Assisted reproduction technology in Australia and New Zealand 2006

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Please note that as with all statistical reports there is the potential for minor revisions of data in this report over its life. Please refer to the online version at <www.aihw.gov.au>.

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AND
FERTILITY SOCIETY OF AUSTRALIA

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Assisted reproduction technology in Australia and New Zealand 2006

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Requests for data

Enquiries about data for individual fertility centres should be directed to the centre concerned. Other enquiries should be made to the NPSU.

Abbreviations and symbols

AIHW	Australian Institute of Health and Welfare
ANZARD	Australian and New Zealand Assisted Reproduction Database
ART	assisted reproduction technology
DET	double-embryo transfer
DI	donor sperm insemination or artificial insemination with donated sperm
ET	embryo transfer
FSH	follicle-stimulating hormone
g	grams
GIFT	gamete intrafallopian transfer
ICSI	intracytoplasmic sperm injection
IVF	in-vitro fertilisation
NPSU	National Perinatal Statistics Unit
OHSS	ovarian hyperstimulation syndrome
OPU	oocyte pick-up
PGD	preimplantation genetic diagnosis
SET	single-embryo transfer
UNSW	The University of New South Wales
. .	not applicable

Summary

Assisted reproduction technology in Australia and New Zealand 2006 is the twelfth annual report on the use of assisted reproduction technology treatment in Australia and New Zealand. This report provides information on fertility treatment undertaken in 2006, and its pregnancy and birth outcomes.

There were 53,543 treatment cycles reported in Australia and New Zealand in 2006, a 13.7% increase on 2005. Of these cycles in 2006, 90.8% were from Australian fertility centres and 9.2% from New Zealand centres.

Of the treatment cycles in 2006, 22.6% (12,086) resulted in a clinical pregnancy, and 17.3% (9,277) resulted in a live delivery. There were 10,522 babies born to women who had fertility treatment in 2006. This was a 5% increase on 2005.

The average age of women who had fertility treatment in 2006 was 35.6 years, slightly older than the average age (35.2 years) in 2002. The proportion of women aged older than 40 years has increased from 14.3% in 2002 to 16.1% in 2006.

The transfer of blastocysts has increased since 2002. The proportion of blastocyst transfer cycles accounted for 27.1% of all embryo transfer cycles in 2006. This was markedly higher than the 13.9% of all embryo transfers seen in 2002.

Since the Australian and New Zealand Assisted Reproduction Database was established in 2002, there has been a continuous increase in the number of cycles where women received single-embryo transfers. Single-embryo transfer cycles accounted for 56.9% of embryos transfer cycles in 2006, compared with 48.3% in 2005, 40.7% in 2004, 32.0% in 2003 and 28.4% in 2002. The increase in single-embryo transfer cycles resulted in more singleton deliveries. In 2006, the proportion of singleton deliveries following embryo transfer cycles was 88.0% and, consequently, the proportion of twin deliveries was 11.7%, the lowest proportion ever reported.

1 Introduction

Fertility is defined as the ability of an individual to conceive and bear offspring. Infertility is the state of diminished or impaired capacity to do so. Infertility is not an absolute or irreversible condition, but rather a clinical continuum (Carr et al. 2005). To overcome this health condition, assisted reproduction technology (ART) including in-vitro fertilisation (IVF) was introduced. In 1978, the world's first IVF baby, Louise Joy Brown, was born in Great Britain (Steptoe & Edwards 1978).

The first IVF treatment in Australia took place in 1979. This was followed in 1980 by the birth of the first Australian and the world's third IVF baby. The first IVF baby born in New Zealand was in 1983. Gamete intrafallopian transfer (GIFT) was introduced in Australia in 1985 but its use has been in decline in recent years and now accounts for only a small proportion of ART treatment cycles. The first micro-insemination technique for treating male infertility, subzonal insemination, was introduced in 1990. However, this was superseded by the more successful intracytoplasmic sperm injection (ICSI) technique introduced in 1993.

ART encompasses procedures and techniques involving the manipulation of gametes, zygotes and embryos. The main ART procedures include:

- IVF, in which eggs and sperm are combined in the laboratory for fertilisation outside the body and replaced in the uterus
- ICSI, in which a single sperm is injected into an egg for fertilisation outside the body and replaced in the uterus
- GIFT, in which eggs and sperm are placed in the fallopian tubes for fertilisation inside the body.

Embryos arising from IVF and ICSI procedures can be frozen and then used in subsequent ART treatments when they are thawed and transferred to the uterus.

As part of fertility treatment, artificial insemination is provided in medical facilities in Australia and New Zealand. Artificial insemination is a term that covers a range of techniques of placing sperm into the female genital tract.

The Australian and New Zealand Assisted Reproduction Database (ANZARD) was established in 2002, superseding the National Perinatal Statistics Unit (NPSU) – Fertility Society of Australia database that ran from 1985 to 2001. ANZARD collects information on ART treatment and its pregnancy and birth outcomes. Information on artificial insemination using donated sperm (donor sperm insemination (DI)) performed in fertility centres in Australia and New Zealand is also collected by ANZARD.

Assisted reproduction technology in Australia and New Zealand 2006 is the twelfth annual report on the use of ART in Australia and New Zealand. This report is based on data collected from all 28 fertility centres in Australia and 4 in New Zealand in 2006. This report provides information on ART treatment, pregnancy and birth outcomes. Also included are the trends in ART treatment since 2002, and trends of pregnancy and birth outcomes since 1997.

Purpose of this report

The main purpose of *Assisted reproduction technology in Australia and New Zealand 2006* is to provide:

- information on ART treatment cycles and the resulting pregnancy outcomes in Australia and New Zealand
- evidence of quality improvement through monitoring ART treatment practices, success rates and perinatal outcomes
- information to inform standards for accreditation and monitoring of ART centres
- information for national and international comparisons.

Structure of this report

This report has six chapters. Following this introduction, which briefly describes the data used, Chapter 2 presents data on oocyte pick-up (OPU), IVF, ICSI, embryo transfer, the success of these ART treatments and complications of the ART treatment. Chapter 3 presents data on the outcomes, including pregnancies, deliveries and births, from embryo transfer cycles. Chapter 4 presents data on GIFT cycles (including intended GIFT cycles) and surrogacy cycles, and their subsequent outcomes in pregnancies and births. Chapter 5 presents data on DI cycles, and their subsequent outcomes in pregnancies and births. Chapter 6 presents trends in all ART treatments from 2002 to 2006 and trends in the outcomes of ART treatment from 1997 to 2006. Appendix 1 describes the ANZARD data collection used to prepare the report and Appendix 2 presents the data items in ANZARD.

This report is available in PDF format on the NPSU website <www.npsu.unsw.edu.au>. The website also includes supplementary tables (in PDF format).

2 ART treatment in 2006

This chapter presents data on OPU, IVF, ICSI, embryo transfer, the success of ART treatment and complications of ART treatment. Because GIFT cycles (including intended GIFT cycles) and surrogacy cycles accounted for less than 0.3% of all treatment cycles, they are separately presented in Chapter 4. DI cycles are presented in Chapter 5.

2.1 ART treatment overview

ART treatment cycles

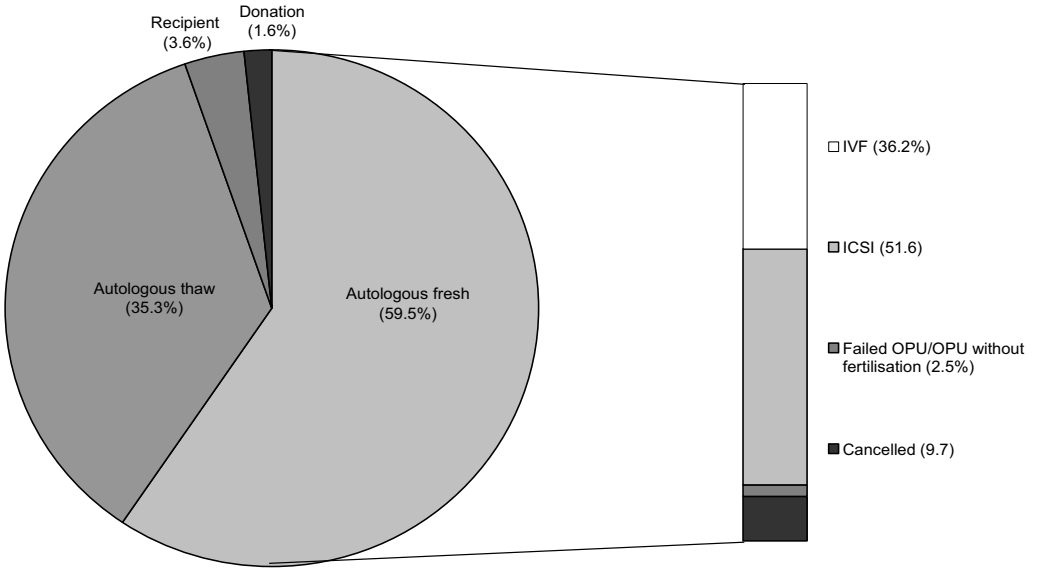
A total of 50,275 ART treatment cycles were reported to ANZARD in Australia and New Zealand in 2006 (Table 1). Of these, 91.5% (45,986) were reported from fertility centres in Australia and 8.5% (4,289) from New Zealand centres. In Australia there were 10.5 cycles per 1,000 women of reproductive age (15–44 years) and in New Zealand there were 4.8 cycles per 1,000 women of reproductive age.

Types of ART treatment cycles

In 2006, about three-fifths of cycles were autologous fresh cycles and over a third were autologous thaw cycles. Donation and recipient cycles accounted for a small proportion of total treatment cycles: 3.6% (1,827) for oocyte/embryo recipient cycles and 1.6% (805) for oocyte donation cycles (Table 1 and Figure 1).

Table 1: Number of ART treatment cycles by treatment type, Australia and New Zealand, 2006

Treatment type	Number	Per cent
Autologous		
Fresh	29,891	59.5
Thaw	17,752	35.3
Oocyte/embryo recipient	1,827	3.6
Oocyte donation	805	1.6
Total	**50,275**	**100.0**



Note: GIFT, DI and surrogacy cycles are not included.

Figure 1: Proportion of ART treatment cycles by treatment type and procedure, Australia and New Zealand, 2006

Fresh cycles

Fresh cycles include cycles in which OPU was performed, cycles in which OPU was cancelled and cycles in which thawed oocytes were used in fertilisation.

Slightly more than half (51.6%) of all autologous fresh cycles used ICSI procedures (15,417) and 36.2% were IVF procedures (10,816). The remaining 12.2% (3,658) of autologous fresh cycles included cycles in which oocytes were not retrieved, cycles in which oocytes were retrieved but no fertilisation occurred, and cycles in which OPU was cancelled (Table 2). There were 19 cycles in which thawed oocytes were used.

Table 2: Number of fresh cycles by treatment type and procedure, Australia and New Zealand, 2006

	Autologous		Oocyte recipient	
Procedure	**Number**	**Per cent**	**Number**	**Per cent**
IVF	10,816	36.2	311	37.3
ICSI	15,417	51.6	521	62.5
Other	3,658[(a)]	12.2	2[(b)]	0.2
Total	**29,891**	**100.0**	**834**	**100.0**

(a) Includes cycles in which oocytes were not retrieved, cycles with oocyte retrieval but no fertilisation and cancelled OPU.

(b) Oocyte recipient cycles without fertilisation.

There were 805 oocyte donation fresh cycles (Table 1) and 834 oocyte recipient fresh cycles (Table 2). Of oocyte recipient fresh cycles, 37.3% (311) had an IVF procedure and 62.5% (521) had an ICSI procedure. No fertilisation occurred in two (0.2%) oocyte recipient fresh cycles.

Thaw cycles

Thaw cycles include ART treatment cycles in which cryopreserved (frozen) embryos are thawed with the intention of a transfer.

In 2006, ICSI cycles were 47.7% (8,475) and IVF cycles were 44.3% (7,864) of all autologous thaw cycles. Oocyte/embryo recipient thaw cycles had similar proportions of ICSI and IVF cycles, 52.7% and 46.4% respectively (Table 3).

Table 3: Number of thaw cycles by treatment type and procedure, Australia and New Zealand, 2006

	Autologous		Oocyte/embryo recipient	
Procedure	**Number**	**Per cent**	**Number**	**Per cent**
IVF	7,864	44.3	461	46.4
ICSI	8,475	47.7	523	52.7
Not stated	1,413	8.0	9	0.9
Total	**17,752**	**100.0**	**993**	**100.0**

OPUs performed in 2006

OPU refers to a medical procedure in which oocytes are collected from ovaries by ultrasound-guided transvaginal aspiration or by laparoscopic surgery.

In 2006, there were 27,821 OPUs performed in Australia and New Zealand. Most OPUs (97.2%) were for the patient's own use. A small proportion (2.8%; 777) of OPUs were performed for oocyte donation. Overall, over one-third (35.9%) of OPUs were performed in women aged 38 years or older (Table 4).

Table 4: Number of OPUs by treatment type and age group, Australia and New Zealand, 2006

	Age groups (years)[a]					
	< 38		≥ 38		All[b]	
Treatment type	**Number**	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**
OPU for own use	17,140	63.4	9,900	36.6	27,044	100.0
OPU for oocyte donation	690	88.8	86	11.1	777	100.0
Total	**17,830**	**64.1**	**9,986**	**35.9**	**27,821**	**100.0**

(a) Age at time of treatment.

(b) Includes cycles in which age was not stated.

Number of embryos transferred per embryo transfer cycle

Of the embryo transfer cycles in 2006, more than half (56.8%) were single-embryo transfers, and 42.2% were double-embryo transfers. Transfer of three or more embryos accounted for about 1% of all embryo transfer cycles in 2006 (Table 5). Single-embryo transfers have shown a continuously increasing trend from 28.4% in 2002 to 56.8% in 2006.

Table 5: Number of embryo transfer cycles by number of embryos transferred per cycle and women's age group, Australia and New Zealand, 2006

	Age group (years)[(a)]						
Number of embryos	**≤ 24**	**25–29**	**30–34**	**35–39**	**40–44**	**≥ 45**	**Total**
				Number			
1	342	2,927	8,105	8,444	3,184	458	23,460
2	97	1,295	4,393	7,011	4,204	402	17,402
≥ 3	0	5	22	57	274	43	401
Total	**439**	**4,227**	**12,520**	**15,512**	**7,662**	**903**	**41,263**
				Per cent			
1	77.9	69.2	64.7	54.4	41.6	50.7	56.8
2	22.1	30.6	35.1	45.2	54.9	44.5	42.2
≥ 3	0.0	0.1	0.2	0.4	3.6	4.8	1.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Age at time of treatment.

The proportion of single-embryo transfer cycles decreased with women's advancing age. In general, women aged 38 years or older had more embryos transferred per cycle than those aged less than 38 years (Figures 2 and 3).

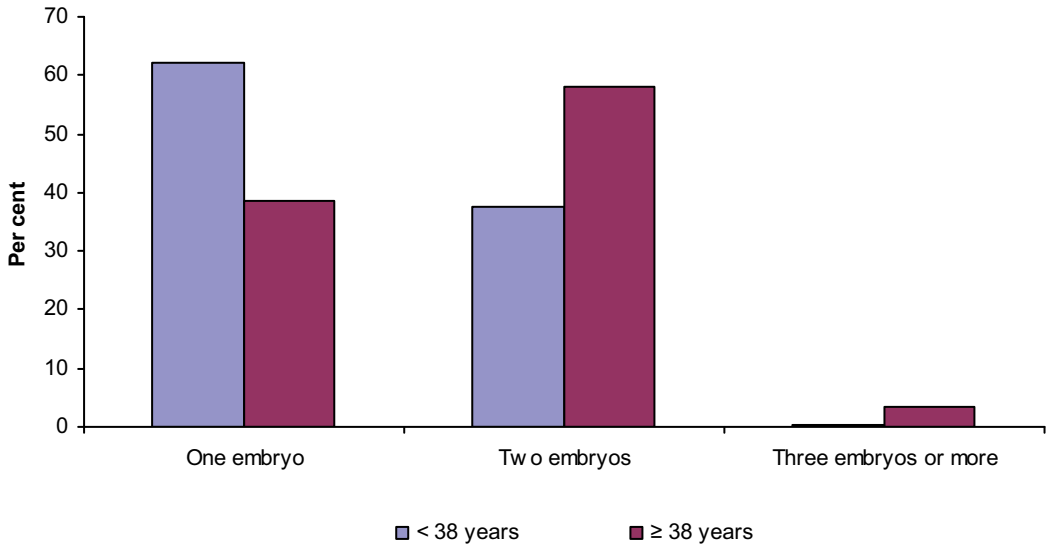


Figure 2: Proportion of fresh embryo transfer cycles by number of embryos transferred per cycle and women's age group, Australia and New Zealand, 2006

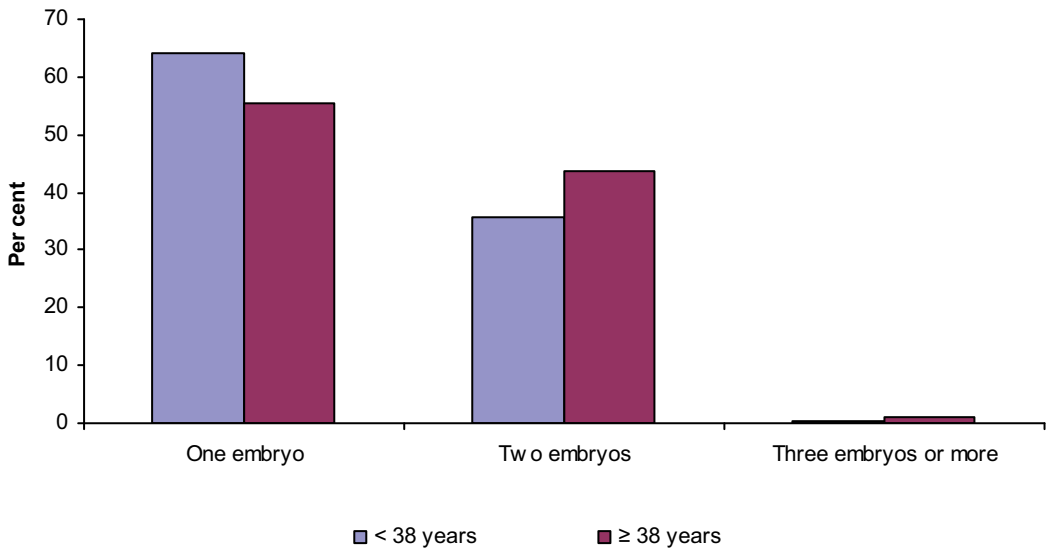


Figure 3: Proportion of thawed embryo transfer cycles by number of embryos transferred per cycle and women's age group, Australia and New Zealand, 2006

Embryo transfer cycles by stage of embryo development

In 2006, blastocyst transfers made up more than one in four (27.1%) embryo transfer cycles. The proportion of blastocyst transfer cycles was marginally higher for thaw cycles (27.7%) than for fresh cycles (26.6%) (Table 6).

Table 6: Number of embryo transfer cycles by treatment type and stage of embryo development, Australia and New Zealand, 2006

	Fresh		Thaw		All	
Stage of embryo development	**Number**	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**
Cleavage stage embryo	17,759	73.4	12,342	72.3	30,101	72.9
Blastocyst	6,428	26.6	4,734	27.7	11,162	27.1
Total	**24,187**	**100.0**	**17,076**	**100.0**	**41,263**	**100.0**

Age of the women and their partners

The average age of women who underwent ART treatment in 2006 was 35.6 years, with over one in five aged 40 years or older (Table 7). Partners of women tended to be older, with an average age of 38.0 years, and just over three in five aged less than 40 years (Table 8). Women who used donated oocytes/embryos were older than women who used their own oocytes (Table 7). Similarly, the partners of women who used donated oocytes/embryos were older than the partners of women who had autologous cycles (Table 8).

Table 7: Number of ART treatment cycles by women's age group, treatment type and procedure, Australia and New Zealand, 2006

	Autologous cycle					
Age group (years)[(a)]	Fresh IVF	Fresh ICSI	Fresh other[(b)]	Thaw	Oocyte/embryo recipient	All
Mean age	*35.6*	*35.4*	*36.7*	*35.0*	*40.7*	*35.6*
			Number			
≤ 24	89	223	52	192	2	558
25–29	1,026	1,715	329	1,913	58	5,041
30–34	3,146	4,495	761	5,910	211	14,523
35–39	4,113	5,714	1,286	6,834	417	18,364
40–44	2,330	3,036	1,111	2,676	684	9,837
≥ 45	112	234	115	227	455	1,143
Not stated	0	0	4	0	0	4
Total	**10,816**	**15,417**	**3,658**	**17,752**	**1,827**	**49,470**
			Per cent			
≤ 24	0.8	1.4	1.4	1.1	0.1	1.1
25–29	9.5	11.1	9.0	10.8	3.2	10.2
30–34	29.1	29.2	20.8	33.3	11.5	29.4
35–39	38.0	37.1	35.2	38.5	22.8	37.1
40–44	21.5	19.7	30.4	15.1	37.4	19.9
≥ 45	1.0	1.5	3.1	1.3	24.9	2.3
Not stated	0.0	0.0	0.1	0.0	0.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Age at time of treatment.

(b) Includes cycles in which oocytes were not retrieved, cycles with oocyte retrieval but no fertilisation and cancelled OPU.

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

Table 8: Number of ART treatment cycles by women's partners' age group, treatment type and procedure, Australia and New Zealand, 2006

Age group (years)[a]	Autologous cycle				Oocyte/embryo recipient	All
	Fresh IVF	Fresh ICSI	Fresh other[b]	Thaw		
Mean age	*37.2*	*38.5*	*38.9*	*37.7*	*40.9*	*38.0*
			Number			
≤ 24	65	60	29	63	2	219
25–29	705	945	168	1,025	48	2,891
30–34	2,884	3,413	689	4,459	232	11,677
35–39	3,623	4,723	1,051	6,028	414	15,839
40–44	2,189	3,230	848	3,475	464	10,206
≥ 45	1,126	2,617	627	2,231	430	7,031
Not stated	224	429	246	471	237	1,607
Total	**10,816**	**15,417**	**3,658**	**17,752**	**1,827**	**49,470**
			Per cent			
≤ 24	0.6	0.4	0.8	0.4	0.1	0.4
25–29	6.5	6.1	4.6	5.8	2.6	5.8
30–34	26.7	22.1	18.8	25.1	12.7	23.6
35–39	33.5	30.6	28.7	34.0	22.7	32.0
40–44	20.2	21.0	23.2	19.6	25.4	20.6
≥ 45	10.4	17.0	17.1	12.6	23.5	14.2
Not stated	2.1	2.8	6.7	2.7	13.0	3.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Age at time of treatment.

(b) Includes cycles in which oocytes were not retrieved, cycles with oocyte retrieval but no fertilisation and cancelled OPU.

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

Single-embryo transfer by women's age

In autologous cycles, nearly three-quarters (74.3%) of single-embryo transfer cycles were in women aged less than 38 years. However, in oocyte/embryo recipient cycles, more than two-thirds (70.1%) of single-embryo transfer cycles were in women aged 38 years or older (Table 9).

Table 9: Number of ART treatment cycles with single-embryo transfer by treatment type and women's age group, Australia and New Zealand, 2006

Treatment type	< 38 years		≥ 38 years		All	
	Number	Per cent	Number	Per cent	Number	Per cent
Autologous						
Fresh	9,444	74.7	3,192	25.3	12,636	100.0
Thaw	7,363	73.7	2,625	26.3	9,988	100.0
Oocyte/embryo recipient						
Fresh	100	30.7	226	69.3	326	100.0
Thaw	150	29.4	360	70.6	510	100.0

Cause of infertility

Causes of infertility are based on clinical diagnosis. However, the diagnostic definitions may vary among fertility centres.

In 2006, 28.7% of autologous and oocyte/embryo recipient cycles had male infertility factor listed as the only cause of infertility; 34.1% of cycles had only female infertility factor(s) reported; 15.2% of cycles had combined male–female infertility factors; and 19.2% of cycles had unexplained infertility. Male infertility factor (alone and combined with female infertility factor) was reported for 43.9% of cycles.

Preimplantation genetic diagnosis (PGD)

In 2006, PGD was performed in 2.0% (874) of all cycles in which embryos were created or thawed. Most PGD cycles (83.9%) were fresh cycles (Table 10). Of all 874 PGD cycles, 72.9% (637) had embryos transferred, 20.8% (182) resulted in a clinical pregnancy and 17.7% (155) resulted in a live delivery (Table 10).

Table 10: Stage/outcome of treatment cycles with preimplantation genetic diagnosis (PGD) by type of embryo, Australia and New Zealand, 2006

	Type of ART treatment		
Stage/outcome of treatment	**Fresh**	**Thaw**	**Total**
Number of cycles with PGD	733	141	874
Number of cycles with PGD that had embryo transferred	527	110	637
Number of cycles with PGD that resulted in a clinical pregnancy	149	33	182
Number of cycles with PGD that resulted in a live delivery	133	22	155
Clinical pregnancies per PGD cycle (%)	*20.3*	*23.4*	*20.8*
Live deliveries per PGD cycle (%)	*18.1*	*15.6*	*17.7*

Ovarian hyperstimulation syndrome

ANZARD includes morbidity information that is specifically related to ART treatment. Ovarian hyperstimulation syndrome (OHSS) is a complication of ovulation induction therapy, which involves the administration of drugs to stimulate follicular development.

OHSS and other morbidity data are reported by patients and clinicians, and validated with hospital records by fertility centre staff. It is possible this information is under-reported as there is no nationally agreed definition for OHSS.

There were 244 OHSS cases reported in 2006. Of these, 218 (89.3%) were reported as being admitted to hospital. There were 240 OHSS cases in which OPUs were performed. Overall, OHSS occurred in 0.9% cycles that involved an OPU (Table 11).

Table 11: Number of OPUs with ovarian hyperstimulation syndrome (OHSS) by number of oocytes collected, Australia and New Zealand, 2006

	Number of oocytes collected						
	None	1–4	5–9	10–14	15–19	≥ 20	All
OPUs with OHSS	0	2	33	61	64	80	240
All OPUs	463	6,013	9,650	6,502	3,167	2,026	27,821
OHSS per OPU cycle (%)	*0.0*	*0.0*	*0.3*	*0.9*	*2.0*	*3.9*	*0.9*

2.2 Autologous ART treatment in 2006

2.2.1 Autologous ART treatment overview

In this report, autologous ART treatment is defined as treatment in which the woman's own oocyte/embryo were used.

Of all 47,643 autologous ART treatment cycles in 2006, 91.6% (43,623) were from fertility centres in Australia and 8.4% (4,020) were from New Zealand centres.

2.2.2 Autologous fresh cycles

Autologous fresh cycles include cycles in which OPU is performed, cycles in which thawed oocyte(s) are used in fertilisation, and cancelled cycles in which follicle-stimulating hormone (FSH) is administered.

Oocyte collections

Of the 29,891 initiated autologous fresh cycles, 90.2% had an OPU and 88.7% had oocytes collected, 84.0% had oocytes fertilised, and 3.2% had embryos frozen without transfer. Overall, the rate of transferring embryos from autologous fresh cycles was 78.5% in 2006.

The highest rate (82.3%) was among women in the 30–34 years age group in 2006. Cycles of women aged 45 years or older had the lowest rates, with only 84.8% of initiated cycles having an OPU, 78.1% having oocytes collected, and 61.0% having embryos transferred (Table 12).

Table 12: Stage/outcome of autologous fresh cycles by women's age group, Australia and New Zealand, 2006

Age group (years) [(a)]	Initiated cycles (number)	Cycles with OPU performed (per cent)	Cycles with oocyte collected (per cent)	Cycle with oocyte fertilised (per cent)	Cycles with embryo transferred (per cent)
≤ 24	364	88.2	87.6	83.8	70.9
25–29	3,070	90.4	89.9	86.6	78.5
30–34	8,402	92.4	91.7	88.3	82.3
35–39	11,113	90.7	89.4	84.9	80.2
40–44	6,477	87.1	84.0	77.0	72.1
≥ 45	461	84.8	78.1	64.9	61.0
Total[(b)]	**29,891**	**90.2**	**88.7**	**84.0**	**78.5**

(a) Age at time of treatment.

(b) Includes cycles in which woman's age was not stated.

Clinical pregnancies and deliveries from autologous fresh cycles

The outcome of autologous fresh cycles can be measured in a number of ways, depending on the stage of treatment and the outcome used. Table 13 presents the various measures that can be derived.

In 2006, 25.2% of initiated autologous fresh cycles resulted in a clinical pregnancy and 19.6% resulted in a live delivery. However, 32.1% of embryo transfer cycles had in a clinical pregnancy and 25.0% had a live delivery (Table 13).

Table 13: Clinical pregnancies and live deliveries from autologous fresh cycles, Australia and New Zealand, 2006

Stage of treatment	Cycles that resulted in a clinical pregnancy	Cycles that resulted in a delivery	Cycles that resulted in a live delivery
		Per cent	
Initiated cycles	25.2 (7,535/29,891)	19.8 (5,930/29,891)	19.6 (5,861/29,891)
Embryo transfers	32.1 (7,535/23,459)	25.3 (5,930/23,459)	25.0 (5,861/23,459)

Figure 4 shows:

- the total number of initiated autologous fresh cycles
- the number of cycles in which embryos were transferred.

It also shows the number of initiated autologous fresh cycles that resulted in:

- a clinical pregnancy
- a delivery
- a live delivery.

Treatment can be discontinued for a variety of reasons, including failure of ovaries to respond to drugs, failure of oocyte fertilisation, inadequate embryo growth, development of treatment side effects, patient choice or failure of the embryo(s) to implant in the uterus.

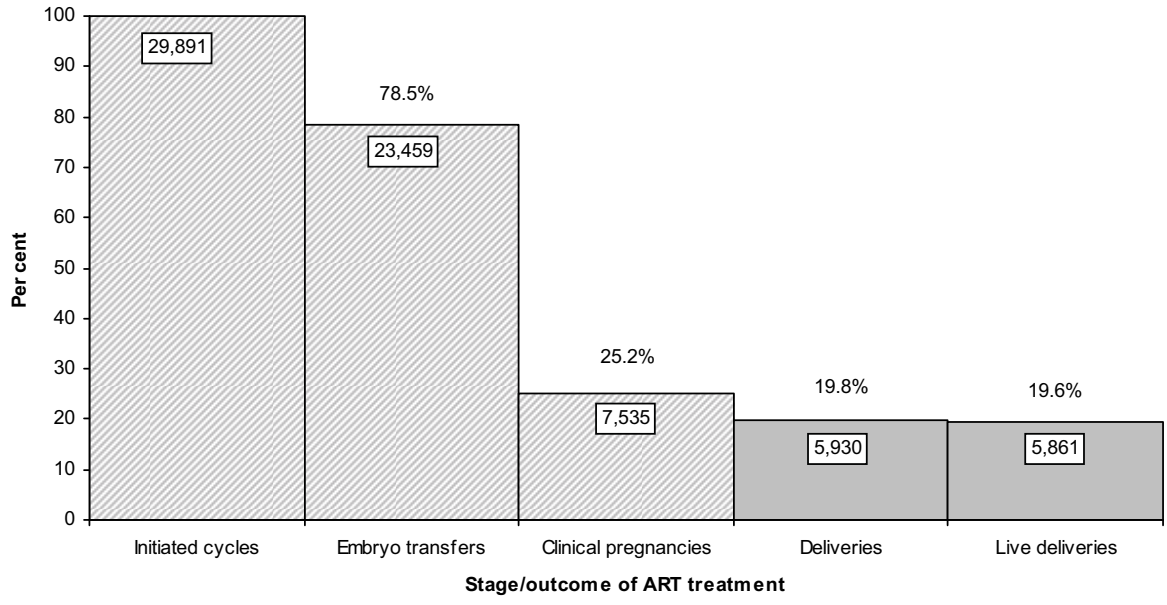


Figure 4: Progression of autologous fresh cycles, Australia and New Zealand, 2006

Live deliveries from autologous fresh cycles by women's age

Women's reproductive age is one of the key factors associated with the outcomes of ART treatment when women use their own oocytes. Figure 5 shows the proportion of initiated cycles that resulted in a live delivery for autologous fresh cycles in 2006 by women's age. Women aged between 21 and 32 years had higher rates. These rates then declined steadily for women older than 32 years. For women aged 45 years or more the live delivery rate was 0.7% in 2006.

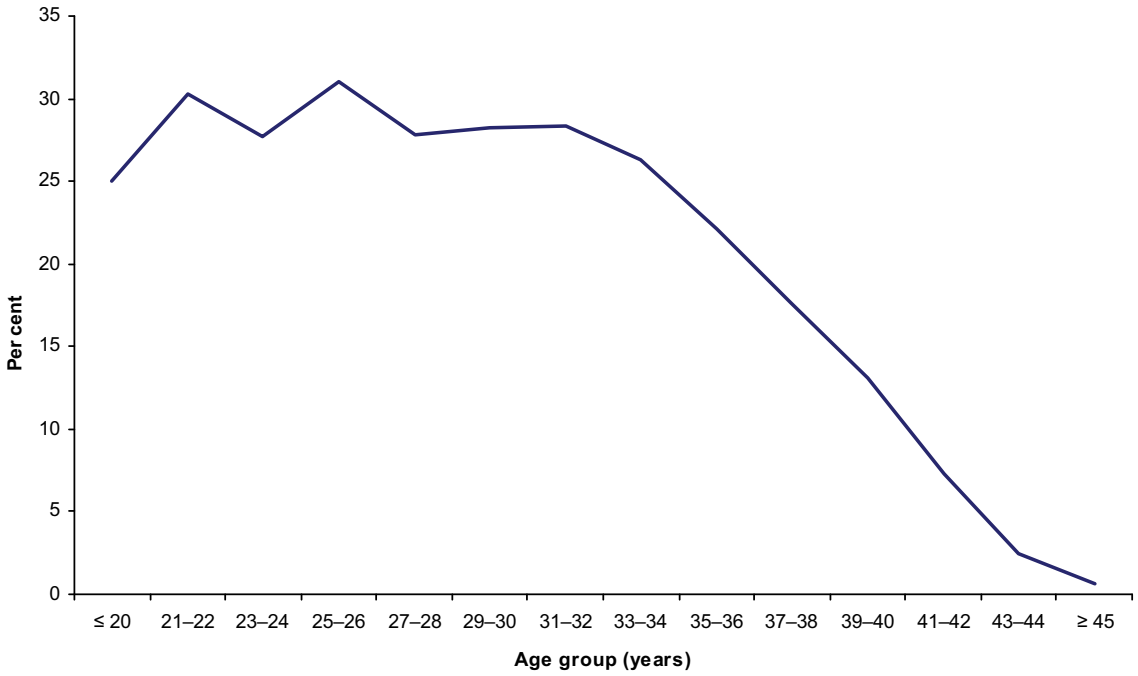


Figure 5: Proportion of autologous fresh cycles that resulted in a live delivery by women's age group, Australia and New Zealand, 2006

In 2006, the highest rate of live deliveries per embryo transfer cycle was in women aged 24 years or younger (39.5%), but the rate declined with advancing women's age. For women aged 40–44 years, the chance of having a liveborn baby following an embryo transfer cycle was 9.9% in 2006. This rate declined to 1.1% in women aged 45 years or older (Table 14).

Table 14: Live deliveries from autologous fresh cycles by stage/outcome of treatment and women's age group, Australia and New Zealand, 2006

	Age group (years)[a]						
Stage/outcome of treatment	**≤ 24**	**25–29**	**30–34**	**35–39**	**40–44**	**≥ 45**	**All[b]**
Initiated cycles	364	3,070	8,402	11,113	6,477	461	29,891
Embryo transfers	258	2,416	6,918	8,917	4,669	281	23,459
Clinical pregnancies	120	1,038	2,775	2,814	779	9	7,535
Live deliveries	102	866	2,312	2,118	460	3	5,861
Live deliveries per initiated cycle (%)	*28.0*	*28.2*	*27.5*	*19.1*	*7.1*	*0.7*	*19.6*
Live deliveries per transfer cycle (%)	*39.5*	*35.8*	*33.4*	*23.8*	*9.9*	*1.1*	*25.0*
Live deliveries per clinical pregnancy (%)	*85.0*	*83.4*	*83.3*	*75.3*	*59.1*	*33.3*	*77.8*

(a) Age at time of treatment.

(b) Includes cycles in which women's age was not stated.

Clinical pregnancies and live deliveries by ART procedure

For autologous fresh embryo transfer cycles undertaken in 2006, the rates of clinical pregnancy and live delivery were similar in IVF cycles and ICSI cycles. For IVF embryo transfer cycles, 32.4% resulted in a clinical pregnancy and 25.0% resulted in a live delivery. For ICSI embryo transfer cycles, 31.9% resulted in a clinical pregnancy and 24.9% resulted in a live delivery (Table 15).

Table 15: Clinical pregnancies and live deliveries from autologous fresh embryo transfer cycles by stage/outcome of treatment and procedure, Australia and New Zealand, 2006

Stage/outcome of treatment	**IVF**	**ICSI**
Embryo transfers	9,530	13,929
Clinical pregnancies	3,088	4,447
Live deliveries	2,386	3,475
Clinical pregnancies per transfer cycle (%)	*32.4*	*31.9*
Live deliveries per transfer cycle (%)	*25.0*	*24.9*

Clinical pregnancies and live deliveries by stage of embryo development

For autologous fresh embryo transfer cycles undertaken in 2006, the rates of clinical pregnancy and live delivery were higher in blastocyst transfer cycles than in cleavage stage embryo transfer cycles. Of blastocyst transfer cycles, 37.3% resulted in a clinical pregnancy and 28.5% resulted in a live delivery. Of cleavage stage embryo transfer cycles, 30.2% resulted in a clinical pregnancy and 23.7% resulted in a live delivery (Table 16).

Table 16: Clinical pregnancies and live deliveries from autologous fresh embryo transfer cycles by stage/outcome of treatment and stage of embryo development, Australia and New Zealand, 2006

Stage/outcome of treatment	Cleavage stage embryo	Blastocyst
Embryo transfers	17,216	6,243
Clinical pregnancies	5,206	2,329
Live deliveries	4,081	1,780
Clinical pregnancies per transfer cycle (%)	*30.2*	*37.3*
Live deliveries per transfer cycle (%)	*23.7*	*28.5*

Clinical pregnancies and live deliveries by cause of infertility

Cycles reported with male infertility factor as the only cause of infertility had the highest rates of clinical pregnancy and live delivery. Of there cycles, 21.9% of initiated autologous fresh cycles resulted in a live delivery (Table 17). Those with female infertility factors had comparatively low live delivery rate per initiated cycle (17.2%).

Table 17: Number of autologous fresh cycles that resulted in a live delivery by cause of infertility, Australia and New Zealand, 2006

Cause of infertility	Initiated cycles (number)	Cycles with embryo transfer (per cent)	Cycles that resulted in a clinical pregnancy (per cent)	Cycles that resulted in a live delivery (per cent)
Male factor only	8,847	82.5	27.9	21.9
Female factor				
Tubal disease only	2,208	81.6	23.0	18.2
Endometriosis only	1,878	79.2	23.9	18.2
Other female factor only	4,521	70.3	21.2	16.3
Combined female factor	1,086	76.2	23.8	17.2
Combined male–female factor	4,587	78.7	24.5	19.1
Unexplained	6,169	78.8	26.5	20.7
Not stated	595	66.9	23.0	18.0
Total	**29,891**	**78.5**	**25.2**	**19.6**

Live deliveries from autologous fresh cycles among fertility centres

The live delivery rate for autologous fresh ART treatment varied among the fertility centres in Australia and New Zealand in 2006, ranged between 2.8% and 29.2% (Table 18).

Variation in live delivery rate among fertility centres is measured using quartiles which rank individual centres' success rates with the success of the top and bottom 25% of centres.

In autologous fresh cycles in 2006, the top 25% (first quartile) of fertility centres had live delivery rates between 23.0% and 29.2%. The bottom 25% (fourth quartile) of fertility centres had rates between 2.8% and 15.5%. The remaining 50% of fertility centres had rates between 15.6% and 22.9% (Table 18).

Table 18: Live deliveries from autologous fresh cycles by women's age group and quartiles of live delivery rate, fertility centres, Australia and New Zealand, 2006

	Live deliveries per initiated autologous fresh cycle (%)				
Age group (years)[a]	**Mean**	**First quartile**	**Second quartile**	**Third quartile**	**Fourth quartile**
< 38	25.3	27.8–33.3	25.8–27.7	18.6–25.7	3.6–18.5
≥ 38	10.2	12.0–57.1	9.8–11.9	8.0–9.7	1.5–7.9
All[b]	19.6	23.0–29.2	20.4–22.9	15.6–20.3	2.8–15.5

(a) Age at time of treatment.

(b) Includes cycles in which women's age was not stated.

The live delivery rate was 19.6% for autologous fresh cycles in all centres in Australia and New Zealand. Women aged less than 38 years had a much higher rate (25.3%) than those aged 38 years or older (10.2%).

Figure 6 shows the average live delivery rate and the 25th and 75th percentiles for autologous fresh cycles with embryos transferred by stage of embryo development in all fertility centres. Single-blastocyst transfers (unadjusted for women's age) achieved the highest crude rate (31.8%) of live deliveries per embryo transferred. Half of the fertility centres that carried out single-blastocyst transfers in 2006 achieved a live delivery rate between 22.3% and 43.8% per single-blastocyst transfer cycle.

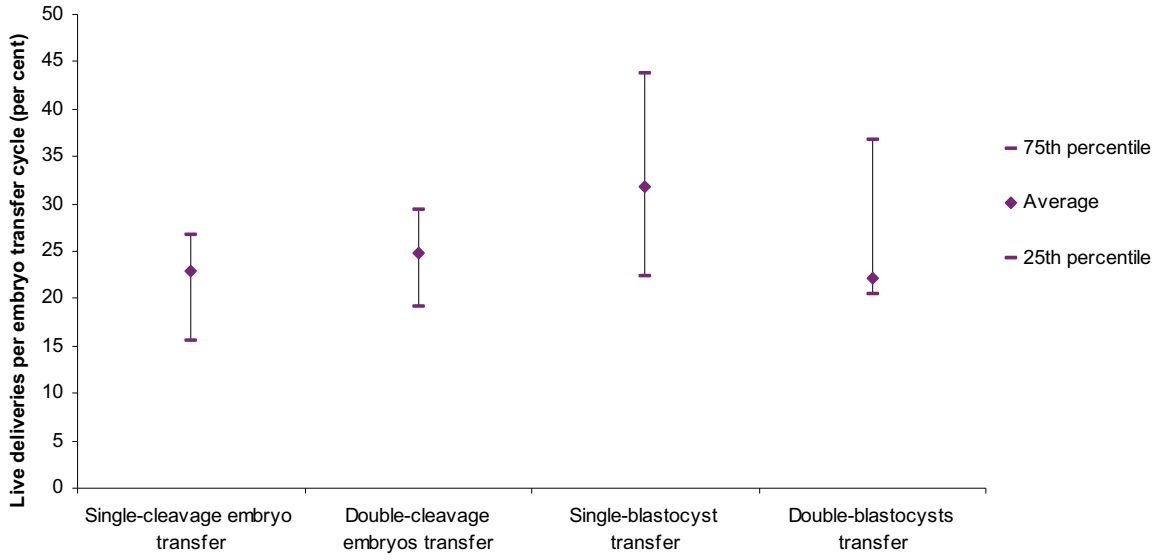


Figure 6: Proportion of autologous fresh cycles with embryo transfer that resulted in a live delivery by number of embryos transferred and stage of embryo development, fertility centres, Australia and New Zealand, 2006

2.2.3 Autologous thaw cycles

Autologous thaw cycles include cycles, with or without a transfer, that involve thawing woman's own cryopreserved (frozen) embryos with the intention of a transfer.

Clinical pregnancies and live deliveries

Figure 7 shows:

- the total number of initiated autologous thaw cycles
- the number of cycles in which embryos were transferred.

It also shows the number of initiated autologous thaw cycles that resulted in:

- a clinical pregnancy
- a delivery
- a live delivery.

In 2006, 15.5% of the 17,752 initiated autologous thaw cycles resulted in a live delivery. This is lower than the rate of autologous fresh cycles, in which 19.6% of initiated cycles resulted in a live delivery (Figures 4 and 7).

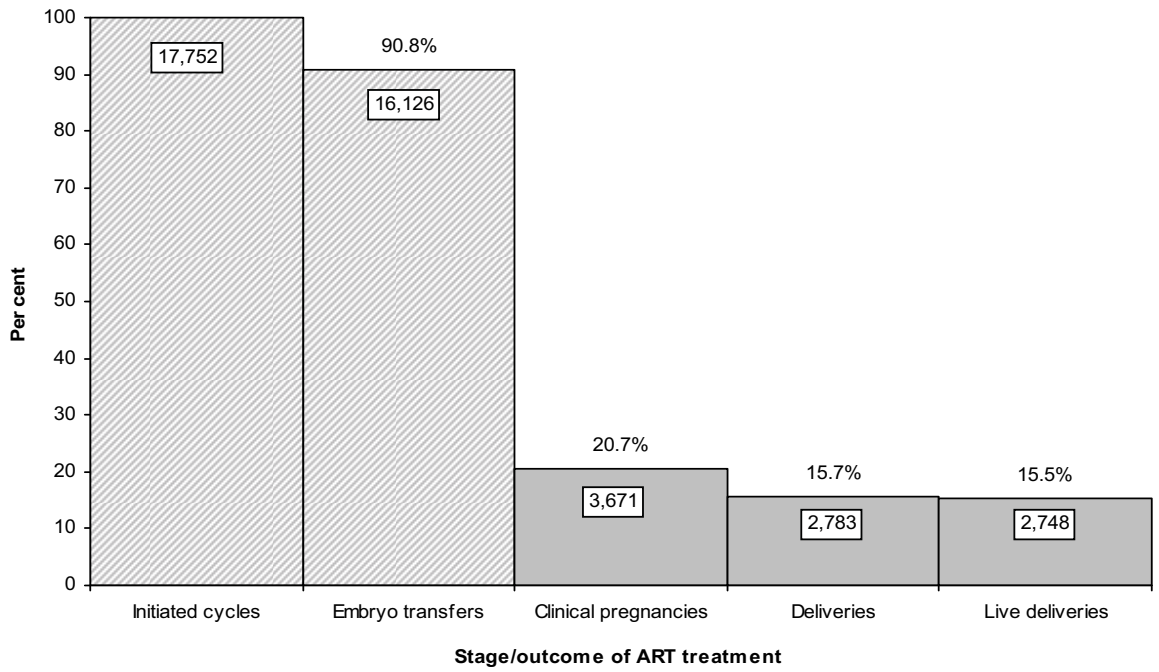


Figure 7: Progression of autologous thaw cycles, Australia and New Zealand, 2006

Live deliveries from autologous thaw cycles by women's age

The live delivery rates per initiated autologous thaw cycle varied by women's age group. Women aged 24 years or younger had the highest live delivery rate (24.0%). Similar to women in autologous fresh cycles, the live delivery rates declined with advancing women's age. For women aged 40 years or older, the live delivery rate was 8.1% per initiated autologous thaw cycle (Table 19 and Figure 8).

Table 19: Live deliveries from autologous thaw cycles by stage/outcome of treatment and women's age group, Australia and New Zealand, 2006

	Age group (years)[(a)]						
Stage/outcome of treatment	**≤ 24**	**25–29**	**30–34**	**35–39**	**40–44**	**≥ 45**	**All**
Initiated cycles	192	1,913	5,910	6,834	2,676	227	17,752
Embryo transfers	179	1,755	5,405	6,206	2,387	194	16,126
Clinical pregnancies	58	486	1,401	1,340	356	30	3,671
Live deliveries	46	373	1,100	995	215	19	2,748
Live deliveries per initiated cycle (%)	*24.0*	*19.5*	*18.6*	*14.6*	*8.0*	*8.4*	*15.5*
Live deliveries per transfer cycle (%)	*25.7*	*21.3*	*20.4*	*16.0*	*9.0*	*9.8*	*17.0*
Live deliveries per clinical pregnancy (%)	*79.3*	*76.7*	*78.5*	*74.3*	*60.4*	*63.3*	*74.9*

(a) Age at time of treatment.

Figure 8 shows the proportion of initiated cycles that resulted in a live delivery by women's age. As for autologous fresh cycles, the live delivery rates declined steadily after the age of 32 years.

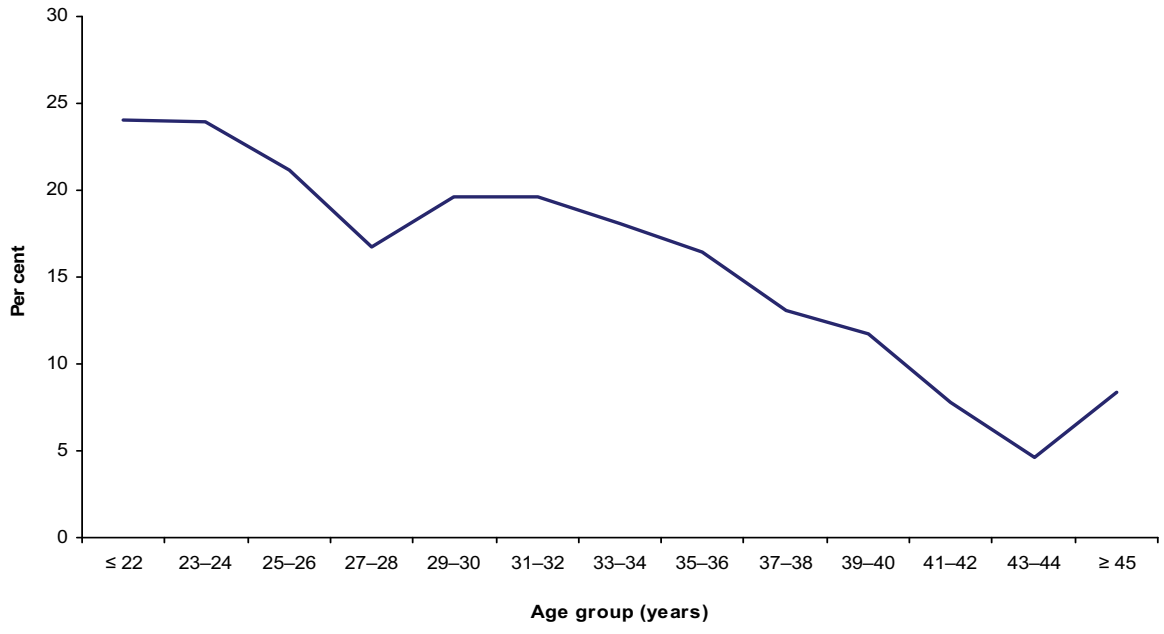


Figure 8: Proportion of autologous thaw cycles that resulted in a live delivery by women's age group, Australia and New Zealand, 2006

Clinical pregnancies and live deliveries by ART procedure

Amongst autologous thaw cycles where embryos were transferred, both the clinical pregnancy rate per transfer cycle and the live delivery rate per transfer cycle were marginally higher for ICSI cycles (23.2% and 17.7% respectively) than for IVF cycles (22.2% and 16.3% respectively) (Table 20).

Table 20: Clinical pregnancies and live deliveries from autologous thaw cycles with embryo transfer by stage/outcome of treatment and procedure, Australia and New Zealand, 2006

Stage/outcome of treatment	IVF	ICSI	Unknown
Embryo transfers	7,274	8,046	806
Clinical pregnancies	1,616	1,864	191
Live deliveries	1,187	1,425	136
Clinical pregnancies per transfer cycle (%)	*22.2*	*23.2*	*23.7*
Live deliveries per transfer cycle (%)	*16.3*	*17.7*	*16.9*

Clinical pregnancies and live deliveries by stage of embryo development

As for autologous fresh cycles, the rates for clinical pregnancies and live deliveries per autologous thaw embryo transfer cycle were higher for blastocyst transfers than for cleavage stage embryo transfers. A quarter of blastocyst transfer cycles resulted in a clinical pregnancy and 18.6% resulted in a live delivery. Of cleavage stage embryo transfer cycles, 21.8% resulted in a clinical pregnancy and 16.4% resulted in a live delivery (Table 21). However, these rates were markedly lower than the rates in autologous fresh cycles (Table 16).

Table 21: Clinical pregnancies and live deliveries from autologous thaw cycles with embryo transfer by stage/outcome of treatment and stage of embryo development, Australia and New Zealand, 2006

Stage/outcome of treatment	Cleavage stage embryo	Blastocyst
Embryo transfers	11,553	4,573
Clinical pregnancies	2,517	1,154
Live deliveries	1,898	850
Clinical pregnancies per transfer cycle (%)	*21.8*	*25.2*
Live deliveries per transfer cycle (%)	*16.4*	*18.6*

Clinical pregnancies and live deliveries by cause of infertility

Couples who had male infertility factor as the only cause of infertility had a higher live delivery rate (16.8%) per autologous thaw cycle compared with couples who had only female infertility factors (14.2%) (Table 22).

Table 22: Number of autologous thaw cycles that resulted in a live delivery by cause of infertility, Australia and New Zealand, 2006

Cause of infertility	Initiated cycles (number)	Cycles with embryo transfer (per cent)	Cycles that resulted in a clinical pregnancy (per cent)	Cycles that resulted in a live delivery (per cent)
Male factor only	5,112	91.6	22.1	16.8
Female factor				
Tubal disease only	1,558	90.2	18.4	14.2
Endometriosis only	1,149	90.7	20.6	15.7
Other female factor only	3,014	91.6	19.4	13.7
Combined female factor	635	89.9	20.2	14.3
Combined male–female factor	2,665	89.6	20.5	15.2
Unexplained	3,042	90.6	21.0	16.2
Not stated	577	90.8	21.0	15.1
Total	**17,752**	**90.8**	**20.7**	**15.5**

Live deliveries from autologous thaw cycles among fertility centres

In 2006, the live delivery rate per initiated autologous thaw cycle among fertility centres ranged from 0.0% to 25.6% (Table 23).

Amongst the top 25% (first quartile) of fertility centres, the live delivery rate of autologous thaw cycles ranged from 16.8% to 25.6%. The bottom 25% (fourth quartile) fertility centres achieved rates between 0.0% and 11.8%. The intermediate 50% of fertility centres achieved rates between 11.9% and 16.7% (Table 23).

The live delivery rate was nearly twice as high for women aged less than 38 years (17.8%) than for women aged 38 years or older (9.9%).

Table 23: Live deliveries from autologous thaw cycles by women's age group and quartiles of success, fertility centres, Australia and New Zealand, 2006

Age group (years)	Live deliveries per initiated autologous thaw cycle (%)				
	Mean	First quartile	Second quartile	Third quartile	Fourth quartile
< 38	17.8	20.1–32.3	17.3–20.0	13.5–17.2	0.0–13.4
≥ 38	9.9	10.9–15.5	9.1–10.8	5.6–9.0	2.4–5.5
All	**15.5**	**16.8–25.6**	**15.0–16.7**	**11.9–14.9**	**0.0–11.8**

Figure 9 shows the average live delivery rate per initiated autologous thaw cycle and 25th and 75th percentiles by stage of embryo development among fertility centres. In autologous thaw cycles, double-blastocyst transfers had the highest live delivery rate, followed by double-cleavage embryo transfers. The average live delivery rate in single-blastocyst transfers was higher (17.6%) than in single-cleavage embryo transfers (14.7%).

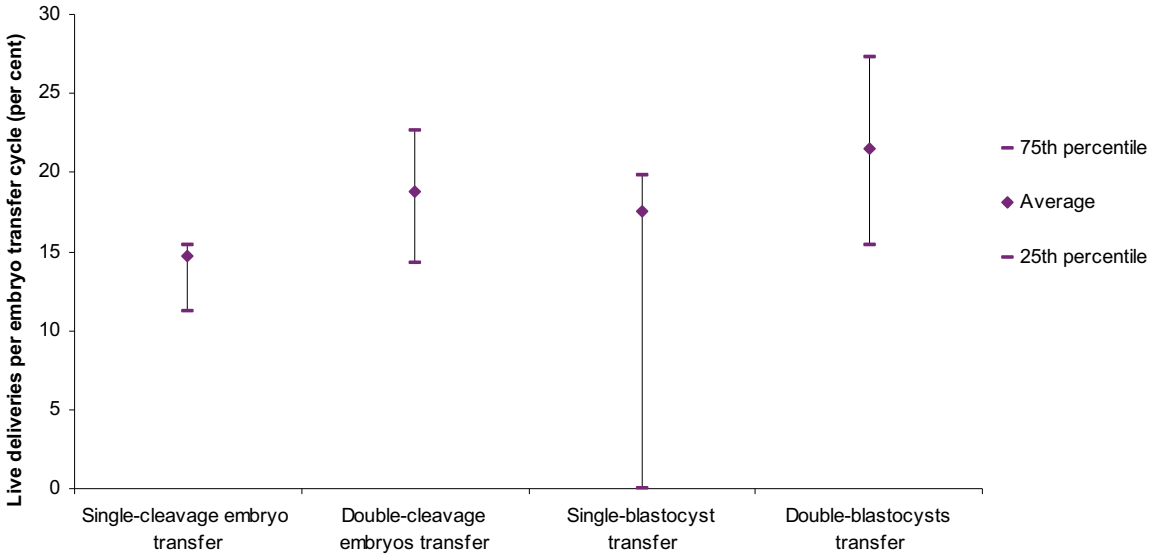


Figure 9: Proportion of autologous thaw cycles with embryo transfer that resulted in a live delivery by number of embryos transferred and stage of embryo development, fertility centres, Australia and New Zealand, 2006

2.3 Donation and recipient cycles in 2006

A donation cycle is a treatment cycle where the patients donate their oocytes, embryos or gametes to others. A recipient cycle is one in which the patients receive donated oocytes, embryos or gametes for their own ART treatment.

In 2006, donation and recipient cycles accounted for 5.2% (2,632) of all treatment cycles (Table 1). Of all donation and recipient cycles, 1,639 (62.3%) cycles were fresh cycles and 993 (37.7%) were thaw cycles.

2.3.1 Oocyte donation cycles

There were 805 initiated oocyte donation cycles reported in Australia and New Zealand in 2006, which included 28 (3.5%) cancelled cycles for oocyte donation (Figure 10). Nearly 94% of the initiated oocyte donation cycles resulted in donations.

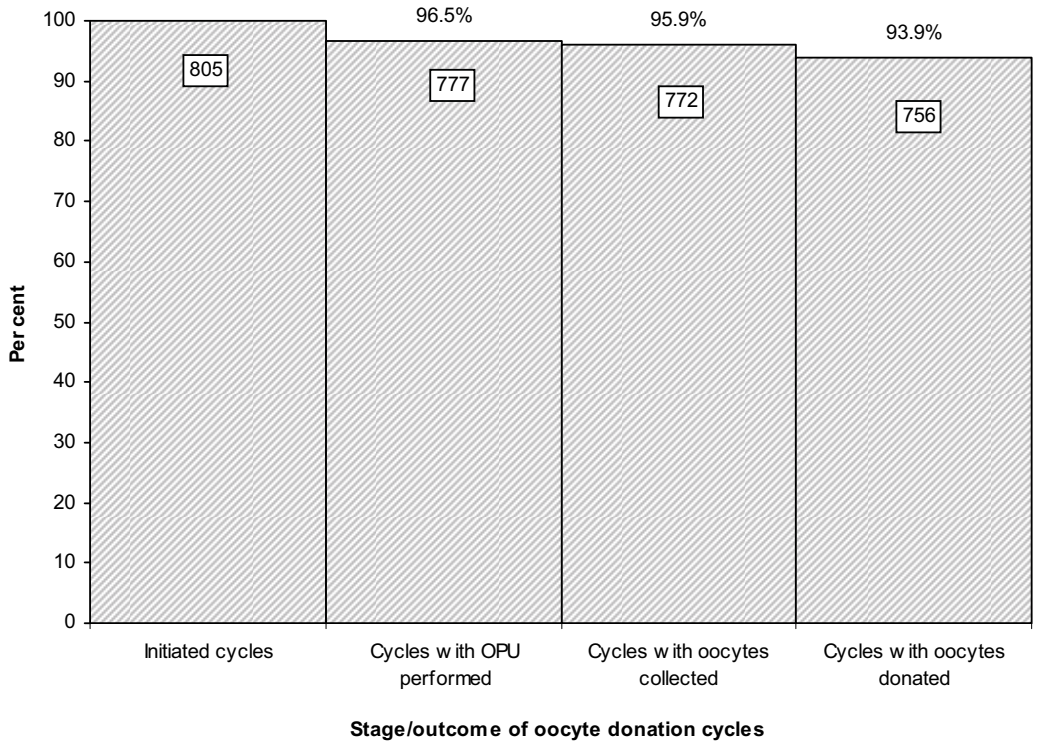


Figure 10: Progression of oocyte donation cycles, Australia and New Zealand, 2006

Of women who donated or intended to donate their oocytes in 2006, three-quarters were aged between 30 and 39 years. The most successful women in achieving an oocyte donation following initiated cycles were in the age group of 25–29 years, with 95.7% of cycles donating oocytes (Table 24).

Table 24: Stage/outcome of oocyte donation cycles by donor's age group, Australia and New Zealand, 2006

Age group (years) [(a)]	Initiated cycles (number)	Cycles with OPU performed (per cent)	Cycles with oocyte collected (per cent)	Cycles with oocyte donated (per cent)
≤ 24	41	97.6	97.6	92.7
25–29	117	98.3	97.4	95.7
30–34	323	96.0	95.4	92.9
35–39	290	96.2	95.9	94.5
≥ 40	33	97.0	93.9	93.9
Total[(b)]	**805**	**96.5**	**95.9**	**93.9**

(a) Age at time of treatment.

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

2.3.2 Oocyte/embryo recipient cycles

There were 1,827 oocyte/embryo recipient cycles reported in 2006 (Table 1). The average age of women receiving donated oocytes/embryos was 40.7 years in 2006. Of these recipient cycles, 89.8% (1,640) were oocyte recipient cycles and 10.2% (187) were embryo recipient cycles.

Clinical pregnancies and live deliveries from oocyte/embryo recipient cycles

Figure 11 shows the number of recipient cycles in which embryos were transferred. It also shows the number of recipient cycles with embryo transfer that resulted in a clinical pregnancy, delivery or a live delivery.

Overall, 21.1% (354 of 1,678) of recipient cycles following embryo transfers resulted in the delivery of a liveborn baby.

Of 1,502 oocyte recipient cycles in which embryos were transferred, 28.4% resulted in a clinical pregnancy and 21.6% resulted in a live delivery. Of 176 embryo recipient cycles in which embryos were transferred, 25.0% resulted in a clinical pregnancy and 16.5% resulted in a live delivery.

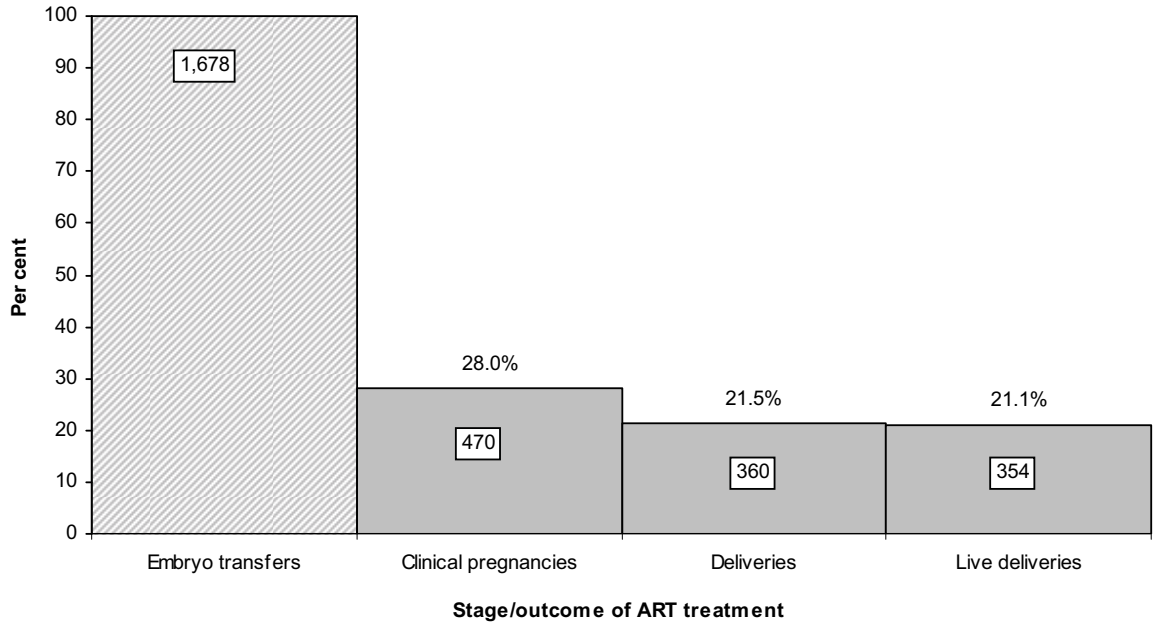


Figure 11: Progression of oocyte/embryo recipient cycles following embryo transfers, Australia and New Zealand, 2006

Live deliveries from oocyte/embryo recipient cycles by recipient's age

The proportion of recipient cycles with embryo transfers that resulted in a live delivery varied by recipient's age group. In 2006, recipients aged less than 35 years had a lower live delivery rate of 18.4%, compared with 21.6% for recipients aged 35 years or older (Table 25).

Table 25: Live deliveries from oocyte/embryo recipient cycles by stage/outcome of treatment and recipient's age group, Australia and New Zealand, 2006

	Age group (years)[(a)]					
Stage/outcome of treatment	**≤ 29**	**30–34**	**35–39**	**40–44**	**≥ 45**	**All**
Embryo transfers	58	197	389	606	428	1678
Clinical pregnancies	15	50	114	157	134	470
Live deliveries	10	37	88	117	102	354
Live deliveries per transfer cycle (%)	*17.2*	*18.8*	*22.6*	*19.3*	*23.8*	*21.1*
Live deliveries per clinical pregnancy (%)	*66.7*	*74.0*	*77.2*	*74.5*	*76.1*	*75.3*

(a) Age at time of treatment.

Clinical pregnancies and live deliveries by ART procedure

The proportion of oocyte/embryo recipient cycles with embryo transfers that resulted in a live delivery was higher in fresh cycles than in thaw cycles (Table 26). IVF cycles had higher live delivery rates (29.1% in fresh cycles and 17.5% in thaw cycles) than ICSI cycles (26.3% and 15.3% respectively).

Table 26: Clinical pregnancies and live deliveries from oocyte/embryo recipient cycles by treatment type and procedure, Australia and New Zealand, 2006

	Fresh		Thaw	
Stage/outcome of treatment	**IVF**	**ICSI**	**IVF**	**ICSI**
Embryo transfers	275	453	439	509
Clinical pregnancies	106	148	103	113
Live deliveries	80	119	77	78
Clinical pregnancies per transfer cycle (%)	*38.5*	*32.7*	*23.5*	*22.2*
Live deliveries per transfer cycle (%)	*29.1*	*26.3*	*17.5*	*15.3*

Clinical pregnancies and live deliveries by stage of embryo development

Transfer of fresh blastocysts in recipient cycles had a higher live delivery rate of 28.6% per embryo transfer cycle compared with the live delivery rate (26.9%) for transfer of fresh cleavage stage embryos (Table 27). Thaw cycles transferring blastocysts had a markedly higher live delivery rate (21.7%) than thaw cycles transferring cleavage stage embryos (15.2%).

Table 27: Clinical pregnancies and live deliveries from oocyte/embryo recipient cycles by treatment type and stage of embryo, Australia and New Zealand, 2006

	Fresh		Thaw	
Stage/outcome of treatment	**Cleavage stage embryo**	**Blastocyst**	**Cleavage stage embryo**	**Blastocyst**
Embryo transfers	543	185	789	161
Clinical pregnancies	179	75	173	43
Live deliveries	146	53	120	35
Clinical pregnancies per transfer cycle (%)	*33.0*	*40.5*	*21.9*	*26.7*
Live deliveries per transfer cycle (%)	*26.9*	*28.6*	*15.2*	*21.7*

3 Pregnancies, deliveries and births following embryo transfer cycles in 2006

3.1 Clinical pregnancies and deliveries following embryo transfer cycles in 2006

Clinical pregnancies overview

There were 11,676 embryo transfer cycles in 2006 that resulted in a clinical pregnancy in Australia and New Zealand. Of these cycles, 10,399 (89.1%) were from fertility centres in Australia, and 1,277 (10.9%) were from New Zealand centres.

In 2006, less than one in five (2,302 of 11,676) clinical pregnancies did not reach 20 weeks gestation. Over three-quarters (77.7%; 9,073) of clinical pregnancies had a delivery. There were 301 (2.6%) clinical pregnancies without information on gestational age and birthweight as the women were unable to be followed up or contacted by the fertility centres.

Early pregnancy loss

There were 2,302 early pregnancy losses reported following embryo transfers in 2006. Of these, 89.4% were miscarriages, 7.3% were ectopic or heterotopic pregnancies and 3.3% were due to fetal reduction or termination of pregnancy (Table 28).

Autologous cycles with ICSI had the highest proportion (4.1%) of ectopic/heterotopic pregnancies and the highest proportion (8.7%) of reductions/terminations.

Table 28: Number of embryo transfer cycles that resulted in a clinical pregnancy of < 20 weeks gestation by pregnancy outcome, treatment type and procedure, Australia and New Zealand, 2006

	Autologous			Oocyte/embryo recipient	All
Pregnancy outcome	Fresh IVF	Fresh ICSI	Thaw		
			Number		
Miscarriage	522	717	729	91	2,059
Reduction or termination	22	34	18	2	76
Ectopic or heterotopic pregnancy	37	72	51	7	167
Total	**581**	**823**	**798**	**100**	**2,302**
			Per cent		
Miscarriage	89.8	87.1	91.4	91.0	89.4
Reduction or termination	3.8	4.1	2.3	2.0	3.3
Ectopic or heterotopic pregnancy	6.4	8.7	6.4	7.0	7.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Deliveries

There were 9,073 deliveries following embryo transfers in 2006. Of these, 98.8% delivered at least one liveborn baby. Fetal deaths accounted for 1.1% of all deliveries in 2006 (Table 29).

The proportion of live deliveries among all deliveries following autologous fresh cycles was similar to the proportion following autologous thaw cycles, but slightly higher than for oocyte/embryo recipient cycles. For oocyte recipient cycles that resulted in a delivery, 98.5% were live deliveries. For embryo recipient cycles that resulted in a delivery, 96.7% were live deliveries.

Table 29: Number of embryo transfer cycles that resulted in a delivery by delivery outcome, treatment type and procedure, Australia and New Zealand, 2006

	Autologous			Oocyte/embryo recipient	All
Delivery outcome	Fresh IVF	Fresh ICSI	Thaw		
			Number		
Live delivery	2,386	3,475	2,748	354	8,963
Fetal death[(a)]	28	35	33	5	101
Not stated	3	3	2	1	9
Total	**2,417**	**3,513**	**2,783**	**360**	**9,073**
			Per cent		
Live delivery	98.7	98.9	98.7	98.3	98.8
Fetal death[(a)]	1.2	1.0	1.2	1.4	1.1
Not stated	0.1	0.1	0.1	0.3	0.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

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

Proportion of multiple gestation pregnancies by the number of embryos transferred

Of all clinical pregnancies, 43.9% followed double-embryo transfer cycles and 55.4% followed single-embryo transfer cycles. This proportion of single-embryo transfer cycles was higher than in 2005 (43.9%) (Wang et al. 2007) and 2004 (34.6%) (Wang et al. 2006). A small proportion (0.7%) of clinical pregnancies resulted from the transfer of more than two embryos (Table 30).

Multiple gestation pregnancies are closely related to the number of embryos transferred in ART treatment. Two fetal hearts were detected in 21.9% of clinical pregnancies following double-embryo transfer cycles. This was markedly higher than the 2.1% of clinical pregnancies following single-embryo transfer cycles (Table 30).

Table 30: Number of embryo transfer cycles that resulted in a clinical pregnancy by number of fetal hearts and number of embryos transferred, Australia and New Zealand, 2006

Number of fetal hearts	One		Two		Three or more		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
0[(a)]	468	7.2	343	6.7	12	14.1	823	7.0
1	5,652	87.4	3,334	65.0	53	62.4	9,039	77.4
2	135	2.1	1,121	21.9	10	11.8	1,266	10.8
3	2	0.0	32	0.6	0	0.0	34	0.3
4	2	0.0	0	0.0	0	0.0	2	0.0
Not stated	206	3.2	296	5.8	10	11.8	512	4.4
Total	**6,465**	**100.0**	**5,126**	**100.0**	**85**	**100.0**	**11,676**	**100.0**

(a) No fetal heart detected at the time of ultrasound.

Note: A clinical pregnancy fulfils one of the following criteria: 1. Known to be ongoing at 20 weeks; 2. Evidence by ultrasound of an intrauterine sac (with or without a fetal heart); 3. Examination of products of conception reveal chorionic villi; or 4. An ectopic pregnancy has been diagnosed by laparoscope or by ultrasound.

Multiple gestation deliveries by the number of embryos transferred

Of the 9,073 deliveries following embryo transfer cycles in 2006, 12.0% (1,086) were multiple deliveries (Table 31). This proportion of multiple deliveries was lower than in 2005 (14.0%) (Wang et al. 2007) and in 2004 (16.3%) (Wang et al. 2006).

There were 1,064 twin deliveries in 2006, accounting for 11.7% of all deliveries. The majority of twin deliveries were from double-embryo transfer cycles (89.8%; 955/1,064). Among deliveries following double-embryo transfer cycles, the proportion of twin deliveries was 24.1%. Among deliveries following single-embryo transfer cycles, 2.0% were twin deliveries.

There were 21 triplet deliveries and one quadruplet delivery following embryo transfer cycles in 2006.

Table 31: Number of embryo transfer cycles that resulted in a delivery by gestation and number of embryos transferred, Australia and New Zealand, 2006

Gestation	One		Two		Three		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Singleton	4,946	97.9	2,994	75.4	47	88.7	7,987	88.0
Twin	103	2.0	955	24.1	6	11.3	1,064	11.7
Higher order multiple	2	0.0	20	0.5	0	0.0	22	0.3
Total	**5,051**	**100.0**	**3,969**	**100.0**	**53**	**100.0**	**9,073**	**100.0**

Multiple gestation delivery by maternal age

The average age (at delivery) of women who had a delivery following embryo transfer cycles in 2006 was 34.7 years. This is 4.9 years older than the average age (29.8 years) of women who gave birth in Australia in 2005 (Laws et al. 2007).

Women aged less than 38 years had a higher proportion of multiple gestation deliveries compared with women aged 38 years or older (12.5% and 10.6% respectively) (Table 32).

Table 32: Number of embryo transfer cycles that resulted in a delivery by gestation and maternal age group, Australia and New Zealand, 2006

	Age group (years)[(a)]					
	< 38		≥ 38		Total	
Gestation	Number	Per cent	Number	Per cent	Number	Per cent
Singleton	5,839	87.5	2,148	89.4	7,987	88.0
Multiple	*831*	*12.5*	*255*	*10.6*	*1,086*	*12.0*
Twin	812	12.2	252	10.5	1,064	11.7
Triplet	18	0.3	3	0.1	21	0.2
Quadruplet	1	0.0	0	0.0	1	0.0
Total	**6,670**	**100.0**	**2,403**	**100.0**	**9,073**	**100.0**

(a) Age at time of delivery.

Caesarean section

In 2006, more than one in two deliveries following embryo transfer cycles was by caesarean section (Table 33). The proportion of deliveries by caesarean section increased marginally from 50.0% in 2005 (Wang et al. 2007) to 50.9% in 2006.

There was a marked difference in the caesarean section rate for singleton deliveries (47.1%) compared with twin deliveries (78.5%) (Table 33).

Table 33: Number of embryo transfer cycles that resulted in a delivery by gestation and method of delivery, Australia and New Zealand, 2006

	Singleton		Twin		Triplet		Total	
Method of delivery	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Caesarean section	3,762	47.1	835	78.5	19	86.4	4,616	50.9
Other	4,219	52.8	228	21.4	2	9.1	4,449	49.0
Not stated	6	0.1	1	0.1	1	4.5	8	0.1
Total	**7,987**	**100.0**	**1,064**	**100.0**	**22**	**100.0**	**9,073**	**100.0**

The rate of caesarean section deliveries following embryo transfer cycles increased with advancing women's age at delivery. For women aged less than 38 years, 47.5% had a caesarean section. For women aged 38 years or older, the rate was 60.2%. The lowest rate of caesarean section deliveries was 36.5% in women aged less than 25 years (Table 34).

Table 34: Number of embryo transfer cycles that resulted in a delivery by method of delivery and maternal age group, Australia and New Zealand, 2006

	Age group (years)[(a)]								
Method of delivery	**≤ 24**	**25–29**	**30–34**	**35–39**	**40–44**	**≥ 45**	**Total**	**< 38**	**≥ 38**
					Number				
Caesarean section	35	410	1,461	1,918	663	129	4,616	3,169	1,447
Other	61	595	1,703	1,639	421	30	4,449	3,496	953
Not stated	0	0	4	4	0	0	8	5	3
Total	**96**	**1,005**	**3,168**	**3,561**	**1,084**	**159**	**9,073**	**6,670**	**2,403**
					Per cent				
Caesarean section	36.5	40.8	46.1	53.9	61.2	81.1	50.9	47.5	60.2
Other	63.5	59.2	53.8	46.0	38.8	18.9	49.0	52.4	39.7
Not stated	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1
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.

3.2 Outcomes of babies conceived from embryo transfer cycles in 2006

Babies in this section were born at 20 weeks or more gestational age or of 400 grams or more birthweight following embryo transfer cycles in 2006.

3.2.1 Baby outcomes

There were 10,182 babies born to women who had embryo transfer cycles in 2006. Of these babies, 88.8% were from fertility centres in Australia and 11.2% from New Zealand centres. Of babies born to women who had embryo transfer cycles in 2006, 78.4% were singletons, 20.9% were twins and 0.7% were higher order multiples. There were 10,038 liveborn babies, representing 98.6% of all babies.

Proportion of preterm birth for babies

The average gestational age of babies born to women who had embryo transfer cycles in 2006 was 37.6 weeks (Table 35). This is similar to the average gestational age of babies born to women who had embryo transfer cycles in 2005 (37.5 weeks) (Wang et al. 2007), but less than the average gestational age of 38.8 weeks for all babies born in Australia in 2005 (Laws et al. 2007).

Less than a quarter (21.5%) of babies were preterm (less than 37 weeks gestation), which is markedly higher than the proportion of preterm babies (8.1%) born in Australia in 2005 (Laws et al. 2007). The high proportion of babies born preterm is related to the higher proportion of multiple births among babies born to women who had ART treatment.

The average gestational age of singletons born to women who had embryo transfer cycles in 2006 was 38.4 weeks, for twins it was 34.9 weeks and for higher order multiples, 30.9 weeks. One in ten singletons was born preterm. Multiples had much higher proportions of preterm babies. For twins it was 59.1% and all higher order multiples were preterm (Table 35).

Table 35: Number of babies born to women who had embryo transfer cycles by gestational age and plurality, Australia and New Zealand, 2006

Gestational age (weeks)	Singleton		Twin		Higher order multiple		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Mean (weeks)	*38.4*		*34.9*		*30.9*		*37.6*	
≤ 27	95	1.2	100	4.7	13	19.4	208	2.0
28–31	86	1.1	148	7.0	9	13.4	243	2.4
32–36	679	8.5	1,010	47.5	45	67.2	1,734	17.0
≥ 37	7,127	89.2	870	40.9	0	0.0	7,997	78.5
Total	**7,987**	**100.0**	**2,128**	**100.0**	**67**	**100.0**	**10,182**	**100.0**
≤ 36	*860*	*10.8*	*1,258*	*59.1*	*67*	*100.0*	*2,185*	*21.5*

Figure 12 shows the distribution of gestational age for singletons and twins born to women who had embryo transfer cycles in 2006. The proportions of preterm singletons (10.8%) and twins (59.1) born to women who had embryo transfer cycles in 2006 were higher than the proportions of preterm singletons and twins born in Australia in 2005 (6.5% and 53.1% respectively) (Laws et al. 2007).

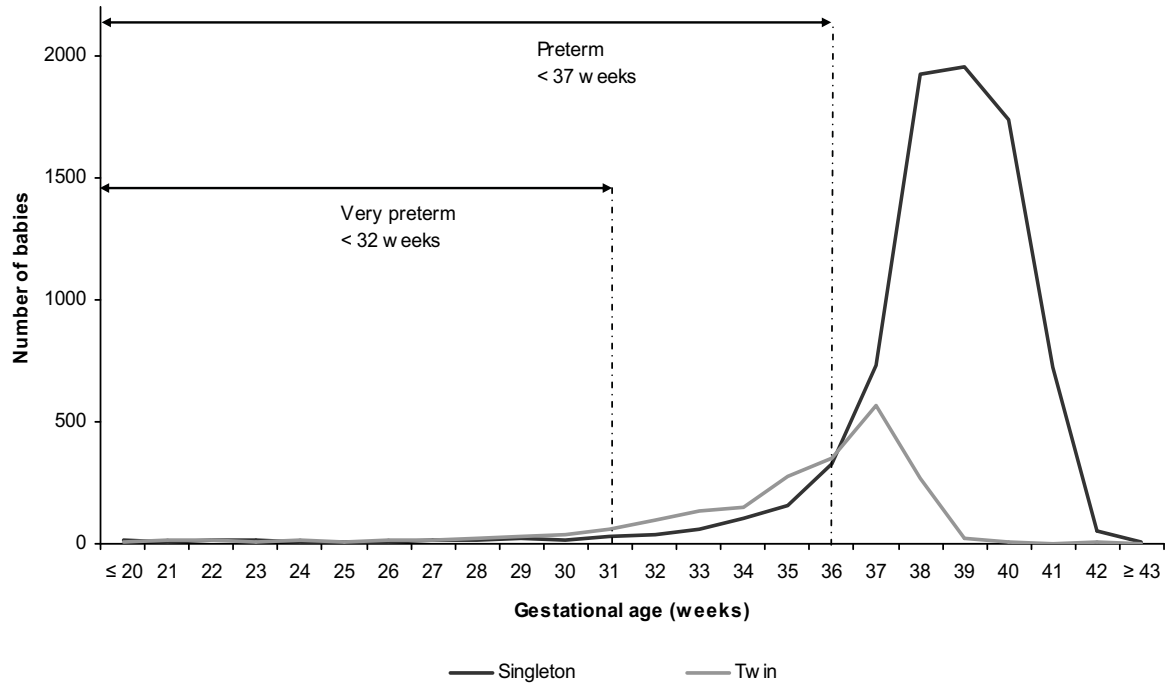


Figure 12: Number of babies born to women who had embryo transfer cycles by gestational age, Australia and New Zealand, 2006

Proportion of low birthweight in liveborn babies

The average birthweight for liveborn babies to women who had embryo transfer cycles in 2006 was 3,110 grams. This is slightly higher than the average birthweight of 3,079 grams for liveborn babies to women who had embryo transfer cycles in 2005 (Wang et al. 2007).

Less than one in five (16.8%) liveborn babies in 2006 was low birthweight (< 2,500 grams), which is less than the low birthweight rate of liveborn babies to women who had embryo transfer cycles in 2005 (18.4%) (Wang et al. 2007). Just over 3% of liveborn babies in 2006 were very low birthweight (< 1,500 grams) (Table 36).

As with gestational age, the high proportion of low birthweight will reflect the high proportion of multiple births amongst babies conceived after embryo transfer cycles.

Table 36: Number of liveborn babies to women who had embryo transfer cycles by birthweight group and plurality, Australia and New Zealand, 2006

	Singleton		Twin		Higher order multiple		Total	
Birthweight (g)	**Number**	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**
Mean (g)	*3,314*		*2,377*		*1,721*		*3,110*	
< 1,000	45	0.6	65	3.1	8	13.1	118	1.2
1,000–1,499	53	0.7	135	6.5	7	11.5	195	1.9
1,500–1,999	122	1.5	264	12.7	22	36.1	408	4.1
2,000–2,499	335	4.2	616	29.5	19	31.1	970	9.7
2,500–2,999	1,294	16.4	703	33.7	5	8.2	2,002	19.9
3,000–3,499	2,992	37.9	251	12.0	0	0.0	3,243	32.3
3,500–3,999	2,233	28.3	29	1.4	0	0.0	2,262	22.5
≥ 4,000	769	9.7	2	0.1	0	0.0	771	7.7
Not stated	49	0.6	20	1.0	0	0.0	69	0.7
Total	**7,892**	**100.0**	**2,085**	**100.0**	**61**	**100.0**	**10,038**	**100.0**
< 2,500	*555*	*7.0*	*1,080*	*51.8*	*56*	*91.8*	*1,691*	*16.8*

Figure 13 shows the distribution of birthweights for liveborn singletons and twins to women who had embryo transfer cycles in 2006. It also shows the difference in the average birthweights of liveborn singletons and liveborn twins. Singletons had an average birthweight of 3,314 grams, compared with 2,377 grams for twins (average birthweights indicated by vertical lines). Of liveborn singletons, 7.0% were low birthweight (Table 36), which is markedly higher than the proportion of low birthweight singletons (4.8%) born in Australia in 2005 (Laws et al. 2007). Of liveborn twins, 51.8% were low birthweight, which is slightly higher than the proportion of low birthweight twins (49.7%) born in Australia in 2005 (Laws et al. 2007).

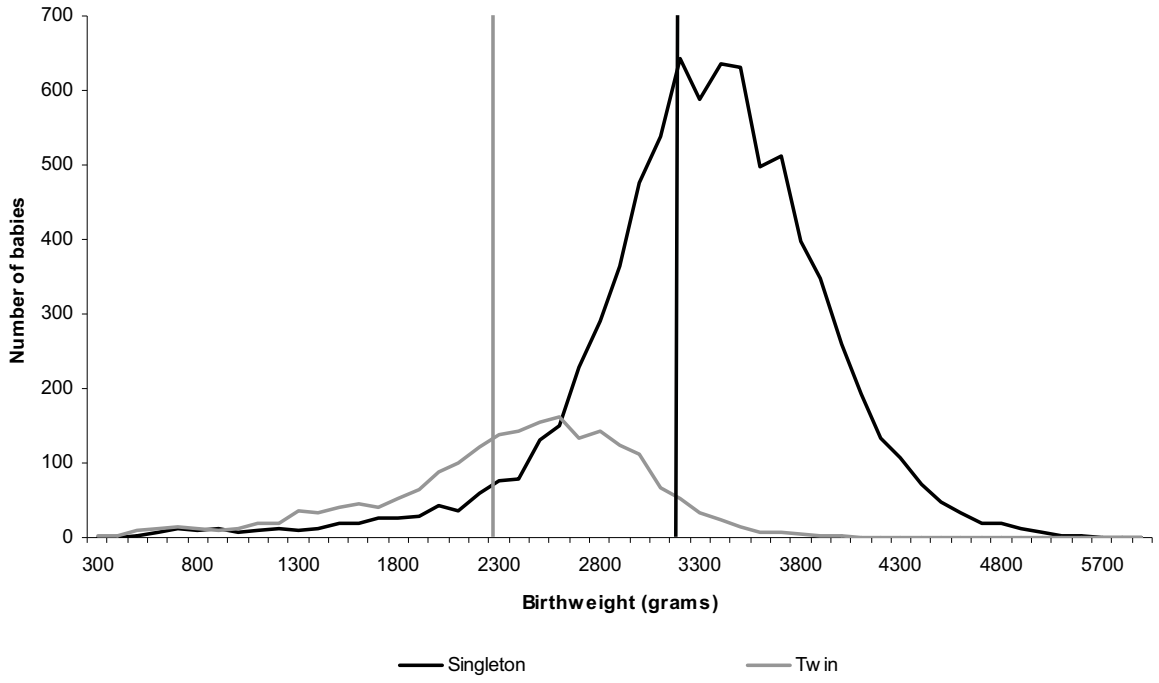


Figure 13: Number of liveborn babies to women who had embryo transfer cycles by birthweight and plurality, Australia and New Zealand, 2006

Sex distribution in liveborn babies

For liveborn babies to women who had embryo transfer cycles in 2006, there were 103.0 male babies for every 100 female babies. For liveborn babies to women who had autologous fresh IVF embryo transfer cycles in 2006, the ratio was 113.2. For liveborn babies to women who had autologous fresh ICSI embryo transfer cycles, the ratio was 100.5 (Table 37).

Table 37: Number of liveborn babies to women who had embryo transfer cycles by sex, treatment type and procedure, Australia and New Zealand, 2006

Sex	Autologous			Oocyte/embryo recipient	All
	Fresh IVF	Fresh ICSI	Thaw		
			Number		
Male	1,422	1,965	1,518	186	5,091
Female	1,256	1,956	1,512	218	4,942
Not stated	1	3	1	0	5
Total	**2,679**	**3,924**	**3,031**	**404**	**10,038**
			Per cent		
Male	53.1	50.1	50.1	46.0	50.7
Female	46.9	49.8	49.9	54.0	49.2
Ratio[(a)]	*113.2*	*100.5*	*100.4*	*85.3*	*103.0*

(a) Number of males to 100 females.

Perinatal mortality in all babies

Perinatal mortality is a measure for fetal deaths (stillbirths) and the deaths of liveborn babies occurring within 28 days of birth (neonatal deaths). There were 178 perinatal deaths in 2006. Of these, 134 were fetal deaths and 44 were neonatal deaths. The perinatal death rate in 2006 was 17.5 deaths per 1,000 births (Table 38). This is lower than the rate of 19.3 deaths per 1,000 births to women who had ART treatment in 2004 (Wang et al. 2006), but higher than the rate of 14.7 deaths per 1,000 births to women who had embryo transfer cycles in 2005 (Wang et al. 2007).

Table 38: Perinatal mortality of babies born to women who had embryo transfer cycles by type of death and plurality, Australia and New Zealand, 2006

Type of death	Singleton	Twin	Higher order multiple	Total
		Number		
Fetal deaths	87	41	6	134
Neonatal deaths	8	31	5	44
Perinatal deaths[(a)]	**95**	**72**	**11**	**178**
		Rate per 1,000 births		
Fetal deaths per 1,000 births	*10.9*	*19.3*	*89.6*	*13.2*
Neonatal deaths per 1,000 live births	*1.0*	*14.9*	*82.0*	*4.4*
Perinatal deaths per 1,000 births[(b)]	*11.9*	*33.8*	*164.2*	*17.5*

(a) Perinatal deaths are reported by patients to fertility centre staff. These data are not official vital statistics.

(b) Fetal and perinatal death rates were calculated using all births (live births and fetal deaths) to women who had ART treatment in 2006. Neonatal death rates were calculated using all live births to women who had embryo transfer cycles in 2006.

Singletons had the lowest perinatal mortality rate, 11.9 deaths per 1,000 births, and twins had a higher rate of 33.8 deaths per 1,000 births (Table 38).

In 2006, information relating to birth outcomes was not stated for less than 2.6% of clinical pregnancies. Even for cycles in which there is successful follow-up, data are limited by the self-reported nature of the information, especially on pregnancy complications and infant morbidity. Data on perinatal mortality should be interpreted with caution because of the small numbers and potential variability in case reporting.

3.2.2 Baby outcomes—single-embryo transfer and double-embryo transfer

There were 5,159 babies born to women who had a single-embryo transfer (SET) in 2006, and 4,964 babies born to women who had a double-embryo transfer (DET). Most SET babies (95.9%) were singletons. Three in five (60.3%) DET babies were singletons.

Perinatal outcomes of babies born following SET and DET

The adverse perinatal outcomes of babies born to women who had ART treatment can be measured in the proportions of preterm babies (born before 37 weeks gestation), babies born with low birthweight (less than 2,500 grams) and perinatal deaths. Table 39 presents the perinatal outcomes of babies born to women who had single-embryo transfers in 2006. Table 40 presents the perinatal outcomes of babies from double-embryo transfers.

The proportion of preterm babies was 12.7% for SET babies and 30.6% for DET babies.

Similarly, only 9.1% of SET liveborn babies were low birthweight, compared with 24.9% of DET liveborn babies (tables 39 and 40). SET liveborn babies in 2006 on average had a birthweight of 3,287 grams. This is markedly higher than the average birthweight of 2,926 grams for DET liveborn babies.

SET babies in 2006 had a lower perinatal death rate (12.6 deaths per 1,000 births), compared with DET babies (22.6 deaths per 1,000 births) (tables 39 and 40).

Table 39: Perinatal outcomes of babies born to women who had single-embryo transfer cycles by plurality, Australia and New Zealand, 2006

	Singleton		Multiple		Total	
Perinatal outcome	**Number**	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**
Gestational age (weeks)						
≥ 37	4,448	89.9	58	27.2	4,506	87.3
< 37	498	10.1	155	72.8	653	12.7
Total	**4,946**	**100.0**	**213**	**100.0**	**5,159**	**100.0**
Birthweight of liveborn babies (grams)						
≥ 2,500	4,526	92.5	71	35.1	4,597	90.3
< 2,500	334	6.8	131	64.9	465	9.1
Not stated	31	0.6	0	0.0	31	0.6
Total	**4,891**	**100.0**	**202**	**100.0**	**5,093**	**100.0**
Baby outcome						
Live birth—survived	4,887	98.8	202	94.8	5,089	98.6
Live birth—neonatal death	4	0.1	0	0.0	4	0.1
Fetal death	50	1.0	11	5.2	61	1.2
Not stated	5	0.1	0	0.0	5	0.1
Total	**4,946**	**100.0**	**213**	**100.0**	**5,159**	**100.0**
Perinatal deaths per 1,000 births[(a)(b)]		*10.9*		*51.6*		*12.6*

(a) Perinatal deaths are reported by patients to fertility centre staff. These data are not official vital statistics.

(b) Perinatal death rates were calculated using all births (live births and fetal deaths) to women who had embryo transfer cycles in 2006.

Table 40: Perinatal outcomes of babies born to women who had double embryo transfer cycles by plurality, Australia and New Zealand, 2006

	Singleton		Multiple		Total	
Perinatal outcome	**Number**	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**
Gestational age (weeks)						
≥ 37	2,637	88.1	810	41.1	3,447	69.4
< 37	357	11.9	1,160	58.9	1,517	30.6
Total	**2,994**	**100.0**	**1,970**	**100.0**	**4,964**	**100.0**
Birthweight of liveborn babies (grams)						
≥ 2500	2,720	92.0	913	47.3	3,633	74.3
< 2500	217	7.3	999	51.7	1,216	24.9
Not stated	18	0.6	20	1.0	38	0.8
Total	**2,955**	**100.0**	**1,932**	**100.0**	**4,887**	**100.0**
Baby outcome						
Live birth–survived	2,951	98.6	1,896	96.2	4,847	97.6
Live birth–neonatal death	4	0.1	36	1.8	40	0.8
Fetal death	36	1.2	36	1.8	72	1.5
Not stated	3	0.1	2	0.1	5	0.1
Total	**2,994**	**100.0**	**1,970**	**100.0**	**4,964**	**100.0**
Perinatal deaths per 1,000 births[(a)(b)]		*13.4*		*36.5*		*22.6*

(a) Perinatal deaths are reported by patients to fertility centre staff. These data are not official vital statistics.

(b) Perinatal death rates were calculated using all births (live births and fetal deaths) to women who had embryo transfer cycles in 2006.

Perinatal outcomes of singletons following SET and DET

There were 4,946 singletons born following SET and 2,994 born following DET. Singletons born following SET had better perinatal outcomes than singletons born following DET.

Among liveborn singletons following SET, 6.8% were low birthweight, which was lower than 7.3% of liveborn singletons following DET. The proportion of preterm SET singletons (born before 37 weeks gestation) was 10.1% compared with 11.9% for DET singletons. Similarly, the perinatal death rate was lower in SET singletons than in DET singletons (10.9 and 13.4 deaths per 1,000 births respectively) (tables 39 and 40).

4 GIFT and surrogacy cycles in 2006

4.1 GIFT cycles

The use of gamete intrafallopian transfer (GIFT) as part of ART treatment provided in Australia and New Zealand has been declining in recent years. In 2006, there were 149 GIFT cycles or intended GIFT cycles reported to ANZARD. Of these cycles, 123 (82.6%) had oocytes transferred. Of the 123 GIFT cycles, 17.9% (22) resulted in a clinical pregnancy and 13.0% (16) resulted in a live delivery. One in four deliveries following GIFT cycles were multiple deliveries.

All 21 babies born to women who had GIFT cycles in 2006 were liveborn. Of these, 38.1% (8) were born preterm and 28.6% (6) were low birthweight.

4.2 Surrogacy cycles

There were 97 surrogacy cycles reported to ANZARD in 2006. Sixty-three were surrogacy carrier cycles. Among surrogacy carrier cycles, 22 (34.9%) resulted in a clinical pregnancy and 20 (31.7%) resulted in a live delivery. All 17 singletons and 6 twins born to surrogacy carriers in 2006 were liveborn.

5 Donor sperm insemination (DI) cycles in 2006

5.1 DI cycles performed in 2006

The information presented here does not include DI cycles undertaken in hospitals or private clinics that are not fertility centres. Only DI cycles undertaken in fertility centres in Australia and New Zealand are included in this section.

In 2006, there were 3,022 DI cycles reported to ANZARD, which included 15.6% (471) FSH-stimulated cycles and 84.4% (2,551) unstimulated cycles. Of all DI cycles in 2006, 12.1% resulted in a clinical pregnancy and 9.2% resulted in a live delivery (Table 41). The average age of women who had a DI cycle in 2006 was 35.0 years.

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

Two-thirds (66.5%) of DI cycles in 2006 were in women aged between 30 and 39 years. Women in the 30–34 years age group had the highest live delivery rate per DI cycle (13.6%). Two of the 52 DI cycles in women aged 45 years or older resulted in a clinical pregnancy, but neither resulted in a live delivery (Table 41).

Table 41: Clinical pregnancies and live deliveries from DI cycles by stage/outcome of treatment and women's age group, Australia and New Zealand, 2006

	Age group (years)[(a)]						
Stage/outcome of treatment	**≤ 24**	**25–29**	**30–34**	**35–39**	**40–44**	**≥ 45**	**Total**
DI cycles	49	351	850	1,161	559	52	3,022
Clinical pregnancies	7	55	143	132	27	2	366
Live deliveries	6	46	116	96	14	0	278
Clinical pregnancies per DI cycle (%)	*14.3*	*15.7*	*16.8*	*11.4*	*4.8*	*3.8*	*12.1*
Live deliveries per DI cycle (%)	*12.2*	*13.1*	*13.6*	*8.3*	*2.5*	*0.0*	*9.2*
Live deliveries per clinical pregnancy (%)	*85.7*	*83.6*	*81.1*	*72.7*	*51.9*	*0.0*	*76.0*

(a) Age at time of treatment.

5.2 DI cycles resulting in clinical pregnancies in 2006

In 2006, 366 DI cycles resulted in a clinical pregnancy, of which 0.5% were ectopic/ heterotopic pregnancies and 1.4% were terminations/reductions. More than three-quarters of clinical pregnancies (280 of 366) resulted in a delivery. Most deliveries (278 of 280) were live deliveries. Multiple gestation deliveries accounted for 5.7% (16 of 280) of all deliveries.

5.3 Babies conceived through DI treatment in 2006

There were 296 babies born to women who had DI treatment in 2006. Of these babies, 10.8% (32) were born preterm, which is higher than the proportion of preterm babies (8.1%) born in Australia in 2005 (Laws et al. 2007). The mean birthweight of liveborn babies following DI treatment was 3,306 grams, with 23 babies (7.8%) born with low birthweight, which is higher than the proportion of low birthweight babies (6.4%) born in Australia in 2005 (Laws et al. 2007). The perinatal death rate was 6.8 per 1,000 births to women who had DI treatment in 2006.

6 Trends in ART treatment and outcomes of ART treatment

This chapter includes autologous cycles, donation and recipient cycles, GIFT cycles, surrogacy cycles and unclassified cycles from 2002 to 2006.

6.1 Trends in ART treatment—2002 to 2006

Use of ART treatment

In 2006, 50,521 initiated ART treatment cycles (including all autologous, donation and recipient cycles, GIFT cycles, surrogacy cycles and unclassified cycles) were reported to ANZARD in Australia and New Zealand. This is an increase of 6.0% of ART treatment cycles from 2005 and an increase of 47.4% of ART treatment cycles from 2002 (Table 42).

In 2006, 11,720 ART treatment cycles resulted in a clinical pregnancy. This is 11.7% more than the number of clinical pregnancies following ART treatment in 2005 and 61.0% more than the number of clinical pregnancies following ART treatment in 2002. In 2006, the rates of clinical pregnancies and live deliveries per initiated cycle were marginally higher than in previous years (Table 42).

Table 42: Live deliveries from ART treatment, Australia and New Zealand, 2002 to 2006

Stage/outcome of treatment	2002	2003	2004	2005	2006
Cycles started[(a)]	34,267	36,966	41,904	47,661	50,521
Oocyte/embryo transfers	28,036	30,184	34,232	39,121	41,447
Clinical pregnancies	7,279	7,977	8,794	10,492	11,720
Live deliveries	5,552	6,022	6,792	8,166	8,999
Clinical pregnancies per cycles started (%)	*21.2*	*21.6*	*21.0*	*22.0*	*23.2*
Live deliveries per cycles started (%)	*16.2*	*16.3*	*16.2*	*17.1*	*17.8*

(a) Includes all ART treatment (autologous cycles, oocyte/embryo donation and recipient cycles, GIFT cycles, surrogacy cycles and unclassified cycles).

Types of ART treatment and ART procedure

The proportional contribution of IVF and ICSI to all ART procedures were similar between 2002 and 2006. The use of GIFT declined from 0.7% of all fresh cycles in 2002 to 0.3% in 2006 (Table 43).

Table 43: Number of ART treatment cycles with oocyte/embryo transfer by treatment type and procedure, Australia and New Zealand, 2002 to 2006

	2002		2003		2004		2005		2006	
Treatment type/procedure	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Fresh										
IVF	6,874	24.5	7,362	24.4	8,383	24.5	9,414	24.1	9,803	23.7
ICSI	9,354	33.4	10,069	33.4	11,560	33.8	13,251	33.9	14,385	34.7
GIFT	190	0.7	183	0.6	138	0.4	123	0.3	123	0.3
Thaw										
IVF	5,150	18.4	5,586	18.5	6,447	18.8	7,545	19.3	7,755	18.7
ICSI	6,153	21.9	6,449	21.4	7,181	21.0	8,169	20.9	8,571	20.7
Not stated	274	1.0	523	1.7	517	1.5	618	1.6	809	2.0
Unclassified	41	0.1	12	0.0	6	0.0	1	0.0	1	0.0
Total	**28,036**	**100.0**	**30,184**	**100.0**	**34,232**	**100.0**	**39,121**	**100.0**	**41,447**	**100.0**

Women's age

Most ART treatment cycles in each year were in women aged between 30 and 40 years. The proportion of cycles in women older than 40 years increased from 14.3% in 2002 to 16.2% in 2006. The mean women's age in 2006 (35.6 years) was 0.4 years older than in 2002 (35.2 years) (Table 44).

Table 44: Number of ART treatment cycles by women's age group, Australia and New Zealand, 2002 to 2006

	2002		2003		2004		2005		2006	
Age group (years)[(a)]	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Mean (years)	*35.2*		*35.2*		*35.4*		*35.5*		*35.6*	
≤ 24	412	1.2	474	1.3	504	1.2	544	1.1	575	1.1
25–29	3,790	11.1	4,085	11.1	4,298	10.3	4,724	9.9	5,096	10.1
30–34	10,937	31.9	11,914	32.2	13,340	31.8	14,868	31.2	14,654	29.0
35–37	7,102	20.7	7,746	21.0	9,090	21.7	10,589	22.2	11,675	23.1
38–40	6,516	19.0	6,775	18.3	7,776	18.6	9,007	18.9	9,744	19.3
41–42	2,727	8.0	3,134	8.5	3,476	8.3	3,941	8.3	4,517	8.9
43–44	1,389	4.1	1,480	4.0	1,886	4.5	2,249	4.7	2,506	5.0
≥ 45	754	2.2	789	2.1	999	2.4	1,084	2.3	1,150	2.3
Other/not stated	640	1.9	569	1.5	535	1.3	655	1.4	604	1.2
Total	**34,267**	**100.0**	**36,966**	**100.0**	**41,904**	**100.0**	**47,661**	**100.0**	**50,521**	**100.0**

(a) Age at time of treatment.

Number of embryos transferred per transfer cycle

Most embryo transfer cycles over the period 2002 to 2006 had one or two embryos transferred (Figure 14). There has been a significant decline in the number of cycles in which three or more embryos were transferred, from 6.0% in 2002 to 1.0% in 2006 ($p<0.01$). There has been a highly significant shift in recent years to the transfer of one embryo per cycle. The proportion of single-embryo transfer cycles increased from 28.4% in 2002 to 56.9% in 2006 ($p<0.01$) in Australia and New Zealand.

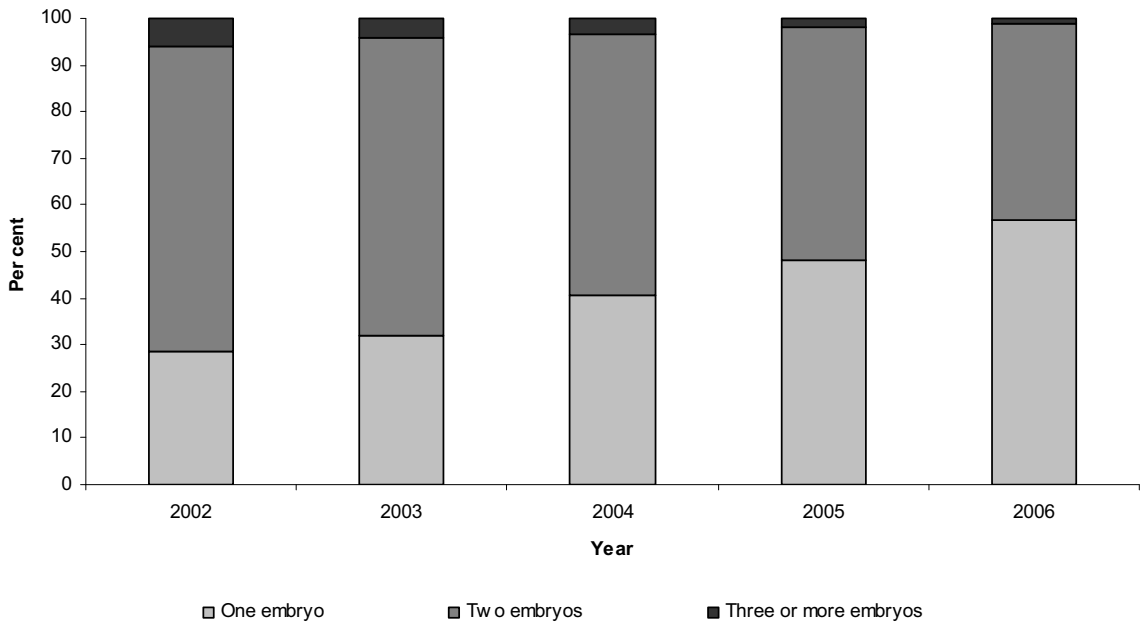


Figure 14: Proportion of embryo transfer cycles by number of embryos transferred, Australia and New Zealand, 2002 to 2006

Clinical pregnancies and live deliveries from embryo transfer cycles

The rate of clinical pregnancy per transfer of single fresh embryo in 2006 was 32.8%, which is 1.4 times the rate in 2002 (23.4%, $p<0.01$). The rate of clinical pregnancy per transfer of single thawed embryo significantly increased from 14.2% in 2002 to 21.1% in 2006 ($p<0.01$) (Table 45).

Table 45: Number of ART treatment cycles with embryo transfer by stage/outcome of treatment, treatment type and number of embryos transferred, Australia and New Zealand, 2002 to 2006

	Fresh embryo			Thawed embryo		
Year	Embryo transfer cycles	Clinical pregnancies	Clinical pregnancies per transfer cycle (%)	Embryo transfer cycles	Clinical pregnancies	Clinical pregnancies per transfer cycle (%)
			Single-embryo transfer			
2002	3,965	929	*23.4*	3,942	560	*14.2*
2003	4,894	1,253	*25.6*	4,713	768	*16.3*
2004	7,410	1,987	*26.8*	6,385	1,049	*16.4*
2005	10,084	2,950	*29.3*	8,734	1,638	*18.8*
2006	12,963	4,255	*32.8*	10,537	2,223	*21.1*
			Double-embryo transfer			
2002	11,149	3,714	*33.3*	7,114	1,620	*22.8*
2003	11,651	3,894	*33.4*	7,447	1,686	*22.6*
2004	11,725	3,708	*31.6*	7,479	1,744	*23.3*
2005	12,052	3,917	*32.5*	7,379	1,801	*24.4*
2006	10,904	3,466	*31.8*	6,518	1,669	*25.6*

Age-specific rate of live delivery from autologous fresh cycles

The highest clinical pregnancy rate per initiated cycle was in women aged 28 years. However, the clinical pregnancy rate per initiated cycle declined with each advancing year of age from 31 years onwards, the rate of decline accelerating after the age of 35 years. For women aged 45 years or older, the average clinical pregnancy rate was 2.0% (Table 46).

Cycles in women aged 26–31 years had a higher rate of live deliveries per initiated cycle than women of other ages. Among this age group, the live delivery rate was above 26% at each age. The live delivery rate decreased progressively for women after the age of 31. For women aged 45 years or older, there was only one live delivery per 117 initiated cycles (Table 46).

Table 46: Age-specific rates of clinical pregnancy and live delivery from autologous fresh cycles, Australia and New Zealand, 2002 to 2006

Age (years)[(a)]	Initiated cycles	Clinical pregnancies	Live deliveries	Clinical pregnancies per initiated cycle (%)	Live deliveries per initiated cycle (%)	95% confidence intervals of live deliveries per initiated cycle (%)
≤ 24	1,568	484	403	30.9	25.7	23.8–27.6
25	1,159	338	296	29.2	25.5	23.3–27.8
26	1,732	564	468	32.6	27.0	25.2–28.9
27	2,427	794	673	32.7	27.7	26.2–29.3
28	3,406	1,128	944	33.1	27.7	26.4–29.0
29	4,353	1,388	1,156	31.9	26.6	25.4–27.7
30	5,470	1,778	1,484	32.5	27.1	26.1–28.2
31	6,780	2,206	1,849	32.5	27.3	26.3–28.2
32	7,847	2,429	2,025	31.0	25.8	24.9–26.7
33	8,576	2,646	2,170	30.9	25.3	24.5–26.1
34	9,143	2,616	2,103	28.6	23.0	22.2–23.8
35	9,416	2,553	2,057	27.1	21.8	21.1–22.6
36	9,090	2,440	1,914	26.8	21.1	20.3–21.9
37	8,743	2,075	1,545	23.7	17.7	16.9–18.5
38	8,728	1,926	1,402	22.1	16.1	15.2–16.9
39	8,750	1,702	1,197	19.5	13.7	12.9–14.5
40	7,709	1,248	809	16.2	10.5	9.6–11.4
41	6,662	832	492	12.5	7.4	6.4–8.3
42	5,156	473	229	9.2	4.4	3.4–5.5
43	3,796	261	100	6.9	2.6	1.4–3.9
44	2,311	111	43	4.8	1.9	0.3–3.5
≥ 45	2,060	42	16	2.0	0.8	0.0–2.5
Not stated	33	5	5	15.2	15.2	1.8–28.5
Total	**124,915**	**30,039**	**23,380**	**24.0**	**18.7**	**. .**

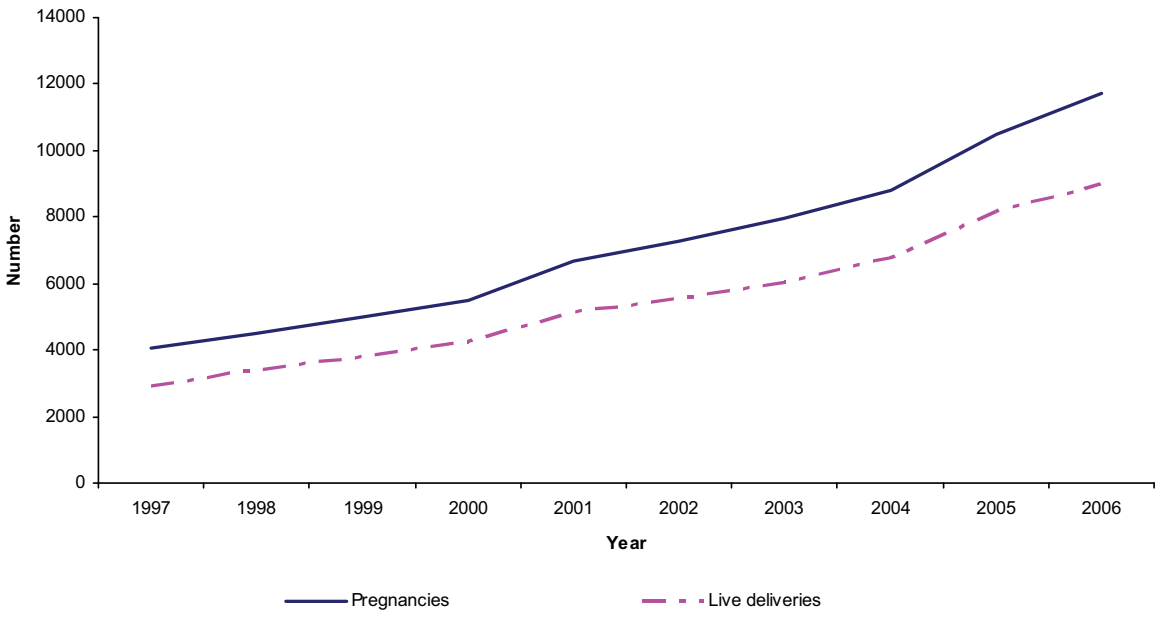
(a) Age at time of treatment.

. . Not applicable

6.2 Trends in the outcomes of ART treatment—1997 to 2006

Clinical pregnancies and live deliveries

Between 1997 and 2006, there was a steady increase in the numbers of clinical pregnancies and live deliveries resulting from ART treatment in Australia and New Zealand (Figure 15). This increase results partly from the increase in the number of ART treatment cycles provided by fertility centres in Australia and New Zealand. In 2006, there were 8,999 live deliveries, 3.1 times the 2,932 live deliveries in 1997. This significant increase represents a growth of 837 clinical pregnancies per year and 659 live deliveries per year ($p<0.01$) between 1997 and 2006 in Australia and New Zealand.



Note: 1997–2001 data are from the Assisted Conception Data Collection.

Figure 15: Number of ART treatment cycles that resulted in a clinical pregnancy and a live delivery, Australia and New Zealand, 1997 to 2006

Multiple gestation deliveries

Between 1997 and 2006, there was a decrease in the number of triplet or higher order multiple gestation deliveries that resulted from ART treatment. In 1997, 1.6% of deliveries were triplets or higher order multiples, compared with 0.3% in 2006. Of all deliveries, the proportion of singleton deliveries significantly increased from 79.4% in 1997 to 88.0% in 2006 ($p<0.01$). The proportion of twin deliveries in 2006 was 11.7%, the lowest since ANZARD was established in 2002 (Table 47).

Table 47: Number of ART treatment cycles that resulted in a delivery by plurality, Australia and New Zealand, 1997 to 2006

	Singleton		Twin		Higher order multiple		Total
Year	Number	Per cent	Number	Per cent	Number	Per cent	Number
1997	2,480	79.4	591	18.9	51	1.6	3,122
1998	2,748	79.9	645	18.8	47	1.4	3,440
1999	3,014	78.2	789	20.5	50	1.3	3,853
2000	3,335	78.0	901	21.1	42	1.0	4,278
2001	4,087	78.3	1,097	21.0	35	0.7	5,219
2002	4,536	80.0	1,068	18.8	33	0.6	5,671 [(a)]
2003	4,951	80.9	1,124	18.4	21	0.3	6,123 [(a)]
2004	5,740	82.8	1,114	16.1	23	0.3	6,932 [(a)]
2005	7,085	85.9	1,134	13.8	27	0.3	8,246
2006	8,016	88.0	1,070	11.7	23	0.3	9,109

(a) Includes cycles in which plurality was unknown.

Note: 1997–2001 data are from the Assisted Conception Data Collection.

Appendix 1: Data used in this report

The data presented in this report are supplied by fertility centres in Australia and New Zealand, and are compiled into ANZARD. ANZARD includes information about the ART treatment procedures of IVF, ICSI and GIFT. It also includes information about ART treatment using thawed embryos; treatment involving donated gametes or embryos; the use of techniques such as assisted hatching, PGD and blastocyst culture; and DI cycles. ANZARD also contains information on outcomes in pregnancies and births. This includes method of birth, birth status, birthweight, gestational age, plurality, perinatal mortality and selected information on maternal morbidity. ANZARD does not contain information about artificial insemination if the woman's partner's sperm was used.

This report presents information on all treatment cycles that took place in fertility centres in Australia and New Zealand in 2006, and their resulting pregnancies and births. The babies included in this report were conceived through the treatment cycles undertaken in 2006 and were born in either 2006 or 2007.

Data validation

Most fertility centres have computerised data management systems and are able to provide the NPSU with high-quality data. The NPSU subjects all data to an extensive process of validation. Data queries are followed up with fertility centre staff. In 2006, information relating to pregnancy and birth outcomes was not stated for less than 0.6% of cycles. The Reproductive Technology Accreditation Committee plays a role in ensuring the quality of ANZARD data by validating selected records against clinic files in their triennial inspections.

Data presentation

Data presented 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 also 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 were measured per initiated cycle. Where the number of initiated cycles was not available, for example using blastocysts or cleavage stage embryos, 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.

Data limitations

Follow-up of information on pregnancy and on 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 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. These data include pregnancy complications, complications of fertility treatment and infant morbidity. 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.

Appendix 2: ANZARD data items

Variable	*Data domain*
Unit identifier	3-digit code for clinics provided by NPSU
Site of main treatment	For centres with multiple sites, this identifies location of most significant part of the treatment.
Unit patient ID/medical record number	Unique ID for patient.
Woman's date of birth	Day/month/year.
Husband/male partner DOB	Day/month/year.
Oocyte/embryo donor's age	Completed years at time of donation.
Previous Medicare item 13200s	The number of billed Australian Medicare item 13200. New Zealand units leave this field blank.
Cause of infertility: tubal disease	Yes—in the opinion of the treating clinician or clinic there is significant tubal disease present.
	No—other.
Cause of infertility: endometriosis	Yes—in the opinion of the treating clinician or clinic there is significant endometriosis contributing to this couple's subfertility.
	No—other.
Cause of infertility: male factor	Yes—in the opinion of the treating clinician or clinic there is a significant male factor problem.
	No—other.
Cause of infertility: other factors	Yes—in the opinion of the treating clinician or clinic there is subfertility due to any other factors apart from female age, tubal disease, male factor or endometriosis. Possible examples are fibroids, ovulation disorders or premature ovarian failure. There is no clinical subfertility (e.g. egg donor, preimplantation genetic diagnosis or other non-fertility reason for ART).
	No—other.
Cause of infertility: idiopathic	Yes—in the opinion of the treating clinician or clinic there is clinical subfertility without any apparent explanation.
	No—other, including case of PGD for genetic disease.
Previous pregnancies < 20 weeks	Number of known pregnancies less than 20 weeks in the female partner regardless of whether by ART or by a different partner.
Previous pregnancies ≥ 20 weeks	Number of known pregnancies reaching 20 weeks or more in the female partner regardless of whether by ART or by a different partner.
Cycle ID	Unique cycle identifier.
Cycle date	For treatment cycles this is according to the Medicare definition and is the date of LMP for unstimulated cycles or, where FSH is used, the first day of FSH administration. For cycles where the only process is movement or disposal of embryos, this is the date of embryo movement. This date defines the year in which a cycle is reported to NPSU.
Surrogacy	Yes—the procedure is part of a surrogate arrangement.
	No—the procedure is not part of a surrogate arrangement.
Injectable FSH stimulation given	Yes—FSH administered. Does not include clomiphene or hCG alone unless FSH was also given.
	No—other.
DI date	Date of first insemination with donor sperm.
OPU date	Date of oocyte retrieval.
Number of eggs retrieved	Number of eggs retrieved at OPU. Include any immature oocytes that are identified.
Number of eggs donated	Number of eggs donated to someone else.
Number of eggs received	Number of eggs received from someone else.

Variable	*Data domain*
Number of eggs GIFT	Number of eggs replaced in a GIFT procedure.
Number of eggs IVF	Number of eggs treated with IVF.
Number of eggs ICSI	Number of eggs treated with ICSI.
Site of sperm used	Site of sperm extraction: ejaculated, epididymal (whether by open biopsy or by PESA), testicular or other.
Person from which sperm derives	Husband/partner (h), known donor (k), anonymous donor (a), embryo received or embryo transferred is a donated embryo (e).
Number of eggs fertilised normally	Number of eggs fertilised normally.
Preimplantation genetic diagnosis	Yes—preimplantation genetic diagnosis in any form (including aneuploidy screening or sex selection) has been performed on any of the embryos (transferred or not).
	No—PGD not performed.
Assisted hatching	Yes—where assisted hatching in any form has been performed on any of the embryos (transferred or not).
	No—assisted hatching not performed.
Number of embryos received from someone else or imported into the unit	To minimise the number of required fields in the data collection, this field serves two purposes: 1. Records the number of embryos to be received from donation (recipient cycle); or 2. Records the number of embryos to be imported into the current unit from another unit.
Number of cleavage embryos thawed	Number of zygotes or cleavage stage embryos (up to 4 days) thawed with intention of performing an embryo transfer if they survive.
Number of blastocysts thawed	Number of blastocysts (i.e. greater than 4 days culture from fertilisation) thawed with intention of performing an embryo transfer if they survive.
ET date	Embryo transfer date.
Number of early embryos transferred	Number of zygote or cleavage stage embryos (i.e. up to 4 days since fertilisation) transferred.
Number of blastocysts transferred	Number of blastocyst embryos (i.e. > 4 days since fertilisation) transferred.
Any embryos ICSI?	Yes—any embryos transferred were fertilised by ICSI.
	No—no transferred embryos were fertilised by ICSI.
Number of zygotes/cleavage stage embryos frozen	Number of zygote or cleavage stage embryos (i.e. up to 4 days since fertilisation) frozen.
Number of blastocysts frozen	Number of blastocyst embryos (i.e. > 4 days since fertilisation) frozen.
Number of embryos donated to someone else or exported from the unit of treatment	To minimise the number of required fields in the data collection, this field serves two purposes: 1. Records the number of embryos to be donated to someone else (donor cycle); or 2. Records the number of embryos to be exported from the current unit to another unit.
Number of potentially usable frozen embryos discarded	Potentially usable embryos disposed of in accordance with patient or government request.
Clinical pregnancy	A pregnancy that fulfils one of the following criteria: 1. Known to be ongoing at 20 weeks; 2. Evidence by ultrasound of an intrauterine sac (with or without a fetal heart); 3. Examination of products of conception reveal chorionic villi; or 4. A definite ectopic pregnancy that has been diagnosed laparoscopically or by ultrasound.
Date pregnancy ended	Date on which delivery, miscarriage or termination takes place.
Number of fetal hearts	Number of fetal hearts seen on first ultrasound (intrauterine only).
Ectopic pregnancy	Yes—pregnancy is an ectopic pregnancy, or a combined ectopic and uterine (heterotopic) pregnancy.
	No—pregnancy not ectopic or heterotopic.
Elective termination of pregnancy	Yes—pregnancy is terminated.
	No—pregnancy not terminated.
Selective reduction performed	Yes—selective reduction was performed owing to fetal abnormality.
	No—selective reduction not performed.

Variable	*Data domain*
Fetal abnormality in a pregnancy ending < 20 weeks or in a fetus removed by selective reduction	Details of elective terminations of pregnancy and fetal reductions due to fetal abnormality.
Maternal complications of pregnancy	Describes morbidity related to pregnancy.
Number of babies delivered	Include all liveborn and stillborn babies.
Caesarean delivery	Yes—delivery by planned or emergency caesarean section.
	No—other.
Baby 1 outcome	Liveborn, stillborn or neonatal death.
Baby 1 sex	Male or female.
Baby 1 birthweight	Weight in grams.
Baby 1 abnormality	Describes any known congenital malformation.
Baby 1 date of neonatal death	Date of neonatal death.
Baby 2 outcome	Liveborn, stillborn or neonatal death.
Baby 2 sex	Male or female.
Baby 2 weight	Weight in grams.
Baby 2 abnormality	Describes any known congenital malformation.
Baby 2 date of neonatal death	Date of neonatal death.
Baby 3 outcome	Liveborn, stillborn or neonatal death.
Baby 3 sex	Male or female.
Baby 3 weight	Weight in grams.
Baby 3 abnormality	Describes any known congenital malformation.
Baby 3 date of neonatal death	Date of neonatal death.
Baby 4 outcome	Liveborn, stillborn or neonatal death.
Baby 4 sex	Male or female.
Baby 4 weight	Weight in grams.
Baby 4 abnormality	Describes any known congenital malformation.
Baby 4 date of neonatal death	Date of neonatal death.
Admitted with ART morbidity	Yes—woman is admitted to hospital with any condition (excluding any pregnancy-related issues, such as ectopic pregnancy) that could be in any way related to fertility treatment.
OHSS	Yes—admission to hospital is due to symptoms of OHSS.
Morbidity detail	Describes symptoms of treatment-related morbidity.

Terminology used in this report

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

Autologous cycle: an ART treatment cycle in which patients intend to use their own oocytes/gametes.

Cancelled cycle: a cycle which is started and no further procedures undertaken.

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.

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

DI cycle: an artificial insemination cycle in which donated sperm is used in the procedure.

Donation cycle: an ART treatment cycle in which a woman intends to donate or donates her oocyte/embryo.

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.

ET: an embryo transfer cycle in which embryo(s) are placed in the uterus or fallopian tube. The embryo(s) can be fresh or thawed following cryopreservation. Embryo transfer includes transfer of cleavage stage embryos (2 to 3 days after fertilisation) or transfer of blastocysts (5 to 6 days after fertilisation).

Fresh cycle: an ART treatment cycle in which oocyte pick-up (OPU) is performed. It also includes cancelled OPU cycles, failed OPU cycles and cycles where thawed oocytes were used in fertilisation.

Full-term: a gestation of at least 37 weeks.

Gamete: a reproductive cell, either a sperm or an egg.

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

- fresh and thaw cycles with embryo transfer (cleavage):

  (pregnancy end date – embryo transfer date) + 16 days
- fresh and thaw cycles with embryo transfer (blastocyst):

  (pregnancy end date – embryo transfer date) + 19 days

  In this report, for cycles with blastocyst transfer, gestational age was estimated using the calculation that is used for cycles with cleavage transfer.

- GIFT cycles:

  (pregnancy end date – OPU date) + 14 days
- DI cycles:

  (pregnancy end date – date of insemination) + 14 days.

GIFT cycle: an ART treatment cycle in which a GIFT procedure is used. Cycles using both GIFT and IVF/ICSI procedures are included.

ICSI cycle: an ART treatment cycle in which embryos are fertilised using an ICSI procedure. Mixed IVF–ICSI cycles are included.

IVF cycle: an ART treatment cycle in which embryos are fertilised using an IVF procedure. Mixed IVF–ICSI cycles are excluded.

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 of gestation or 400 grams or more in birthweight.

Live delivery: a delivery in which one or more babies is a live birth.

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

Mixed IVF–ICSI cycle: an ART treatment cycle in which two or more embryos are fertilised, and at least one embryo is fertilised using an IVF procedure and another is fertilised using an ICSI procedure. Mixed IVF–ICSI cycles are included in ICSI cycles.

OHSS: ovarian hyperstimulation syndrome refers to the complication of ovulation induction therapy, which involves the administration of stimulation drugs. OHSS symptoms include abdominal pain and fluid retention.

OPU: oocyte pick-up refers to the procedure to collect oocytes from ovaries by ultrasound-guided transvaginal aspiration or by laparoscopic surgery.

Preterm: a gestation of less than 37 weeks.

Recipient cycle: an ART treatment cycle in which donated oocytes/embryos are used.

Surrogacy cycle: an ART treatment cycle which involves a surrogate arrangement. Surrogacy cycles in this report include both commission and carrier cycles.

Thaw cycle: an ART treatment cycle in which cryopreserved (frozen) embryos are thawed with or without transfer.

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

Treatment cycle: an ART cycle initiates with the intention to treat a patient.

Very low birthweight: a birthweight of less than 1,500 grams.

Very preterm: a gestation of less than 32 weeks.

Zygote: a diploid cell resulting from the fertilisation of an oocyte by a spermatozoon, which subsequently develops into an embryo.

The International Committee for the Monitoring of Assisted Reproductive Technologies (ICMART) has published an ART glossary for the terms used in ART data collections (Zegers-Hochschild et al. 2006). However, the terminology used in this report may differ from that in the ICMART glossary.

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