Assisted reproduction technology in Australia and New Zealand 2003

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Please note that as with all statistical reports there is the potential for minor revisions of data in *Assisted reproduction technology in Australia and New Zealand 2003* over its one-year life. Please refer to the online version at <www.npsu.unsw.edu.au>.

AUSTRALIAN INSTITUTE OF HEALTH AND WELFARE
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AND
THE FERTILITY SOCIETY OF AUSTRALIA

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Preface

The data recorded in the *Assisted reproduction technology in Australia and New Zealand 2003* report reflects very positively on clinical changes implemented by ART professionals in Australia and New Zealand. The collection of this data was initiated and continues to be supported by the Fertility Society of Australia (FSA). It has proven invaluable in assessing the standards of care offered to people and implementing procedural changes for those accessing fertility treatment in Australia and New Zealand. These data are audited by the Reproductive Technology Accreditation Committee (RTAC) and used as a quality assurance tool to assess standards of treatment in the field of assisted reproduction.

Most notably in the 2003 data is the decreasing multiple pregnancy rate with 95.6% of all cycles having one or two embryos transferred. This reflects changes to the RTAC Guidelines in 2002 emphasising the need to reduce multiple pregnancy rates. These rates will be further reduced with the 2005 RTAC Code of Practice which requires maximum limits on the number of embryos transferred and education of patients on the risks associated with multiple pregnancies. Decreasing multiple pregnancy rates will aid in reducing caesarean section rates and preterm births, and increasing birthweights.

The trend to decreasing the number of embryos transferred is reflected in the number of frozen embryos in storage. Improvements in embryo culturing methods and decreased numbers of embryos transferred have resulted in an increased number of frozen embryos in storage. This is despite the significant increase in the number of frozen embryos thawed over the last few years.

Between 2002 and 2003 there was a 9% increase in the number of treatment cycles, emphasising the continued need for ART treatment in Australia and New Zealand. Pregnancy rates for fresh embryo transfers have almost doubled since 1994, reflecting major improvements in technology and quality of care over this period. This highlights the ART profession's desire for continual improvement through self-regulation and public review.

The average age of ART mothers in 2003 was 34.4 years. This is 4.9 years older than all Australian women giving birth in 2003. The FSA continues to focus on educating the general population on the significance of declining pregnancy rates associated with reproductive age. The ANZARD data have proven invaluable in assisting ART specialists in advising patients on their best pregnancy treatment options based on reproductive age. The data reflect declining pregnancy rates with age and this, viewed in relation to ovarian reserve and the diagnosis of genetic abnormalities, assists in convincing people of the value of various ART treatments.

Over the years the data collection criteria have been altered to reflect changing technologies and the need to gather information useful in determining treatment modalities. The FSA with the aid of the NPSU staff will continue to revise and utilise these data to assist in providing the highest standards of ART care. The FSA thanks Dr Elizabeth Sullivan and her staff for their tireless efforts in this data collection and presentation. The countless hours required by ART unit staff to collect the raw data must not go unacknowledged and much thanks is also offered to fertility centres and patients for their continued support.

Adrianne Pope, BSc, Hons, PhD

President, Fertility Society of Australia

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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

ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
ANZARD	Australian and New Zealand Assisted Reproduction Database
ART	Assisted reproduction technology
COH	controlled ovarian hyperstimulation
ET	embryo transfer
FET	frozen embryo transfer
GIFT	gamete intrafallopian transfer
ICSI	intracytoplasmic sperm injection
IUI	intra-uterine insemination
IVF	in-vitro fertilisation
LMP	last menstrual period
MESA	microscopic epididymal sperm aspiration
n.a.	not available
n.p.	not published
NPSU	National Perinatal Statistics Unit
NSW	New South Wales
NT	Northern Territory
NZ	New Zealand
OHSS	ovarian hyperstimulation syndrome
OPU	oocyte pick-up
PESA	percutaneous epididymal sperm aspiration
PGD	preimplantation genetic diagnosis
Qld	Queensland
RTAC	Reproductive Technology Accreditation Committee
SA	South Australia
SUZI	subzonal insemination
Tas	Tasmania
TESA	testicular sperm aspiration
UNSW	University of New South Wales
Vic	Victoria
WA	Western Australia
ZIFT	zygote intrafallopian transfer
. .	not applicable

Summary

Assisted reproduction technology in Australia and New Zealand 2003 is the ninth annual report on the use of assisted reproduction technology (ART) in Australia and New Zealand.

Treatment characteristics

- During 2003, 39,720 treatment cycles were attempted in Australia and New Zealand. Of these, 90.7% (36,040) took place in Australia and 9.3% (3,680) in New Zealand.
- In Australia, there were 8.4 treatment cycles per 1,000 women of reproductive age (15–44 years). Correspondingly, in New Zealand, there were 4.2 cycles per 1,000 women of reproductive age (15–44 years).
- More than half (53.8%) of ART procedures involved fresh, non-donor oocytes or embryos, almost a third (31.9%) used frozen, non-donor embryos, 5.7% used oocytes or embryos received from a donor and 7.8% of cycles were intra-uterine insemination using donated sperm.
- The average age of women undergoing treatment in 2003 was 35.2 years. Their partners were aged on average 37.8 years.
- For fresh, non-donor (oocytes / embryos) cycles, 18.6% of all cycles started resulted in the delivery of at least one live baby. For frozen, non-donor (embryos) cycles, 13.9% of all cycles in which embryos were thawed resulted in the delivery of at least one live baby. The success of fresh, non-donor treatment varied among fertility centres. The highest ranked group of fertility centres achieved a live delivery in at least 20.2% of treatment attempts. The lowest ranked group of fertility centres achieved live delivery in less than 15.0% of treatment cycles.
- In 2003, the majority (95.6%) of treatment cycles transferred one or two embryos.
- The success of fresh, non-donor (oocytes / embryos) treatment cycles varied by women's age. Women aged 25–29 years achieved the greatest success, with 27.7% of initiated cycles achieving a live delivery. Women aged 40–44 years had a success rate of 6.8%.

Pregnancies and births

- Overall, there were 8,365 pregnancies reported in the 2003 cohort. Of these pregnancies, 23.1% were less than 20 weeks gestation and 76.9% were at least 20 weeks gestation resulting in 7,479 liveborn babies and 108 fetal deaths.
- Of all pregnancies, 88.2% (7,374) were reported from fertility centres in Australia, resulting in 6,474 liveborn babies. Fertility centres in New Zealand reported 11.8% (991) of all pregnancies, resulting in 1,005 liveborn babies.
- Of the 8,365 pregnancies arising from the 2003 conception cohort, 20.7% resulted in miscarriage. Ectopic pregnancies accounted for 1.8%. A small proportion (0.6%) were either reduced or terminated.

- There were 1,163 (18.1%) multiple deliveries in the 2003 cohort. Of these, most (98.1%, 1,141) were deliveries of twins and a small proportion (0.3%, 22) were triplets.
- Half (50.0%, 3,203) of deliveries were by caesarean section, almost twice the proportion reported for all Australian births in 2003 (28.5%). Whereas 47.8% of ART mothers aged younger than 38 years delivered by caesarean section, only 27.5% of mothers in this age group in the Australian population did so. Similarly, 59.0% of ART mothers aged 38 years or older delivered by caesarean section, compared with only 41.1% of same-aged mothers in the Australian population.
- The average age of women giving birth was 34.4 years, 4.9 years older than the average age of Australian mothers in 2003 (29.5 years).
- The average gestational age of all babies was 37.2 weeks. More than a quarter (26.6%) of babies were born preterm with a gestational age of less than 37 weeks. This is a lower proportion than that reported in 2000 (32.6%), suggesting improved outcomes for babies following assisted reproduction.
- The average birthweight of all babies was 2,990 grams. Babies born with low birthweight (<2,500 g) made up 21.8% of all babies, which is less than the 26.4% of babies with low birthweight in 2000. However, babies born following ART in 2003 had a lower average birthweight than that reported for all babies in Australia in 2003 (3,372 g).
- There were 142 reported perinatal deaths in the 2003 cohort, comprising 108 fetal deaths and 34 neonatal deaths. This represents a perinatal mortality rate of 18.7 deaths per 1,000 births. This is higher than the perinatal mortality rate reported for the 2002 cohort (17.3 deaths per 1,000 births).

1 Introduction

Assisted reproduction technology (ART) methods are used by clinicians to help couples with fertility problems achieve pregnancy. The main ART methods reported here include:

- in-vitro fertilisation (IVF), where eggs and sperm are combined in the laboratory for fertilisation outside the body and replaced in the uterus
- intracytoplasmic sperm injection (ICSI), where a single sperm is injected into an egg for fertilisation outside the body and replaced in the uterus
- gamete intrafallopian transfer (GIFT) (a less common method), where eggs and sperm are placed in the fallopian tubes for fertilisation inside the body.

The embryos arising from the IVF and ICSI method can be frozen and used in subsequent ART treatment where they are thawed and transferred to the uterus.

The first ART method used in Australia was IVF in 1979. This was followed by the first Australian-born IVF baby in 1980. In New Zealand, the first IVF baby was born in 1983. GIFT was introduced in Australia in 1985 but its use has been in sharp decline in recent years and now accounts for only a small proportion of ART treatment cycles. The first microinsemination technique for treating male infertility, subzonal insemination (SUZI), was introduced in 1990. However, lately this has been superseded by the more successful ICSI technique.

The main purposes of this report are to place in the public domain:

- 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 set standards for accreditation and monitoring of ART units
- information for national and international comparisons.

This report

This chapter briefly describes the data source.

Chapter 2 presents data on ART procedures, embryo transfer and storage, the success of ART treatment and complications of ART treatment. Summary trends since 1994 are also presented.

Chapter 3 presents data on the outcome of pregnancies and births from ART in 2003. Summary trends since 1994 are also presented.

Appendix 1 presents tables containing data referred to in body of the report.

The data items contained in ANZARD are presented in Appendix 2.

This report and additional data on the Internet

This report is available in PDF format on the Internet at <www.npsu.unsw.edu.au>. This site also includes supplementary tables (in PDF format) which present data not included in the report.

Data source

Data used in this report come from the Australian and New Zealand Assisted Reproduction Database (ANZARD). ANZARD includes information about the treatment methods of IVF, ICSI and GIFT. It also includes information about treatment via the cryopreservation and thaw of embryos; intra-uterine insemination using donated sperm (IUI-donor); treatment involving donated gametes or embryos; and the use of technologies such as assisted hatching, preimplantation genetic diagnosis and blastocyst culture. ANZARD contains details of all pregnancy and birth outcomes, including method of delivery, birth status, birthweight, gestational age, plurality, perinatal mortality, congenital anomalies and maternal morbidity. ANZARD does not contain information about intra-uterine insemination (IUI) using partner's sperm.

Data on treatment cycles are collected at each fertility centre at the time of treatment and provided to the NPSU within 6 months. Fertility centre staff follow up patients for data on their pregnancy and birth outcomes, which is provided to the NPSU within 6–12 months.

Report cohort

This report presents information on all treatment cycles that took place in 2003 and the resulting pregnancies and births. The babies discussed in this report were conceived in 2003 and born in either 2003 or 2004. The report also includes data from 1994 to 2003.

Data accuracy

Most fertility centres have advanced 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. Inaccuracies are followed up with fertility centre staff. For 2003, less than 0.1% of treatment data and 0.3% of pregnancy outcomes were not stated. The Reproductive Technology Accreditation Committee (RTAC) plays a role in ensuring the quality of ANZARD data by validating random data records against clinic files in their triennial inspections.

Data presentation

Data presented are for treatment cycles and not patients. Thus, it is possible that an individual woman can undergo more than one treatment in an annual cohort or experience more than one pregnancy. This also means that information reported about patient characteristics, such as age, parity, and cause of infertility, are based on calculations in which individuals may be counted several times.

For multiple pregnancies, mother items which may be different for each baby, such as gestational age and method of birth, are classified according to the features of the first born baby.

Where applicable, percentages in tables have been calculated including the 'Not stated' category. Cell sizes of three or less have not been published, in accordance with the AIHW's policy on the reporting of small numbers. Exceptions to this are small numbers in 'Other' and 'Not stated' categories.

Note that ANZARD includes 28 different ART cycle combinations and therefore in some instances totals in some tables may appear inconsistent with corresponding totals in other tables. Where this has occurred, the discrepancy has been footnoted.

Data limitations

Follow-up of pregnancy information is limited because the ongoing care of pregnant patients is often carried out by non-ART practitioners. Usually, the fertility centre follows up the outcome of the pregnancy with either the patient or her clinician. 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 (including congenital anomalies). Fertility centre staff invest a lot of effort into validating such information by obtaining medical records from clinicians or hospitals. Data about previous ART treatment and history of pregnancies are, in some cases, self-reported.

Terms used in this report

This report categorises ART treatments according to whether the patient used her own oocytes and embryos (non-donor) or oocytes and embryos donated by another woman (donor) and whether the embryos are transferred soon after fertilisation (fresh) or following cryopreservation and thaw (frozen).

Treatment cycle: all ART cycles initiated with the intention to treat a patient. These include cycles with: (1) attempted or successful oocyte retrieval (stimulated or unstimulated); (2) thawing of cryopreserved embryos; (3) intra-uterine insemination using donated sperm (IUI-donor); and (4) cancellation where follicle-stimulating hormone (FSH) has been administered.

Pregnancy: a pregnancy in which at least one of the following criteria are met: (1) known to be ongoing at 20 weeks; (2) evidence by ultrasound of an intra-uterine 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 laproscopically or by ultrasound.

2003 conception cohort: the group of patients who received ART treatment between 1 January 2003 and 31 December 2003.

Delivery: a birth in which one or more babies are born.

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

Live birth: 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 (WHO definition).

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

- OPU and FET cycles: (pregnancy end date – embryo transfer date) + 16 days.
- GIFT cycles: (pregnancy end date – OPU date) + 14 days.
- IUI-donor cycles: (pregnancy end date – date of insemination) + 14 days.

OPU: oocyte pick-up, refers to the procedure in which oocytes are collected from the ovaries via ultrasound-guided, fine-needle aspiration.

IVF: refers to all treatment cycles in which embryos were fertilised via IVF; mixed IVF–ICSI cycles are excluded.

ICSI: refers to all treatment cycles in which embryos were fertilised via ICSI; mixed IVF–ICSI cycles are excluded.

IUI-donor: intra-uterine insemination using donated sperm.

Mixed IVF–ICSI: refers to a treatment cycle in which some oocytes are subjected to IVF and others to ICSI.

GIFT: refers to any cycle involving GIFT, including GIFT combined with IVF or ICSI.

FET: treatment by frozen embryo transfer.

Full-term: gestation of at least 37 weeks.

Preterm: gestation of at least 20 weeks but less than 37 weeks.

Very preterm: gestation of at least 20 weeks but less than 32 weeks.

Normal birthweight: birthweight of at least 2,500 grams.

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

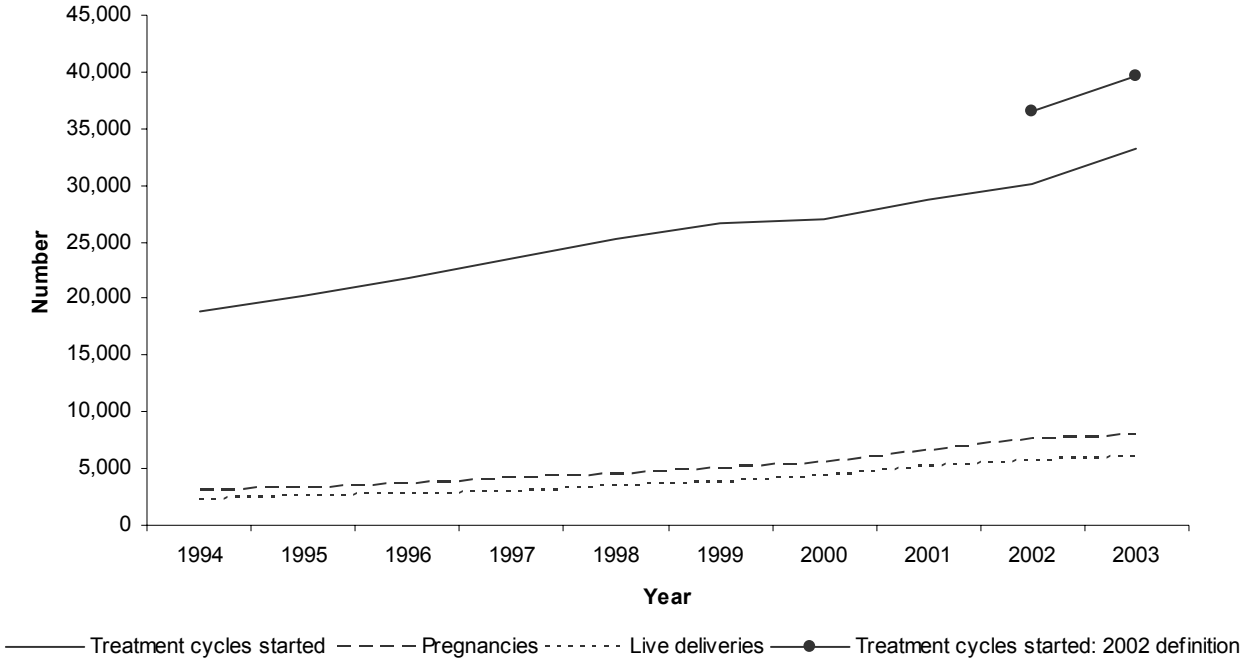
Very low birthweight: birthweight of less than 1,500 grams.

2 Assisted reproduction technology treatment in 2003

2.1 Ten-year trends (1994 to 2003)

Has the use of ART changed since 1994?

In 2003, 39,720 treatment cycles were started in Australia and New Zealand, which is an increase of 9% on the 36,483 that took place in 2002 (Table R1). Figure 1 demonstrates the increase in the number of pregnancies and deliveries resulting from ART treatment in Australia and New Zealand since 1994. In 2003, 7,964 pregnancies were reported, which is an almost three-fold increase on the 3,139 pregnancies reported for 1994 (Table R1). The number of live deliveries reported in 2003 (6,026) was almost three times the number reported for 1994 (2,318).



Note: Treatment cycles started, pregnancies and live deliveries are based on the pre-ANZARD definition.

Figure 1: Treatment cycles started, pregnancies and live deliveries, Australia and New Zealand, 1994 to 2003

ANZARD was introduced in 2002 and includes donor insemination cycles, cancelled ART cycles and unsuccessful OPUs and embryo thaws in addition to cycles for the treatment methods included in the previous Assisted Conception data collection. Counting these treatment cycles provides a more accurate assessment of the total number of treatment cycles

attempted, which allows better appraisal of ART success. The total number of attempted treatments in 2002 and 2003 using the ANZARD definition is presented separately in Figure 1. By this definition, there were 36,627 attempted ART treatment cycles and 3,093 donor insemination cycles (IUI-donor), producing a total of 39,720 treatments in Australia and New Zealand in 2003 (Table R1).

Has the use of different ART treatment types changed since 1994?

Figure 2 demonstrates the changes that have occurred in the types of treatment used in Australia and New Zealand since 1994. Most notably, the use of ICSI has increased almost fourfold since 1994 and now surpasses IVF treatment by approximately 23% (Tables R2 and R7). Treatment by GIFT has declined markedly over this period, representing 27% of fresh transfer cycles in 1994 but only 1% of fresh transfer cycles in 2003 (Table R2).

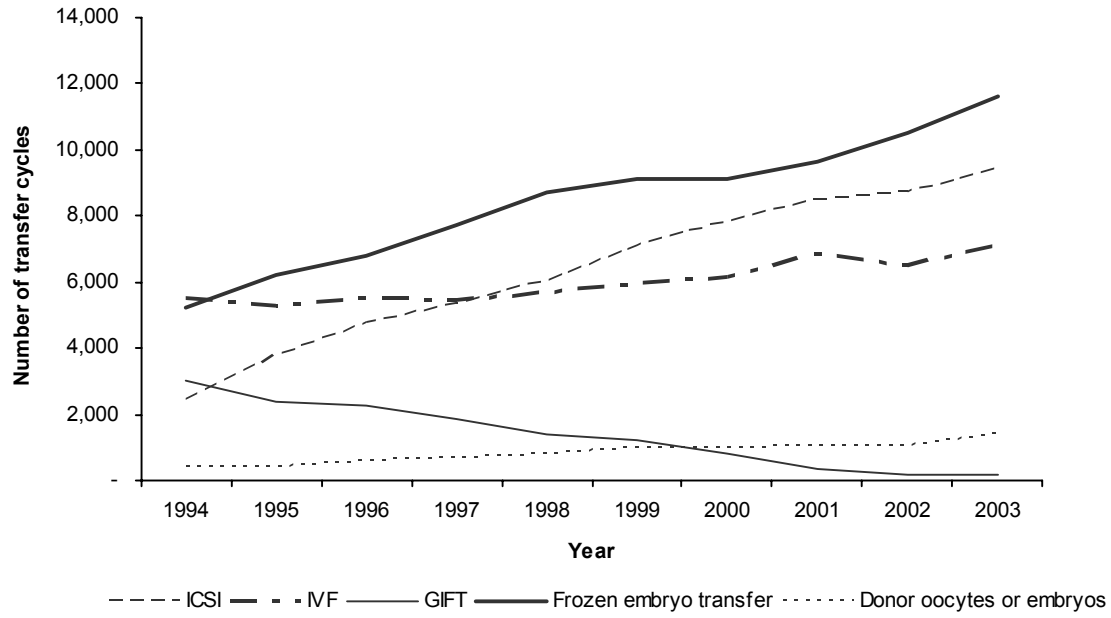


Figure 2: Number of transfer cycles by treatment type, Australia and New Zealand, 1994 to 2003

Has the number of embryos transferred per treatment cycle changed since 1994?

Figure 3 demonstrates that the majority of treatment cycles involving the transfer of embryos in 2003 had one or two embryos transferred. In 1994, 48.7% of embryo transfer cycles transferred three or more embryos compared with 4.3% of cycles in 2003 (Table R3). These data demonstrate that it is now common practice in Australia and New Zealand to transfer no more than two embryos per embryo transfer cycle.

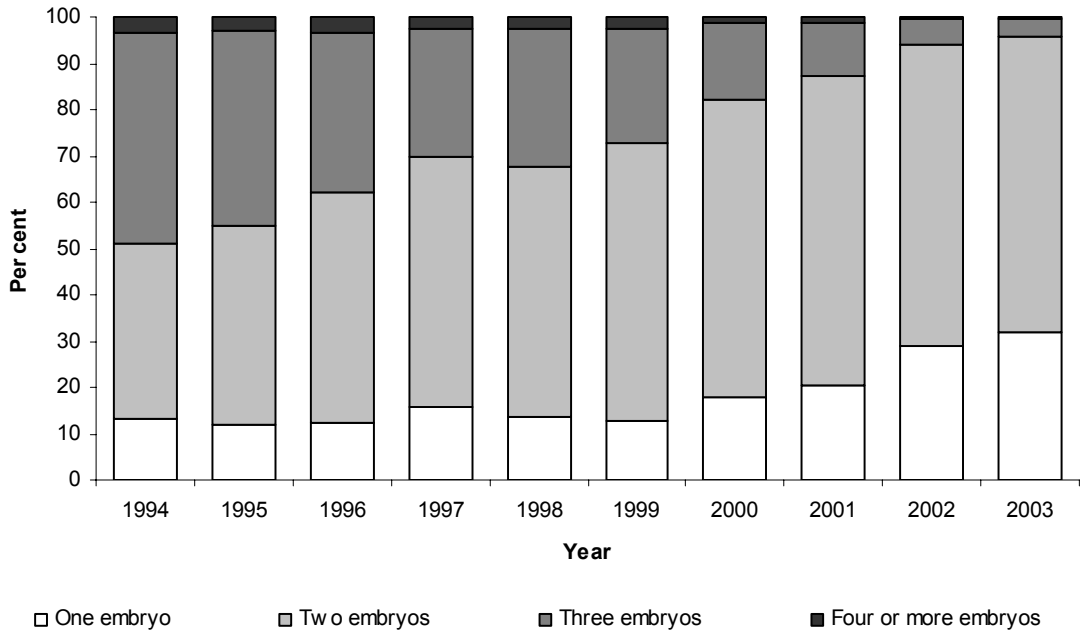


Figure 3: Proportion of fresh and frozen embryo transfer cycles transferring one, two, three or more embryos, Australia and New Zealand, 1994 to 2003

Has the success of ART treatment improved since 1994?

Figure 4 shows the increasing success of ART treatment since 1994. ART treatment using fresh embryos demonstrates the greatest increase, with the pregnancy success rate in 2003 (30.9 pregnancies per 100 embryo transfer cycles) being almost twice what it was in 1994 (17.5 pregnancies per 100 embryo transfer cycles) (Table R4). Similarly, the pregnancy success rate of ART using frozen embryos has increased from 15.5% of embryo transfer cycles in 1994 to 20.4% in 2003 (Table R4).

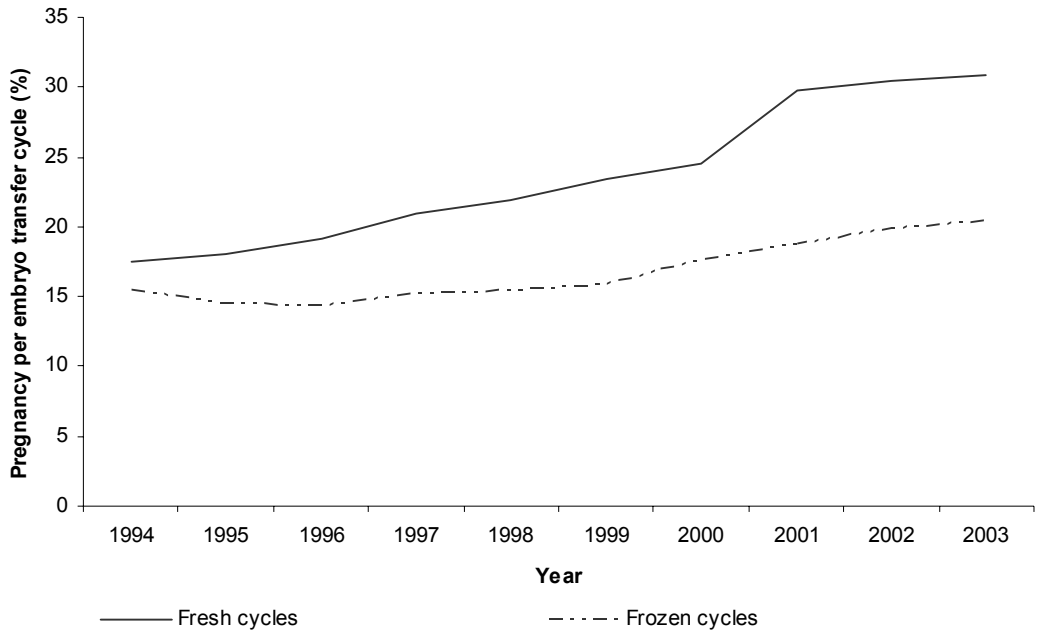


Figure 4: Rate of pregnancy per embryo transfer cycle, Australia and New Zealand, 1994 to 2003

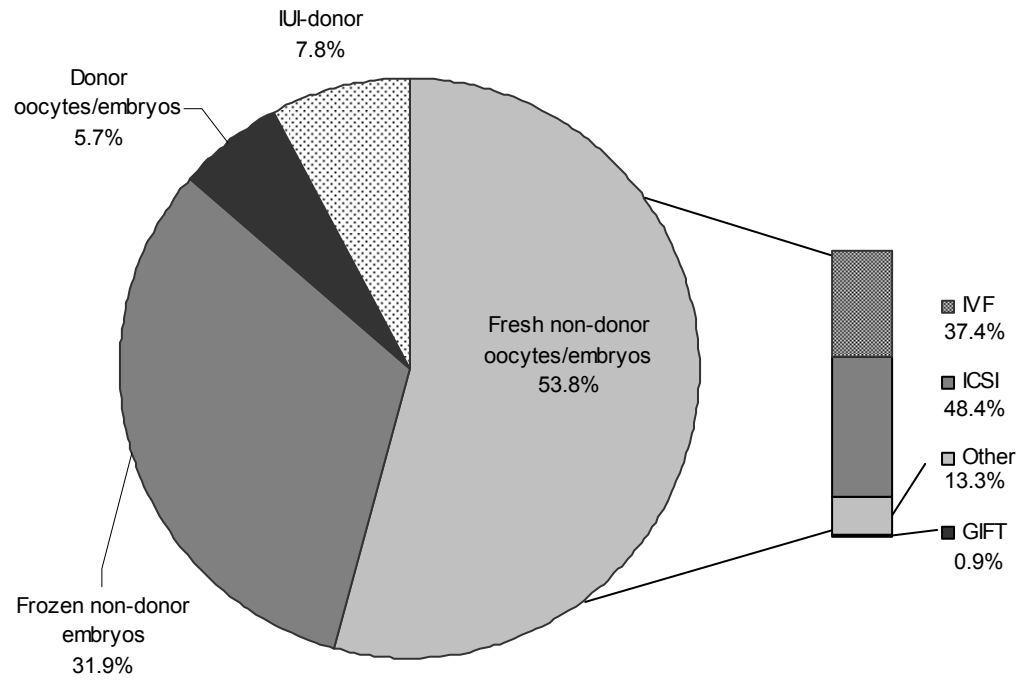
2.2 ART treatment in 2003

A total of 39,720 ART treatment cycles took place in Australia and New Zealand in 2003. Of these, 90.7% (36,040) occurred in Australia and 8.3% (3,680) in New Zealand. In Australia there were 8.4 cycles per 1,000 women of reproductive age (15–44 years) and in New Zealand there were 4.2 cycles per 1,000 women of reproductive age.

What types of ART treatments took place in Australia and New Zealand in 2003?

Figure 5 shows that the majority of ART treatment cycles in 2003 (53.8%, 21,443) used fresh, non-donor oocytes or embryos (Table R5). About a third (31.9%, 12,702) used frozen, non-donor embryos (Table R5) and a small proportion (5.7%, 2,262) used donated oocytes or embryos that were either fresh or frozen (Table R5). Of the remaining treatment cycles, 7.8% (3,093) involved intra-uterine insemination (IUI-donor) using sperm donated from an anonymous or known donor (Table R5).

Almost half of all fresh, non-donor cycles involved ICSI (10,373) and more than a third used IVF (8,028) (Table R6). GIFT accounted for 0.9% (183) of all fresh, non-donor cycles. The remaining 13.3% of fresh, non-donor treatments included mixed IVF and ICSI cycles, cycles that did not successfully retrieve oocytes, and cycles that were cancelled before oocyte retrieval.



Note: Other includes cancelled or failed OPUs, mixed IVF–ICSI cycles, OPU with freeze-all embryos, failed OPUs and OPUs with fertilisation but no transfer.

Figure 5: Proportion of treatment cycles, by treatment type, Australia and New Zealand, 2003

How many embryos were transferred in embryo transfer cycles in 2003?

Most ART treatment cycles (95.6%) in 2003 involved the transfer of one or two embryos (Table R8). Figure 6 shows that, in 2003, women aged 38 years or older tended to have more embryos transferred than those aged less than 38 years (Table R8).

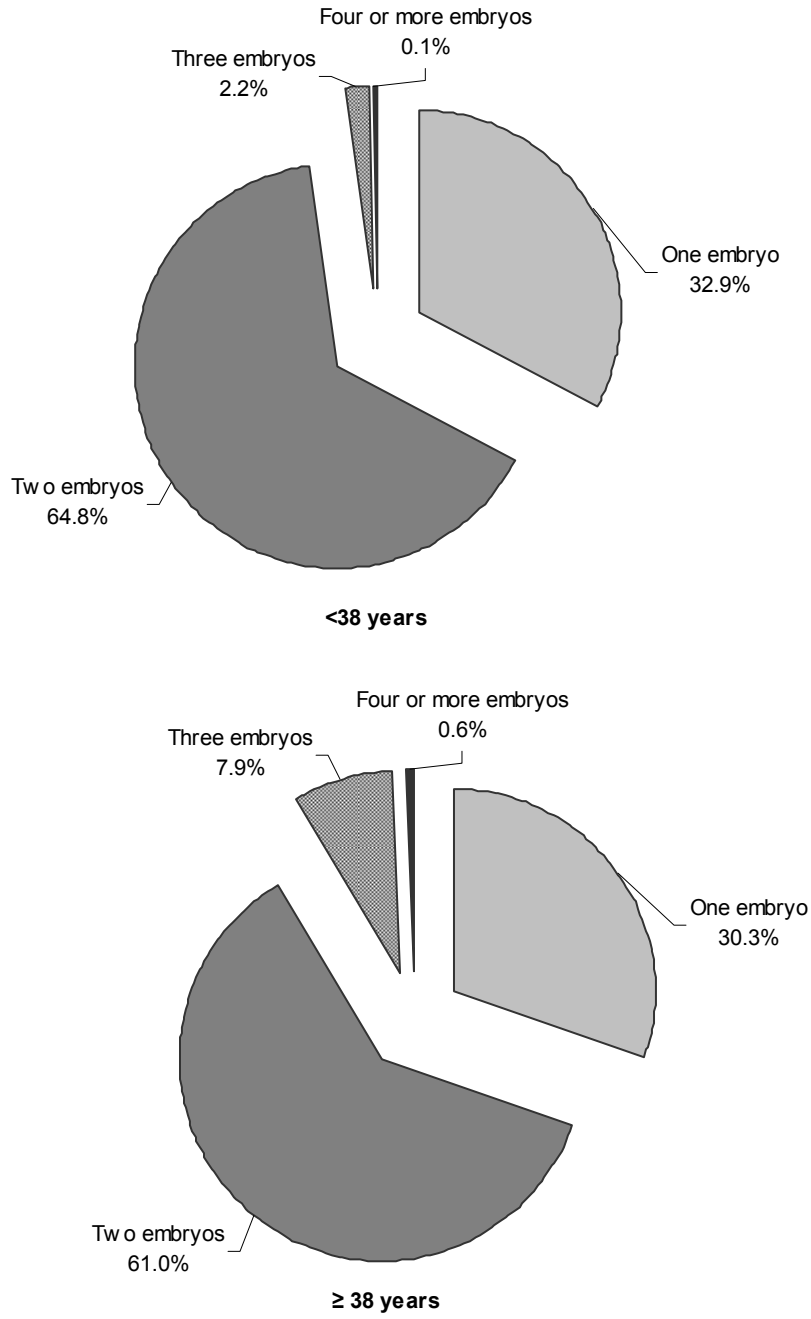


Figure 6: Proportion of fresh and frozen embryo transfer cycles transferring one, two, three and four or more embryos, by age group, Australia and New Zealand, 2003

How many embryos were stored in 2003?

The number of embryos removed from or added to storage in fertility centres each year is provided to ANZARD. In 2003, there were 10,630 fresh cycles where embryos were frozen (Table R9). A total of 48,579 embryos were stored for the purposes of future treatment. Another 13,691 cycles involved the thawing of embryos for treatment purposes where 32,728 embryos were thawed. A further 3,475 embryos were removed from storage due to patient request, government regulation or donation to research. This contributed a net 12,376 embryos to the current pool of embryos available for treatment, leaving 104,917 embryos in storage at 31 December 2003 (Table R9).

What was the average age of couples undergoing ART treatment in 2003?

In 2003, the average age of women having treatment cycles was 35.2 years and they ranged in age from 17 to 55 years (Table R10). Men tended to be older and ranged in age from 19 to 87 years, with an average age of 37.7 years (Table R11).

2.3 Success of ART in 2003

The success of different types of ART procedures can be compared by measuring the number of live deliveries per embryo transfer cycle. Table 1 presents the number of live deliveries per embryo transfer as a percentage for each ART treatment type (Table R12). In 2003, 23.7% of fresh non-donor embryo transfer cycles resulted in the delivery of one or more live babies, compared with 15.2% of frozen non-donor embryo transfer cycles.

However, calculating the number of successful embryo transfer cycles is only one way of measuring ART success. Because the processes behind fresh and frozen treatment are different, it is often more accurate to use measures of success that are specific to fresh or frozen ART treatments. These are presented in the following sections 2.3.1–2.3.3.

Table 1: Live delivery per embryo transfer cycle, by treatment type, Australia and New Zealand, 2003

Treatment type		Live delivery per embryo transfer (%)
Non-donor oocytes/embryos	Fresh	23.7
	Frozen	15.2
Donor oocytes/embryos	Fresh	24.5
	Frozen	14.5

2.3.1 Success of fresh, non-donor (oocytes/embryos) ART treatment cycles in 2003

How is fresh, non-donor (oocytes/embryos) ART success measured?

Figure 7 shows the total number of fresh, non-donor cycles started in 2003 and how many of these progressed to the stage of oocyte retrieval, embryo transfer, pregnancy and the delivery of at least one live baby. The treatment process can be discontinued at any stage for a variety of reasons, including inadequate oocyte production, failure of the oocyte and sperm to fertilise, inadequate embryo growth, development of treatment side effects, patient choice, or failure of the embryo to implant in the uterus.

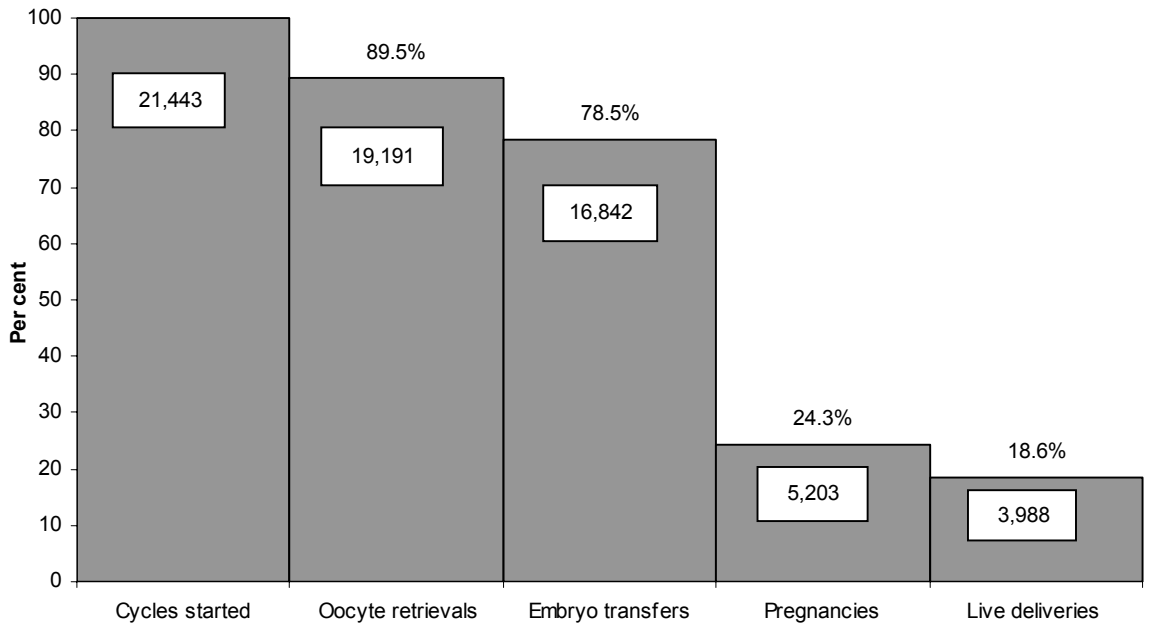


Figure 7: Progression of fresh, non-donor (oocytes/embryos) treatment cycles, Australia and New Zealand, 2003

The success of fresh, non-donor (oocytes / embryos) ART treatment is determined in a number of ways, depending on which values are considered the endpoint (numerator) and the starting point (denominator). Below, Table 2 presents the various success measures that can be derived from the steps depicted in Figure 7. For instance, in 2003, 18.6% of all fresh, non-donor cycles started resulted in the delivery of one or more live babies.

Table 2: Measures of success for fresh, non-donor (oocytes/embryos) treatment cycles, Australia and New Zealand, 2003

Stage of treatment	Pregnancy	Live delivery
Cycle started	24.3% (5,203/21,443)	18.6% (3,988/21,443)
Oocyte retrieval	27.1% (5,203/19,191)	20.8% (3,988/19,191)
Embryo transfer	30.9% (5,203/16,842)	23.7% (3,988/16,842)

Did ART success vary by type of ART treatment procedure in 2003?

Table 3 shows the number of live deliveries per cycle started as a percentage for IVF and ICSI treatment. In 2003, treatment by IVF and ICSI achieved similar success (Table R12). Only 183 cycles of GIFT were reported in 2003 resulting in a live delivery rate per cycle of 12%; however, this figure should be interpreted with caution because of the small number of treatment cycles involved.

Table 3: Live delivery per cycle started by type of fresh, non-donor (oocytes/embryos) ART procedure, Australia and New Zealand, 2003

ART procedure	Live delivery per cycle started (%)
IVF	21.2
ICSI	21.2

Did ART success vary by cause of infertility?

Table 4 shows the number of live deliveries per cycle started as a percentage of fresh, non-donor (oocytes / embryos) cycles by different causes of infertility. The causes are based on clinical diagnosis; however the diagnostic definitions may vary among fertility centres. In 2003, couples in which male factor only infertility was reported achieved the highest live delivery success rate (21.8%). Those with female factors of infertility, such as tubal disease or endometriosis, had comparatively less success. The relative success of couples with male factor infertility is to be expected when it is taken into account that the female partner usually has normal reproductive physiology.

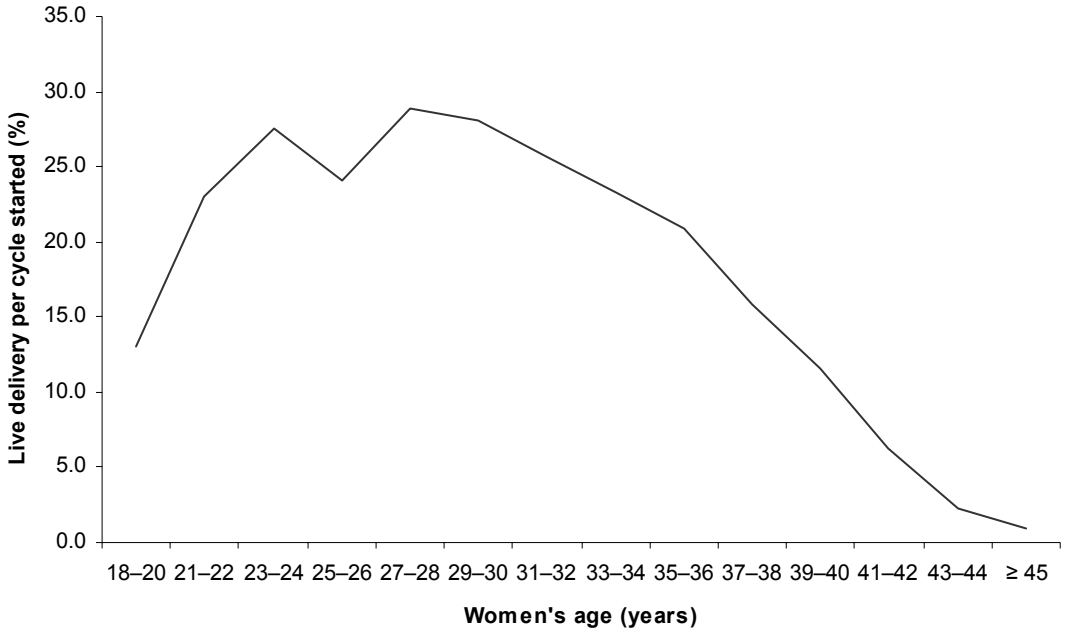
Table 4: Live delivery per cycle started by cause of infertility for fresh, non-donor (oocytes/embryos) ART treatment cycles, Australia and New Zealand, 2003

Cause of infertility	Number of cycles started	Number of live deliveries	Live delivery per cycle started (%)
Male factor only	5,009	1,094	21.8
Female factor only			
Tubal disease	1,835	326	17.8
Endometriosis	1,221	240	19.7
Multiple causes[(a)]	7,127	1,241	17.4
Unexplained	3,669	711	19.4
Other (including fibroids, ovulation disorders, premature ovarian failure)	2,170	320	14.7
No cause/not stated	412	56	13.6

(a) Includes tubal disease and endometriosis, male factor and tubal disease, and male factor and endometriosis.

Did ART success vary by women's age in 2003?

Figure 8 indicates how the success of fresh, non-donor (oocytes / embryos) cycles varied among women of different ages in 2003 (Table R13). Women's ovarian or reproductive age is one of the key factors associated with ART success when women use their own oocytes. The figure demonstrates how success is greatest when women are aged in their mid-20s to mid-30s but declines steadily from this age onwards. For women over the age of 40 years the chance of achieving a live delivery is, on average, less than 5% (Table R13).



Note: Values for women aged ≥ 45 years were combined owing to small numbers.

Figure 8: Live delivery per cycle started by women's age for fresh, non-donor (oocytes/embryos) treatment cycles, Australia and New Zealand, 2003

2.3.2 Success of frozen, non-donor (embryos) ART treatment cycles in 2003

How is frozen, non-donor (embryos) ART success measured?

Figure 9 shows the total number of frozen, non-donor treatment cycles started in 2003 and the number that progressed from the stage of attempted embryo thaw to embryo transfer, pregnancy and delivery of at least one live baby. In 2003, 13.9% of all attempted thaw cycles resulted in the delivery of at least one live baby (Table R12). This compares well with the success of fresh, non-donor (oocytes / embryos) treatment in which 18.6% of cycles initiated resulted in the delivery of one or more live babies (Figure 7), particularly when considering that treatment with frozen embryos can be less invasive.

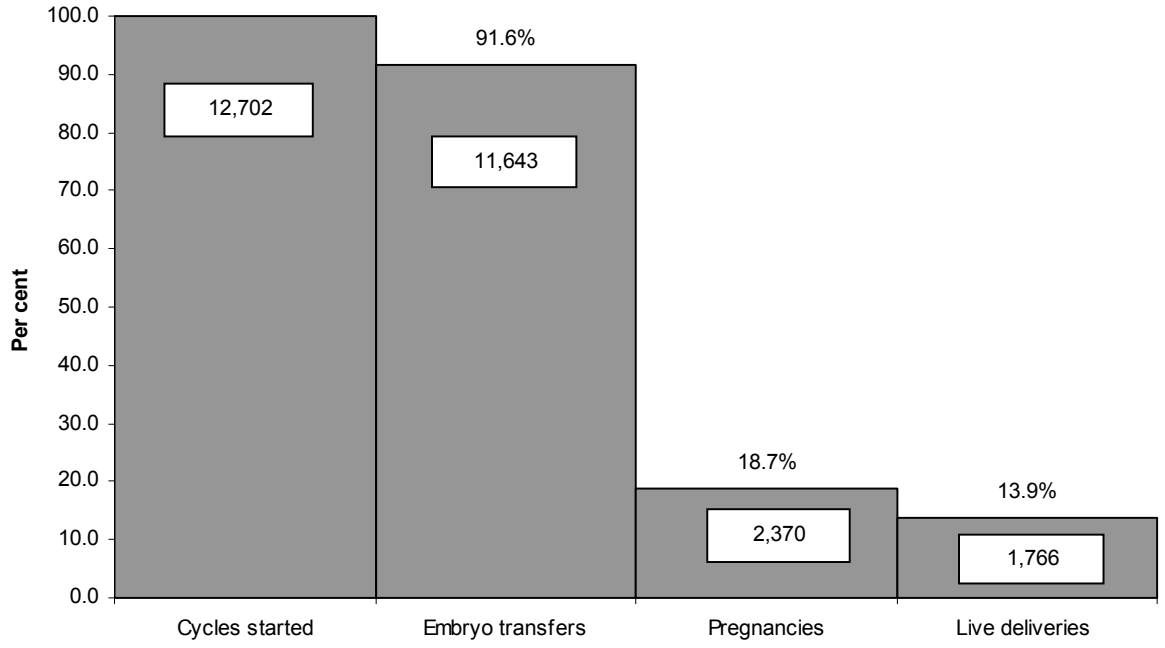


Figure 9: Progression of frozen, non-donor (embryos) treatment cycles, Australia and New Zealand, 2003

2.3.3 Success of donor sperm intra-uterine insemination procedures in 2003

Treatment by artificial insemination is defined as intra-uterine insemination using donated sperm (IUI-donor) for the purpose of this report. With IUI-donor, oocytes are not retrieved from the body. Instead, sperm is placed in the uterus and fertilisation occurs inside the body. Accordingly, the success of IUI-donor is measured differently from ART procedures, usually as the number of live deliveries per cycle started. In 2003, there were 3,093 IUI-donor procedures using sperm donated from an anonymous or known donor. Of these, 10.1% (313) resulted in the delivery of one or more live babies (Table R12).

2.4 Variation in success rates among fertility centres

How did fresh, non-donor (oocytes/embryos) ART success vary among fertility centres in Australia and New Zealand in 2003?

The variation in success among fertility centres is best measured using quartiles which rank individual centre success rates and report the success of the top and bottom 25% of centres.

For fresh, non-donor (oocytes / embryos) ART treatment cycles in 2003, the top 25% of fertility centres (first quartile) achieved live deliveries in at least 20.2% of treatment attempts (first quartile range 20.2–32.9%) (Table R14). The bottom 25% of fertility centres (fourth quartile) achieved live deliveries in less than 15.0% of treatment attempts. The remaining 50% of fertility centres achieved success rates (live delivery per cycle started) between 15.0% and 20.1% (Table R14).

The variation in fertility centre success persists across age groups. Table 5 shows the rankings for fresh, non-donor (oocytes / embryos) ART treatment by women's age group. For women aged 40 years or older, the top 25% of fertility centres achieved live delivery in at least 10.0% of treatment attempts (first quartile range 10.0–15.8%).

Table 5: Quartiles for fertility centres for fresh, non-donor (oocytes/embryos) treatment cycles, by women's age group, Australia and New Zealand, 2003

	Live delivery per cycle started (%)				
Age group (years)	Average for all fertility centres	First quartile	Second quartile	Third quartile	Fourth quartile
<35 years	24.9	28.0–40.9	24.3–27.9	22.1–24.2	<22.1
35–39 years	14.7	17.5–30.0	13.9–17.4	11.1–13.8	<11.1
≥ 40 years	7.1	10.0–15.8	6.3–9.9	4.2–6.2	<4.2

How did frozen, non-donor (embryos) ART success vary among fertility centres in Australia and New Zealand in 2003?

For frozen, non-donor (embryos) ART treatment in 2003, the top 25% of fertility centres (first quartile) achieved live delivery in at least 16.5% of treatment attempts (first quartile range 16.5–24.9%) (Table R15). The bottom 25% of fertility centres (fourth quartile) achieved live delivery in less than 10.0% of treatment attempts (Table R15). The remaining 50% of fertility centres achieved success rates (live delivery per cycle started) between 10.0% and 16.4% (Table R15).

Table 6 presents the rankings for frozen, non-donor (embryos) ART treatment by women's age group.

Table 6: Quartiles for fertility centres for frozen, non-donor (embryos) treatment cycles, by women's age group, Australia and New Zealand, 2003

	Live delivery per attempted thaw cycle (%)				
Age group (years)[(a)]	Average for all fertility centres	First quartile	Second quartile	Third quartile	Fourth quartile
<35 years	15.8	20.3–29.5	15.6–20.2	10.1–15.5	<10.1
35–39 years	12.9	17.3–24.5	13.2–17.2	8.5–13.1	<8.5

(a) Data not shown for women aged 40 years and over owing to small cell sizes.

2.5 Complications of ART in 2003

ANZARD includes morbidity information that is specifically related to ART but only where hospital admission is required. Morbidity data are self-reported by patients and validated later with hospital records by fertility centre staff. It is possible that there is under-reporting of this information.

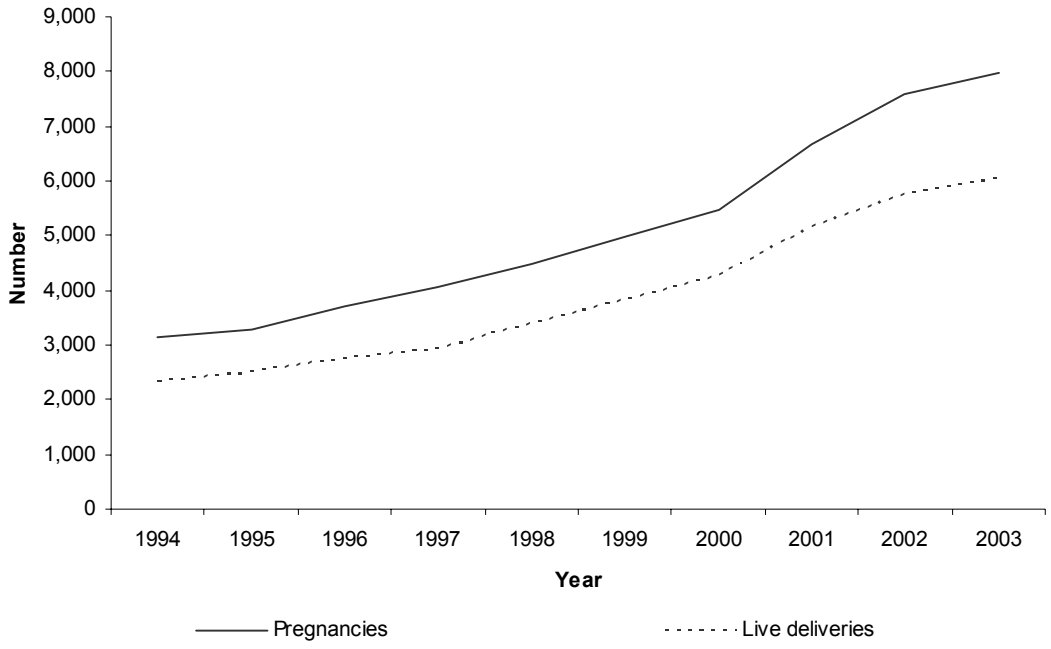
In 2003, there were 390 cases in which women were admitted to hospital with complications of ART treatment, representing 1.0% of all treatment cycles. Of these, most (56%, 218) were hospitalised for symptoms of ovarian hyperstimulation syndrome (OHSS) (Table R16). OHSS is a complication of ovulation induction therapy and includes symptoms of abdominal pain and fluid retention. Other treatment-related complications in 2003 included abdominal pain, bleeding and infection.

3 Pregnancies and babies from assisted reproduction technology in 2003

3.1 Ten-year trends (1994 to 2003)

How many pregnancies have resulted from ART treatment since 1994?

Figure 10 shows the steady increase in the number of pregnancies and live deliveries resulting from ART treatment since 1994. In 2003, there were 6,026 live deliveries in Australia and New Zealand following ART, which is 2.6 times more than 2,318 in 1994 (Table R1).



Note: Data based on the pre-ANZARD definition

Figure 10: Total number of pregnancies and live deliveries, Australia and New Zealand, 1994 to 2003

Has the proportion of multiple births changed since 1994?

Figure 11 shows the decline in the proportion of triplet or higher order deliveries since 1994. In 1994, 2.4% of deliveries were of triplets or higher order multiples compared with 0.3% of deliveries in the 2003 conception cohort. In 2003, the proportion of twin deliveries (17.8%) declined to its lowest level since 1994 (Table R17).

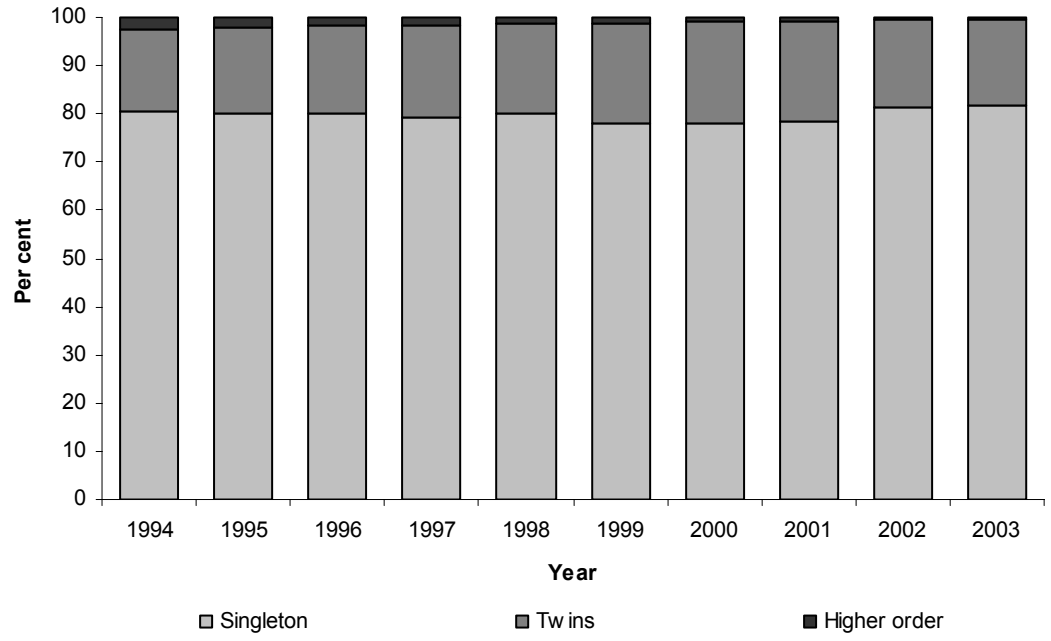


Figure 11: Proportion of singleton, twin and higher order deliveries, all pregnancies ≥20 weeks gestation, Australia and New Zealand, 1994 to 2003

3.2 Pregnancies achieved from ART treatment in 2003

In 2003, 8,365 ART treatment pregnancies were reported in Australia and New Zealand (Table R18 and R19). Of these, 88.2% (7,374) were reported from fertility centres in Australia and 11.8% (991) from centres in New Zealand. Overall, 20.7% of pregnancies resulted in miscarriage, 1.8% of pregnancies were ectopic or heterotopic pregnancies and a small proportion of pregnancies (0.6%) were either reduced or terminated (Table R18).

Early pregnancy loss of ART pregnancies

Of the 8,365 pregnancies arising from the 2003 conception cohort, 23.1% (1,933) ended before 20 weeks gestation. Of these, 89.5% resulted in miscarriage, 7.9% were ectopic or heterotopic pregnancies and 2.6% were either reduced or terminated (Table R18).

Outcomes of ART pregnancies of at least 20 weeks gestation

More than three-quarters of pregnancies reported in the 2003 conception cohort had a gestation of at least 20 weeks (6,432 pregnancies, 76.9%) (Table R19). Of these pregnancies, 6,334 (98.5%) were reported as live deliveries and just over 1% (77) were deliveries where fetal death (stillbirth) was reported.

What was the risk of multiple pregnancy in 2003?

Of all deliveries in the 2003 conception cohort, live and stillborn, 18.1% (1,163) involved the delivery of twins or triplets (Table R17). There were 1,141 deliveries of twins (17.8% of all deliveries) and 22 deliveries of triplets (0.3% of all deliveries). The decline in the number of triplets is a continuing trend, with a 50% decline from 2002, and better approximates triplet rates found in the general community. Nevertheless, the proportion of multiple pregnancies is considerably higher than that reported in the Australian population where, in 2003, 1.7% of deliveries were multiple (AIHW: Laws & Sullivan 2005).

What was the risk of multiple pregnancy in relation to the number of embryos transferred?

Table 7 correlates the number of embryos transferred in a treatment cycle to the number of babies resulting from that transfer. Single and double embryo transfer accounted for 95.6% of embryo transfers in 2003. Nine out of ten twin pregnancies followed a double embryo transfer with single embryo transfers resulting in only 2% of twin pregnancies. Twin pregnancies following single embryo transfer were spontaneously occurring monozygotic twins. Similarly, although not shown in Table 7 because of small cell sizes, most triplets arose from two-embryo transfers, also suggesting the occurrence of monozygotic twinning.

Table 7: Plurality of pregnancies of ≥20 weeks gestation, by number of embryos transferred, Australia and New Zealand, 2003

Plurality	Number of embryos transferred					
	1	2	3	4 or more	Not applicable[(a)]	Total deliveries
Singleton	1,536 (29.3%)	3,208 (61.2%)	173 (3.3%)	14 (0.3%)	315 (6.0%)	5,246
Twin	23 (2.0%)	1,053 (92.3%)	45 (3.9%)	n.p.	n.p.	1,141

(a) Includes treatments in which no embryos were transferred, such as IUI-donor and GIFT.

n.p. Not published owing to small cell size.

Did pregnancy outcome vary with maternal age?

The average age of women giving birth to ART babies in the 2003 conception cohort was 34.4 years, 4.9 years older than the average age (29.5) of Australian mothers in 2003 (AIHW: Laws & Sullivan 2005).

On average, in 2003, 75.7% of all pregnancies resulted in the delivery of one or more live babies (Table R20). Figure 12 shows the rate of live delivery per pregnancy for the 2003 cohort. It demonstrates how the capacity of women to maintain a pregnancy through to live delivery changes with advancing age. For women aged 25–29 years, 80.6% of all pregnancies resulted in a live delivery (Table R20). However, this steadily declined with advancing age and, for women aged 40–44 years, only 60.0% of all pregnancies resulted in a live delivery (Table R20).

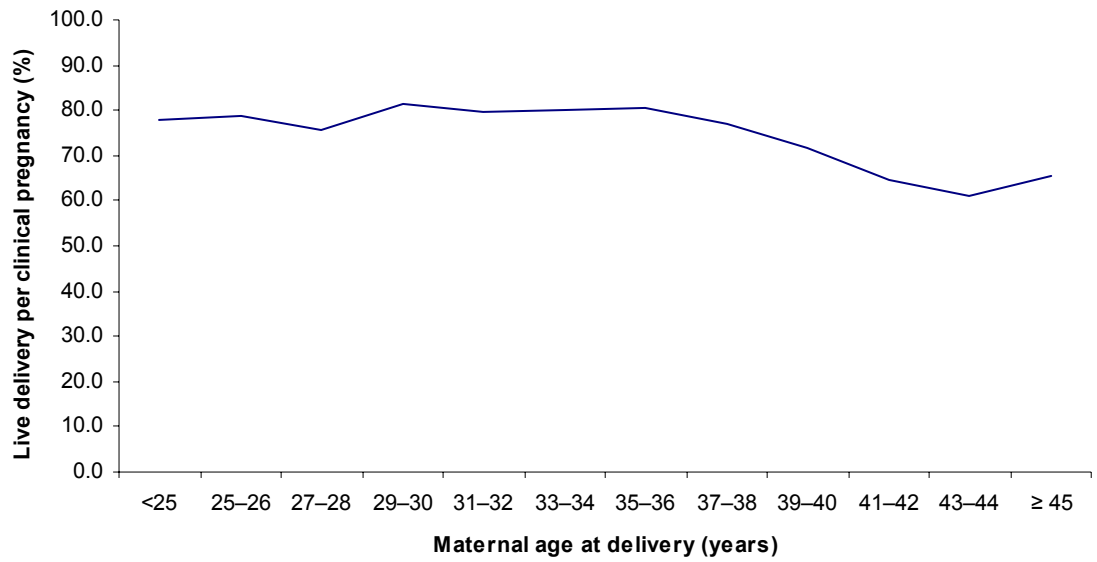


Figure 12: Live delivery per pregnancy by maternal age, Australia and New Zealand, 2003

Caesarean section deliveries

There were 3,203 caesarean sections performed, accounting for 50.0% of all women who gave birth from the 2003 conception cohort (Table R21). This represents half (50.0%) of all deliveries after ART and is almost twice that reported in the Australia population for 2003 in which 28.5% of deliveries were by caesarean section (AIHW: Laws & Sullivan 2005). The high proportion of caesarean deliveries in ART pregnancies compared with that in the Australian population persisted across age groups. Whereas 47.8% of ART mothers aged younger than 38 years delivered by caesarean section (Table R22), only 27.5% of mothers in this age group in the Australian population did so. Similarly, 59.0% of ART mothers aged 38 years or older delivered by caesarean section (Table R22), compared with only 41.1% of same-aged mothers in the Australian population.

The high proportion of caesarean sections among ART births is in part influenced by the high number of multiple pregnancies resulting from ART. Whereas 44.3% of singletons were delivered by caesarean section, 75.3% of multiples were delivered in this way (Table R21).

3.3 Babies conceived in 2003

The 2003 conception cohort resulted in the birth of 7,589 babies of at least 20 weeks gestation. Singletons accounted for 69.1% (5,242) of babies, twins accounted for 30.0% (2,281 babies), and 0.9% (66 babies) were triplets (Table R23, Table R24). Of these, 86.5% (6,474) were conceived at fertility centres in Australia and 15.5% (1,005) in New Zealand. There were 7,479 liveborn babies, representing 98.6% of all ART babies.

What was the risk of preterm birth for ART babies?

The average gestational age for all babies of at least 20 weeks gestation in the 2003 conception cohort was 37.2 weeks (Table R23). This is less than the average of 38.9 weeks of all babies born in Australia in 2003 (AIHW: Laws & Sullivan 2005).

Figure 13 shows the distribution of gestational age for all babies in the 2003 cohort. Most (73.4%, 5,574) reached full-term gestation of at least 37 weeks (Table R23). This is similar to the 72.7% of ART babies that were born at full-term in the 2002 cohort (AIHW: Bryant et al. 2004). In 2003 20.5% (1,557) of babies were born at 32–36 weeks and a further 6.1% at 20–31 weeks (Table R23).

The proportion of ART babies that were preterm was 26.6%, which is much higher than the Australian population in 2003 in which 7.9% of babies were preterm (AIHW: Laws & Sullivan 2005). The high proportion of babies that were preterm is possibly related to the high incidence of multiple births resulting from ART pregnancies. Whereas the average gestational age for singletons was 38.2 weeks, for twins this was 35.0 weeks and for triplets 30.6 weeks (Table R23). Similarly, only 11.8% of singletons were born preterm but 58.4% of twins and 95.5% of triplets were born preterm (Table R23).

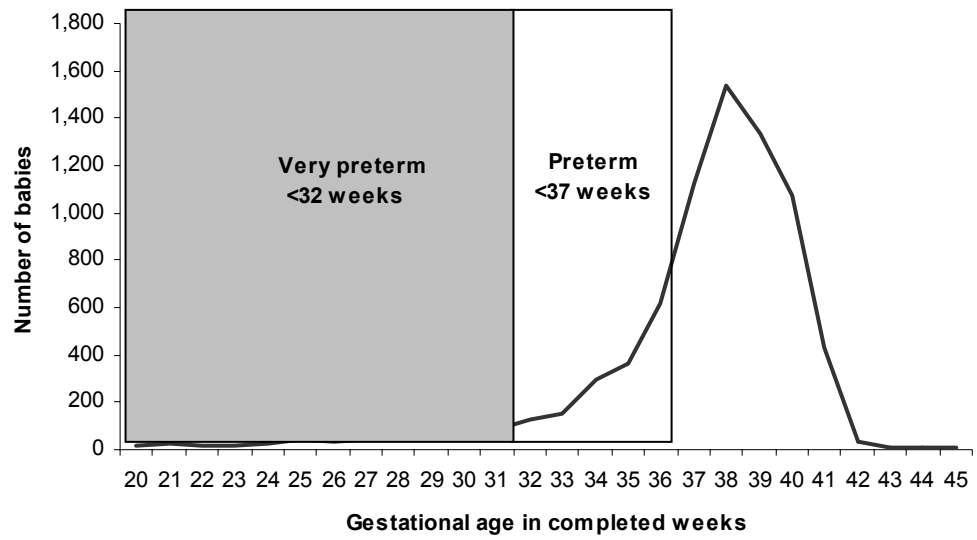


Figure 13: Distribution of gestational age for all babies of ≥20 weeks gestation, Australia and New Zealand, 2003

What was the risk of low birthweight for ART babies?

The average birthweight for all babies of at least 20 weeks gestation in the 2003 conception cohort was 2,990 grams. Liveborn babies had an average birthweight of 3,010 grams. The average birthweight for ART babies was less than the average of 3,372 grams for the Australian population in 2003 (AIHW: Laws & Sullivan 2005). Of all ART babies, 21.8% were classified as having low birthweight (<2,500g) (Table R24), which is similar to the 21.7% of ART babies reported to be low birthweight in the 2002 cohort (AIHW: Bryant et al. 2004).

Again, this outcome is possibly related to the high number of twins resulting from ART pregnancies. Figure 14 shows the difference in the average birthweight and distribution of singletons compared with twins for the 2003 conception cohort. Singletons had an average birthweight of 3,281 grams compared with twins whose average birthweight was 2,363 grams (average indicated by vertical lines). Similarly, 8.4% of singletons were classified as low or very low birthweight compared with 50.6% of twins (Table R24).

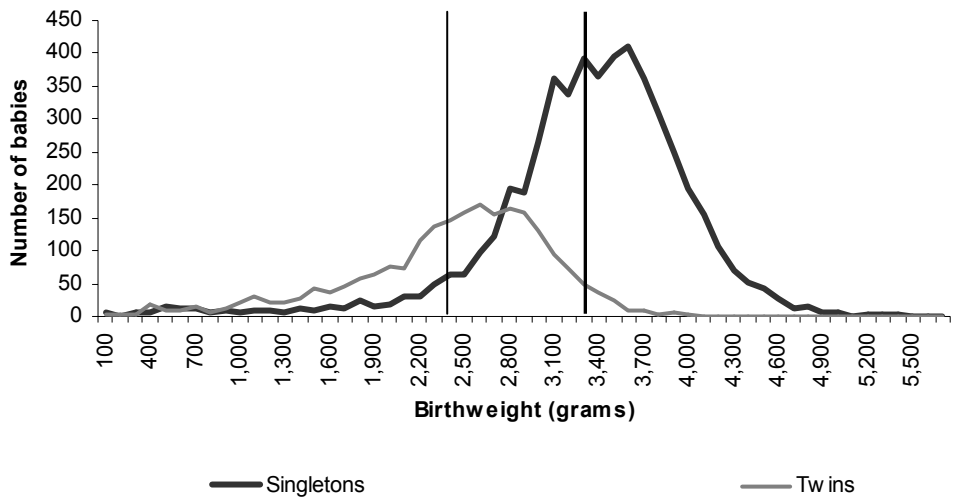


Figure 14: Distribution of birthweight for all babies of ≥20 weeks gestation by plurality, Australia and New Zealand, 2003

What was the sex distribution for ART babies in 2003?

In the 2003 cohort, there were 102.6 male babies for every 100 female babies (Table R25). This is similar to that reported in the 2002 ART cohort in which there were 104.6 males per 100 females (AIHW: Bryant et al. 2004). Fresh non-donor (oocytes / embryos) ICSI treatment had a lower ratio of 92.0 males to 100 females and fresh non-donor (oocytes / embryos) IVF treatment had a higher ratio of 110.7 males to 100 females (Table R25).

What was the risk of perinatal mortality among ART babies conceived in 2003?

Perinatal mortality refers to fetal deaths (stillbirths) of at least 20 weeks gestation or 400 grams birthweight and the deaths of liveborn babies occurring within 28 days of birth (neonatal deaths). In the 2003 conception cohort, 108 fetal deaths and 34 neonatal deaths were reported, giving a total of 142 perinatal deaths. This represents a perinatal death rate of 18.7 deaths per 1,000 ART births in Australia and New Zealand (Table R26). This was higher than the 10.1 deaths per 1,000 births reported in the Australian population in 2003 (AIHW: Laws & Sullivan 2005) and is marginally higher than the rate of 17.3 reported for ART babies in the 2002 cohort.

Perinatal mortality correlates with plurality of ART pregnancies. Singletons had the lowest perinatal mortality rate: 12.0 deaths per 1,000 births. Twins had a higher rate: 31.6 deaths per 1,000 births; and triplets reported the highest rate: 106.1 deaths per 1,000 births (Table R26).

Appendix 1 Report tables

Table R1: Success of treatment, 1994 to 2003

	Year									
Stage of treatment	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Cycles started[(a)]	18,876	20,181	21,739	23,512	25,235	26,592	27,067	28,797	36,483 (30,119)	39,720 (33,195)
Oocyte retrievals	13,247	13,556	14,337	15,071	15,728	16,461	16,982	18,092	18,506	20,151
Embryo transfers	16,966	18,337	20,052	21,330	22,829	24,534	24,915	26,556	27,154	29,968
Pregnancies	3,139	3,282	3,706	4,071	4,481	4,988	5,467	6,660	7,577	7,964
Live deliveries	2,318	2,515	2,765	2,932	3,395	3,796	4,253	5,154	5,761	6,026
Liveborn babies	2,801	3,071	3,355	3,530	4,099	4,658	5,208	6,285	6,856	7,147
Pregnancies per cycles started (%)	16.6	16.3	17.0	17.3	17.8	18.8	20.2	23.1	25.2	24.0
Live deliveries per cycles started (%)	12.3	12.5	12.7	12.5	13.5	14.3	15.7	17.9	19.1	18.2

(a) In 2002 the definition of 'treatment cycle' was broadened to include cancelled ART cycles, unsuccessful OPUs and embryo thaws, and IUI-donor. The numbers in brackets reflect the treatment cycles defined as for previous years, the numbers above these reflect the treatment cycles defined as per the new definition.

Table R2: Number of transfer cycles, by treatment type[(a)], 1994 to 2003

		Year								
Treatment type		**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Fresh[(b)]	ICSI	2,436	3,778	4,738	5,364	6,038	7,098	7,854	8,499	8,716	9,436
	IVF	5,524	5,295	5,520	5,471	5,685	6,010	6,155	6,871	6,490	7,142
	GIFT	3,012	2,387	2,250	1,858	1,415	1,239	800	341	189	183
Frozen		5,238	6,198	6,801	7,723	8,720	9,130	9,117	9,664	10,505	11,634
Donor oocytes/embryos		391	427	601	718	787	1,001	968	1,041	1,052	1,387

(a) Excludes intra-uterine insemination (IUI-donor).
(b) Excludes mixed IVF–ICSI cycles.

Table R3: Proportion of fresh and frozen embryo transfer cycles transferring one, two, three and four or more embryos, 1994 to 2003

Number of embryos	Year									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
						Fresh (per cent)				
1	n.a.	n.a.	n.a.	12.6	12.0	12.9	14.4	16.7	24.7	28.1
2	n.a.	n.a.	n.a.	51.2	50.5	59.9	63.6	67.9	68.5	66.8
3	n.a.	n.a.	n.a.	32.9	33.8	24.7	20.2	13.9	6.4	4.8
≥ 4	n.a.	n.a.	n.a.	3.3	3.7	2.5	1.8	1.5	0.5	0.4
Total cycles	**n.a.**	**n.a.**	**n.a.**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
						Frozen (per cent)				
1	n.a.	n.a.	n.a.	21.3	16.9	12.9	23.1	26.2	34.7	37.6
2	n.a.	n.a.	n.a.	59.3	60.0	59.9	66.0	65.3	61.1	59.3
3	n.a.	n.a.	n.a.	18.5	22.1	24.7	10.4	8.1	3.9	3.0
≥ 4	n.a.	n.a.	n.a.	0.9	1.0	2.5	0.5	0.4	0.3	0.2
Total cycles	**n.a.**	**n.a.**	**n.a.**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
						All (per cent)				
1	13.1	11.8	12.5	15.7	13.8	12.9	17.7	20.3	28.8	32.1
2	38.1	43.2	49.5	54.1	53.9	59.9	64.5	66.9	65.4	63.6
3	45.4	42.0	34.5	27.7	29.6	24.7	16.5	11.7	5.4	4.0
≥ 4	3.3	3.0	3.5	2.4	2.7	2.4	1.3	1.1	0.4	0.3
Total cycles	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

n.a. Not available. Data on the number of embryos transferred that were fresh or frozen was not available before 1997.

Table R4: Number of embryo transfer cycles[(a)] and pregnancies, by fresh and frozen embryo type, 1994 to 2003

Transfer cycles/outcomes	Year									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
						Fresh cycles				
Embryo transfer cycles	8,325	9,325	10,400	11,031	11,907	13,164	14,036	15,510	15,906	17,418
Pregnancies	1,455	1,688	2,000	2,306	2,610	3,079	3,432	4,602	4,858	5,380
Pregnancy per embryo transfer (%)	*17.5*	*18.1*	*19.2*	*20.9*	*21.9*	*23.4*	*24.5*	*29.7*	*30.5*	*30.9*
						Frozen cycles				
Embryo transfer cycles	5,238	6,198	6,801	7,723	8,720	9,130	9,117	9,664	11,160	12,466
Pregnancies	811	899	973	1,172	1,348	1,442	1,618	1,812	2,225	2,543
Pregnancy per embryo transfer (%)	*15.5*	*14.5*	*14.3*	*15.2*	*15.5*	*15.8*	*17.7*	*18.8*	*19.9*	*20.4*

(a) Excludes mixed fresh–thaw cycles.

Note: Excludes intra-uterine insemination (IUI-donor) for which embryo transfer is not applicable.

Table R5: Number of cycles started, by treatment type, 2003

Treatment type	Number	Per cent
Fresh non-donor (oocytes/embryos)	21,443	53.8
Frozen non-donor (embryos)	12,702	31.9
Fresh donor[(a)] (oocytes/embryos)	1,396	3.5
Frozen donor (embryos)	866	2.2
IUI-donor	3,093	7.8
Other[(b)]	320	0.8
Not stated	5	0.0
Total cycles	**39,825**	**100.0**

(a) Includes 105 oocyte recipient fresh cycles where no embryo transfer took place.

(b) Includes surrogate cycles with oocyte retrieval, embryo thaw or embryo transfer; donor insemination (IUI-donor) combined with ART; cycles where embryos were thawed and discarded; and oocyte retrievals with neither fertilisation nor transfer.

Table R6: Number of fresh cycles started, by ART procedure, 2003

	Non-donor oocytes/embryos		Donor oocytes/embryos[(a)]	
ART procedure	Number	Per cent	Number	Per cent
IVF	8,028	37.4	252	18.1
ICSI	10,373	48.4	408	29.2
GIFT	183	0.9	––	0.0
Other	2859[(b)]	13.3	736[(c)]	52.7
Not stated	––	0.0	––	0.0
Total	**21,443**	**100.0**	**1,396**	**100.0**

(a) Includes 105 oocyte recipient fresh cycles where no embryo transfer took place.

(b) Includes cycles cancelled before OPU, cycles that fail to retrieve oocytes, mixed IVF–ICSI cycles.

(c) Includes oocyte donations.

Table R7: Number of frozen cycles started, by ART procedure, 2003

	Non-donor oocytes/embryos		Donor oocytes/embryos	
ART procedure	Number	Per cent	Number	Per cent
IVF	5,597	44.1	466	53.8
ICSI	6,426	50.6	383	44.2
Not stated	679	5.3	17	2.0
Total cycles	**12,702**	**100.0**	**866**	**100.0**

Table R8: Proportion of fresh and frozen embryo transfer cycles transferring one, two, three, and four or more embryos, by women's age group, 2003

Number of embryos	Age group (years)									
	≤ 24	25–29	30–34	35–39	40–44	≥ 45	Not stated	All ages	<38	≥ 38
						Number				
1	n.p.	1,189	3,345	3,220	1,488	n.p.	1	9,604	6,706	2,897
2	227	2,164	6,579	6,789	2,995	296	1	19,051	13,220	5,830
3	n.p.	n.p.	189	408	489	69	0	1,208	450	758
≥ 4	0	n.p.	11	21	42	n.p.	0	84	25	59
Not stated	0	3	5	7	6	0	0	21	13	8
Total cycles	**382**	**3,409**	**10,129**	**10,445**	**5,020**	**581**	**2**	**29,968**	**20,414**	**9,552**
						Per cent				
1	n.p.	34.9	33.0	30.8	29.6	n.p.	50.0	32.0	32.9	30.3
2	59.4	63.5	65.0	65.0	59.7	50.9	50.0	63.6	64.8	61.0
3	n.p.	n.p.	1.9	3.9	9.7	11.9	0.0	4.0	2.2	7.9
≥ 4	0.0	n.p.	0.1	0.2	0.8	n.p.	0.0	0.3	0.1	0.6
Not stated	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1
Total cycles	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

n.p. Not published owing to small cell size.

Table R9: Freezing, thawing and storage of embryos, 1994 to 2003

Status of embryos	Year									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
						Embryo freezing				
No. of cycles having embryos frozen	4,404	4,912	6,213	6,391	7,462	8,669	8,819	9,545	9,645	10,630
No. of embryos frozen	19,563	22,499	26,550	32,327	37,057	39,682	41,413	46,835	44,911	48,579
						Embryo thawing				
No. cycles having embryos thawed	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	12,117	13,691
No. embryos thawed	14,375	17,313	19,027	22,611	25,521	28,286	29,371	31,194	29,805	32,728
No. of embryos transferred after thawing	10,581	12,515	13,430	15,959	18,085	18,907	18,362	18,777	19,011	20,796
						Removal for other reasons				
No. of embryos removed for other purposes	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4,192	3,562
						Treatment embryos in storage				
Treatment embryos in storage on 31 December	22,280	30,475	41,662	46,322	56,136	65,518	71,176	81,627	92,541	104,830

n.a. Not available.

Table R10: Women's age group[(a)] by treatment type, 2003

Age group (years)	Non-donor oocytes/embryos				Donor oocytes/ embryos[(b)]	IUI-donor	Other/ not stated	All
	Fresh all	Fresh ICSI	Fresh IVF	Frozen				
				Number				
≤ 24	301	170	90	156	10	46	6	519
25–29	2,365	1,222	821	1,576	93	366	26	4,426
30–34	6,786	3,428	2,592	4,675	314	909	80	12,764
35–39	7,441	3,558	2,885	4,539	417	1,068	120	13,585
40–44	4,209	1,843	1,548	1,659	534	649	75	7,126
≥ 45	341	152	92	97	302	54	11	805
Not stated	0	0	0	0	487	1	7	495
Total cycles	**21,443**	**10,373**	**8,028**	**12,702**	**2,157**	**3,093**	**325**	**39,720**
Mean age	35.2	34.9	35.3	34.5	39.1	35.4	—	35.2
				Per cent				
≤ 24	1.4	1.6	1.1	1.2	0.5	1.5	1.8	1.3
25–29	11.0	11.8	10.2	12.4	4.3	11.8	8.0	11.1
30–34	31.6	33.0	32.3	36.8	14.6	29.4	24.6	32.1
35–39	34.7	34.3	35.9	35.7	19.3	34.5	36.9	34.2
40–44	19.6	17.8	19.3	13.1	24.8	21.0	23.1	17.9
≥ 45	1.6	1.5	1.1	0.8	14.0	1.7	3.4	2.0
Not stated	0.0	0.0	0.0	0.0	22.6	0.0	2.2	1.2
Total cycles	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Age is calculated at time of procedure.

(b) Excludes 105 oocyte recipient fresh cycles where no embryo transfer took place.

Note: Data are collected on a per treatment cycle basis and not on a per patient basis. Therefore, some individuals may be counted more than once.

Table R11: Men's age group[a] by treatment type, 2003

Age group (years)	Non-donor oocytes/embryos				Donor oocytes/ embryos[b]	IUI-donor	Other/ not stated	All
	Fresh all	Fresh ICSI	Fresh IVF	Frozen				
				Number				
≤ 24	100	42	44	48	5	9	1	163
25–29	1,468	651	614	865	40	140	13	2,526
30–34	5,462	2,532	2,268	3,512	186	420	45	9,625
35–39	6,439	2,995	2,566	4,059	365	503	104	11,470
40–44	4,364	2,128	1,602	2,493	357	362	64	7,640
≥ 45	2,880	1,724	666	1,379	323	376	61	5,019
Not stated/single female	730	301	268	346	881	1,283	37	3,277
Total cycles	**21,443**	**10,373**	**8,028**	**12,702**	**2,157**	**3,093**	**325**	**39,720**
Mean age	37.7	38.3	36.7	37.3	40.6	39.1	—	37.7
				Per cent				
≤ 24	0.5	0.4	0.5	0.4	0.2	0.3	0.3	0.0
25–29	6.8	6.3	7.6	6.8	1.9	4.5	4.0	6.4
30–34	25.5	24.4	28.3	27.6	8.6	13.6	13.8	24.2
35–39	30.0	28.9	32.0	32.0	16.9	16.3	32.0	28.9
40–44	20.4	20.5	20.0	19.6	16.6	11.7	19.7	19.2
≥ 45	13.4	16.6	8.3	10.9	15.0	12.2	18.8	12.6
Not stated/single female	3.4	2.9	3.3	2.7	40.8	41.5	11.4	8.3
Total cycles	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Age is calculated at the time of procedure.

(b) Excludes 105 oocyte recipient fresh cycles where no embryo transfer took place.

Note: Data are collected on a per treatment cycle basis and not on a per patient basis. Therefore, some individuals may be counted more than once.

Table R12: Success of treatment, by treatment type[(a)], 2003

	Non-donor oocytes/embryos				Donor oocytes/embryos					
Stage/outcome of treatment	**Fresh all**	**Fresh ICSI**	**Fresh IVF**	**Frozen**	**Fresh all donor**	**Fresh all recipient**	**Fresh ICSI**	**Fresh IVF**	**Frozen**	**IUI-donor**
Cycles started	21,443	10,373	8,028	12,702	720	571	354	206	866	3,093
Oocyte retrievals	19,191	10,373	8,028	. .	683	. .	. .	. .	. .	. .
Embryo transfers	16,842	9,436	7,142	11,634	. .	571	354	206	816	. .
Pregnancies	5,203	2,843	2,249	2,370	. .	205	127	74	168	400
Live deliveries	3,988	2,201	1,699	1,766	. .	140	85	51	118	313
Live deliveries per cycles started (%)	*18.6*	*21.2*	*21.2*	*13.9*	. .	*24.5*	*24.0*	*24.8*	*13.6*	*10.1*
Live deliveries per OPU (%)	*20.8*	*21.2*	*21.2*	. .	. .	. .	. .	. .	. .	. .
Live deliveries per embryo transfer (%)	*23.7*	*23.3*	*23.8*	*15.2*	. .	*24.5*	*24.0*	*24.8*	*14.5*	. .

(a) Excludes mixed fresh–thaw cycles, surrogate cycles, IUI-donor combined with ART, cycles where embryos were thawed and discarded, oocytes retrievals with neither fertilisation nor transfer, and cycles where the procedure was not stated.

. . Not applicable.

Table R13: Success of fresh, non-donor (oocytes/embryos) treatment, by women's age group, 2003

	Age group (years)						
Stage/outcome of treatment	**≤ 24**	**25-29**	**30-34**	**35-39**	**40-44**	**≥ 45**	**All**
Cycles started	301	2,365	6,786	7,441	4,209	341	21,443
Oocyte retrievals	269	2,121	6,206	6,667	3,661	267	19,191
Embryo transfers	232	1,869	5,573	5,952	3,012	204	16,842
Pregnancies	n.p.	790	2,095	1,703	509	n.p.	5,203
Live deliveries	n.p.	656	1,693	1,273	287	n.p.	3,988
Pregnancy per cycles started (%)	n.p.	*33.4*	*30.9*	*22.9*	*12.1*	n.p.	*24.3*
Live deliveries per cycles started (%)	n.p.	*27.7*	*24.9*	*17.1*	*6.8*	n.p.	*18.6*
Live deliveries per OPU (%)	n.p.	*30.9*	*27.3*	*19.1*	*7.8*	n.p.	*20.8*
Live deliveries per ET (%)	n.p.	*35.1*	*30.4*	*21.4*	*9.5*	n.p.	*23.7*
Live deliveries per pregnancy (%)	n.p.	*83.0*	*80.8*	*74.8*	*56.4*	n.p.	*76.6*

n.p. Not published owing to small cell size.

Table R14: Success of fresh, non-donor (oocytes/embryos) treatment, by grouped fertility centres, 2003

Stage/outcome of treatment	First quartile[(a)]	Second quartile	Third quartile	Fourth quartile[(a)]	All
Includes centres that achieved a live delivery per cycle started (%) of:	20.2–32.9	18.2–20.1	15.0–18.1	<15.0	
Number of fertility centres in this range	8	7	7	7	29
Combined number of:					
Cycles started	6,888	4,184	7,841	2,530	21,443
Oocyte retrievals	6,458	3,711	6,918	2,104	19,191
Embryo transfers	5,673	3,339	6,068	1,762	16,842
Pregnancies	2,097	1,090	1,599	417	5,203
Live deliveries	1,668	776	1,236	308	3,988
Pregnancy per cycles started (%)	*30.4*	*26.1*	*20.4*	*16.5*	*24.3*
Live deliveries per cycles started (%)	*24.2*	*18.5*	*15.8*	*12.2*	*18.6*
Live deliveries per OPU (%)	*25.8*	*20.9*	*17.9*	*14.6*	*20.8*
Live deliveries per ET (%)	*29.4*	*23.2*	*20.4*	*17.5*	*23.7*
Mean age of women (years)	35.2	35.1	35.4	35.1	35.2

(a) The first quartile represents the eight fertility centres with the highest success rates. The fourth quartile represents the seven fertility centres with the lowest success rates.

Table R15: Success of frozen non-donor (embryos) treatment, by grouped fertility centres, 2003

Stage/outcome of treatment	First quartile[(a)]	Second quartile	Third quartile	Fourth quartile[(a)]	All
Includes centres that achieved a live delivery per cycle started (%) of:	16.5–24.9	14.3–16.4	10.0–14.2	<10.0	
Number of fertility centres in this range	7	7	7	7	28
Combined number of:					
Cycles started	2,753	4,728	2,087	3,134	12,702
Embryo transfers	2,596	4,353	1,869	2,816	11,634
Pregnancies	717	961	345	347	2,370
Live deliveries	534	700	267	265	1,766
Pregnancy per cycles started (%)	*26.0*	*20.3*	*16.5*	*11.1*	*18.7*
Live deliveries per cycles started (%)	*19.4*	*14.8*	*12.8*	*8.5*	*13.9*
Live deliveries per ET (%)	*20.6*	*16.1*	*14.3*	*9.4*	*15.2*
Mean age of women (years)	34.5	34.8	34.2	34.3	34.5

(a) The first quartile represents the seven fertility centres with the highest success rates. The fourth quartile represents the seven fertility centres with the lowest success rates.

Table R16: Cases of ovarian hyperstimulation syndrome (OHSS), by number of oocytes collected, 2003

	Number of oocytes collected							
OHSS	**1–4**	**5–6**	**7–8**	**9–10**	**11–12**	**13–14**	**≥ 15**	**All**
OPUs with OHSS	3	11	22	27	27	24	104	218
All OPUs	4,145	2,714	2,731	2,475	1,962	1,631	4,144	19,802
% with OHSS	0.1	0.4	0.8	0.9	1.5	1.2	2.6	1.1

Table R17: Incidence of singleton, twin and higher order multiple deliveries[a], 1994 to 2003

	Singleton delivery		Twin delivery		Triplet delivery		Total
Year	**Number**	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**	**deliveries**
1994	1,903	80.6	403	17.1	56	2.4	2,362
1995	2,043	79.9	465	18.2	49	1.9	2,557
1996	2,250	80.1	508	18.1	52	1.9	2,810
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	4,748	81.1	1,070	18.3	33	0.6	5,851
2003	5,246	81.9	1,141	17.8	22	0.3	6,409

(a) ≥ 20 weeks gestation.

Table R18: Outcome of pregnancies of <20 weeks gestation, by treatment type, 2003

Pregnancy outcome	Non-donor oocytes/embryos				Donor oocytes /embryo	IUI-donor	Not stated	All
	Fresh all	Fresh ICSI	Fresh IVF	Frozen				
				Number				
Miscarriage	1,022	551	454	530	98	78	3	1,731
Reduction or termination	30	17	12	11	4	4	1	50
Ectopic or heterotopic pregnancy	102	48	50	39	7	4	0	152
Total	**1,154**	**616**	**516**	**580**	**109**	**86**	**4**	**1,933**
				Per cent				
Miscarriage	88.6	89.4	88.0	91.4	89.9	90.7	75.0	89.5
Reduction or termination	2.6	2.8	2.3	1.9	3.7	4.7	25.0	2.6
Ectopic or heterotopic pregnancy	8.8	7.8	9.7	6.7	6.4	4.7	0.0	7.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table R19: Outcome of pregnancies of ≥20 weeks gestation, by treatment type, 2003

Pregnancy outcome	Non-donor oocytes/embryos				Donor oocytes /embryo	IUI-donor	Not stated	All
	Fresh all	Fresh ICSI	Fresh IVF	Frozen				
				Number				
Live delivery	3,985	2,199	1,698	1,764	n.p	n.p	16	6,334
Stillbirth[(a)]	54	25	29	16	n.p	n.p	0	77
Not stated	10	3	6	10	1	0	0	21
Total	**4,049**	**2,227**	**1,733**	**1,790**	**264**	**314**	**16**	**6,432**
				Per cent				
Live delivery	98.4	98.7	98.0	98.5	n.p	n.p	100.0	98.5
Stillbirth[(a)]	1.3	1.1	1.7	0.9	n.p	n.p	0.0	1.2
Not stated	0.2	0.1	0.3	0.6	0.4	0.0	0.0	0.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

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

n.p. Not published owing to small cell size.

Table R20: Number of pregnancies and number of live deliveries ≥ 20 weeks gestation, by maternal age, 2003

	Age group (years)							
	≤ 24	25–29	30–34	35–39	40–44	≥ 45	Not stated	Total
Pregnancies	132	1,225	3,282	2,751	878	96	1	8,365
Per cent of total	1.6	14.6	39.2	32.9	10.5	1.1	0.0	100.0
Live deliveries	106	987	2,606	2,051	527	56	1	6,334
Per cent of total	1.7	15.6	41.1	32.4	8.3	0.9	0.0	100.0
Live deliveries per pregnancy (%)	*80.3*	*80.6*	*79.4*	*74.6*	*60.0*	*58.3*	*100.0*	*75.7*

Table R21: Method of delivery for all deliveries ≥ 20 weeks gestation, by plurality, 2003

	Method of delivery						
	Caesarean section		Other		Not stated		Total deliveries
Plurality	Number	Per cent	Number	Per cent	Number	Per cent	
Singleton	2,327	44.3	2,910	55.5	9	0.2	5,246
Multiples	876	75.3	286	24.6	1	0.1	1,163
Twin	n.p.	n.p.	n.p.	n.p.	1	0.1	1,141
Triplet	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	22
Total deliveries	**3,203**	**50.0**	**3,196**	**49.9**	**10**	**0.2**	**6,409**

n.p. Not published owing to small cell size.

Table R22: Method of delivery for all deliveries ≥ 20 weeks gestation, by maternal age, 2003

	Age group (years)									
Method of delivery	≤ 24	25–29	30–34	35–39	40–44	≥ 45	Not stated	Total	<38	≥ 38
					Number					
Caesarean section	38	417	1,263	1,105	335	45	0	3,203	2,467	736
Other	69	586	1,365	965	199	11	1	3,196	2,686	509
Not stated	0	2	5	2	1	0	0	10	8	2
Total deliveries	**107**	**1,005**	**2,633**	**2,072**	**535**	**56**	**1**	**6,409**	**5,161**	**1,247**
					Per cent					
Caesarean section	35.5	41.5	48.0	53.3	62.6	80.4	0.0	50.0	47.8	59.0
Other	64.5	58.3	51.8	46.6	37.2	19.6	100.0	49.9	52.0	40.8
Not stated	0.0	0.2	0.2	0.1	0.2	0.0	0.0	0.2	0.2	0.2
Total deliveries	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

n.p. Not published owing to small cell size.

Table R23: Gestational age of all babies of ≥ 20 weeks gestation, by plurality, 2003

Gestational age (weeks)	Singleton		Twin		Triplet		Total babies	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
20–27	87	1.7	122	5.3	18	27.3	227	3.0
28–31	69	1.3	n.p	n.p	n.p	n.p	232	3.1
32–36	464	8.9	1,057	46.3	36	54.5	1,557	20.5
20–36	*620*	11.8	*1,333*	58.4	*63*	95.5	*2,016*	26.6
≥ 37	4,622	88.2	n.p	n.p	n.p	n.p	5,573	73.4
Total babies	**5,242**	**100.0**	**2,281**	**100.0**	**66**	**100.0**	**7,589**	**100.0**
Mean gestational age	38.2		35.0		30.6		37.2	

Table R24: Birthweight of all babies of ≥ 20 weeks gestation, by plurality, 2003

Birthweight (g)	Singleton		Twin		Triplet		Total babies	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
<1,000	76	1.4	103	4.5	25	37.9	204	2.7
1,000–1,499	n.p	n.p	142	6.2	n.p	n.p	192	2.5
1,500–1,999	81	1.5	281	12.3	21	31.8	383	5.0
2,000–2,499	238	4.5	629	27.6	12	18.2	879	11.6
<2,500	*439*	8.4	*1,155*	50.6	*64*	97.0	*1,658*	21.8
2,500–2,999	870	16.6	n.p	n.p	n.p	n.p	1,653	21.8
3,000–3,499	1,851	35.3	279	12.2	0	0.0	2,130	28.1
3,500–3,999	1,525	29.1	29	1.3	0	0.0	1,554	20.5
≥ 4,000	n.p	n.p	n.p	n.p	0	0.0	510	6.7
Not stated	48	0.9	35	1.5	1	1.5	84	1.1
Total babies	**5,242**	**100.0**	**2,281**	**100.0**	**66**	**100.0**	**7,589**	**100.0**
Mean birthweight	3,281		2,363		1,439		2,990	

n.p. Not published owing to small cell size.

Table R25: Sex of all babies of ≥ 20 weeks gestation, by treatment type, 2003

Sex	Non-donor oocytes/embryos				Donor oocytes/ embryos	IUI-donor	Other/ Not stated	All
	Fresh all	Fresh IVF	Fresh ICSI	Frozen				
				Number				
Male	2,456	1,108	1,288	1024	167	177	12	3,836
Female	2,447	1001	1,400	979	151	156	6	3,739
Not stated	8	4	4	4	2	0	0	14
Total	**4,911**	**2,113**	**2,692**	**2,007**	**320**	**333**	**18**	**7,589**
				Per cent				
Male	50.0	52.4	47.8	51.0	52.2	53.2	66.7	50.5
Female	49.8	47.4	52.0	48.8	47.2	46.8	33.3	49.3
Ratio	*100.4*	*110.7*	*92.0*	*104.6*	*110.6*	*113.5*	*200.0*	*102.6*

Table R26: Perinatal mortality of all babies of ≥ 20 weeks gestation or 400 grams birthweight, by plurality, 2003

Birth outcome	Singleton	Twin	Triplet	Total births
		Number		
Fetal deaths	54	n.p	n.p	108
Neonatal deaths	9	n.p	n.p	34
Perinatal deaths[(a)]	**63**	**72**	**7**	**142**
		Rate per 1,000 births[(b)]		
Fetal deaths per 1,000 births	10.3	n.p	n.p	14.2
Neonatal deaths per 1,000 live births	1.7	n.p	n.p	4.5
Perinatal deaths per 1,000 births[(a)]	12.0	31.6	106.1	18.7

(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 stillbirths). Neonatal death rates were calculated using all live births.

n.p. Not published owing to small cell size.

Appendix 2 ANZARD data items

Item name	Description	Codes
unit	Unit identifier	
site	Site of main treatment	For centres with multiple sites, this identifies location of most significant part of the treatment.
pat_id	Unit ID/Medical record number	Unique ID for patient.
mdob	Woman's date of birth	Day/month/year.
pdob	Husband/male partner DOB	Day/month/year.
don_age	Egg/embryo donor's age	Completed years at time of donation.
n_13200	Previous Medicare item 13200s	The number of billed Australian Medicare item 13200. New Zealand units leave this field blank.
ci_tube	Cause of infertility: tubal disease	Yes—in the opinion of the treating clinician or clinic there is significant tubal disease present.
		No—other.
ci_endo	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.
ci_male	Cause of infertility: male factor	Yes—in the opinion of the treating clinician or clinic there is a significant male factor problem.
		No—other.
ci_oth	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.
ci_unex	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.
n_prless	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.
n_prmore	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	Cycle ID	Unique cycle identifier.
cyc_date	Cycle date	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.
surr	Surrogacy	Yes—the procedure is part of a surrogate arrangement.
		No—the procedure is not part of a surrogate arrangement.
ov_stim	Injectable FSH stimulation given	Yes—FSH administered. Does not include clomiphene or hCG alone unless FSH was also given.
		No—other.
di_insem	DI date	Date of first donor insemination.
opu_date	OPU date	Date of oocyte retrieval.

Item name	Description	Codes
n_eggs	Number of eggs retrieved	Number of eggs retrieved at OPU. Include any immature oocytes that are identified.
n_donate	Number of eggs donated	Number of eggs donated to someone else.
n_recvd	Number of eggs received	Number of eggs received from someone else.
n_gift	Number of eggs GIFT	Number of eggs replaced in a GIFT procedure.
n_insem	Number of eggs IVF	Number of eggs treated with IVF.
n_icsi	Number of eggs ICSI	Number of eggs treated with ICSI.
sp_site	Site of sperm used	Site of sperm extraction: ejaculated, epididymal (whether by open biopsy or by PESA), testicular or other.
sp_persn	Person from which sperm derives	Husband/partner, known donor, or anonymous donor.
n_fert	Number of eggs fertilised normally	The number of eggs fertilised normally in the opinion of the treating embryologist.
pgd	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.
ass_hatc	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.
emrecimp	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.
n_clthaw	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.
n_blthaw	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	ET date	Embryo transfer date.
n_emb_et	Number of early embryos transferred	Number of zygote or cleavage stage embryos (i.e. up to 4 days since fertilisation) transferred.
n_bl_et	Number of blastocysts transferred	Number of blastocyst embryos (i.e. >4 days since fertilisation) transferred.
emb_icsi	Any embryos ICSI?	Yes—any embryos transferred were fertilised by ICSI.
		No—no transferred embryos were fertilised by ICSI.
n_clfroz	Number of zygotes/cleavage stage embryos frozen	Number of zygote or cleavage stage embryos (i.e. up to 4 days since fertilisation) frozen.
n_blfroz	Number of blastocysts frozen	Number of blastocyst embryos (i.e. >4 days since fertilisation) frozen.
emdonexp	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.
emb_disp	Number of potentially usable frozen embryos discarded	Potentially usable embryos disposed of in accordance with patient or government request.
pr_clin	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 intra-uterine 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.
pr_end_dt	Date pregnancy ended	Date on which delivery, miscarriage or termination takes place.
n_fh	Number of fetal hearts	Number of fetal hearts seen on first ultrasound (intra-uterine only).

Item name	Description	Codes
pr_ectop	Ectopic pregnancy	Yes—pregnancy is an ectopic pregnancy, or a combined ectopic and uterine (heterotopic) pregnancy.
		No—pregnancy not ectopic or heterotopic.
pr_top	Elective termination of pregnancy	Yes—pregnancy is terminated.
		No—pregnancy not terminated.
pr_reduc	Selective reduction performed	Yes—selective reduction was performed owing to fetal abnormality.
		No—selective reduction not performed.
abn_less	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.
mat_comp	Maternal complications of pregnancy	Describes morbidity related to pregnancy.
n_deliv	Number of babies delivered after 20 weeks	Include all liveborn and stillborn babies.
CS	Caesarean delivery	Yes—delivery by planned or emergency caesarean section.
		No—other.
bab1_out	Baby 1 outcome	Liveborn, stillborn or neonatal death.
bab1_sex	Baby 1 sex	Male or female.
bab1_wt	Baby 1 birthweight	Weight in grams.
bab1_abn	Baby 1 abnormality	Describes any known congenital malformation.
bab1_nnd	Baby 1 date of neonatal death	Date of neonatal death.
bab2_out	Baby 2 outcome	Liveborn, stillborn or neonatal death.
bab2_sex	Baby 2 sex	Male or female.
bab2_wt	Baby 2 weight	Weight in grams.
bab2_abn	Baby 2 abnormality	Describes any known congenital malformation.
bab2_nnd	Baby 2 date of neonatal death	Date of neonatal death.
bab3_out	Baby 3 outcome	Liveborn, stillborn or neonatal death.
bab3_sex	Baby 3 sex	Male or female.
bab3_wt	Baby 3 weight	Weight in grams.
bab3_abn	Baby 3 abnormality	Describes any known congenital malformation.
bab3_nnd	Baby 3 date of neonatal death	Date of neonatal death.
bab4_out	Baby 4 outcome	Liveborn, stillborn or neonatal death.
bab4_sex	Baby 4 sex	Male or female.
bab4_wt	Baby 4 weight	Weight in grams.
bab4_abn	Baby 4 abnormality	Describes any known congenital malformation.
bab4_nnd	Baby 4 date of neonatal death	Date of neonatal death.
morb_adm	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.
mrb_ohss	OHSS	Yes—admission to hospital is due to symptoms of OHSS.
morb_inf	Morbidity detail	Describes symptoms of treatment-related morbidity.

Glossary

This glossary is authored by the International Committee for the Monitoring of Assisted Reproductive Technologies (ICMART) and is endorsed by the World Health Organization. Please note that some definitions differ from those used in the *Assisted reproduction technology in Australia and New Zealand 2003* report.

Aspiration cycle: initiated ART cycle in which one or more follicles are punctured and aspirated irrespective of whether or not oocytes are retrieved.

Assisted hatching: an in-vitro procedure in which the zona pellucida of an embryo (usually at 8-cell stage or a blastocyst) is perforated by chemical, mechanical or laser-assisted methods to assist separation of the blastocyst from the zona pellucida.

Assisted reproduction technology (ART): all treatments or procedures that include the in vitro handling of human oocytes and sperm or embryos for the purpose of establishing a pregnancy. This includes, but is not limited to, in vitro fertilisation and trans-cervical embryo transfer, gamete intrafallopian transfer, zygote intrafallopian transfer, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation and gestational surrogacy. ART does not include assisted insemination (artificial insemination) using sperm from either a woman's partner or sperm donor.

Birth defect: Structural, functional or developmental abnormalities present at birth or later in life, due to genetic or non-genetic factors acting before birth.

Blastocyst: an embryo with a fluid-filled blastocele cavity (usually developing by five or six days after fertilisation).

Cancelled cycle: an ART cycle in which ovarian stimulation or monitoring has been carried out with the intent of undergoing ART but which did not proceed to follicular aspiration, or in the case of a thawed embryo, to transfer.

Clinical abortion: an abortion of a clinical pregnancy which takes place between the diagnosis of pregnancy and 20 completed weeks' gestational age.

Clinical pregnancy: evidence of pregnancy by clinical or ultrasound parameters (ultrasound visualisation of a gestational sac). It includes ectopic pregnancy. Multiple gestational sacs in one patient are counted as one clinical pregnancy.

Clinical pregnancy rate: number of clinical pregnancies expressed per 100 initiated cycles, aspiration cycles or embryo transfer cycles. When clinical pregnancy rates are given, the denominator (initiated, aspirated or embryo transfer cycles) must be specified.

Controlled ovarian hyperstimulation (COH): medical treatment to induce the development of multiple ovarian follicles to obtain multiple oocytes at follicular aspiration.

Cryopreservation: freezing and storage of gametes, zygotes or embryos.

Delivery rate: number of deliveries expressed per 100 initiated cycles, aspiration cycles or embryo transfer cycles. When delivery rates are given, the denominator (initiated, aspirated or embryo transfer cycles) must be specified. It includes deliveries that resulted in a live birth and/or stillbirth. The delivery of a singleton, twin or other multiple pregnancy is registered as one delivery.

Early neonatal death: death occurring within the first seven days after delivery.

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

Embryo: product of conception from the time of fertilisation to the end of the embryonic stage eight weeks after fertilisation (the term 'pre-embryo' or dividing conceptus has been replaced by embryo).

Embryo donation: the transfer of an embryo resulting from gametes that did not originate from the recipient and / or her partner.

Embryo transfer (ET): procedure in which embryo(s) are placed in the uterus or fallopian tube.

Embryo transfer cycle: ART cycle in which one or more embryos are transferred into the uterus or fallopian tube.

Fertilisation: the penetration of the ovum by the spermatozoon and fusion of genetic materials resulting in the development of a zygote.

Fetus: the product of conception starting from completion of embryonic development (at eight completed weeks after fertilisation) until birth or abortion.

Full-term birth: a birth that takes place at 37 or more completed weeks of gestational age. This includes both live births and stillbirths.

Gamete intrafallopian transfer (GIFT): ART procedure in which both gametes (oocytes and sperm) are transferred to the fallopian tubes.

Gestational age: age of an embryo or fetus calculated by adding 14 days (2 weeks) to the number of completed weeks since fertilisation.

Gestational carrier: a woman in whom a pregnancy resulted from fertilization with third-party sperm and oocytes. She carries the pregnancy with the intention or agreement that the offspring will be parented by one or both of the persons that produced the gametes.

Gestational sac: a fluid-filled structure containing an embryo that develops early in pregnancy usually within the uterus.

Hatching: it is the process that precedes implantation by which an embryo at the blastocyst stage separates from the zona pellucida.

Host uterus: see gestational carrier.

Implantation: the attachment and subsequent penetration by the zona-free blastocyst (usually in the endometrium) which starts five to seven days following fertilisation.

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

Infertility: failure to conceive after at least one year of unprotected coitus.

Initiated cycles: ART treatment cycles in which the woman receives ovarian stimulation, or monitoring in the case of spontaneous cycles, irrespective of whether or not follicular aspiration is attempted.

Intracytoplasmatic (intracytoplasmic) sperm injection (ICSI): IVF procedure in which a single spermatozoon is injected through the zona pellucida into the oocyte.

Live birth: a birth in which a fetus is delivered with signs of life after complete expulsion or extraction from its mother, beyond 20 completed weeks of gestational age. (Live births are counted as birth events, e.g. a twin or triplet live birth is counted as one birth event.)

Live-birth delivery rate: number of live-birth deliveries expressed per 100 initiated cycles, aspiration cycles or embryo transfer cycles. When delivery rates are given, the denominator (initiated, aspirated or embryo transfer cycles) must be specified. It includes deliveries that

resulted in at least one live birth. The delivery of a singleton, twin or other multiple birth is registered as one delivery.

Malformation rate: includes all structural, functional, genetic and chromosomal abnormalities identified in aborted tissue or diagnosed before or subsequent to birth.

Medically assisted conception: conception brought about by noncoital conjunction of the gametes. Includes ART procedures and intra-uterine, intracervical and intravaginal insemination with semen of husband / partner or donor.

Micromanipulation (also referred to as **assisted fertilisation**): the use of special micromanipulative technology that allows operative procedures to be performed on the oocyte, sperm or embryo.

Microscopic epididymal sperm aspiration (MESA): procedure in which spermatozoa are obtained from the epididymis, by either aspiration or surgical excision.

Missed abortion: a clinical abortion where the products of conception are not expelled spontaneously from the uterus.

Neonatal death: death within 28 days of birth.

Newborns or infants born: the number of live births plus stillbirths.

Oocyte donation: an ART procedure performed with third-party oocytes.

Preclinical abortion: an abortion that takes place before clinical or ultrasound evidence of pregnancy.

Preclinical pregnancy (biochemical pregnancy): evidence of conception based only on biochemical data in the serum or urine before ultrasound evidence of a gestational sac.

Preimplantation genetic diagnosis (PGD): screening of cells from preimplantation embryos for the detection of genetic and / or chromosomal disorders before embryo transfer.

Preterm birth: a birth which takes place after at least 20, but less than 37, completed weeks of gestation. This includes both live births and stillbirths. Births are counted as birth events (e.g. a twin or triplet live birth is counted as one birth event).

Recipient: in an ART cycle refers to the woman who receives an oocyte or an embryo from another woman.

Spontaneous abortion: spontaneous loss of a clinical pregnancy before 20 completed weeks of gestation or, if gestational age is unknown, a weight of 500 g or less.

Stillbirth: a birth in which the fetus does not exhibit any signs of life when completely removed or expelled from the birth canal at or above 20 completed weeks of gestation. Stillbirths are counted as birth events (e.g. a twin or triplet stillbirth is counted as one birth event).

Surrogate mother: see **Gestational carrier**.

Testicular sperm aspiration (TESA): procedure in which spermatozoa are obtained directly from the testicle, by either aspiration or surgical excision of testicular tissue.

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

Zygote intrafallopian transfer (ZIFT): procedure in which the zygote, in its pronuclear stage of development, is transferred into the fallopian tube.

References

AIHW: Bryant J, Sullivan E & Dean J 2004. Assisted reproductive technology in Australia and New Zealand 2002. AIHW Cat. No. PER 26. Sydney: Australian Institute of Health and Welfare National Perinatal Statistics Unit and the Fertility Society of Australia (Assisted Reproductive Technology Series no. 8).

AIHW: Laws PJ & Sullivan EA 2005. Australia's mothers and babies 2003. AIHW Cat. No. PER 29. Canberra: AIHW National Perinatal Statistics Unit (Perinatal Statistics Series no. 16).

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