.0**	**1,562**	**100.0**

(a) Fetal death (stillbirth) is reported by patients to fertility centre staff. These data are not vital statistics.

4.3 Deliveries by plurality and maternal age

The average age of women at the time of delivery was 35.5 years. Of the 1,562 autologous and recipient deliveries, 2.0% were multiple gestation deliveries (Table 21).

Table 21: Deliveries by plurality and maternal age, New Zealand, 2016

	Age group (years)[(a)]								
	< 35			35–39			≥ 40		
	One embryo	Two embryos	All	One embryo	Two embryos	All[(b)]	One embryo	Two embryos	All[(b)]
					Number				
Singleton	652	8	660	570	16	586	270	15	285
Multiple	10	2	12	8	7	15	2	2	4
Twin	*10*	*2*	*12*	*8*	*7*	*15*	*2*	*2*	*4*
Higher order multiple	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total	**662**	**10**	**672**	**578**	**23**	**601**	**272**	**17**	**289**
					Percent				
Singleton	98.5	80.0	98.2	98.6	69.6	97.5	99.3	88.2	98.6
Multiple	1.5	20.0	1.8	1.4	30.4	2.5	0.7	11.8	1.4
Twin	*1.5*	*20.0*	*1.8*	*1.4*	*30.4*	*2.5*	*0.7*	*11.8*	*1.4*
Higher order multiple	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Age at time of delivery.

(b) Includes three or more embryos.

4.4 Gestational age of babies

The average gestational age of babies born following autologous and recipient embryo transfer cycles was 38.4 weeks (Table 22). One in six babies (11.5%) were preterm (less than 37 weeks gestation); the average gestational age of ART singletons was 38.5 weeks, while the average gestational age for ART twins was 34.7 weeks.

Table 22: Babies by gestational age and plurality, New Zealand, 2016

Gestational age (weeks)	Singletons		Twins		Higher order multiples		Total	
Mean (SD)	38.5 (2.6)		34.7 (2.3)		–		38.4 (2.7)	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
≤ 27	16	1.0	0	0.0	0	0.0	16	1.0
28–31	19	1.2	6	9.7	0	0.0	25	1.6
32–36	98	6.4	44	71.0	0	0.0	142	8.9
≥ 37	1,396	91.2	12	19.4	0	0.0	1,408	88.4
Not stated	2	0.1	0	0.0	0	0.0	2	0.1
Total	**1,531**	**100.0**	**62**	**100.0**	**0**	**–**	**1,593**	**100.0**

4.5 Birth outcomes

The average birthweight for liveborn babies to women who had autologous and recipient embryo transfer cycles was 3,319 grams. Of all liveborn babies, 8.0% were low birthweight (less than 2,500 grams) (Table 23). The average birthweight was 3,364 grams and 2,224 grams for liveborn ART singletons and twins respectively. Low birthweight was reported for 5.7% of liveborn singletons following SET and 7.9% of liveborn singletons following DET.

Table 23: Liveborn babies by birthweight group and plurality, New Zealand, 2016

Birthweight (grams)	Singletons		Twins	Higher order multiples	Total[c]
	SET[a]	DET[b]			
			Number		
< 1,000	*8*	*0*	*0*	*0*	*8*
1,000–1,499	*10*	*0*	*4*	*0*	*14*
1,500–1,999	*28*	*1*	*8*	*0*	*37*
2,000–2,499	*38*	*2*	*27*	*0*	*67*
< 2,500	84	3	39	0	126
2,500–2,999	215	5	18	0	238
3,000–3,499	531	18	3	0	552
3,500–3,999	440	10	0	0	450
≥ 4,000	192	2	0	0	194
Not stated	18	0	0	0	18
Total	**1,480**	**38**	**60**	**0**	**1,578**
			Percent		
< 1,000	*0.5*	*0.0*	*0.0*	*0.0*	*0.5*
1,000–1,499	*0.7*	*0.0*	*6.7*	*0.0*	*0.9*
1,500–1,999	*1.9*	*2.6*	*13.3*	*0.0*	*2.3*
2,000–2,499	*2.6*	*5.3*	*45.0*	*0.0*	*4.2*
< 2,500	5.7	7.9	65.0	0.0	8.0
2,500–2,999	14.5	13.2	30.0	0.0	15.1
3,000–3,499	35.9	47.4	5.0	0.0	35.0
3,500–3,999	29.7	26.3	0.0	0.0	28.5
≥ 4,000	13.0	5.3	0.0	0.0	12.3
Not stated	1.2	0.0	0.0	0.0	1.1
Total	**100.0**	**100.0**	**100.0**	**–**	**100.0**

(a) SET: single embryo transfer.

(b) DET: double embryo transfer.

(c) Included singletons following transfer of three or more embryos.

5 Preimplantation genetic testing in 2016

Preimplantation genetic testing (PGT) is a procedure where DNA from oocytes or embryos is tested for chromosomal disorders or genetic diseases before embryo transfer. This term includes preimplantation genetic diagnosis (PGD) and preimplantation genetic screening (PGS). The indication for PGT is not recorded in ANZARD. In 2016, PGT was performed in 327 cycles, representing 5.5% of cycles in which embryos were created or thawed. Among the 327 PGT cycles, 173 (52.9%) were part of a *freeze-all* cycle. Of the 327 PGT cycles, 117 (35.8%) had embryos transferred, resulting in 48 (14.7%) clinical pregnancies and 42 (12.8%) live deliveries.

Table 24: Number of cycles with PGT by type of embryo, New Zealand, 2016

Type of embryo	Stage of treatment		Number of embryo transfers following PGT	Number of live deliveries following PGT
	Number of cycles with fresh or thawed embryos	Number of cycles with PGT		
Fresh	3,141	190	3	0
Freeze-all cycles	*693*	*173*	*n.a.*	*n.a.*
Thaw	2,777	137	114	42
Total	**5,918**	**327**	**117**	**42**

n.a.: not applicable

PGT: Preimplantation genetic testing

6 Donor insemination cycles in 2016

Donor sperm insemination (DI) covers a range of techniques of placing sperm into the female genital tract using donated sperm from a man who is not the woman's partner. The information presented in this section only describes DI cycles undertaken in fertility centres in New Zealand and does not include DI undertaken outside of this setting.

In 2016, there were 391 DI cycles reported, which included 42 (10.7%) undertaken with controlled ovarian hyperstimulation and 349 (89.3%) undertaken in unstimulated cycles. Of all DI cycles, 22.8% resulted in a clinical pregnancy and 19.2% resulted in a live delivery (Table 25). There was one multiple birth following a DI cycles in 2016. The average age of women who had a DI cycle was 36.2 years. The clinical pregnancy rate was highest in women aged between 30 and 34 years, whereas the live delivery rate was highest in women aged under 30 and decreased with advancing woman's age. Of the DI cycles in women aged under 35 years, 26.7% resulted in a live delivery, compared with 6.6% of DI cycles in women aged 40 years or older (Table 25).

Table 25: Outcomes of DI cycles by women's age group, New Zealand, 2016

	Age group (years)[a]				
	< 30	**30–34**	**35–39**	**≥ 40**	**Overall**
DI cycles	29	87	199	76	391
Controlled ovarian hyperstimulation	*0*	*12*	*25*	*5*	*42*
Unstimulated cycles	*29*	*75*	*174*	*71*	*349*
Clinical pregnancies	8	26	48	7	89
Live deliveries	8	23	39	5	75
Clinical pregnancies per DI cycle (%)	*27.6*	*29.9*	*24.1*	*9.2*	*22.8*
Live deliveries per DI cycle (%)	*27.6*	*26.4*	*19.6*	*6.6*	*19.2*
Live deliveries per clinical pregnancy (%)	*100.0*	*88.5*	*81.3*	*71.4*	*84.3*

(a) Age at start of treatment cycle.

DI: Donor sperm insemination

6.1 Clinical pregnancies

Of the 89 clinical pregnancies following DI cycles, 14 (15.7%) ended in early pregnancy loss. Of the 75 live deliveries, 74 (98.7%) were singleton deliveries and 1 (1.3%) was a twin delivery.

6.2 Perinatal outcomes of babies

There were 76 babies born to women who had DI treatment, all of which were liveborn. Of these, 4 were born preterm (less than 37 weeks gestation). The mean birthweight of liveborn babies was 3,492 grams (SD 554). There were 2 liveborn babies (2.7%) born with low birthweight (less than 2,500 grams).

7 Trends in ART treatment and outcomes 2012–2016

This section includes autologous cycles, donation/recipient cycles and surrogacy cycles undertaken in New Zealand from 2012 to 2016. It does not include DI cycles.

In 2016, 6,705 initiated fresh or thaw ART treatment cycles were undertaken in New Zealand. This was an increase of 6.9% compared to 2015 and an increase of 22.8% from 2012 (Table 26). Between 2012 and 2016, the live delivery rates per initiated cycle ranged from 22.1% to 23.4%. The live delivery rate per initiated cycle (excluding freeze-all) has been relatively stable at around 24.2% since 2012, with a slight increase in 2015 and further increase to 26.2% in 2016 (Table 26).

Table 26: Number of fresh and thaw cycles by stage/outcome of treatment, New Zealand, 2012–2016

Stage/outcome of treatment	2012	2013	2014	2015	2016
Initiated cycles[(a)]	5,177	5,373	5,891	6,242	6,705
Cycles with OPU[(b)]	3,021	3,167	3,230	3,397	3,404
Freeze-all	191	319	480	542	766
Embryo transfers	4,291	4,365	4,597	4,821	4,884
Clinical pregnancies	1,564	1,560	1,655	1,766	1,924
Live deliveries	1,209	1,225	1,302	1,401	1,556
Clinical pregnancies per initiated cycle (%)	*30.2*	*29.0*	*28.1*	*28.3*	*28.7*
Clinical pregnancies per embryo transfer (%)	*36.4*	*35.7*	*36.0*	*36.7*	*39.4*
Live deliveries per initiated cycle (%)	*23.4*	*22.8*	*22.1*	*22.4*	*23.2*
Live deliveries per initiated cycle (excluding freeze-all[(c)]) (%)	*24.2*	*24.2*	*24.1*	*24.6*	*26.2*
Live deliveries per embryo transfer (%)	*28.2*	*28.1*	*28.3*	*29.1*	*31.9*

(a) Included autologous cycles, oocyte donation cycles, oocyte/embryo recipient cycles, and surrogacy cycles.

(b) Cycles with OPU included cycles where no oocytes were collected during the procedure.

(c) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

8 Cumulative success rates for women undertaking autologous treatment 2014–2016

This section presents information on all women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014. Women were followed from the start of their first autologous fresh cycle through subsequent fresh and thaw cycles, excluding *freeze-all* cycles, until 31 December 2016 or until they achieved a live delivery (a delivery of at least one liveborn baby) up to and including 31 October 2017. This longitudinal perspective provides a measure of the outcomes of successive ART treatment cycles undertaken by the same woman up to her first birth following ART treatment. These women might have had additional treatment cycles after 2016 and their treatment information and resulting outcomes will be captured in subsequent annual reports. Therefore, in this dynamic cohort of women undergoing their first autologous fresh ART treatment between 1 January 2014 and 31 December 2014, the cumulative success rates may increase over time as women return for treatment at a later date.

ART treatment cycles presented in Tables 27 to 32 include all initiated autologous fresh and thaw cycles, excluding *freeze-all* cycles. Cycles which were cancelled at any stage and did not proceed to oocyte collection or embryo transfer are included. Donor sperm insemination cycles, oocyte/embryo recipient cycles, oocyte/embryo donation cycles, surrogacy arrangement cycles and gamete intrafallopian transfer (GIFT) cycles are not included. A pregnancy that ends before 20 weeks gestation or a stillbirth (fetal death) are not counted as a live delivery.

Table 27 presents the number of cycles by women's age group. Tables 28 to 32 present cycle-specific live delivery rates, non-progression rates and cumulative live delivery rates for all age groups and women aged under 30 years, between 30–34 years, between 35–39 years and over 40 years. Only the first five cycles are presented due to the small number of women undertaking six or more treatment cycles between 1 January 2014 and 31 December 2016.

8.1 Definitions and calculations

- The cycle-specific live delivery rate for a specific number of cycles is calculated as the number of live deliveries resulting from the specific number of cycles divided by the number of women who undertook that cycle number. For instance, in Table 28, the cycle-specific live delivery rate of 19.8% for cycle number three represents the proportion of women who undertook a third cycle and achieved a live delivery in that cycle.
- The non-progression rate for a specific cycle is calculated as the number of women who did not return for further ART treatment cycles before 31 December 2016 divided by the number of women who did not have a live delivery in that cycle. For example, the non-progression rate of 34.1% for a third cycle represents the proportion of women who did not achieve a live delivery in their third cycle and did not progress to a fourth cycle (Table 28). The reasons surrounding a woman's or couple's choice to not return or

progress with further treatment, include poor prognosis, natural pregnancy, migration, financial, psychological and other unrelated reasons; these are not collected by ANZARD.

- The cumulative live delivery rate for a specific cycle is calculated as the total number of live deliveries following this cycle and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014. For example, the cumulative live delivery rate of 44.4% for the third cycle represents the proportion of women who started ART treatment in 2014 and achieved a live delivery following their first three cycles (Table 28).

Note that following ART, only the first birth to a woman is counted in cumulative live birth rates.

Table 27: Number of cycles by women's age group for all women who started their first autologous fresh cycle (excluding *freeze-all* cycles[a]) between 1 January 2014 and 31 December 2014, New Zealand, 2014–2016

Cycle number	Age group years[b]				
	< 30	30–34	35–39	≥ 40	All
			Number		
One	103	205	228	133	669
Two	52	133	147	64	396
Three	30	87	96	35	248
Four	16	37	54	22	129
Five or more	20	44	69	16	149
Total	**221**	**506**	**594**	**270**	**1,591**
			Percent		
One	46.6	40.5	38.4	49.3	42.0
Two	23.5	26.3	24.7	23.7	24.9
Three	13.6	17.2	16.2	13.0	15.6
Four	7.2	7.3	9.1	8.1	8.1
Five or more	9.0	8.7	11.6	5.9	9.4
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) *Freeze-all* cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

(b) Age at start of first autologous fresh ART treatment cycle undertaken in 2014.

Note: Women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014 were followed through subsequent fresh and thaw cycles (excluding *freeze-all* cycles) until 31 December 2016 or delivery of a liveborn baby up to and including 31 October 2017. Totals and subtotals may not equal 100.0 due to rounding. Data should be interpreted with caution due to small numbers in certain cells.

Table 28: Cycle-specific and cumulative live delivery rates for all women who started their first autologous fresh cycle (excluding *freeze-all* cycles[f]) between 1 January 2014 and 31 December 2014, New Zealand, 2014–2016

Cycle number[a]	Number of women starting cycle	Number of women who had a live delivery[b]	Cycle-specific live delivery rate (%)[c]	Number of women who did not progress to next treatment	Non-progression rate (%)[d]	Cumulative live delivery rate (%)[e]
One	1,591	401	25.2	268	22.5	25.2
Two	922	202	21.9	194	26.9	37.9
Three	526	104	19.8	144	34.1	44.4
Four	278	64	23.0	65	30.4	48.5
Five	149	35	23.5	50	43.9	50.7

(a) Cycle one represents a woman's first autologous (excluding *freeze-all*) fresh ART treatment cycle between 1 January 2014 and 31 December 2014. Cycles two to five could be either a fresh or thaw cycle (excluding *freeze-all* cycles) undertaken by a woman until 31 December 2016 or delivery of a liveborn baby up to and including 31 October 2017.

(b) A live delivery is the delivery of one or more liveborn infants, with the birth of twins or higher order multiples counted as one live delivery.

(c) The cycle-specific live delivery rate is calculated as the number of live deliveries resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.

(d) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31 December 2016 divided by the number of women who did not have a live delivery in that 'cycle number'.

(e) The cumulative live delivery rate for a specific 'cycle number' is calculated as the total number of live deliveries following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014.

(f) *Freeze-all* cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

Note: Further treatment cycles after the fifth cycle and resulting live deliveries are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells and measures of statistical variance are not supplied.

Table 29: Cycle-specific and cumulative live delivery rates for women aged less than 30 years who started their first autologous fresh cycle (excluding *freeze-all* cycles[f]) between 1 January 2014 and 31 December 2014, New Zealand, 2014–2016

Cycle number[a]	Number of women starting cycle	Number of women who had a live delivery[b]	Cycle-specific live delivery rate (%)[c]	Number of women who did not progress to next treatment	Non-progression rate (%)[d]	Cumulative live delivery rate (%)[e]
One	221	76	34.4	27	18.6	34.4
Two	118	31	26.3	21	24.1	48.4
Three	66	17	25.8	13	26.5	56.1
Four	36	13	36.1	3	13.0	62.0
Five	20	9	45.0	6	54.5	66.1

(a) Cycle one represents a woman's first autologous (excluding *freeze-all*) fresh ART treatment cycle between 1 January 2014 and 31 December 2014. Cycles two to five could be either a fresh or thaw cycle (excluding *freeze-all* cycles) undertaken by a woman until 31 December 2016 or delivery of a liveborn baby up to and including 31 October 2017.

(b) A live delivery is the delivery of one or more liveborn infants, with the birth of twins or higher order multiples counted as one live delivery.

(c) The cycle-specific live delivery rate is calculated as the number of live deliveries resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.

(d) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31 December 2015 divided by the number of women who did not have a live delivery in that 'cycle number'.

(e) The cumulative live delivery rate for a specific 'cycle number' is calculated as the total number of live deliveries following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014.

(f) *Freeze-all* cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

Note: Further treatment cycles after the fifth cycle and resulting live deliveries are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells and measures of statistical variance are not supplied.

Table 30: Cycle-specific and cumulative live delivery rates for women aged 30–34 years who started their first autologous fresh cycle (excluding *freeze-all* cycles[f]) between 1 January 2014 and 31 December 2014, New Zealand, 2014–2016

Cycle number[a]	Number of women starting cycle	Number of women who had a live delivery[b]	Cycle specific-live delivery rate (%)[c]	Number of women who did not progress to next treatment	Non-progression rate (%)[d]	Cumulative live delivery rate (%)[e]
One	506	155	30.6	50	14.2	30.6
Two	301	90	29.9	43	20.4	48.4
Three	168	44	26.2	43	34.7	57.1
Four	81	20	24.7	17	27.9	61.1
Five	44	14	31.8	14	46.7	63.8

(a) Cycle one represents a woman's first autologous (excluding *freeze-all*) fresh ART treatment cycle between 1 January 2014 and 31 December 2014. Cycles two to five could be either a fresh or thaw cycle (excluding *freeze-all* cycles) undertaken by a woman until 31 December 2016 or delivery of a liveborn baby up to and including 31 October 2017.

(b) A live delivery is the delivery of one or more liveborn infants, with the birth of twins or higher order multiples counted as one live delivery.

(c) The cycle-specific live delivery rate is calculated as the number of live deliveries resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.

(d) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31 December 2016 divided by the number of women who did not have a live delivery in that 'cycle number'.

(e) The cumulative live delivery rate for a specific 'cycle number' is calculated as the total number of live deliveries following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014.

(f) *Freeze-all* cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

Note: Further treatment cycles after the fifth cycle and resulting live deliveries are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells and measures of statistical variance are not supplied.

Table 31: Cycle-specific and cumulative live delivery rates for women aged 35–39 years who started their first autologous fresh cycle (excluding *freeze-all* cycles[f]) between 1 January 2014 and 31 December 2014, New Zealand, 2014–2016

Cycle number[a]	Number of women starting cycle	Number of women who had a live delivery[b]	Cycle-specific live delivery rate (%)[c]	Number of women who did not progress to next treatment	Non-progression rate (%)[d]	Cumulative live delivery rate (%)[e]
One	594	136	22.9	92	20.1	22.9
Two	366	65	17.8	82	27.2	33.8
Three	219	39	17.8	57	31.7	40.4
Four	123	26	21.1	28	28.9	44.8
Five	69	11	15.9	24	41.4	46.6

(a) Cycle one represents a woman's first autologous (excluding *freeze-all*) fresh ART treatment cycle between 1 January 2014 and 31 December 2014. Cycles two to five could be either a fresh or thaw cycle (excluding *freeze-all* cycles) undertaken by a woman until 31 December 2016 or delivery of a liveborn baby up to and including 31 October 2017.

(b) A live delivery is the delivery of one or more liveborn infants, with the birth of twins or higher order multiples counted as one live delivery.

(c) The cycle-specific live delivery rate is calculated as the number of live deliveries resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.

(d) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31 December 2016 divided by the number of women who did not have a live delivery in that 'cycle number'.

(e) The cumulative live delivery rate for a specific 'cycle number' is calculated as the total number of live deliveries following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014.

(f) *Freeze-all* cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

Note: Further treatment cycles after the fifth cycle and resulting live deliveries are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells and measures of statistical variance are not supplied.

Table 32: Cycle-specific and cumulative live delivery rates for women aged 40 years and over who started their first autologous fresh cycle (excluding *freeze-all* cycles[f]) between 1 January 2014 and 31 December 2014, New Zealand, 2014–2016

Cycle number[a]	Number of women starting cycle	Number of women who had a live delivery[b]	Cycle-specific live delivery rate (%)[c]	Number of women who did not progress to next treatment	Non-progression rate (%)[d]	Cumulative live delivery rate (%)[e]
One	270	34	12.6	99	41.9	12.6
Two	137	16	11.7	48	39.7	18.5
Three	73	4	5.5	31	44.9	20.0
Four	38	5	13.2	17	51.5	21.9
Five	16	1	6.3	6	40.0	22.2

(a) Cycle one represents a woman's first autologous (excluding *freeze-all*) fresh ART treatment cycle between 1 January 2014 and 31 December 2014. Cycles two to five could be either a fresh or thaw cycle (excluding *freeze-all* cycles) undertaken by a woman until 31 December 2016 or delivery of a liveborn baby up to and including 31 October 2017.

(b) A live delivery is the delivery of one or more liveborn infants, with the birth of twins or higher order multiples counted as one live delivery.

(c) The cycle-specific live delivery rate is calculated as the number of live deliveries resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.

(d) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31 December 2016 divided by the number of women who did not have a live delivery in that 'cycle number'.

(e) The cumulative live delivery rate for a specific 'cycle number' is calculated as the total number of live deliveries following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1 January 2014 and 31 December 2014.

(f) *Freeze-all* cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved and an embryo transfer does not take place.

Note: Further treatment cycles after the fifth cycle and resulting live deliveries are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells and measures of statistical variance are not supplied.

Appendix A: Contributing fertility clinics

Fertility Associates, Auckland (Dr Simon Kelly)
Fertility Associates Christchurch, Christchurch (Dr Sarah Wakeman)
Fertility Associates Hamilton, Hamilton (Dr VP Singh)
Fertility Associates Otago, Dunedin (Associate Professor Wayne Gillett)
Fertility Associates Wellington, Wellington (Dr Andrew Murray)
Fertility Plus, Auckland (Dr Cindy Farquhar)
Genea Oxford Women's Health, Christchurch (Dr Robert Woolcott)
Repromed Auckland, Auckland (Dr Guy Gudex)

Appendix B: Data used in this report

The data presented in this report are supplied by eight fertility clinics in New Zealand and are compiled into ANZARD 2.0. ANZARD 2.0 includes autologous treatment cycles, treatment involving donated oocytes or embryos and treatment involving surrogacy arrangements. ANZARD 2.0 collects data on the use of ART techniques such as ICSI, oocyte/embryo freezing methods, PGD and cleavage stage /blastocyst transfers. In addition to ART procedures, ANZARD 2.0 also collects data from fertility centres about artificial insemination cycles using donated sperm (DI). The outcomes of pregnancies, deliveries and babies born following ART and DI treatments are also maintained in ANZARD 2.0. This includes the method of birth, birth status, birthweight, gestational age, plurality, perinatal mortality and selected information on maternal morbidity.

This report presents information on ART and DI treatment cycles that took place in fertility clinics in New Zealand in 2016, and the resulting pregnancies and births. The babies included in this report were conceived through treatment cycles undertaken in 2016 and were born in either 2016 or 2017.

Data validation

Most fertility centres have computerised data information management systems and provide the National Perinatal Epidemiology and Statistics Unit (NPESU) with high quality data. All data processed by NPESU undergo a validation process, with data queries being followed up with fertility centre staff. In 2016, information relating to pregnancy and birth outcomes was provided for all New Zealand based cycles.

The Reproductive Technology Accreditation Committee of the Fertility Society of Australia also plays a role in ensuring the quality of ANZARD 2.0 data by validating selected records against clinic files in their annual inspections.

Data presentation

Data presented in Chapters 2 to 6 are for treatment cycles and not patients. It is possible for an individual woman to undergo more than one treatment cycle in a year or experience more than one pregnancy. This means that information reported about patient characteristics, such as age, parity and cause of infertility, is based on calculations in which individuals may be counted more than once.

The rates of clinical pregnancy and live delivery in Chapters 2 to 6 were measured per initiated cycle. Where the number of initiated cycles was not available, the rates were measured per embryo transfer cycle.

Where applicable, percentages in tables have been calculated including the 'Not stated' category. Throughout the report, for totals, percentages may not add up to 100.0 and, for subtotals, they may not add up to the sum of the percentages for the categories. This is due to rounding error.

Data limitations

Follow-up of pregnancy and birth outcomes is limited because the ongoing care of pregnant patients is often carried out by non-ART practitioners. The method of follow-up varies by fertility centre and includes follow-up with the patient or clinician, or the use of routine data sourced from a health department. In a small proportion of cases this information is not available. For pregnancies in which there is successful follow-up, data are limited by the self-reported nature of the information. Fertility centre staff invest significant effort in validating such information by obtaining medical records from clinicians or hospitals. Data about previous ART treatment and history of pregnancies are, in some cases, reported by patients.

Glossary

This report categorises ART treatments according to whether a woman used her own oocytes or embryos, or oocytes/embryos were donated by another woman/couple, and whether the embryos were transferred soon after fertilisation or following cryopreservation.

Artificial insemination: a range of techniques of placing sperm into the female genital tract and can be used with controlled ovarian hyperstimulation or in unstimulated cycles. These techniques are referred to as donor insemination (DI) in this report.

ART (assisted reproductive technology): treatments or procedures that involve the in vitro handling of human oocytes (eggs) and sperm or embryos for the purposes of establishing a pregnancy. ART does not include artificial insemination.

Assisted hatching: when the outer layer of the embryo, the zona pellucida, is either thinned or perforated in the laboratory to aid 'hatching' of the embryo, the aim being to potentially improve the chance of implantation in the uterus.

Autologous cycle: an ART treatment cycle in which a woman intends to use or uses her own oocytes or embryos. GIFT cycles are classified separately from autologous cycles.

Blastocyst: an embryo comprising about 100 cells usually developed by 5 or 6 days after fertilisation.

Caesarean section: an operative delivery by surgical incision through the abdominal wall and uterus.

Cleavage stage embryo: an embryo comprising about 8 cells usually developed by 2 or 3 days after fertilisation.

Clinical pregnancy: a pregnancy in which at least one of the following criteria is met:

- known to be ongoing at 20 weeks
- evidence by ultrasound of an intrauterine sac (with or without a fetal heart)
- examination of products of conception reveal chorionic villi, or
- an ectopic pregnancy has been diagnosed by laparoscope or by ultrasound.

Controlled ovarian hyperstimulation: medical treatment to induce the development of multiple ovarian follicles in order to obtain multiple oocytes at oocyte pick-up (OPU).

Cryopreservation: freezing embryos for potential future ART treatment.

Delivery: a birth event in which one or more babies of 20 weeks or more gestation or of 400 grams or more birthweight is born.

DI (donor insemination) cycle: an artificial insemination cycle in which sperm not from the woman's partner (donor sperm) is used.

Discontinued cycle: an ART cycle that does not proceed to oocyte pick-up (OPU) or embryo transfer.

Donation cycle: an ART treatment cycle where a woman intends to donate or donates her oocytes to others. A donation cycle may result in the donation of either oocytes or embryos to a recipient woman. The use of donor sperm does not alter the donor status of the cycle.

Ectopic pregnancy: a pregnancy in which implantation takes place outside the uterine cavity.

Embryo: an egg that has been fertilised by a sperm and has undergone one or more divisions.

Embryo transfer: a procedure whereby embryo(s) are placed in the uterus or fallopian tube. The embryo(s) can be fresh or thawed following cryopreservation and may include the transfer of cleavage stage embryos or blastocysts.

***Freeze-all* cycle:** a fresh cycle where all oocytes or embryos that are potentially suitable for transfer are cryopreserved for potential future use.

Fetal death (stillbirth): the birth of an infant after 20 or more weeks gestation or 400 grams or more birthweight that shows no signs of life.

Fresh cycle: an ART treatment cycle that intends to use or uses embryo(s) that have not been cryopreserved (frozen).

Gestational age: the completed weeks of gestation of the fetus. This is calculated as follows:

- Cycles with embryos transferred: (pregnancy end date – embryo transfer date + 16 days) for transfer of cleavage stage embryos and (pregnancy end date – embryo transfer date + 19 days) for transfer of blastocysts.
- GIFT cycles: (pregnancy end date – OPU date) + 14 days.
- DI cycles: (pregnancy end date – date of insemination) + 14 days.

GIFT (gamete intrafallopian transfer): an ART treatment where mature oocytes and sperm are placed directly into a woman's fallopian tubes so that in vivo fertilisation may take place. GIFT cycles are classified separately from autologous cycles.

Heterotopic pregnancy: a double gestation pregnancy in which implantation takes place both inside and outside the uterine cavity.

ICSI (intracytoplasmic sperm injection): a procedure whereby a single sperm is injected directly into the oocyte to aid fertilisation. If an embryo transfer cycle involves the transfer of at least one embryo created using ICSI, it is counted as an ICSI cycle.

IVF (In vitro fertilisation): an ART procedure that involves extracorporeal fertilisation.

Live birth: according to the World Health Organization (WHO) definition, a live birth is defined as the complete expulsion or extraction from its mother of a product of conception irrespective of the duration of the pregnancy, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of the voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn. In this report, live births are included if they meet the WHO definition and if they are of 20 weeks or more gestation or 400 grams or more birthweight.

Live delivery: a live delivery is the delivery of one or more liveborn infants, with the birth of twins, triplets or more counted as one live delivery.

Low birthweight: a birthweight of less than 2,500 grams.

Oocyte (egg): a female reproductive cell.

OPU (oocyte pick-up): the procedure to collect oocytes from ovaries, usually by ultrasound guided transvaginal aspiration and rarely by laparoscopic surgery.

Parity: a classification of a woman in terms of the number of previous pregnancies experienced that reached 20 weeks or more gestation.

Parous: refers to a woman who has had at least one previous pregnancy of 20 weeks or more gestation.

PGD (preimplantation genetic diagnosis): a procedure where embryonic cells are removed and screened for chromosomal disorders or genetic diseases before embryo transfer.

Nulliparous: refers to a woman who has never had a pregnancy of 20 weeks or more gestation.

Perinatal death: a fetal death (stillbirth) or neonatal death of at least 20 weeks gestation or at least 400 grams birthweight.

Preterm: a gestation of less than 37 weeks.

Recipient cycle: an ART treatment cycle in which a woman receives oocytes or embryos from another woman.

Secondary sex ratio: the number of male liveborn babies per 100 female liveborn babies.

Surrogacy arrangement: an arrangement where a woman, known as the gestational carrier agrees to carry a child for another person or couple, known as the intended parent(s), with the intention that the child will be raised by the intended parent(s). The oocytes and/or sperm used to create the embryo(s) in the surrogacy cycle can be either from the intended parents or from a donor(s).

Thaw cycle: an ART treatment cycle in which cryopreserved embryos are thawed with the intention of performing embryo transfer.

Thawed embryo: an embryo thawed after cryopreservation. It is used in thaw cycles.

Vitrification: an ultra-rapid cryopreservation method that prevents ice formation within the suspension which is converted to a glass-like solid.

Note: The International Committee Monitoring Assisted Reproductive Technologies (ICMART) has published an ART glossary for the terms used in ART data collections (Zegers-Hochschild et al. 2009). However, the terminology used in this report may differ from that in the ICMART glossary.

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