Assisted reproduction technology in Australia and New Zealand 2006

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The AIHW National Perinatal Statistics Unit (NPSU) is a collaborating unit of the AIHW, established in 1979. The NPSU aims to improve the health of Australian mothers and babies through the collection, anal sis and reporting of information on reproductive, perinatal and maternal health. It maintains national collections on perinatal health, maternal deaths, congenital anomalies and assisted reproduction technolog . The NPSU is located at the S dne Children s Hospital and is part of the School of Women s and Children s Health, Facult of Medicine, The Universit of New South Wales.

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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Number 1

Assisted reproduction technology in Australia and New Zealand 2006

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AIHW National Perinatal Statistics Unit
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AIHW cat. no. P

This publication is part of the Australian Institute of Health and Welfare s Assisted reproduction technolog series. A complete list of the Institute s publications is available from the Institute s website <www.aihw.gov.au>.

ISSN 1/ _ 7 _
IS N 97 1 7 / 9

uggested citation

Wang A, ean H, adger Par er T Sullivan A / / . Assisted reproduction technolog in Australia and New ealand / / . Assisted reproduction technolog series no. 1 . AIHW cat. no. P _. S dne, AIHW National Perinatal Statistics Unit.

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Published b the Australian Institute of Health and Welfare
Printed b Union ffset Printers

Contents

Ac nowledg ents

The Australian and New Zealand Assisted Reproduction Database (ANZARD), funded by the Fertility Society of Australia, is a collaborative effort between the Australian Institute of Health and Welfare's National Perinatal Statistics Unit (NPSU) and fertility centres in Australia and New Zealand. We recognise and thank all staff in the fertility centres for their efforts in compiling the data and providing additional information when requested.

We thank (in alphabetic order) Professor Michael Chapman, Professor David Healy, Professor Peter Illingworth, Professor Gab Kovacs, Dr David Molloy, Dr Ossie Petrucco and Dr James Stanger for peer reviewing the report. Cecilia Burke from the AIHW coordinated the printing and publication process.

The AIHW NPSU is a formally affiliated institution of The University of New South Wales (UNSW) and is linked to the Perinatal and Reproductive Epidemiology and Research Unit of the School of Women's and Children's Health. We would like to acknowledge the support of the AIHW NPSU by the School of Women's and Children's Health, UNSW, and the Sydney Children's Hospital.

Following is a list of the fertility centres and their directors who contributed data for this report.

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Canberra Fertility Centre, Deakin (Dr Martyn Stafford-Bell)

Sydney IVF, Canberra (Dr Janelle McDonald)

New outh ales

Albury Reproductive Medicine Centre, Albury (Dr Scott Giltrap)

Department of Reproductive Medicine, Royal Hospital for Women (Dr Stephen Steigrad)

Fertility East, Bondi Junction (Dr Joel Berstein)

Fertility First, Hurstville (Dr Anne Clark)

Hunter IVF (Monash), New Lambton Heights (Dr Steven Raymond, Dr Andrew Hedges)

IVF Australia

- Central Coast, Gosford (Dr Malcolm Tucker)
- Eastern Suburbs, Maroubra (Dr Graeme Hughes)
- North Shore, Chatswood (Dr Frank Quinn)
- Southern Sydney, Kogarah (Dr Andrew Kan)
- Western Sydney, Westmead (Prof. Peter Illingworth)

Next Generation Fertility, Parramatta (Dr David Knight)

Sydney IVF

- Central Coast (Dr Robert Woolcott)
- City, Sydney (Prof. Robert Jansen)
- Coffs Harbour (Prof. Robert Jansen)

Illawarra, Wollongong (Dr Chris James)

Lismore (Prof. Robert Jansen)

Liverpool (Dr Derek Lok)

Maitland (Dr Robert Woolcott)

Newcastle (Dr Robert Woolcott)

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Westmead Fertility Centre, Westmead (Dr Howard Smith)

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REPROMED Darwin, Tiwi (Dr Richard Henshaw)

Queensland

City Fertility Centre

The New Zealand Centre for Reproductive Medicine, Christchurch (Dr Peter Benny)

The Otago Fertility Services, Dunedin (Assoc. Prof. Wayne Gillett)

inancial support

We acknowledge the financial support from the Fertility Society of Australia for the compilation of ANZARD and the preparation of this report.

e uests or 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

u ary

Assisted reproduction technolog 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

urpose o this report

The main purpose of *Assisted reproduction technolog 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.

tructure o this report

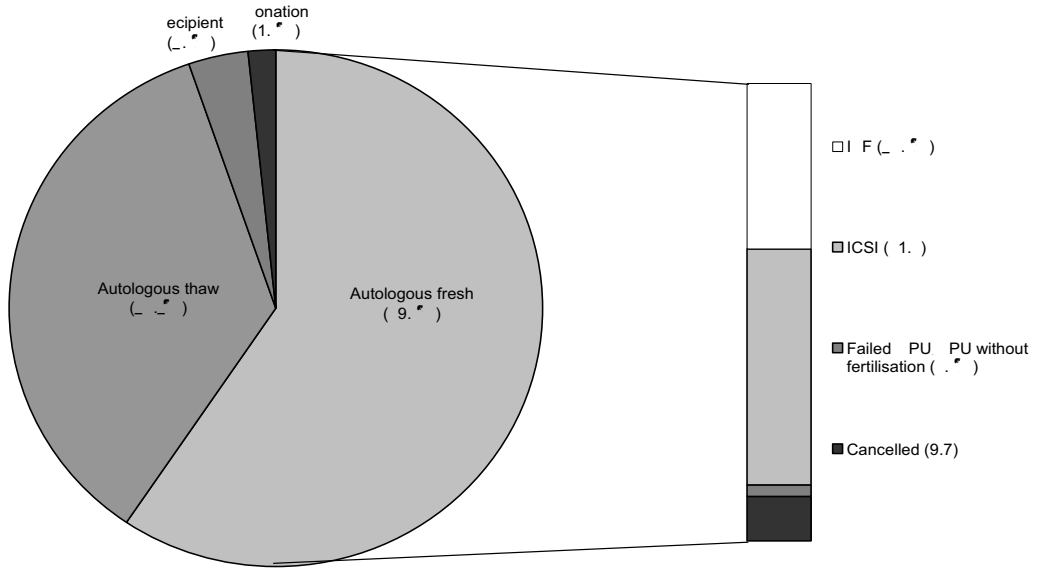
This report has six chapters. Following this introduction, which briefly describes the data used, Chapter 2 presents data on oocyte pick-up (OPU), IVF, ICSI, embryo transfer, the success of these ART treatments and complications of the ART treatment. Chapter 3 presents data on the outcomes, including 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



IFT, I and surrogac, c, cles are not included.

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

resh 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	
rocedure	**Nu er**	**er cent**	**Nu er**	**er cent**
I F	1/ , 1	_ .	_11	_7._
ICSI	1 , 17	1.	1	.
ther	_, (a)	1 .	(b)	/ .
otal	**2 , 1**	**100.0**		**100.0**

(a) Includes c, cles in which ooc, tes were not retrieved, c, cles with ooc, te retrieval but no fertilisation and cancelled PU.

(b) oc, te recipient c, cles without fertilisation.

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]						
Nu er o e ryos	2	2 2	0		0		otal
				Nu er			
1	_	,9 7	,1/	,	_,1		_, /
	97	1, 9	,_9_	7,/ 11	, /	/	17, /
_	/			7	7	_	/ 1
otal		,22	12, 20	1 , 12	,662	0	1,26
				er cent			
1	77.9	9.	.7	.	1.	/ .7	.
	.1	_/ .	_ .1	.	.9	.	.
_	/ ./	/ .1	/ .	/ .	_.	.	1./
otal	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).

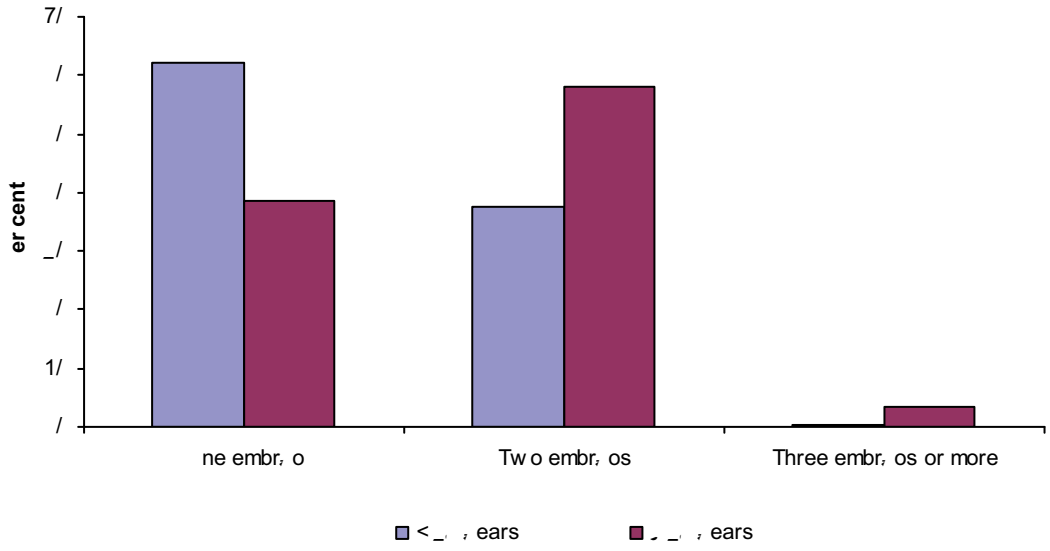


Figure 2: Proportion of fresh embryo transfer cycles by number of embryos transferred per cycle and women's age group, Australia and New] b7,fer cy

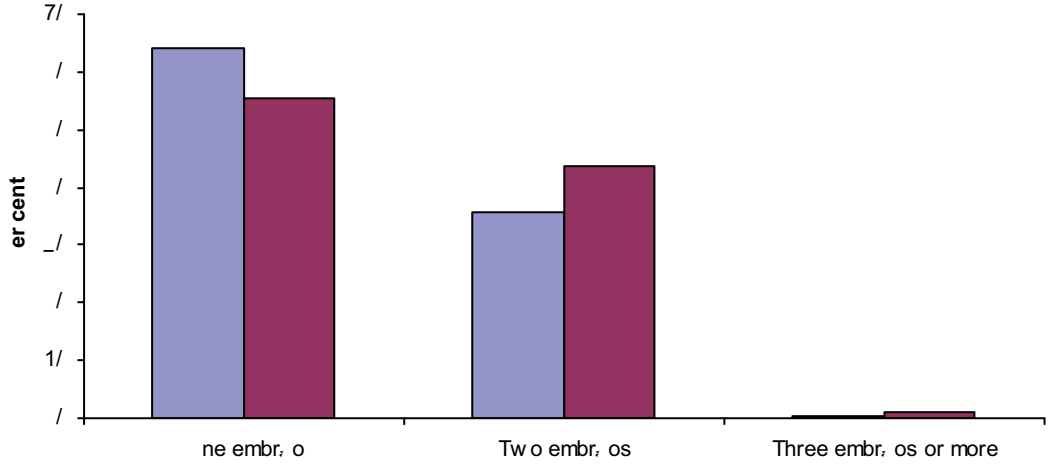

7/
/
/
/
_/
/
1/
/
er cent
ne embr, o
Tw o embr, os
Three embr, os or more

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	fresh	fresh other[b]	thaw		
Median age	.	.	.	.	.	.
			Number			
		/	9	_		19
9	7/	9	1	1,/		91
_/ _		_, 1_	9	9	_	11, 77
_ _9	_, _	,7 _	1,/ 1	,/	1	1 _9
/	,1 9	_, _/		_, 7		1/ , /
	1,1	, 17	7	, _1	_/	7,/ _1
Not stated		9		71	_7	1, / 7
Total	**10, 16**	**1 , 1**	**,6**	**1 , 2**	**1, 2**	**0**
			Per cent			
	/ .	/ .	/	/ .	/ .1	/ .
9	.	.1	.		.	
_/ _	.7	.1	1	.1	1 .7	_.
_ _9	__.	_/ .	.7	_ ./	.7	_ ./
/	/ .	1./	_.	19.	.	/ .
	1/ .	17./	17.1	1 .	_.	1 .
Not stated	.1		.7	.7	1_./	_.
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

ause o in ertility

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.

rei plantation genetic diagnosis (D)

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

	ype o A treat ent		
tage/outco e o treat ent	resh	haw	otal
Number of c cles with P	7__	1 1	7
Number of c cles with P that had embr o transferred	7	11/	_7
Number of c cles with P that resulted in a clinical pregnanc	1 9	__	1
Number of c cles with P that resulted in a live deliver	1__		1
ica eg cie e G c c e	.	.	.
e de e ie e G c c e	.	.	.

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.

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

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).

i e deli eries ro autologous resh cycles y wo en'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

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]						
tage/outco e o treat ent	2	2 2	0		0		All[b]
Initiated c cles	_	_,/ 7/	, /	11,11_	, 77	1	9, 91
mbr o transfers		, 1	,91	,917	, 9	1	_, 9
Clinical pregnancies	1 /	1,/ _	,77	, 1	779	9	7, _
ive deliveries	1/		,_1	,11	/	_	, 1
e de e e e itia ed c ce %	.	.	.	.	.	.	.
e de e e e fe c ce %	.	.	.	.	.	.	.
e de e e e ca eg c %	.	.	.	.	.	.	.

(a) Age at time of treatment.

(b) Includes c cles in which women s age was not stated.

linical pregnancies and li e deli eries y A 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

tage/outco e o treat ent		
mbr o transfers	9, _/	1_,9 9
Clinical pregnancies	_,/	, 7
ive deliveries	,_	_, 7
ca eg cie e fe c ce %	.	.
e de e e e fe c ce %	.	.

linical pregnancies and li e deli eries y stage o e ryo de elop ent

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

tage/outco e o treat ent	lea age stage e ryo	Blastocyst
mbr o transfers	17, 1	, –
Clinical pregnancies	, /	,– 9
ive deliveries	,/ 1	1,7 /
ica eg. cie e fe c c e %	.	.
e de e e fe c c e %	.	.

linical pregnancies and li e deli eries y cause o in ertility

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

ause o o et

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

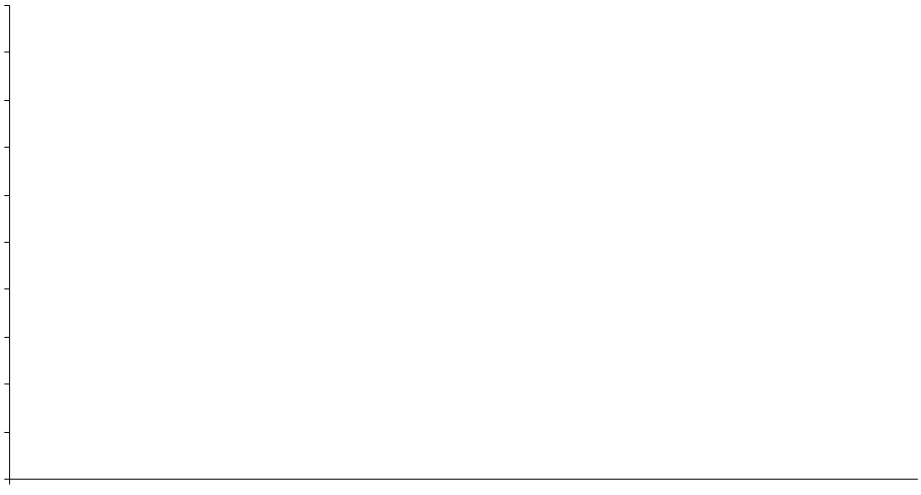
	i, e deli, eries per initiated autologous resh cycle (%)				
Age group (years)[a]	**ean**	**irst uartile**	**econd uartile**	**hird uartile**	**ourth uartile**
< _	._	7. __._	. 7.7	1. .7	_. 1.
- _	1/ .	1 ./ 7.1	9. 11.9	./ 9.7	1. 7.9
All[b]	19.	_./ 9.	/ . .9	1 . / ._	. 1 .

(a) Age at time of treatment.

(b) Includes c, cles 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.



2.2. 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.

linical pregnancies and li e deli eries

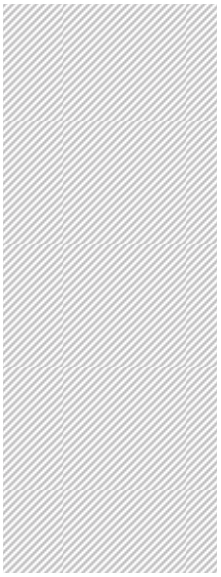
Figure 7 shows:

- 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).



i e deli eries ro autologous thaw cycles y wo en'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)]						
tage/outco e o treat ent	2	2 2	0		0		All
Initiated c cles	19	1,91_	,91/	, _	, 7	7	17,7
mbr o transfers	179	1,7	, /	, /	,_ 7	19	1 ,1
Clinical pregnancies			1, / 1	1,_ /	_	_/	_, 71
ive deliveries		_7_	1,1/ /	99	1	19	,7
e de e te e ia ed c ce	.	.	.	.	.	.	.
e de e te e fe c ce	.	.	.	.	.	.	.
e de e te e c ca eg. a c	.	.	.	.	.	.	.

(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.

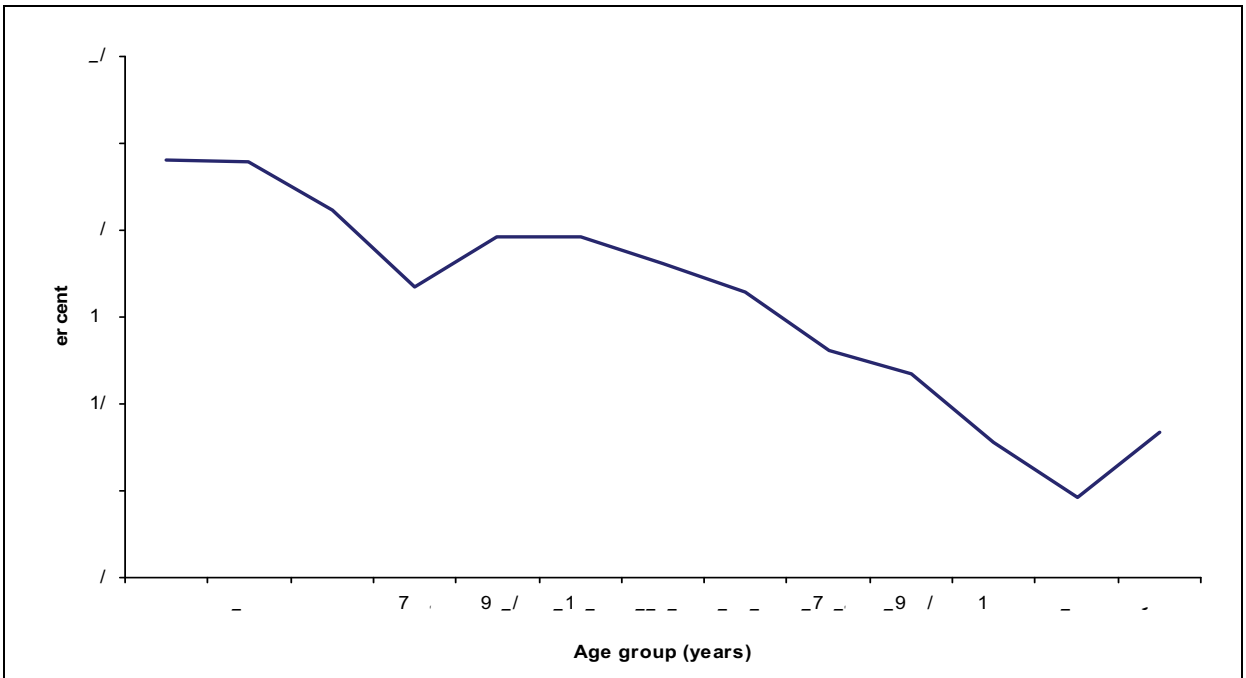


Figure 8: Proportion of autologous thaw cycles that resulted in a live delivery by women's age group, Australia and New Zealand, 2006

linical pregnancies and li e deli eries y A 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

tage/outco e o treat ent	\	\	n nown
mbr, o transfers	7, 7	,/	/
Clinical pregnancies	1, 1	1,	191
ive deliveries	1,1 7	1,	1_
ica eg acie e fe c c e %	.	.	.
e de i e ie e fe c c e %	.	.	.

linical pregnancies and li e deli eries y stage o e ryo de elop ent

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

tage/outco e o treat ent	lea age stage e ryo	Cleavage st

linical pregnancies and li e deli eries y cause o in ertility

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

ause o in ertility	nitiated cycles (nu er)	e ryo trans er (per cent)	ycles that resulted in a clinical pregnancy (per cent)	ycles that resulted in a li e deli ery (per cent)
Male factor onl	,11	91.	.1	1
Female factor				
Tubal disease onl	1,	9/ .	1. .	1 .
ndometriosis onl	1,1 9	9/ .7	/ .	1 .7
ther female factor onl	_,/ 1	91.	19.	1_.7
Combined female factor	_	9.9	/ .	1 ._
Combined male female factor	,	9.	/ .	1 .
Une plained	_,/	9/ .	1./	1 .
Not stated	77	9/ .	1./	1 .1
otal	**1 , 2**	**0.**	**20.**	**1 .**

i e deli eries ro autologous thaw cycles a ong ertility centres

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

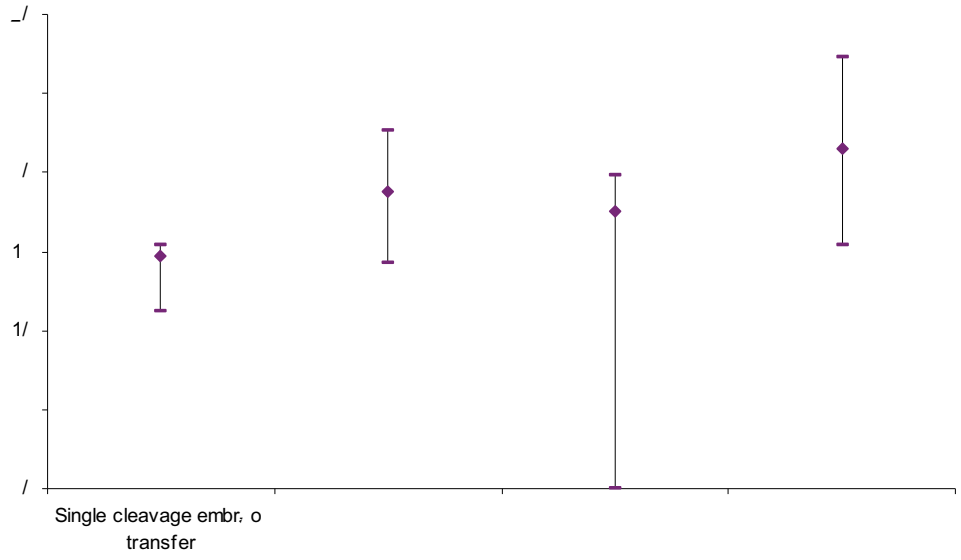
Amongst the top 25% (first quartile) of fertility centres, the live delivery rate of autologous thaw cycles ranged from 16.8% to 25.6%. The bottom 25% (fourth quartile) fertility centres achieved rates between 0.0% and 11.8%. The intermediate 50% of fertility centres achieved rates between 11.9% and 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)	i e deli eries per initiated autologous thaw cycle (%)				
	ean	irst uartile	econd uartile	hird uartile	ourth uartile
< _	17.	/ .1 _ ._	17._ / ./	1_. 17.	/ ./ 1_.
- _	9.9	1/ .9 1 .	9.1 1/ .	. 9./	. .
All	**1 .**	**16. 2 .6**	**1 .0 16.**	**11. 1 .**	**0.0 11.**

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%).



2. 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.

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)
	1	97.	97.	9 .7
9	117	9 ._	97.	9 .7
_/ _	_ _	9 ./	9 .	9 .9
_ _9	9/	9 .	9 .9	9 .
- /	__	97./	9_.9	9_.9
otal[b]	0	6.	.	.

(a) Age at time of treatment.

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

2. .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.

linical pregnancies and live deliveries ro 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.

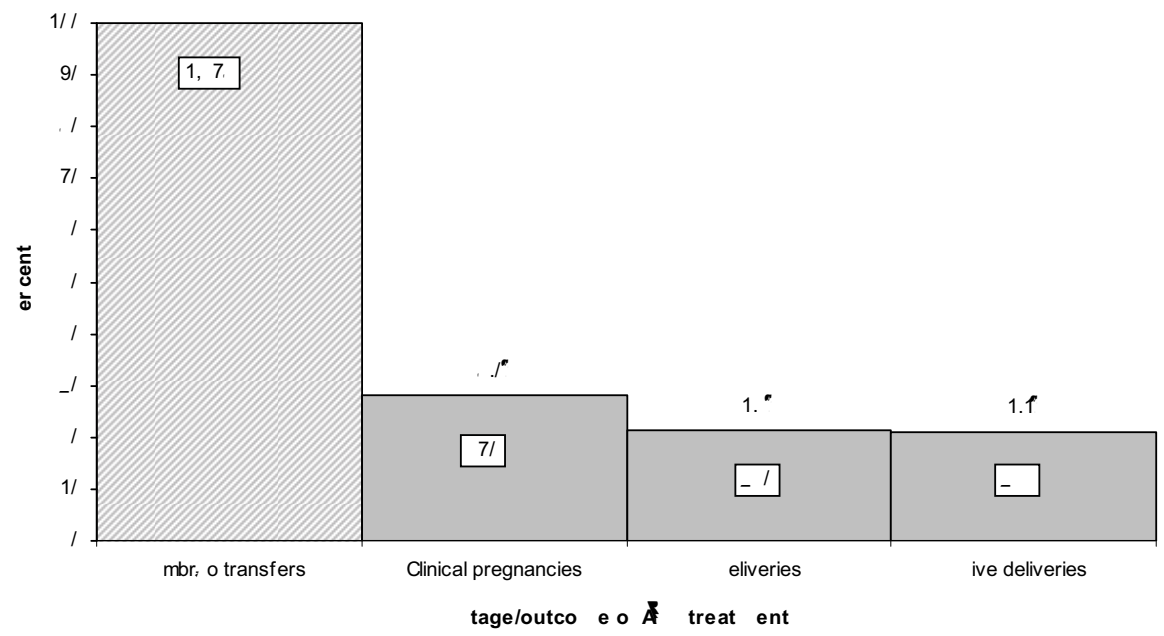


Figure 11: Progression of oocyte/embryo recipient cycles following embryo transfers, Australia and New Zealand, 2006

i, e deli, eries ro oocyte/e ryo recipient cycles y 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]					
tage/outco e o treat ent	2	0		0		All
mbr, o transfers		197	_ 9	/		1 7.
Clinical pregnancies	1	/	11	1 7	1_	7/
ive deliveries	1/	_7		117	1/	_
[illegible]	.	.	.	.	.	.
[illegible]	.	.	.	.	.	.

(a) Age at time of treatment.

linical pregnancies and li e deli eries y A 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

	resh		haw	
tage/outco e o treat ent	\	\	\	\
mbr, o transfers	7	_	_9	/ 9
Clinical pregnancies	1/	1	1/ _	11_
ive deliveries	/	119	77	7
ica eg a cie e fe c c e %	.	.	.	.
e de i e e fe c c e %	.	.	.	.

linical pregnancies and li e deli eries y stage o e ryo de elop ent

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

	resh		haw	
tage/outco e o treat ent	lea age stage e ryo	Blastocyst	lea age stage e ryo	Blastocyst
mbr, o transfers	_	1	7 9	1 1
Clinical pregnancies	179	7	17_	_
ive deliveries	1	_	1 /	_
ica eg a cie e fe c c e %	.	.	.	.
e de i e e fe c c e %	.	.	.	.

regnancies, deli eries and irths ollowing e ryo trans er cycles in 2006

.1 linical pregnancies and deli eries ollowing e ryo trans er cycles in 2006

linical pregnancies o er iew

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.

arly 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/e ryo	
regnancy outco e	**resh**	**resh e**	**haw**	**recipient**	**All**
			Nu er		
Miscarriage		717	7 9	91	,/ 9
eduction or termination		_	1		7
ctopic or heterotopic pregnanc	_7	7	1	7	1 7
otal	**1**	**2**		**100**	**2, 02**
			er cent		
Miscarriage	9.	7.1	91.	91./	9.
eduction or termination	_.	.1	._	./	_._
ctopic or heterotopic pregnanc	.	.7	.	7./	7._
otal	**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	Fresh	Thaw		
			Number		
Live delivery					
Fetal death[a]					1
Not stated				1	9
Total					

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

Nu er o etal hearts	One		wo		hree or ore		otal	
	Nu er	er cent	Nu er	er cent	Nu er	er cent	Nu er	er cent
/ [(a)]		7.	_ _	.7	1	1 .1	_	7./
1	,	7.	_ ,_ _	./	_	.	9,/ _9	77.
	1_	.1	1,1 1	1.9	1/	11.	1,	1/ .
_		/ ./	_	/ .	/	/ ./	_	/ ._
		/ ./	/	/ ./	/	/ ./		/ ./
Not stated	/	_.	9	.	1/	11.	1	.
otal	**6,7 6**	**100.0**	**,126**	**100.0**		**100.0**	**11,6 6**	**100.0**

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

e

_/

)c 0030 03

The rate of caesarean section deliveries following embryo transfer cycles increased with

.2 Outco es o a ies concei ed ro e ryo trans er 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.

.2.1 Ba y outco es

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.

roportion o preter irth or a ies

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

estational age (wee s)	ingleton			win			igher order ultiple			otal		
	Nu	er	er cent	Nu	er	er cent	Nu	er	er cent	Nu	er	er cent
ea ee		.			.			.			.	
7		9	1.		1/ /	.7		1_	19.		/	./
_1			1.1		1	7./		9	1_.		_	.
_ _		79	.		1,/ 1/	7.			7.		1,7_	

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).

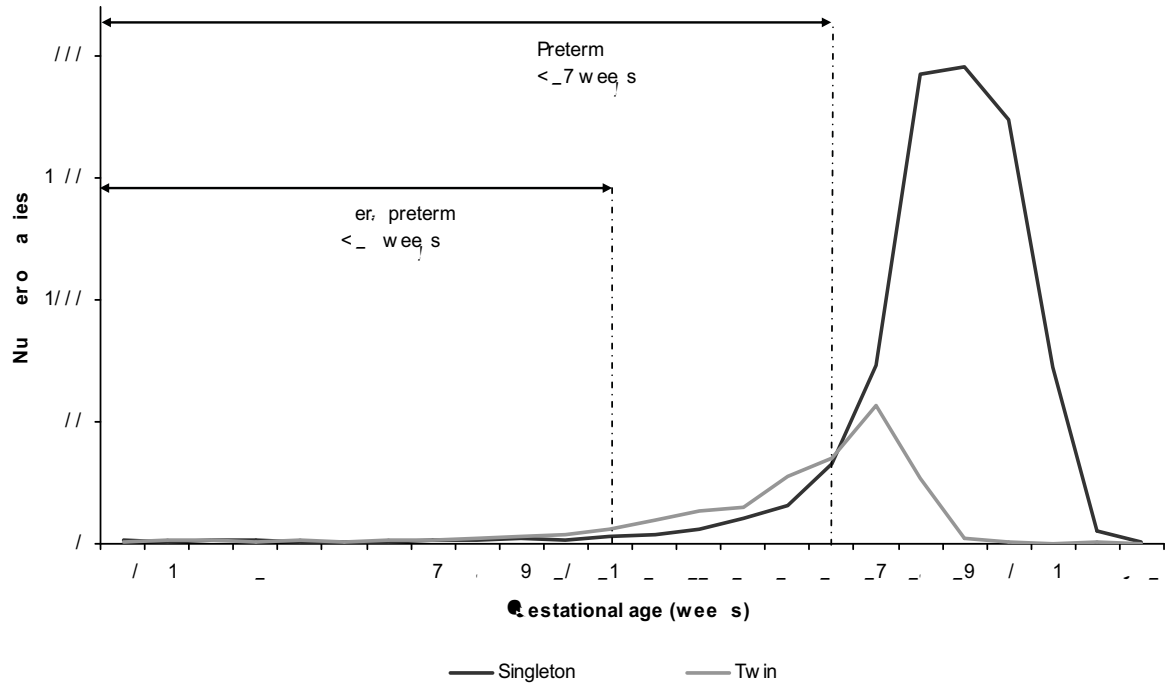
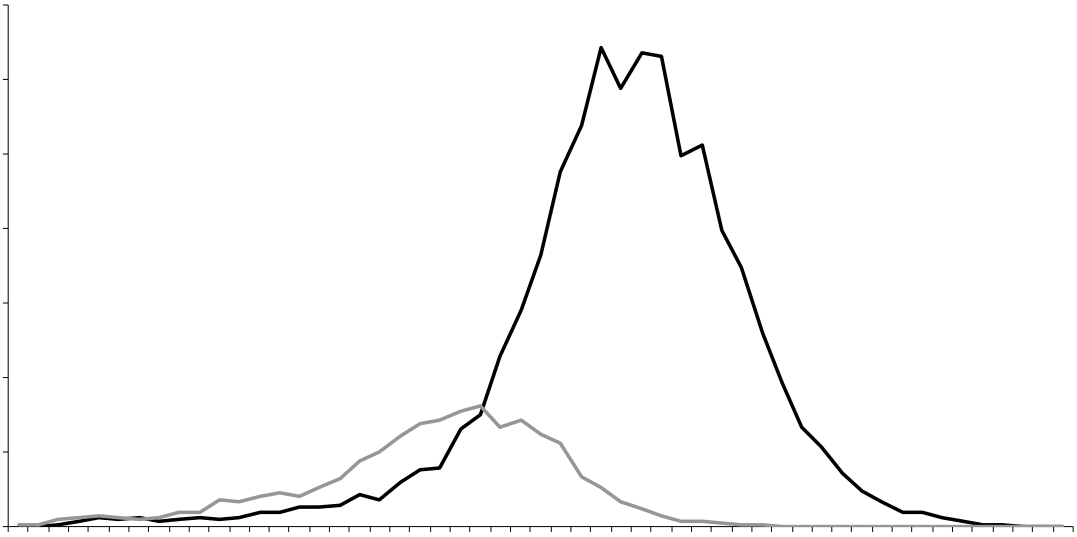


Figure 12: Number of babies born to women who had embryo transfer cycles by gestational age, Australia and New Zealand, 2006

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).



ex distri ution in li e orn a ies

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

ex	Autologous resh\	Autologous resh	haw	Oocyte/e ryo recipient	All
			Nu er		
Male	1,	1,9	1, 1	1	,/ 91
Female	1,	1,9	1, 1	1	,9
Not stated	1	_	1	/	
otal	**2,6**	**, 2**	**,0 1**	**0**	**10,0**
			er cent		
Male	_.1	/ .1	/ .1	./	/ .7
Female	.9	9.	9.9	./	9.
a i [a]	.	.	.	.	.

(a) Number of males to 1/ / females.

erinatal ortality in all a ies

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

ype o death	ingleton	win	igher order ultiple	otal
		Nu er		
Fetal deaths	7	1		1_
Neonatal deaths		_1		
erinatal deaths[(a)]		**2**	**11**	**1**
		ate per 1,000 irths		
e a dea h e bi h	.	.	.	.
Ne a a dea h e i e bi h	.	.	.	.
e a a dea h e bi h [b]	.	.	.	.

(a) Perinatal deaths are reported b patients to fertilit 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 A T treatment in / / . Neonatal death rates were calculated using all live births to women who had embr o transfer c cles in / / .

The adverse perinatal outcomes of babies born to women who had ART treatment can be measured in the p 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

	ingleton		ultiple		otal	
erinatal outco e	Nu er	er cent	Nu er	er cent	Nu er	er cent
estational age (wee s)						
_7	,	9.9		7.	, /	7._
<_7	9	1/ .1	1	7 .	_	1 .7
otal	**, 6**	**100.0**	**21**	**100.0**	**,1**	**100.0**
irthweight of liveborn babies (grams)						
, / /	,	9 .	71	_ .1	, 97	9/ ._
< , / /	__	.	1_1	.9		9.1
Not stated	_1	/ .	/	/ ./	_1	/ .
otal	**, 1**	**100.0**	**202**	**100.0**	**,0**	**100.0**
ab outcome						
ive birth survived	, 7	9 .	/	9 .	,/ 9	9 .
ive birth neonatal death		/ .1	/	/ ./		/ .1
Fetal death	/	1./	11	.	1	1.
Not stated		/ .1	/	/ ./		/ .1
otal	**, 6**	**100.0**	**21**	**100.0**	**,1**	**100.0**
e i a a dea h e bi h [a b]		.		.		.

(a) Perinatal deaths are reported b patients to fertilit 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 embr o transfer c cles in / / .

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

	ingleton		ultiple		otal	
erinatal outco e	Nu er	er cent	Nu er	er cent	Nu er	er cent
estational age (wee s)						
_7	, _7	.1	1/	1.1	_, 7	9.
< _7	_ 7	11.9	1,1 /	.9	1, 17	_/ .
otal	**2,**	**100.0**	**1, 0**	**100.0**	**, 6**	**100.0**
irthweight of liveborn babies (grams)						
/ /	,7 /	9 ./	91_	7._	_, __	7 ._
< / /	17	7._	999	1.7	1, 1	.9
Not stated	1	/ .	/	1./	_	/ .
otal	**2,**	**100.0**	**1, 2**	**100.0**	**,**	**100.0**
ab outcome						
ive birth survived	,9 1	9 .	1, 9	9 .	, 7	97.
ive birth neonatal death		/ .1	_	1.	/	/ .
Fetal death	_	1.	_	1.	7	1.
Not stated	_	/ .1		/ .1		/ .1
otal	**2,**	**100.0**	**1, 0**	**100.0**	**, 6**	**100.0**
e i a a dea h e bi h [a b]		.		.		.

4 [illegible] and surrogacy cycles in 2006

4.1 [illegible] 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 urrogacy 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.

Donor sperm insemination (DI) cycles in 2006

.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	2[illegible]	2 2	0 [illegible]	[illegible]0 [illegible]	[illegible]	[illegible]	otal

.2 Ð 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.

. Ba ies concei, ed through Ð treat ent 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 rends in A treat ent and outco es o A treat ent

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

6.1 rends in A treat ent 2002 to 2006

se o A treat ent

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

tage/outco e o treat ent	2002	200	200	200	2006
C, cles started[(a)]	_ , 7	_ ,9	1,9/	7, 1	/ , 1
oc, te embr, o transfers	,/ _	_/ ,1	_ , _	_9,1 1	1, 7
Clinical pregnancies	7, 79	7,977	,79	1/ , 9	11,7 /
ive deliveries	,	,/	,79	,1	,999
ca eg cie ce a ed %	.	.	.	.	.
e de e ce a ed %	.	.	.	.	.

(a) Includes all A T treatment (autologous c, cles, ooc, te embr, o donation and recipient c, cles, IFT c, cles, surrogac, c, cles and unclassified c, cles).

ypes o A treat ent and A 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		200		200		200		2006	
reat ent type/procedure	Nu er	er cent	Nu er	er cent	Nu er	er cent	Nu er	er cent	Nu er	er cent
Fresh										
I F	, 7	.	7,_	.	, ,_ _	.	9, 1	.1	9, / _	_.7
ICSI	9,_	__.	1/ ,/ 9	__.	11, /	__.	1_, 1	__.9	1 ,_	_ .7
IFT	19/	/ .7	1 _	/ .	1_	/ .	1 _	/ ._	1 _	/ ._
Thaw										
I F	,1 /	1 .	,	1 .	, 7	1 .	7,	19._	7,7	1 .7
ICSI	,1 _	1.9	, 9	1.	7,1 1	1./	,1 9	/ .9	, 71	/ .7
Not stated	7	1./	_	1.7	17	1.	1	1.	/ 9	./
Unclassified	1	/ .1	1	/ ./		/ ./	1	/ ./	1	/ ./
otal	**2 ,0 6**	**100.0**	**0,1**	**100.0**	**,2 2**	**100.0**	**,121**	**100.0**	**1,**	**100.0**

o en'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		200		200		200		2006	
Age group (years)[(a)]	Nu er	er cent	Nu er	er cent	Nu er	er cent	Nu er	er cent	Nu er	er cent
ea ea	.		.		.		.		.	
	1	1.	7	1._	/	1.		1.1	7	1.1
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ther not stated	/	1.9	9	1.	_	1._		1.	/	1.
otal	**,26**	**100.0**	**6, 66**	**100.0**	**1, 0**	**100.0**	**,661**	**100.0**	**0, 21**	**100.0**

(a) Age at time of treatment.

Nu er o e ryos trans erred per trans er 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.

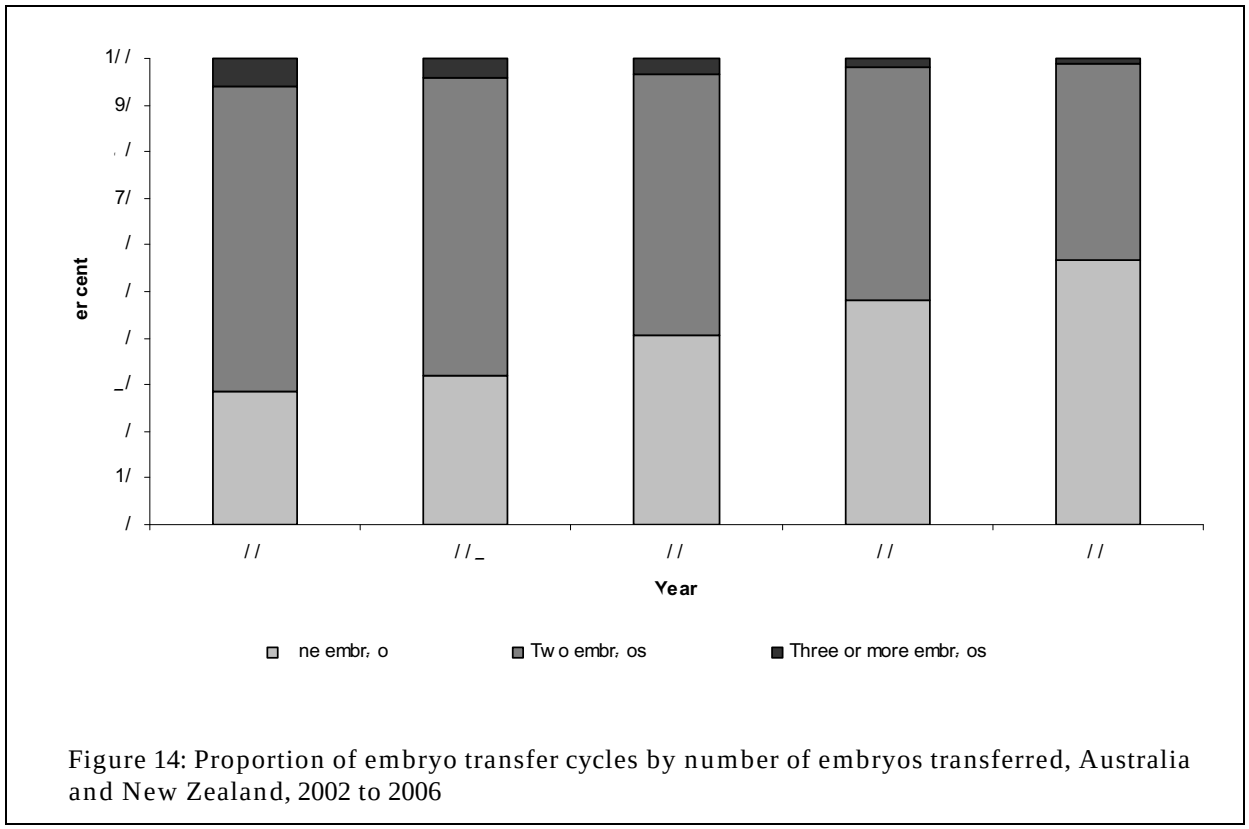


Figure 14: Proportion of embryo transfer cycles by number of embryos transferred, Australia and New Zealand, 2002 to 2006

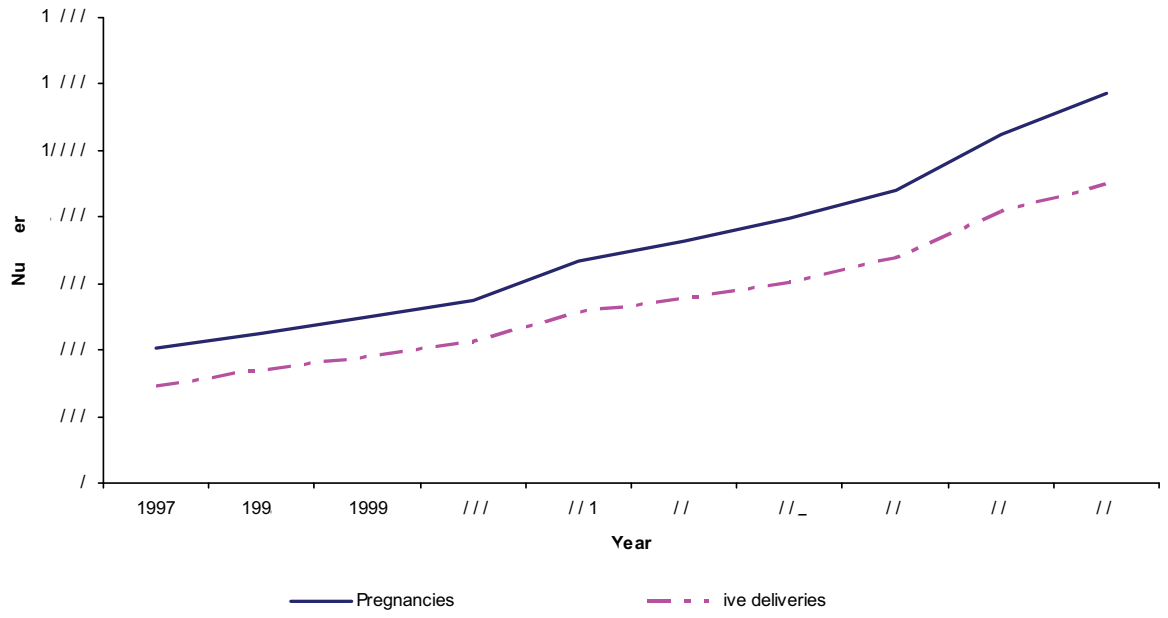
linical pregnancies and li e deli eries ro e ryo trans er cycles

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

6.2 rends in the outco es o A treat ent 1 to 2006

linical pregnancies and li e deli eries

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.



N e 1997 / / 1 data are from the Assisted Conception ata 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

ultiple gestation deli eries

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

	ingleton			win			igher order ultiple			otal
Year	Nu	er	er cent	Nu	er	er cent	Nu	er	er cent	

Appendix 1 Data used in this report

The data presented in this report are supplied by fertility centres in Australia and New

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 ANZA Ddata ite s

Va ab	*Da a d a*
Unit identifier	_ digit code for clinics provided b, NPSU
Site of main treatment	For centres with multiple sites, this identifies location of most significant part of the treatment.
Unit patient l medical record number	Uni ue l for patient.
Woman s date of birth	a, month , ear.
Husband male partner	a, month , ear.
oc, te embr, o donor s age	Completed , ears at time of donation.
Previous Medicare item 1_ / / s	The number of billed Australian Medicare item 1_ / / . New ealand units leave this field blan .
Cause of infertilit, tubal disease	/ es in the opinion of the treating clinician or clinic there is significant tubal disease present. No other.
Cause of infertilit, endometriosis	/ es in the opinion of the treating clinician or clinic there is significant endometriosis contributing to this couple s subfertilit, . No other.
Cause of infertilit, male factor	/ es in the opinion of the treating clinician or clinic there is a significant male factor problem. No other.
Cause of infertilit, other factors	/ es in the opinion of the treating clinician or clinic there is subfertilit, due to an, other factors apart from female age, tubal disease, male factor or endometriosis. Possible e amples are fibroids, ovulation disorders or premature ovarian failure. There is no clinical subfertilit, (e.g. egg donor, preimplantation genetic diagnosis or other non fertilit, reason for A T). No other.
Cause of infertilit, idiopathic	/ es in the opinion of the treating clinician or clinic there is clinical subfertilit, without an, apparent e planation. No other, including case of P for genetic disease.
Previous pregnancies < / wee s	Number of , nown pregnancies less than / wee s in the female partner regardless of whether b, A T or b, a different partner.
Previous pregnancies _ / wee s	Number of , nown pregnancies reaching / wee s or more in the female partner regardless of whether b, A T or b, a different partner.
C, cle l	Uni ue c, cle identifier.
C, cle date	For treatment c, cles this is according to the Medicare definition and is the date of MP for unstimulated c, cles or, where FSH is used, the first da, of FSH administration. For c, cles where the onl, process is movement or disposal of embr, os, this is the date of embr, o movement. This date defines the , ear in which a c, cle is reported to NPSU.
Surrogac,	/ es the procedure is part of a surrogate arrangement. No the procedure is not part of a surrogate arrangement.
In ectable FSH stimulation given	/ es FSH administered. oes not include clomiphene or hC alone unless FSH was also given. No other.
I date	ate of first insemination with donor sperm.
PU date	ate of ooc, te retrieval.
Number of eggs retrieved	Number of eggs retrieved at PU. Include an, immature ooc, tes 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.

Va ab	*Da a d a*
Number of eggs IFT	Number of eggs replaced in a IFT procedure.
Number of eggs I F	

Va ab ***Da a***

er inology 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 bl4occ1_0 1 Tf0.0008 9fte-il tr

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- 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

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.

e erences

Carr BR, Black EB & Azziz R 2005. Essential reproductive medicine. New York: McGraw-Hill Companies, Inc.

Laws PJ, Abeywardana S, Walker J & Sullivan EA 2007. Australia's mothers and babies 2005. Perinatal statistics series no. 20. AIHW cat. no. PER 40. Sydney: AIHW National Perinatal Statistics Unit.

Steptoe PC & Edwards RG 1978. Birth after reimplantation of a human embryo (Letter). Lancet 2(8085):366.

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