# Assisted reproductive technology in Australia and New Zealand 2023

UNSW SYDNEY

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NPESU National Perinatal Epidemiology and Statistics Unit

FERTILITY SOCIETY OF AUSTRALIA AND NEW ZEALAND

# Assisted reproductive technology in Australia and New Zealand 2023

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The National Perinatal Epidemiology and Statistics Unit (NPESU) aims to provide national information and statistics in reproductive and perinatal health.



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# Contents

# Acknowledgments

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All assisted reproductive technology (ART) and donor insemination (DI) cycles undertaken in Australian and New Zealand ART Units must be reported to the ANZARD as part of their accreditation by the Reproductive Technology Accreditation Committee of the FSANZ.

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# Abbreviations

| | |
|---|---|
| ANZARD | Australian and New Zealand Assisted Reproduction Database |
| ART | assisted reproductive technology |
| DET | double embryo transfer |
| DI | donor (sperm) insemination |
| FSANZ | Fertility Society of Australia and New Zealand |
| FSH | follicle stimulating hormone |
| GIFT | gamete intrafallopian transfer |
| hCG | human chorionic gonadotropin |
| ICSI | intracytoplasmic sperm injection |
| IVF | in vitro fertilisation |
| IUI | intrauterine insemination |
| LMP | last menstrual period |
| NPESU | National Perinatal Epidemiology and Statistics Unit |
| OHSS | ovarian hyperstimulation syndrome |
| OPU | oocyte pick-up |
| PCOS | polycystic ovary syndrome |
| PESA | percutaneous epididymal sperm aspiration |
| PGT | preimplantation genetic testing |
| RTAC | Reproductive Technology Accreditation Committee |
| SET | single embryo transfer |
| SLK | statistical linkage key |
| UNSW | University of New South Wales |
| WHO | World Health Organization |

# Symbols

| | |
|---|---|
| .. | not applicable |
| % | percentage |
| n | number |

# Summary

Assisted reproductive technology (ART) is a group of procedures that involve the in vitro (outside of body) handling of human oocytes (eggs) and sperm or embryos for the purposes of establishing a pregnancy. Each ART treatment involves a number of stages and is generally referred to as an ART treatment cycle. The embryos transferred to a female patient can either originate from the cycle in which they were created (fresh cycle) or be frozen (cryopreserved) and thawed before transfer (thaw cycle).

## Over 112,000 ART treatment cycles were performed in Australia and New Zealand in 2023

There were 112,707 ART treatment and lab-only cycles performed in Australian and New Zealand ART Units in 2023 (103,556 and 9,151 respectively). This represents an increase of 3.5% in Australia and 3.1% in New Zealand from 2022. This equates to 18.7 cycles per 1,000 women of reproductive age (15–44 years) in Australia, compared with 8.6 cycles per 1,000 women of reproductive age in New Zealand.

Women used their own oocytes or embryos (autologous cycles) in approximately 94% (105,855) of fresh and/or thaw cycles. These cycles were undertaken by 55,783 women, with more cycles per woman in Australia (1.9 cycles per woman) than in New Zealand (1.7 cycles per woman). There were 8,827 fertility preservation cycles and 307 surrogacy/gestational carrier cycles. Approximately 9% of cycles performed in 2023 underwent preimplantation genetic testing (PGT).

## Over one-third of recipient cycles were undertaken by single women or female same-sex couples

Of the 109,535 autologous and recipient cycles, 14.6% were undertaken by single female and 4.4% by female-female intended parents. Of the oocyte/embryo recipient cycles, more than one in three (39.3%) cycles were in single female or female-female intended parents, noting that this includes cycles where oocytes or embryos were provided by one female intended parent to her female partner.

## One in seven autologous fresh cycles were performed for fertility preservation

In 2023, of the 65,283 initiated autologous fresh cycles, 8,827 were performed for fertility preservation. This represents a 27.9% increase in fertility preservation cycles from 2022.

## One in four cycles attributed to male infertility

Male factor infertility was reported in approximately one in four cycles. The principal cause of male infertility was unexplained in the majority (77.4%) of these cycles.

## Modest rise in thaw cycle live birth rates continues

The overall clinical pregnancy rate for autologous and recipient fresh and thaw cycles reaching embryo transfer was 38.2%.

The live birth rate per initiated autologous fresh cycle was 14.5% after freeze-all cycles were excluded, and 25.4% for fresh cycles reaching embryo transfer. The live birth rate per initiated autologous thaw cycle was 32.6%, and 33% for thaw cycles reaching embryo transfer.

There was a higher live birth rate in younger women. For women aged under 30 years, the live birth rate per embryo transfer was 38.9% for autologous fresh cycles and 38.1% for autologous thaw cycles. For women older than 44 years, the live birth rate per embryo transfer was 2.4% for autologous fresh cycles and 12.9% for thaw cycles.

## Over 80% of the 20,000+ babies born were full-term, singletons, and of normal birth weight

There were 20,417 babies born (including 20,174 liveborn babies) following ART treatment in 2023. Of these, 18,338 (89.8%) were from treatments performed in Australian ART Units and 2,079 (10.2%) were from New Zealand ART Units. Eight in ten liveborn babies (83%) were full-term singletons of normal birthweight.

## More than one third of women achieved a live birth in their first ever complete ART cycle

Of the 41,543 women who began their first ART ovarian stimulation cycle between January 2020 and December 2021 and were followed through to the end of 2023, 39% achieved a live birth from their first complete ART cycle (which includes the initial stimulation and all fresh and frozen embryo transfers). By the sixth complete cycle, 59.7% had achieved a live birth. Assuming that women who discontinued treatment had an equal chance of achieving a live birth as those who continued, the estimated cumulative live birth rate after the sixth complete cycle would be 78.4%. Cumulative success rates varied by the woman's age.

## Trends in ART laboratory practices

Between 2019 and 2023, notable shifts in ART practice patterns were observed. The use of intracytoplasmic sperm injection (ICSI) in embryo transfer cycles declined from 58.2% to 55.4%. In contrast, the proportion of embryo transfer cycles using cryopreserved (frozen) embryos increased from 58.5% to 66.3%. Correspondingly, 71.5% of the 19,741 live births from ART in 2023 resulted from thaw cycles, up from 62.1% in 2019. The proportion of initiated fresh cycles that resulted in all oocytes or embryos being frozen (freeze-all cycles) also rose substantially—from 28.1% to 41.7%.

Additional trends included a continued move toward blastocyst stage transfers, rising from 88.3% of all transfers in 2019 to 93.3% in 2023. There was also broader adoption of vitrification as the preferred cryopreservation technique, used in 98.1% of thaw blastocyst transfers in 2023, up from 95.5% in 2019.

## Live birth rates per thaw cycle continue to increase

Over the past five years, live birth rates per embryo transfer cycle have steadily improved. The rate for fresh transfers rose slightly from 25.5% in 2019 to 25.7% in 2023, while thaw (frozen) embryo transfers saw a more notable increase, from 29.7% to 32.8%. Overall, the live birth rate per embryo transfer cycle increased from 28% to 30.4% between 2019 and 2023.

## Single embryo transfers continue to increase resulting in a low multiple birth rate

The proportion of single embryo transfers rose from 91.9% in 2019 to 94.9% in 2023, reflecting continued efforts to reduce the risks associated with multiple pregnancies. As a result, the multiple birth rate following ART treatment declined from 2.9% to 2.2% over the same period.

# 1 Introduction

Infertility affects millions of people around the world. Estimates suggest that approximately one in six people of reproductive age experience infertility in their lifetime (World Health Organization 2023). Advancements in infertility treatments, especially assisted reproductive technologies (ART), are increasingly helping couples overcome infertility. ARTs have evolved over the last four decades into a suite of mainstream medical interventions that have resulted in the birth of more than 13 million children worldwide (Adamson et al. 2025). The most recent national estimates indicate that 6.3% of all women who gave birth in Australia in 2023 received some form of ART treatment (AIHW 2025).

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

The Fertility Society of Australia and New Zealand (FSANZ) and Australian and New Zealand ART Units, in collaboration with the University of New South Wales (UNSW Sydney), are committed to providing informative annual statistics on ART treatments and pleased to present the annual report on ART performed in Australia and New Zealand in 2023.

## Treatments covered in this report

ART is a group of procedures that involve the in vitro (outside of body) handling of human oocytes (eggs) and sperm or embryos for the purposes of establishing a pregnancy (Zegers-Hochschild et al. 2017). A typical fresh in vitro fertilisation (IVF) cycle involves the following five steps:

1. Ovarian stimulation during which an ovarian stimulation regimen, typically using follicle stimulating hormone (FSH) is administered to a woman over a number of days to induce the maturation of multiple oocytes (eggs).
2. Oocyte pick-up (OPU) where oocytes are aspirated from ovarian follicles.
3. Fertilisation of the collected oocytes using the male intended parent or donor sperm.
4. Embryo development during which a fertilised oocyte is cultured for 2–4 days to form a cleavage-stage embryo (6–8 cells) or 5–6 days to a blastocyst (60–100 cells).
5. Transfer of one fresh embryo into the uterus in order to achieve pregnancy.

Treatment may be discontinued at any stage during a treatment cycle due to several reasons, including suboptimal response to ovarian stimulation, failure to obtain oocytes, failure of oocyte fertilisation, inadequate embryo development or patient choice.

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

- intracytoplasmic sperm injection (ICSI), when a single sperm is injected directly into the oocyte
- assisted hatching, when the outer layer of the embryo, the zona pellucida, is either thinned or perforated in the laboratory to aid ‘hatching’ of the embryo
- gamete intrafallopian transfer (GIFT), when mature oocytes and sperm are placed directly into a woman’s fallopian tubes so that fertilisation may take place in vivo (inside the body). While once popular, this procedure now accounts for only a very small percentage of ART cycles
- preimplantation genetic testing (PGT), when DNA from oocytes or embryos is tested for chromosomal disorders or genetic diseases before embryo transfer

- oocyte/embryo donation, when a female patient who is not an intended parent, intends to donate or donates her oocytes/embryos to others, or where a female intended parent provides oocytes/embryos to a female partner who is also an intended parent.
- oocyte/embryo recipient, when a female patient who is an intended parent receives oocytes/embryos from another individual/couple who is not an intended parent, or where a female intended parent receives oocytes/embryos from a female partner who is also an intended parent, to achieve a pregnancy.
- cryopreservation and storage of embryos that are not transferred in the initial fresh treatment cycle. Once thawed or warmed, the embryos can be transferred in subsequent treatment cycles. Cryopreservation techniques include both the traditional slow freezing method and vitrification. Vitrification can be used to cryopreserve gametes and embryos, and uses an ultra-rapid temperature change with exposure to higher concentrations of cryoprotectants
- cryopreservation and storage of oocytes and embryos for medical and non-medical fertility preservation
- freeze-all cycles where all oocytes or embryos resulting from an OPU are cryopreserved for potential future use
- in vitro maturation where immature oocytes are collected and placed in a special culture medium to mature before fertilisation is attempted.
- surrogacy arrangements, where a female patient, known as the 'gestational carrier' or 'surrogate', agrees to carry a child for another person or couple, known as the 'intended parent(s)', with the intention that the child will be raised by the intended parent(s). The oocytes and/or sperm used to create the embryo(s) in the cycle can be either from the intended parent(s) or from a donor(s).

Along with ART, a number of other fertility treatments are undertaken in Australia and New Zealand. Artificial insemination is one such treatment by which sperm are placed into the female genital tract (for example, intracervical or intrauterine), and can be used with ovarian stimulation or in natural cycles. Artificial insemination can be undertaken using a male intended parent's sperm, or donated sperm, also known as 'donor (sperm) insemination' (DI). Only DI performed at an ART Unit is reported to ANZARD.

## Data used in this report

This report provides information on ART and DI treatments performed in an accredited ART Unit and the resulting treatment, pregnancy and birth outcomes. Also included is an analysis of trends in ART treatments and outcomes in the five years from 2019 to 2023. Reporting ART treatment cycles in Australia is a requirement for ART Units to be licensed by the FSANZ's Reproductive Technology Accreditation Committee (RTAC). All ART Units in Australia and New Zealand provided data to ANZARD for cycles performed in 2023, comprising 93 ART Units in Australia and 7 ART Units in New Zealand. The full list of contributing ART Units can be found in Appendix A.

ANZARD is a data collection which uses a statistical linkage key (SLK) that links successive treatment cycles undertaken by one female patient. The SLK is a combination of the first two letters of a female patient's first name, the first two letters of her surname and her date of birth. The SLK enables the number of female patients undergoing treatment across time to be reported. As a joint initiative of the NPESU at UNSW Sydney and FSANZ, ANZARD was upgraded in 2020 to the ANZARD 3.0 Data Dictionary to accommodate new treatment types and reflect different types of patients involved in ART treatments. ANZARD 3.0 collects more information about the intended parents, causes of infertility, period of infertility, PGT, lab-only cycles and fertility preservation. As a result, there are new terms specific to ANZARD 3.0 that are used in this report:

- lab-only cycles – applies to cycles involving laboratory procedures only, with no patient monitoring, treatment, or planned embryo transfer.
- sex of the intended parent(s) – the sex of the intended parent(s) presented in this report is based on their sex at birth to align with the type of ART treatment provided to the individual. This may not be the same as the gender of the intended parent(s).

A more detailed description of ANZARD 3.0 can be found in Appendices B and C.

## Structure of this report

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

Chapter 2 — 'Overview of ART treatment in 2023', provides an outline of the numbers and outcomes of all ART treatments undertaken in Australia and New Zealand.

Chapter 3 — 'Autologous and donation/recipient cycles in 2023', presents data on the number of cycles, cycle types and the outcomes of treatment in terms of discontinued treatment, clinical pregnancies, and births.

Chapter 4 — 'Pregnancy and birth outcomes following autologous and recipient embryo transfer cycles in 2023', presents data on the outcomes of clinical pregnancies and births following autologous and recipient cycles including a description of perinatal outcomes.

Chapter 5 — 'Other cycle types, procedures and treatment complications in 2023', includes information on surrogacy and GIFT cycles, PGT and assisted hatching procedures.

Chapter 6 — 'Donor sperm insemination cycles in 2023', presents data on DI cycles and their outcomes, including a description of pregnancy and perinatal outcomes.

Chapter 7 — 'Trends in ART treatment and outcomes: 2019–2023', presents trends in ART treatments during the last five years of data collection in Australia and New Zealand.

Chapter 8 — 'Women undertaking autologous treatment in 2023', presents information on the number of women undergoing ART treatment in 2023.

Chapter 9 — 'Cycle-specific and cumulative live birth rates', presents information for a cohort of women who started their first autologous ART treatment cycle during between January 2020 and December 2021 and subsequent ART treatments they had up until 31 December 2023, or until they achieved a live birth (a birth of at least one liveborn baby).

Appendices — Appendix A lists the contributing ART Units. Appendix B provides an overview of the ANZARD 3.0 Data Dictionary that was used to prepare this report. Appendix C provides a detailed list of the data items in the collection.

# 2 Overview of ART treatment in 2023

There were 112,707 ART treatment and lab-only cycles reported from Australian and New Zealand ART Units in 2023 (Table 1). Of these, 91.9% (103,556) were from Australian ART Units and 8.1% (9,151) were from New Zealand ART Units. The overall number of ART treatment and lab-only cycles in 2023 increased by 3.5% from the 108,913 cycles in 2022, with a 3.5% increase in Australia and 3.1% increase in New Zealand. In 2023, the number of ART treatment cycles represented 18.7 cycles per 1,000 women of reproductive age (15–44 years) in Australia, compared with 8.6 cycles per 1,000 women of reproductive age in New Zealand (Australian Bureau of Statistics 2023; Statistics New Zealand 2023).

The majority (93.9%) of cycles in 2023 were autologous cycles (where a female intended parent intended to use or used her own oocytes or embryos). Of the 105,855 autologous cycles, 65,283 (61.7%) were fresh cycles and 40,572 (38.3%) were thaw cycles. The remainder represented a small proportion of cycles: 2.2% were oocyte recipient cycles, 1.1% were embryo recipient cycles, 0.9% were oocyte donation cycles, 0.1% were embryo donation cycles, and 0.4% were surrogacy arrangement cycles (Table 1).

Of all initiated ART cycles (excluding donation, surrogacy commissioning and lab-only cycles) in 2023, 22.6% (24,808) resulted in a clinical pregnancy and 18% (19,741) in a live birth (Table 1). Of these clinical pregnancies, 22,223 (89.6%) were from Australian ART Units and 2,585 (10.4%) from New Zealand ART Units. There were 20,417 babies born (including 20,174 liveborn babies) following ART treatment in 2023. Of these, 18,338 (89.8%) were from Australian ART Units and 2,079 (10.2%) from New Zealand ART Units. Of the liveborn babies, 83% (16,741) were singletons at term (gestational age of 37–41 weeks) with normal birthweight (≥ 2,500 grams). The multiple birth rate was 2.2%.

**Table 1: Number of initiated ART cycles by treatment type, Australia and New Zealand, 2023**

| Cycle type | Number of initiated ART cycles | Percent of initiated ART cycles | Number of clinical pregnancies | Number of live births | Number of liveborn babies | Number of liveborn singletons at term with normal birthweight |
|---|---|---|---|---|---|---|
| Autologous | 105,855 | 93.9 | 23,372 | 18,609 | 19,010 | 15,813 |
| *Fresh* | *65,283* | *57.9* | *6,982* | *5,380* | *5,501* | *4,476* |
| *Thaw* | *40,572* | *36.0* | *16,390* | *13,229* | *13,509* | *11,337* |
| Oocyte recipient | 2,492 | 2.2 | 822 | 631 | 648 | 504 |
| Embryo recipient | 1,188 | 1.1 | 483 | 397 | 410 | 334 |
| Oocyte donation | 1,026 | 0.9 | .. | .. | .. | .. |
| Embryo donation | 63 | 0.1 | .. | .. | .. | .. |
| GIFT[(a)] | 5 | 0.0 | 0 | .. | .. | .. |
| Surrogacy arrangement cycles | 405 | 0.4 | 131 | 104 | 106 | 90 |
| *Commissioning cycles[(b)]* | *98* | *0.1* | .. | .. | .. | .. |
| *Surrogate/gestational carrier cycles[(c)]* | *307* | *0.3* | *131* | *104* | *106* | *90* |
| Lab-only cycles | 1,673 | 1.5 | .. | .. | .. | .. |
| **Total** | **112,707** | **100.0** | **24,808** | **19,741** | **20,174** | **16,741** |

(a) GIFT cycles were classified separately from autologous cycles.
(b) A variety of cycle types undertaken as part of surrogacy arrangements, e.g. cycles undertaken by intended parents providing their oocytes or embryos for use by the surrogate/gestational carrier.
(c) A cycle undertaken by a female patient who carries, or intends to carry, a child on behalf of the intended parent(s) with an agreement that the child will be raised by the intended parent(s).

# 3 Autologous and donation/recipient cycles in 2023

This chapter presents data on initiated autologous cycles, oocyte/embryo donation cycles and oocyte/embryo recipient cycles. Surrogacy arrangement cycles and GIFT cycles are presented separately in Chapter 5.

An ‘autologous cycle’ is defined as an ART treatment cycle in which a female intended parent intends to use or uses her own oocytes or embryos to achieve a pregnancy.

A ‘donation cycle’ is defined as an ART treatment cycle in which a female patient who is not an intended parent, intends to donate or donates, her oocytes/embryos to others or where a female intended parent provides oocytes/embryos to a female partner who is also an intended parent.

The use of donor sperm does not determine whether a cycle is an autologous, donation, or recipient cycle.

A ‘recipient cycle’ is defined as an ART treatment cycle in which a female patient who is an intended parent, receives oocytes or embryos from another individual/couple who is not an intended parent, or where a female intended parent receives oocytes or embryos from a female partner who is also an intended parent, to achieve a pregnancy.

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

# 3.1 Overview of autologous and recipient cycles

## Intended parents

The ART cycles in sections 3.1 to 3.3 include treatment cycles undertaken by female-male, single female and female-female intended parents only. These cycles all involve the intention to transfer an embryo to a female patient. Cycles involving male-male and single male intended parents, such as oocyte/embryo donation cycles and surrogacy arrangement cycles, are covered in section 3.4 and Chapter 5, respectively.

There were 46,134 female-male couples, 9,994 single females and 2,690 female-female couples who undertook autologous and recipient cycles in 2023.

Of the 109,535 autologous and recipient cycles, 81% were undertaken by female-male intended parents, followed by single females (14.6%) and female-female intended parents (4.4%). One in four (26.6%) oocyte/embryo recipient cycles were in female-female intended parents (Table 2).

**Table 2: Number of autologous and recipient cycles by intended parents and treatment type, Australia and New Zealand, 2023**

| | Autologous | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | Oocyte/Embryo recipient | | All | |
| Intended parents | n | % | n | % | n | % | n | % |
| Female-male couple | 50,090 | 76.7 | 36,440 | 89.8 | 2,234 | 60.7 | 88,764 | 81.0 |
| Single female | 13,084 | 20.0 | 2,444 | 6.0 | 466 | 12.7 | 15,994 | 14.6 |
| Female-female couple | 2,109 | 3.2 | 1,688 | 4.2 | 980 | 26.6 | 4,777 | 4.4 |
| **Total** | **65,283** | **100.0** | **40,572** | **100.0** | **3,680** | **100.0** | **109,535** | **100.0** |

## Age of female patients and their partners

The average age of female patients undergoing autologous cycles was 36 years. For female patients undergoing oocyte/embryo recipient cycles, the mean age was 40 years, four years older than those in autologous cycles. The largest proportion of autologous fresh and thaw cycles were undertaken by female patients aged 35–39 years. Of all autologous and oocyte/embryo recipient cycles, 25.3% were undertaken by female patients aged 40 or older (Table 3).

**Table 3: Number of autologous and recipient cycles by female patient age and treatment type, Australia and New Zealand, 2023**

| | Autologous | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | Oocyte/Embryo recipient | | All | |
| Age group (years)[(a)] | n | % | n | % | n | % | n | % |
| < 30 | 5,452 | 8.4 | 3,639 | 9.0 | 193 | 5.2 | 9,284 | 8.5 |
| 30–34 | 17,382 | 26.6 | 12,378 | 30.5 | 536 | 14.6 | 30,296 | 27.7 |
| 35–39 | 25,183 | 38.6 | 16,306 | 40.2 | 778 | 21.1 | 42,267 | 38.6 |
| 40–44 | 15,669 | 24.0 | 7,631 | 18.8 | 1,121 | 30.5 | 24,421 | 22.3 |
| ≥ 45 | 1,597 | 2.4 | 618 | 1.5 | 1,052 | 28.6 | 3,267 | 3.0 |
| **Total** | **65,283** | **100.0** | **40,572** | **100.0** | **3,680** | **100.0** | **109,535** | **100.0** |

(a) Age at start of a treatment cycle.

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

The average age of male partners was 38 years, with 36.5% aged 40 or older. The average age of female partners was 36 years (Table 4).

**Table 4: Number of autologous and recipient cycles by female patients' partner age and treatment type, Australia and New Zealand, 2023**

| | Autologous | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | Oocyte/Embryo recipient | | All | |
| Age group (years) of intended parent[(a)] | n | % | n | % | n | % | n | % |
| **Male partner** | | | | | | | | |
| < 30 | 2,917 | 5.8 | 1,998 | 5.5 | 38 | 1.7 | 4,953 | 5.6 |
| 30–34 | 11,109 | 22.2 | 8,982 | 24.6 | 241 | 10.8 | 20,332 | 22.9 |
| 35–39 | 17,153 | 34.2 | 13,453 | 36.9 | 489 | 21.9 | 31,095 | 35.0 |
| 40–44 | 12,038 | 24.0 | 7,912 | 21.7 | 649 | 29.1 | 20,599 | 23.2 |
| ≥ 45 | 6,872 | 13.7 | 4,094 | 11.2 | 817 | 36.6 | 11,783 | 13.3 |
| Not stated | 1 | 0.0 | 1 | 0.0 | 0 | 0.0 | 2 | 0.0 |
| **Total male partners** | **50,090** | **100.0** | **36,440** | **100.0** | **2,234** | **100.0** | **88,764** | **100.0** |
| **Female partner** | | | | | | | | |
| < 30 | 312 | 14.8 | 199 | 11.8 | 113 | 11.5 | 624 | 13.1 |
| 30–34 | 658 | 31.2 | 498 | 29.5 | 364 | 37.1 | 1,520 | 31.8 |
| 35–39 | 678 | 32.1 | 561 | 33.2 | 365 | 37.2 | 1,604 | 33.6 |
| 40–44 | 331 | 15.7 | 299 | 17.7 | 117 | 11.9 | 747 | 15.6 |
| ≥ 45 | 130 | 6.2 | 131 | 7.8 | 21 | 2.1 | 282 | 5.9 |
| Not stated | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Total female partners** | **2,109** | **100.0** | **1,688** | **100.0** | **980** | **100.0** | **4,777** | **100.0** |

(a) Age at start of a treatment cycle.

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

## Parity

Parity is the number of previous pregnancies of 20 weeks or more gestation experienced by a woman. A woman who has had no previous pregnancies of 20 or more weeks gestation is called ‘nulliparous’. A woman who has had at least one previous pregnancy of 20 weeks or more gestation is described as ‘parous’.

Of the 109,535 initiated autologous and recipient cycles undertaken in 2023, 73.5% were undertaken by nulliparous women. Of autologous cycles (fresh and thaw), 73.6% were undertaken by nulliparous women, compared with 71% for oocyte/embryo recipient cycles (Table 5).

**Table 5: Number of autologous and recipient cycles by parity and treatment type, Australia and New Zealand, 2023**

| | Autologous | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | Oocyte/embryo recipient | | All | |
| **Parity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Nulliparous | 52,029 | 79.7 | 25,844 | 63.7 | 2,611 | 71.0 | 80,484 | 73.5 |
| Parous | 12,794 | 19.6 | 14,628 | 36.1 | 1,066 | 29.0 | 28,488 | 26.0 |
| Not stated | 460 | 0.7 | 100 | 0.2 | 3 | 0.1 | 563 | 0.5 |
| **Total** | **65,283** | **100.0** | **40,572** | **100.0** | **3,680** | **100.0** | **109,535** | **100.0** |

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

## Cause of infertility

Causes of clinical infertility may relate to either the female intended parent or her male partner, both, or may be unexplained. For ART cycles performed in 2023 (ANZARD 3.0), cause of infertility is reported for female-male intended parents undertaking ART to treat clinical infertility. The presence of clinical infertility and the associated clinical diagnosis for female and male intended parents is determined by the treating clinician or ART Unit. As a result, diagnostic definitions may vary among clinicians and ART Units and should be interpreted with considerable caution.

Of the 88,764 initiated autologous and recipient cycles undertaken by female-male intended parents, 44.4% reported only female infertility factors, 10.4% reported male infertility factors as the only cause of infertility, 15.2% reported combined female-male factors and 24.5% reported infertility as 'unexplained' (Table 6).

There were 7,411 (8.4%) cycles where the female intended parent had polycystic ovary syndrome (PCOS), regardless of whether it contributed to infertility.

**Table 6: Number of autologous and recipient cycles by intended parent cause of infertility, Australia and New Zealand, 2023**

| | Autologous | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | Oocyte/embryo recipient | | All | |
| **Cause of infertility** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Tubal disease only | 1,249 | 2.5 | 1,151 | 3.2 | 13 | 0.6 | 2,413 | 2.7 |
| Endometriosis only | 2,591 | 5.2 | 1,990 | 5.5 | 65 | 2.9 | 4,646 | 5.2 |
| Other female factors only | 15,591 | 31.1 | 10,002 | 27.4 | 1,125 | 50.4 | 26,718 | 30.1 |
| Combined female factors only | 2,921 | 5.8 | 2,532 | 6.9 | 194 | 8.7 | 5,647 | 6.4 |
| Combined female-male factors | 7,303 | 14.6 | 5,741 | 15.8 | 450 | 20.1 | 13,494 | 15.2 |
| Male factor infertility only | 4,958 | 9.9 | 4,248 | 11.7 | 67 | 3.0 | 9,273 | 10.4 |
| Unexplained infertility | 11,714 | 23.4 | 9,784 | 26.8 | 266 | 11.9 | 21,764 | 24.5 |
| Not stated | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 1 | 0.0 |
| Treatment not for infertility | 3,763 | 7.5 | 991 | 2.7 | 54 | 2.4 | 4,808 | 5.4 |
| **Total** | **50,090** | **100.0** | **36,440** | **100.0** | **2,234** | **100.0** | **88,764** | **100.0** |

There were 22,767 autologous and recipient cycles where the male intended parent was reported as having male factor infertility (Table 7). In 77.4% of these cycles, the primary cause of male infertility was idiopathic (unexplained).

**Table 7: Number of autologous and recipient cycles by male intended parent primary cause of infertility, Australia and New Zealand, 2023**

| | Autologous | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | Oocyte/embryo recipient | | All | |
| **Principal cause of male factor infertility** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Spermatogenic failure | | | | | | | | |
| *Idiopathic (unexplained)* | *9,440* | *77.0* | *7,752* | *77.6* | *432* | *83.6* | *17,624* | *77.4* |
| *Genetic – Klinefelter* | *68* | *0.6* | *72* | *0.7* | *6* | *1.2* | *146* | *0.6* |
| *Genetic – Y deletion* | *48* | *0.4* | *42* | *0.4* | *0* | *0.0* | *90* | *0.4* |
| *Genetic – other aneuploidies, single gene* | *234* | *1.9* | *214* | *2.1* | *6* | *1.2* | *454* | *2.0* |
| *Testis damage – cancer treatment* | *327* | *2.7* | *279* | *2.8* | *3* | *0.6* | *609* | *2.7* |
| *Testis damage – other (e.g. vascular, infective, trauma)* | *490* | *4.0* | *360* | *3.6* | *10* | *1.9* | *860* | *3.8* |
| *Gonadotrophin deficiency* | *140* | *1.1* | *144* | *1.4* | *8* | *1.5* | *292* | *1.3* |
| Obstruction | | | | | | | | |
| *Vasectomy* | *903* | *7.4* | *604* | *6.0* | *31* | *6.0* | *1,538* | *6.8* |
| *Congenital absence of the vas deferens/cystic fibrosis* | *111* | *0.9* | *124* | *1.2* | *3* | *0.6* | *238* | *1.0* |
| *Obstructive disorder* | *119* | *1.0* | *134* | *1.3* | *0* | *0.0* | *253* | *1.1* |
| Erectile and Ejaculatory | | | | | | | | |
| *Erectile dysfunction (incl. psychosexual)* | *224* | *1.8* | *159* | *1.6* | *14* | *2.7* | *397* | *1.7* |
| *Ejaculatory disorders (incl. spinal injury, retrograde and anejaculation)* | *157* | *1.3* | *105* | *1.1* | *4* | *0.8* | *266* | *1.2* |
| **Total[(a)]** | **12,261** | **100.0** | **9,989** | **100.0** | **517** | **100.0** | **22,767** | **100.0** |

(a) Includes cycles where the principal cause of male infertility was not stated/missing.

## Intracytoplasmic sperm injection procedures

Of the 48,303 autologous fresh cycles where fertilisation was attempted, 59.3% used ICSI procedures and 40.7% used IVF procedures.

Of fresh oocyte/embryo recipient cycles where fertilisation was attempted to create an embryo, 85.4% used ICSI procedures and 14.6% used IVF procedures (Table 8).

**Table 8: Number of autologous and recipient cycles with fertilisation attempted by treatment type and procedure, Australia and New Zealand, 2023**

| | Autologous[a] | | Oocyte/embryo recipient[a] | |
|---|---|---|---|---|
| **Procedure** | **n** | **%** | **n** | **%** |
| IVF | 19,664 | 40.7 | 141 | 14.6 |
| ICSI[b] | 28,639 | 59.3 | 822 | 85.4 |
| **Total** | **48,303** | **100.0** | **963** | **100.0** |

(a) Fresh cycles where fertilisation was attempted with a fresh or thawed oocyte.

(b) Includes 2,277 mixed IVF/ICSI cycles.

## Number of embryos transferred

Of the 64,646 fresh and thaw embryo transfer cycles undertaken in autologous and recipient cycles, 94.8% were single embryo transfer (SET) cycles and 5.1% were double embryo transfer (DET). In women aged under 35, 97.5% of embryo transfer cycles were SET cycles and 2.5% were DET cycles. In women aged 35 or older, 93.3% of cycles were SET cycles, 6.7% were DET cycles and <1% had three or more embryos transferred (Table 9).

**Table 9: Number of autologous and recipient cycles by number of embryos transferred and female patient age, Australia and New Zealand, 2023**

| | One | | Two | | Three or more | | All | |
|---|---|---|---|---|---|---|---|---|
| **Age group (years)[(a)]** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| < 30 | 5,250 | 98.4 | 87 | 1.6 | 0 | 0.0 | 5,337 | 8.3 |
| 30–34 | 17,653 | 97.3 | 489 | 2.7 | 0 | 0.0 | 18,142 | 28.1 |
| 35–39 | 23,976 | 95.8 | 1,044 | 4.2 | 1 | 0.0 | 25,021 | 38.7 |
| 40–44 | 12,575 | 89.5 | 1,464 | 10.4 | 17 | 0.1 | 14,056 | 21.7 |
| ≥ 45 | 1,848 | 88.4 | 236 | 11.3 | 6 | 0.3 | 2,090 | 3.2 |
| **Total** | **61,302** | **94.8** | **3,320** | **5.1** | **24** | **0.0** | **64,646** | **100.0** |

(a) Age at start of a treatment cycle.

## Stage of embryo development

Of the 64,646 autologous and recipient embryo transfer cycles, 6.7% involved the transfer of day 2–4 embryos (cleavage-stage embryos) and 93.3% day 5–6 embryos (blastocysts). Of autologous cycles, blastocyst transfers made up 84.5% of fresh cycles compared with 98.3% of thaw cycles (Table 10).

**Table 10: Number of embryo transfer cycles by treatment type and stage of embryo development, Australia and New Zealand, 2023**

| Stage of embryo development | Autologous | | | | Oocyte/embryo recipient | | | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | Fresh | | Thaw | |
| | n | % | n | % | n | % | n | % |
| Cleavage embryo | 3,277 | 15.5 | 686 | 1.7 | 116 | 16.3 | 237 | 9.0 |
| Blastocyst[(a)] | 17,883 | 84.5 | 39,443 | 98.3 | 595 | 83.7 | 2,409 | 91.0 |
| **Total** | **21,160** | **100.0** | **40,129** | **100.0** | **711** | **100.0** | **2,646** | **100.0** |

(a) Includes 6 cycles where both blastocyst and cleavage-stage embryos were transferred.

## Transfer of cryopreserved embryos

Embryos created in a fresh cycle can be cryopreserved by either slow freezing or ultra-rapid (vitrification) methods. Slow-frozen and vitrified embryos can be thawed/warmed and then transferred in subsequent cycles. Of the 42,775 frozen/thawed embryo transfer cycles, 97.7% involved the transfer of vitrified embryos. Of the frozen/thawed blastocyst transfer cycles, 98.1% had vitrified embryos transferred. By comparison, 80.6% of frozen/thawed cleavage-stage embryo transfer cycles used vitrified embryos (Table 11).

**Table 11: Number of embryo transfer cycles by cryopreservation method and stage of embryo development, Australia and New Zealand, 2023**

| Cryopreservation method | Autologous | | | | Oocyte/embryo recipient | | | |
|---|---|---|---|---|---|---|---|---|
| | Cleavage embryo | | Blastocyst | | Cleavage embryo | | Blastocyst | |
| | n | % | n | % | n | % | n | % |
| Slow frozen | 159 | 23.2 | 771 | 2.0 | 20 | 8.4 | 32 | 1.3 |
| Vitrification[(a)] | 527 | 76.8 | 38,672 | 98.0 | 217 | 91.6 | 2,377 | 98.7 |
| **Total** | **686** | **100.0** | **39,443** | **100.0** | **237** | **100.0** | **2,409** | **100.0** |

(a) Includes 3 cycle where both vitrified and slow-frozen embryos were transferred.

## Live births from initiated autologous fresh and thaw, and recipient cycles among ART Units

Figure 1 reports on live births per initiated fresh (excluding freeze-all) and thaw autologous cycles and recipient cycles among 97 ART Units that performed more than 50 of these cycles combined in 2023.

The highest live birth rate was around 35% and the lowest was around 4%. These data should be interpreted with caution because of the small number of patients who underwent autologous and recipient cycles in some ART Units. The live birth rates among ART Units may also vary because of differences in the characteristics and prognosis of patients treated, and different approaches to the use of ARTs and other fertility treatments.

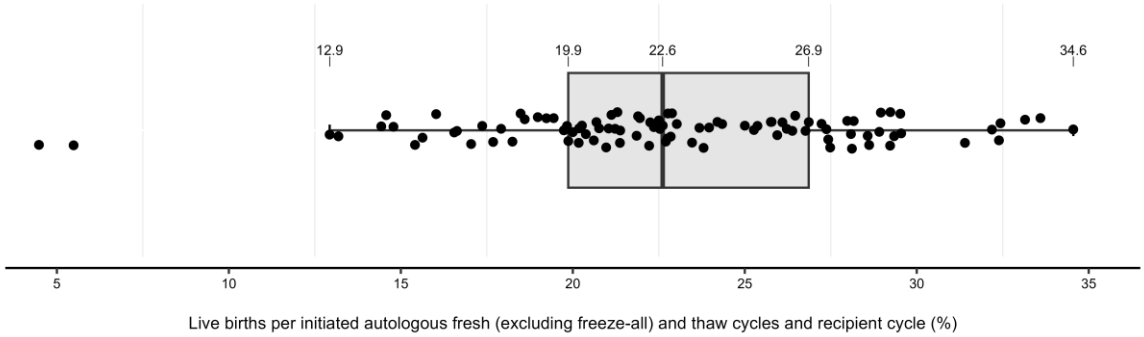
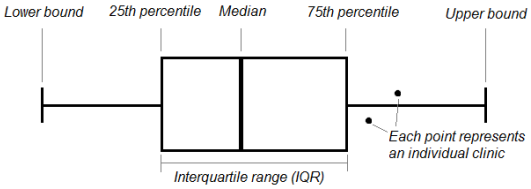



**Figure 1: Live birth rate per initiated autologous fresh (excluding freeze-all) and thaw and recipient cycle (%) among ART Units, Australia and New Zealand, 2023**

## How to interpret Figure 1




- Figure 1 reports on live births per initiated fresh (excluding freeze-all*)* and thaw autologous cycles, and recipient cycles (%) among the 97 ART Units that performed more than 50 of these cycles combined in 2023.
- Each point represents an ART Unit.
- A percentile indicates the value below which a given percentage of ART Units live birth rates fall. For example, 50% of ART Units had a live birth rate less than the median (22.6%).
- The interquartile range (IQR) indicates the range of live birth rates achieved by the middle 50% of ART Units (IQR: 19.9%–26.9%).
- The upper and lower bounds represent the range in which it would be expected that approximately 98% of ART Units will fall (12.9%–34.6%).
- These data should be interpreted with caution because of the small number of patients who underwent autologous and recipient cycles in some ART Units. The live birth rates among ART Units may also vary because of differences in the characteristics and prognosis of patients treated, and different approaches to the use of ARTs and other fertility treatments.

For more information on ART Unit success rates, refer to the YourIVFSuccess website (yourivfsuccess.com.au).

## 3.2 Autologous fresh cycles

In 2023, there were 65,283 initiated autologous fresh cycles, comprising 64,337 (98.6%) FSH-stimulated cycles and 946 (1.4%) unstimulated cycles. Of the initiated autologous fresh cycles, 93.7% (61,189) were in Australian ART Units and 6.3% (4,094) were in New Zealand ART Units.

### Progression of autologous fresh cycles

Figure 2 shows the main stages of autologous fresh cycles and the resulting treatment outcomes. Of the 65,283 initiated autologous fresh cycles in 2023, 90% had OPU performed, 43% were freeze-all cycles and 32.4% had embryos transferred (Figure 2). A treatment cycle can be discontinued for a variety of reasons, including inadequate response of ovaries to medication, excessive ovarian stimulation, failure to obtain oocytes, failure of oocyte fertilisation, inadequate embryo growth or patient choice.

Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are frozen for potential future use. This increasingly common practice (Table 42) is used for a variety of reasons, including reducing the risk of ovarian hyperstimulation syndrome (OHSS), improving endometrial–embryo synchronicity, as part of a PGT cycle, for fertility preservation or as a deliberate treatment option used by some clinicians.

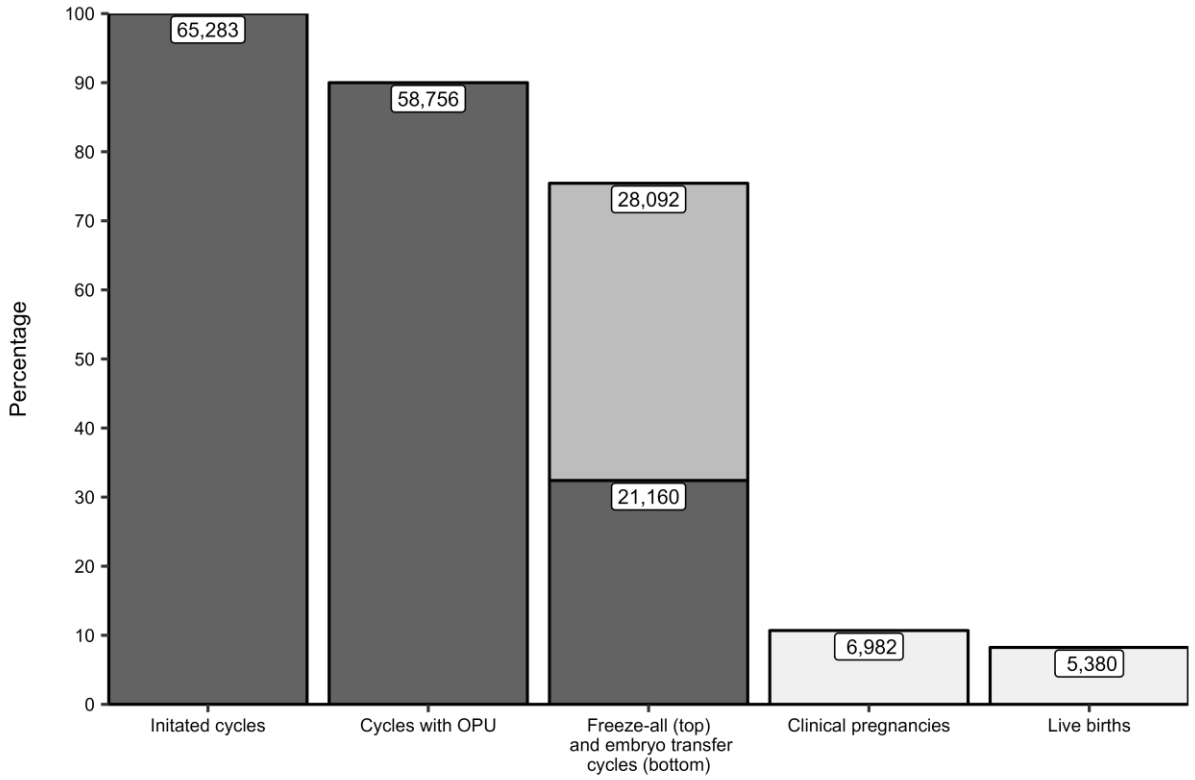



**Figure 2: Progression of autologous fresh cycles, Australia and New Zealand, 2023**

## Fertility preservation

Fertility preservation is where a female patient freezes or intends to freeze all suitable oocytes or embryos for potential future use. There were 8,827 initiated autologous fresh cycles performed for fertility preservation (Table 12), a 27.9% increase from 2022. Of these, over one-third (38.1%) were reported as being for non-medical reasons (e.g. not having a partner). Of the 8,827 initiated autologous fresh cycles for fertility preservation, 7,936 (89.9%) resulted in all suitable oocytes or embryos being cryopreserved. The majority (93.3%) of these freeze-all cycles were for oocyte cryopreservation (7,404).

**Table 12: Number of autologous fresh fertility preservation cycles for female patients by age and treatment type, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | |
|---|---|---|---|---|
| **Reason for fertility preservation** | **< 35** | **35–39** | **≥ 40** | **All** |
| Medical reason – cancer diagnosis | 485 | 177 | 50 | 712 |
| Medical reason – other | 2,232 | 2,053 | 468 | 4,753 |
| Non-medical reason | 1,465 | 1,658 | 239 | 3,362 |
| **Total** | **4,182** | **3,888** | **757** | **8,827** |

(a) Age at start of a treatment cycle.

## Clinical pregnancies and live births by women's age

Maternal age is one of the key factors associated with the outcomes of autologous fresh cycles. The highest live birth rate per embryo transfer cycle was in women aged under 30 (38.9%). The rate declined with advancing age, with a rate of 9.9% for females aged 40–44 and 2.4% for females aged 45 or older (Table 13). In women aged 45 or older, 1,051 cycles (65.8%) occurred in women aged 45 years and 312 cycles (19.5%) in women aged 46 years, with the remaining 234 cycles (14.7%) occurring in women aged 47 or older.

In women aged under 30 years, freeze-all cycles accounted for 55.7% of initiated fresh cycles with the rate decreasing to 14.8% in women 45 years or older. Of the 65,283 initiated autologous fresh cycles, all oocytes were cryopreserved in 9,269 cycles (14.2%) and all embryos were cryopreserved in 18,823 cycles (28.9%).

**Table 13: Outcomes of autologous fresh cycles by female patient age, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | | | |
|---|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **< 30** | **30–34** | **35–39** | **40–44** | **≥ 45** | **All** |
| Initiated cycles | 5,452 | 17,382 | 25,183 | 15,669 | 1,597 | 65,283 |
| Cycles with OPU | 5,001 | 16,078 | 22,886 | 13,544 | 1,247 | 58,756 |
| *Freeze-all cycles[b]* | 3,036 | 9,153 | 11,341 | 4,326 | 236 | 28,092 |
| Embryo transfer cycles | 1,551 | 5,399 | 8,171 | 5,529 | 510 | 21,160 |
| Clinical pregnancies | 702 | 2,414 | 2,858 | 977 | 31 | 6,982 |
| Live births | 603 | 2,037 | 2,180 | 548 | 12 | 5,380 |
| *Live births per initiated cycle (%)* | *11.1* | *11.7* | *8.7* | *3.5* | *0.8* | *8.2* |
| *Live births per initiated cycle (excluding freeze-all)[c] (%)* | *25.0* | *24.8* | *15.7* | *4.8* | *0.9* | *14.5* |
| *Live births per embryo transfer cycle (%)* | *38.9* | *37.7* | *26.7* | *9.9* | *2.4* | *25.4* |
| *Live births per clinical pregnancy (%)* | *85.9* | *84.4* | *76.3* | *56.1* | *38.7* | *77.1* |

(b) Age at start of a treatment cycle.

(c) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved for potential future use.

(d) Live births per initiated cycle (excluding freeze-all) were calculated using live births as the numerator and initiated fresh cycles minus freeze-all cycles as the denominator.

Figure 3 shows age-specific live birth rates per initiated autologous fresh cycle (excluding freeze-all cycles) by two-year age groups. The 95% confidence intervals represent the uncertainty surrounding the live birth rates for otherwise similar female patients of that age group. The wider 95% confidence intervals for women in age groups under 30 years indicate greater uncertainty in the birth rates for these female patients as being representative of all female patients of similar age and characteristics.

The highest live birth rates were in females between the ages of 23 and 32 years. For women aged 45 or older, only 1 live birth resulted from every 113 initiated cycles compared with 1 live birth from every 4 initiated cycles in women aged between 29 and 30.

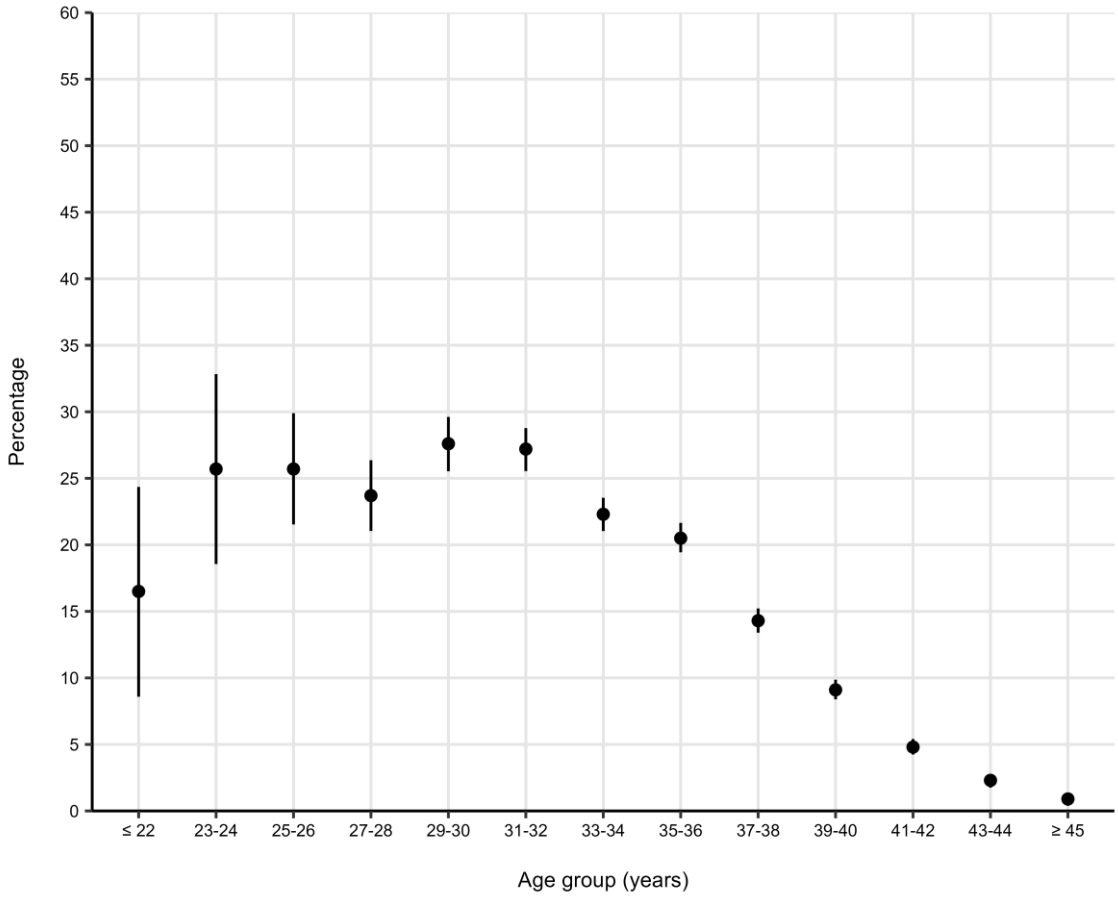



**Figure 3: Live birth rate (with 95% confidence intervals) per initiated autologous fresh cycle (excluding freeze-all) by female patient's age at start of a treatment cycle, Australia and New Zealand, 2023**

## Clinical pregnancies and live births by cause of infertility

Causes of infertility may relate to either the female intended parent or her male partner, both, or may be unexplained. For ART cycles performed in 2023 (ANZARD 3.0), cause of infertility is reported for female-male intended parents undertaking ART to treat clinical infertility. The presence of clinical infertility and the associated clinical diagnosis for female and male intended parents is determined by the treating clinician or ART Unit. As a result, diagnostic definitions may vary among clinicians and ART Units and should be interpreted with considerable caution.

There were 3,763 autologous fresh cycles where ART was performed for reasons other than to treat medical infertility. Examples include chromosomal testing, human leukocyte antigens (HLA) matching and fertility preservation.

There were 50,090 initiated autologous fresh cycles undertaken by female-male intended parents. Cycles where male factor infertility was reported as the only cause of infertility in the intended parents had the highest live birth rate (22.5%) (Table 14). The cause of infertility was unexplained in the intended parents in 23.4% of autologous fresh cycles.

**Table 14: Outcomes of autologous fresh cycles by intended parent cause of infertility, Australia and New Zealand, 2023**

| Cause of infertility | Number of initiated cycles | Embryo transfer cycles per initiated cycle (%) | Clinical pregnancies per initiated non-freeze-all cycle[(a)] (%) | Live births per initiated non-freeze-all cycle[(b)] (%) |
|---|---|---|---|---|
| Tubal disease only | 1,249 | 44.6 | 24.8 | 20.0 |
| Endometriosis only | 2,591 | 41.3 | 20.7 | 16.8 |
| Other female factors only | 15,591 | 36.6 | 14.6 | 10.3 |
| Combined female factors only | 2,921 | 39.1 | 19.0 | 14.0 |
| Combined female-male factors | 7,303 | 40.4 | 18.3 | 13.9 |
| Male factor infertility only | 4,958 | 44.5 | 27.1 | 22.5 |
| Unexplained infertility[(c)] | 11,714 | 41.0 | 23.5 | 18.8 |
| Not stated | 0 | .. | .. | .. |
| Treatment not for infertility | 3,763 | 6.7 | 7.1 | 6.2 |
| **Total** | **50,090** | **37.3** | **19.1** | **14.8** |

(a) Clinical pregnancies per initiated non-freeze-all cycle is calculated using clinical pregnancies as the numerator and initiated cycles minus freeze-all cycles as the denominator.

(b) Live births per initiated non-freeze-all cycle is calculated using live births as the numerator and initiated cycles minus freeze-all cycles as the denominator.

(c) Unexplained infertility is unexplained in both the female and male intended parents.

There were 12,261 autologous fresh cycles where the male intended parent was reported as having male factor infertility (Table 1415). In 77% of these cycles, the primary cause of male infertility was idiopathic (unexplained).

The overall live birth rate per initiated non-freeze-all cycle was 17.3%, ranging from 11.2% for genetic – other aneuploidies, single gene to 29.6% for congenital absence of the vas deferens/cystic fibrosis (Table 15).

**Table 15: Outcomes of autologous fresh cycles by male intended parent principal cause of infertility, Australia and New Zealand, 2023**

| Primary cause of male infertility | Number of initiated cycles | Embryo transfer cycles per initiated cycle (%) | Clinical pregnancies per initiated non-freeze-all cycle (%)[a] | Live births per initiated non-freeze-all cycle (%)[b] |
|---|---|---|---|---|
| Spermatogenic failure | | | | |
| *Idiopathic (unexplained)* | 9,440 | 42.0 | 21.7 | 17.3 |
| *Genetic – Klinefelter* | 68 | 38.2 | 18.6 | 16.3 |
| *Genetic – Y deletion* | 48 | 45.8 | 20.7 | 13.8 |
| *Genetic - other aneuploidies, single gene* | 234 | 21.8 | 12.9 | 11.2 |
| *Testis damage – cancer treatment* | 327 | 45.9 | 23.0 | 17.5 |
| *Testis damage – other (e.g. vascular, infective, trauma)* | 490 | 46.3 | 28.3 | 21.1 |
| *Gonadotrophin deficiency* | 140 | 43.6 | 18.3 | 11.8 |
| Obstruction | | | | |
| *Vasectomy* | 903 | 45.2 | 18.6 | 15.3 |
| *Congenital absence of the vas deferens/cystic fibrosis* | 111 | 45.0 | 33.8 | 29.6 |
| *Obstructive disorder* | 119 | 43.7 | 32.9 | 25.3 |
| Erectile and ejaculatory | | | | |
| *Erectile dysfunction (incl. psychosexual)* | 224 | 36.2 | 19.6 | 15.4 |
| *Ejaculatory disorders (incl. spinal injury, retrograde and anejaculation)* | 157 | 39.5 | 23.5 | 13.3 |
| **Total[c]** | **12,261** | **42.0** | **21.8** | **17.3** |

(a) Clinical pregnancies per initiated non-freeze-all cycle is calculated using clinical pregnancies as the numerator and initiated cycles minus freeze-all cycles as the denominator.

(b) Live births per initiated non-freeze-all cycle is calculated using live births as the numerator and initiated cycles minus freeze-all cycles as the denominator.

(c) Includes cycles where the principal cause of male infertility was not stated/missing.

## Clinical pregnancies and live births by stage of embryo development and number of embryos transferred

Overall, 92.1% of autologous fresh embryo transfer cycles were SET cycles, 7.8% were DET cycles and 0.1% had three or more embryos transferred. In female patients aged 40 or older, three or more fresh embryos were transferred in 14 cycles.

There were more blastocyst (84.5%) than cleavage-stage embryo transfer cycles (15.5%). The rates of clinical pregnancy and live birth were higher in blastocyst transfer cycles than in cleavage-stage embryo transfer cycles for both SET and DET cycles (Table 16). Caution should be taken when comparing clinical pregnancy and live birth rates following cleavage-stage embryo and blastocyst transfer. Patient characteristics, prognosis and treatment strategies may be different between these groups, and generally fewer embryos are available for transfer and cryopreservation when blastocyst culture is used.

The overall live birth rate per embryo transfer cycle was 26.3% for SET cycles and 15.4% for DET cycles (Table 16). Caution should be taken when comparing live birth rates following SET and DET cycles because patient characteristics and prognoses are different between these groups.

**Table 16: Outcomes of autologous fresh embryo transfer cycles by stage of embryo development and number of embryos transferred, Australia and New Zealand, 2023**

| | Cleavage | | Blastocyst | | Total | |
|---|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **SET[(a)]** | **DET[(b)(c)(d)]** | **SET[(a)]** | **DET[(b)(c)(d)]** | **SET[(a)]** | **DET[(b)(c)(d)]** |
| Embryo transfer cycles | 2,549 | 728 | 16,944 | 939 | 19,493 | 1,667 |
| Clinical pregnancies | 509 | 133 | 6,094 | 246 | 6,603 | 379 |
| Live births | 366 | 76 | 4,758 | 180 | 5,124 | 256 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *20.0* | *18.3* | *36.0* | *26.2* | *33.9* | *22.7* |
| *Live births per embryo transfer cycle (%)* | *14.4* | *10.4* | *28.1* | *19.2* | *26.3* | *15.4* |

(a) SET: single embryo transfer.

(b) DET: double embryo transfer.

(c) Includes 5 cycles where both cleavage-stage embryos and blastocysts were transferred.

(d) Includes cycles where three or more embryos were transferred.

# 3.3 Autologous thaw cycles

There were 40,572 autologous thaw cycles reported in 2023 (Figure 4). Of these, 89.5% (36,328) were in Australian ART Units and 10.5% (4,244) in New Zealand ART Units.

## Progression of autologous thaw cycles

Figure 4 shows the main stages of autologous thaw cycles and the resulting treatment outcomes.

Of the 40,572 initiated autologous thaw cycles, 98.9% had embryos transferred, 40.4% resulted in a clinical pregnancy and 32.6% resulted in a live birth (Figure 4).

The rate of live births per initiated cycle was higher for autologous thaw cycles than for autologous fresh cycles excluding freeze-all cycles in 2023 (32.6% and 14.5% respectively) (Table 13 and Table 17).

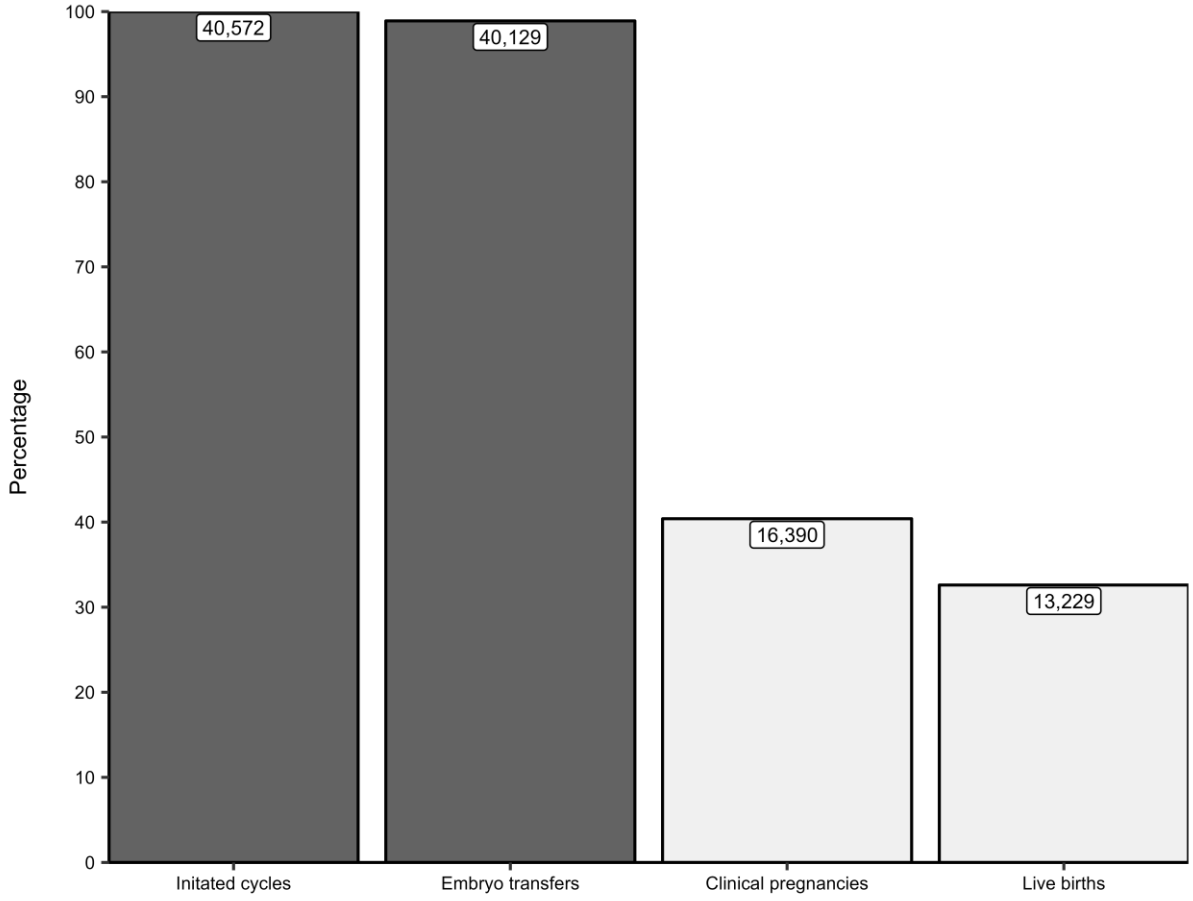



**Figure 4: Progression of autologous thaw cycles, Australia and New Zealand, 2023**

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

The live birth rate per initiated thaw cycle and per thaw embryo transfer cycle was similar for women aged less than 30 years and women aged 30–34 years, with live birth rates declining for older women (Table 17).

The overall live birth rate per initiated autologous thaw cycle was 32.6%, which is 18 percentage points higher than in autologous fresh cycles (excluding freeze-all cycles) (14.5%) (Table 13 and Table 17).

It is important to note that embryos thawed during a thaw cycle were created in an earlier initiated fresh cycle; therefore, a woman's age at the start of a thaw cycle is older than her age at the start of the initiated fresh cycle. Also, there has been a trend towards freeze-all cycles and PGT in recent years (Table 37 and Table 42), resulting in higher quality embryos being transferred in thaw cycles than fresh embryo transfer cycles. This may contribute to the higher success rates following autologous thaw cycles compared to autologous fresh cycles (Table 13 and Table 17).

**Table 17: Outcomes of autologous thaw cycles by female patient age, Australia and New Zealand, 2023**

| | Age group (years)[(a)] | | | | | |
|---|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **< 30** | **30–34** | **35–39** | **40–44** | **≥ 45** | **All** |
| Initiated cycles | 3,639 | 12,378 | 16,306 | 7,631 | 618 | 40,572 |
| Embryo transfers | 3,609 | 12,260 | 16,138 | 7,518 | 604 | 40,129 |
| Clinical pregnancies | 1,662 | 5,592 | 6,671 | 2,346 | 119 | 16,390 |
| Live births | 1,376 | 4,678 | 5,388 | 1,709 | 78 | 13,229 |
| *Live births per initiated cycle (%)* | *37.8* | *37.8* | *33.0* | *22.4* | *12.6* | *32.6* |
| *Live births per embryo transfer cycle (%)* | *38.1* | *38.2* | *33.4* | *22.7* | *12.9* | *33.0* |
| *Live births per clinical pregnancy (%)* | *82.8* | *83.7* | *80.8* | *72.8* | *65.5* | *80.7* |

(a) Age at start of the thaw treatment cycle.

Figure 5 shows age-specific live birth rates per initiated autologous thaw cycle by two-year age groups. The 95% confidence intervals represent the uncertainty surrounding the live birth rates for otherwise similar female patients of that age group.

The highest live birth rates were observed in females in their early 20s and late 20s to early 30s. The wider 95% confidence intervals for women in age groups under 30 years indicates greater uncertainty in the birth rates for these female patients.

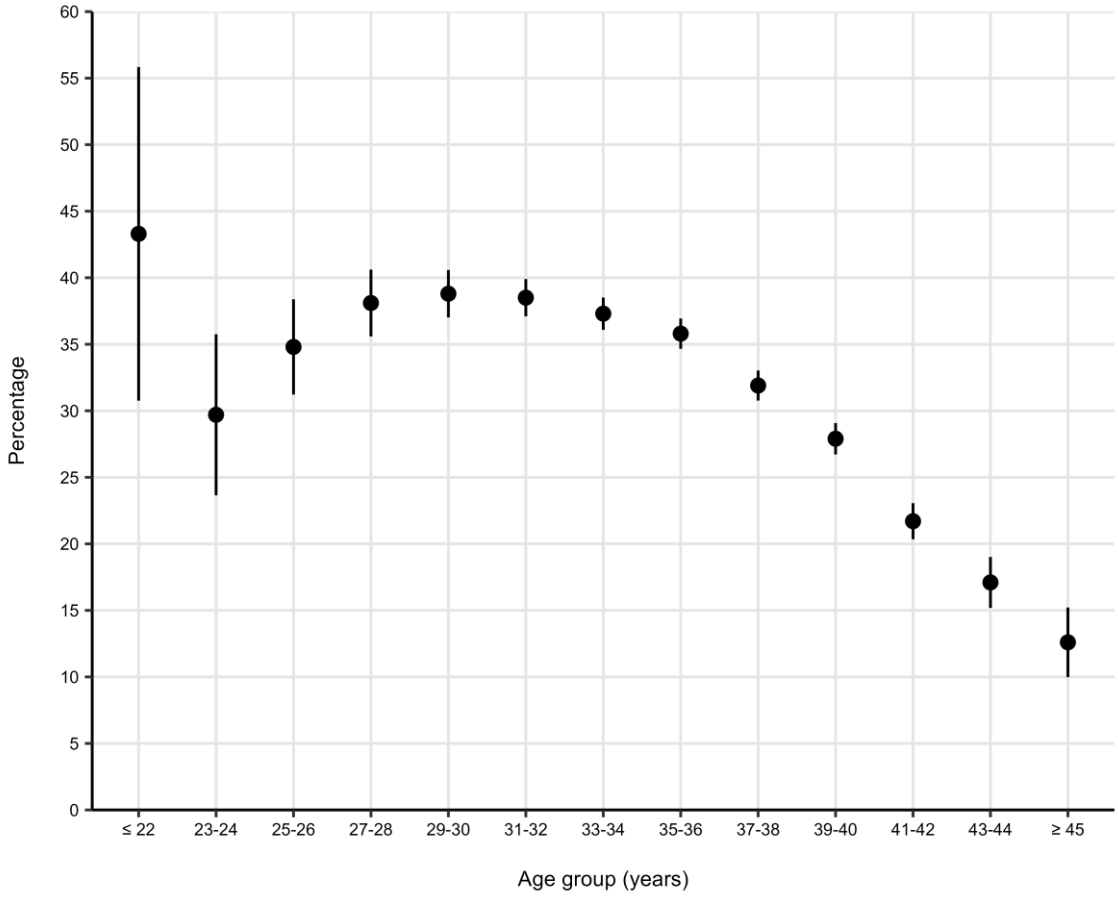



**Figure 5: Live birth rate (with 95% confidence intervals) per initiated autologous thaw cycle by female patient's age at start of a treatment cycle, Australia and New Zealand, 2023**

## Clinical pregnancies and live births by cause of infertility

Causes of infertility may relate to either the female intended parent or her male partner, both, or may be unexplained. For ART cycles performed in 2023 (ANZARD 3.0), cause of infertility is reported for female-male intended parents undertaking ART to treat clinical infertility. The presence of clinical infertility and the associated clinical diagnosis for female and male intended parents is determined by the treating clinician or ART Unit. As a result, diagnostic definitions may vary among clinicians and ART Units and should be interpreted with considerable caution.

There were 991 autologous thaw cycles where ART was performed for reasons other than to treat clinical infertility. Examples include chromosomal testing, human leukocyte antigens (HLA) matching and fertility preservation. Of these 991 cycles, 41% resulted in a live birth.

There were 36,440 initiated autologous thaw cycles undertaken by female-male intended parents. Cycles reported with male only cause of infertility had the highest rate of live births per initiated autologous thaw cycle (36.6%) (Table 18).

**Table 18: Outcomes of autologous thaw cycles by intended parent cause of infertility, Australia and New Zealand, 2023**

| Cause of infertility | Number of initiated cycles | Embryo transfer cycles per initiated cycle (%) | Clinical pregnancies per initiated cycle (%) | Live births per initiated cycle (%) |
|---|---|---|---|---|
| Tubal disease only | 1,151 | 98.5 | 39.4 | 31.5 |
| Endometriosis only | 1,990 | 99.2 | 41.4 | 34.1 |
| Other female factors only | 10,002 | 98.8 | 37.5 | 29.6 |
| Combined female factors only | 2,532 | 98.9 | 38.3 | 29.1 |
| Combined female-male factors | 5,741 | 99.4 | 41.6 | 33.2 |
| Male factor infertility only | 4,248 | 99.1 | 43.7 | 36.6 |
| Unexplained infertility | 9,784 | 99.1 | 42.1 | 34.3 |
| Not stated | 1 | 100.0 | 0.0 | 0.0 |
| Treatment not for infertility | 991 | 94.9 | 47.3 | 41.0 |
| **All** | **36,440** | **98.9** | **40.7** | **32.8** |

Of the 36,440 initiated autologous thaw cycles undertaken by female-male intended parents, 9,989 (27.4%) had male factor infertility (Table 19). The cause of male infertility was unexplained in the majority (77.6%) of cycles. Cycles where the primary cause was ejaculatory disorders had the highest live birth rate per initiated cycle (47.6%).

**Table 19: Outcomes of autologous thaw cycles by male intended parent principal cause of infertility, Australia and New Zealand, 2023**

| Primary cause of male infertility | Number of initiated cycles | Embryo transfer cycles per initiated cycle (%) | Clinical pregnancies per initiated cycle (%) | Live births per initiated cycle (%) |
|---|---|---|---|---|
| Spermatogenic failure | | | | |
| *Idiopathic (unexplained)* | *7,752* | *99.3* | *42.6* | *34.6* |
| *Genetic – Klinefelter* | *72* | *100.0* | *44.4* | *38.9* |
| *Genetic – Y deletion* | *42* | *97.6* | *40.5* | *35.7* |
| *Genetic – other aneuploidies, single gene* | *214* | *99.5* | *48.6* | *40.2* |
| *Testis damage – cancer treatment* | *279* | *98.9* | *44.8* | *37.3* |
| *Testis damage – other (e.g. vascular, infective, trauma)* | *360* | *99.2* | *41.4* | *34.4* |
| *Gonadotrophin deficiency* | *144* | *98.6* | *37.5* | *29.9* |
| Obstruction | | | | |
| *Vasectomy* | *604* | *98.8* | *37.9* | *30.1* |
| *Congenital absence of the vas deferens/cystic fibrosis* | *124* | *98.4* | *40.3* | *33.1* |
| *Obstructive disorder* | *134* | *100.0* | *44.0* | *38.1* |
| Erectile and ejaculatory | | | | |
| *Erectile dysfunction (incl. psychosexual)* | *159* | *98.1* | *42.8* | *37.1* |
| *Ejaculatory disorders (incl. spinal injury, retrograde and anejaculation)* | *105* | *100.0* | *52.4* | *47.6* |
| **Total** | **9,989** | **99.2** | **42.5** | **34.7** |

Of the 40,129 autologous thaw embryo transfer cycles, 96.2% were SET cycles, 3.8% were DET cycles and <1% (9) cycles transferred three or more embryos. Only female patients aged 40 or older had three or more frozen/thawed embryos transferred.

There were more blastocyst transfer cycles (98.3%) than cleavage-stage embryo transfer cycles (1.7%). The rates of clinical pregnancy and live birth were higher in blastocyst transfer cycles (41.2% and 33.3% respectively) than in cleavage-stage embryo transfer cycles (18.5% and 14.3% respectively) (Table 20). Caution should be taken when comparing clinical pregnancy and live birth rates following cleavage-stage embryo and blastocyst transfer. Patient characteristics and prognoses are different between these groups, and generally fewer embryos are available for transfer and cryopreservation when blastocyst culture is used.

The overall live birth rate per embryo transfer cycle was 33.2% for SET cycles and 26.2% for DET cycles (Table 20). Caution should be taken when comparing live birth rates following SET and DET cycles because patient characteristics and prognoses are different between these groups.

**Table 20: Outcomes of autologous thaw embryo transfer cycles by stage of embryo development and number of embryos transferred, Australia and New Zealand, 2023**

| | Cleavage | | Blastocyst | | Total | |
|---|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **SET[(a)]** | **DET[(b)(c)]** | **SET[(a)]** | **DET[(b)(c)]** | **SET[(a)]** | **DET[(b)(c)]** |
| Embryo transfer cycles | 499 | 187 | 38,092 | 1,351 | 38,591 | 1,538 |
| Clinical pregnancies | 91 | 36 | 15,753 | 510 | 15,844 | 546 |
| Live births | 73 | 25 | 12,753 | 378 | 12,826 | 403 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *18.2* | *19.3* | *41.4* | *37.7* | *41.1* | *35.5* |
| *Live births per embryo transfer cycle (%)* | *14.6* | *13.4* | *33.5* | *28.0* | *33.2* | *26.2* |

(a) SET: single embryo transfer.

(b) DET: double embryo transfer.

(c) Includes cycles where three or more embryos were transferred.

## Clinical pregnancies and live births by embryo freezing methods

Of the autologous thaw cycles where a blastocyst was transferred, 98.1% used vitrified embryos compared with 76.8% of cleavage-stage embryo transfer cycles. Live birth rates were higher for vitrified embryos compared to slow-frozen embryos regardless of the stage of embryo development (Table 21).

**Table 21: Outcomes of autologous thaw embryo transfer cycles by stage of embryo development and embryo freezing methods, Australia and New Zealand, 2023**

| | Stage of embryo development | | | | | |
|---|---|---|---|---|---|---|
| | Cleavage stage | | Blastocyst | | All | |
| Stage/outcome of treatment | Slow freezing | Vitrification | Slow freezing | Vitrification | Slow freezing | Vitrification |
| Embryo transfer cycles | 159 | 527 | 771 | 38,672 | 930 | 39,199 |
| Clinical pregnancies | 20 | 107 | 246 | 16,017 | 266 | 16,124 |
| Live births | 13 | 85 | 199 | 12,932 | 212 | 13,017 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *12.6* | *20.3* | *31.9* | *41.4* | *28.6* | *41.1* |
| *Live births per embryo transfer cycle (%)* | *8.2* | *16.1* | *25.8* | *33.4* | *22.8* | *33.2* |

## 3.4 Donation and recipient cycles

A donation cycle is an ART treatment cycle in which a female patient who is not an intended parent, intends to donate or donates, her oocytes/embryos to others or where a female intended parent provides oocytes/embryos to a female partner who is also an intended parent. A recipient cycle is defined as an ART treatment cycle in which a female patient who is an intended parent, receives oocytes or embryos from another individual/couple who is not an intended parent, or where a female intended parent receives oocytes or embryos from a female partner who is also an intended parent, to achieve a pregnancy. The use of donor sperm does not alter the donor status of the cycle.

In 2023, donation and recipient cycles accounted for 4.2% (4,769) of all treatment cycles in Australia and New Zealand. There were 1,089 initiated cycles where the intention was to donate oocytes or embryos to a recipient, consisting of 946 (86.9%) cycles in Australia and 143 (13.1%) in New Zealand.

This chapter does not include surrogacy arrangement cycles. Refer to Chapter 5.

## Oocyte/embryo donation cycles

Of the 1,089 initiated cycles where the intention was to donate oocytes or embryos to a recipient/intended parent(s), 49 (4.5%) cycles were cancelled before OPU, and a further 9 did not result in oocytes being retrieved or donated. Following OPU, 86.6% of initiated donation cycles resulted in fresh oocytes or embryos being donated and 8% resulted in cryopreserved oocytes or embryos being donated.

The average age of females donating oocytes/embryos was 33 years, with 44.5% of cycles in females aged 35 or older (Table 22). There were 556 (51.1%) donation cycles where the recipients were female-male intended parents followed by 272 (25%) donation cycles where the recipients were female-female intended parents (Table 23). There were 63 donation cycles where the recipients were single male or male-male intended parents, for use with a surrogate/gestational carrier, and 55 cycles where oocytes were donated but no intended parents had been assigned to receive the oocytes at the time of the donation cycle.

**Table 22: Number of oocyte/embryo donation cycles by donor age, Australia and New Zealand, 2023**

| Age group (years)[(a)] | Number of initiated cycles | Cycles with OPU performed (%) | Cycles with fresh oocyte(s)/embryo(s) donated[(b)] (%) | Cycles with cryopreserved oocyte(s)/embryo(s) donated (%) |
|---|---|---|---|---|
| < 30 | 216 | 95.4 | 88.0 | 7.4 |
| 30–34 | 388 | 95.6 | 85.6 | 9.3 |
| 35–39 | 381 | 96.1 | 87.1 | 7.6 |
| ≥ 40 | 104 | 93.3 | 85.6 | 5.8 |
| **Total** | **1,089** | **95.5** | **86.6** | **8.0** |

(a) Donor's age at the time of their OPU.
(b) Includes 22 cycles where oocytes/embryos were also cryopreserved.

**Table 23: Number of oocyte/embryo donation cycles to intended parents, Australia and New Zealand, 2023**

| Intended parents | Number of initiated cycles | Cycles with OPU performed (%) | Cycles with fresh oocyte(s)/embryo(s) donated (%)[(a)] | Cycles with cryopreserved oocyte(s)/embryo(s) donated (%) |
|---|---|---|---|---|
| Female-male couple | 556 | 94.4 | 92.1 | 1.3 |
| Single female | 143 | 98.6 | 93.7 | 4.2 |
| Female-female couple | 272 | 95.6 | 77.9 | 16.5 |
| Single male | 4 | 100.0 | 100.0 | 0.0 |
| Male-male couple | 59 | 94.9 | 91.5 | 3.4 |
| Unknown intended parents | 55 | 98.2 | 49.1 | 49.1 |
| **Total** | **1,089** | **95.5** | **86.6** | **8.0** |

(a) Includes 22 cycles where oocytes/embryos were also cryopreserved.

## Oocyte/embryo recipient cycles

There were 3,680 oocyte/embryo recipient cycles in 2023, comprising 3,370 (91.6%) cycles in Australia and 310 (8.4%) cycles in New Zealand. Of these, 67.7% (2,492) were oocyte recipient cycles and 32.3% (1,188) were embryo recipient cycles (Table 24). The average age of women undertaking an oocyte/embryo recipient cycle was 40 years.

## Progression of oocyte/embryo recipient cycles

Figure 6 shows the main stages of oocyte/embryo recipient cycles and the treatment outcomes. Of the 3,680 initiated oocyte/embryo recipient cycles undertaken in 2023, 91.2% resulted in an embryo transfer, 35.5% resulted in a clinical pregnancy and 27.9% in a live birth.

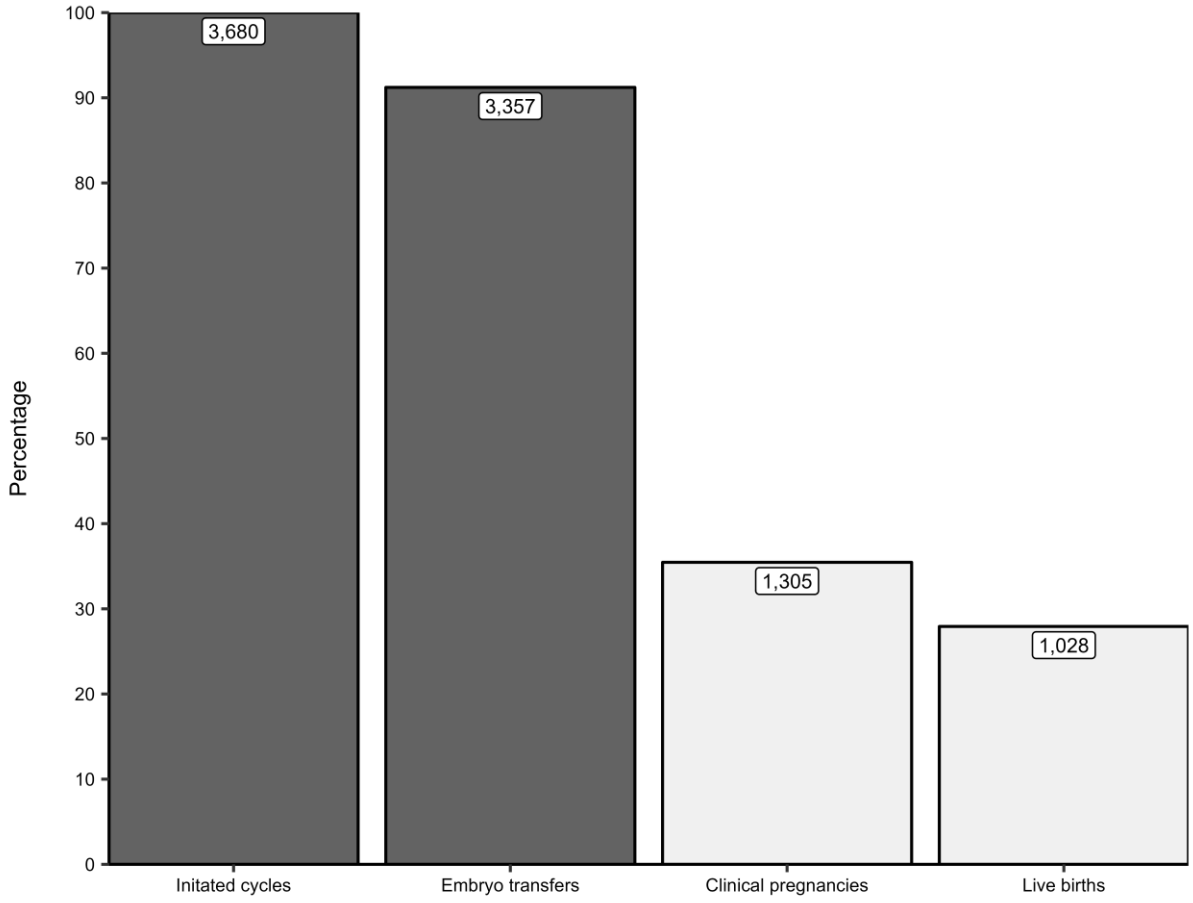



**Figure 6: Progression of fresh and thaw oocyte/embryo recipient cycles, Australia and New Zealand, 2023**

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

Of the 3,680 oocyte/embryo recipient cycles, 27.1% were fresh cycles and 72.9% were thaw cycles. The overall live birth rate per initiated cycle was 25.3% for oocyte recipient cycles and 33.4% for embryo recipient cycles (Table 24).

**Table 24: Outcomes of oocyte/embryo recipient cycles by treatment type, Australia and New Zealand, 2023**

| | Oocyte recipient | | Embryo recipient | | |
|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **Fresh** | **Thaw** | **Fresh** | **Thaw** | **All** |
| Initiated cycles | 966 | 1,526 | 32 | 1,156 | 3,680 |
| Embryo transfer cycles | 679 | 1,505 | 32 | 1,141 | 3,357 |
| Clinical pregnancies | 302 | 520 | 18 | 465 | 1,305 |
| Live births | 234 | 397 | 16 | 381 | 1,028 |
| *Live births per initiated cycle (%)* | *24.2* | *26.0* | *50.0* | *33.0* | *27.9* |
| *Live births per embryo transfer cycle (%)* | *34.5* | *26.4* | *50.0* | *33.4* | *30.6* |
| *Live births per clinical pregnancy (%)* | *77.5* | *76.3* | *88.9* | *81.9* | *78.8* |

## Clinical pregnancies and live births from oocyte/embryo recipient cycles by recipients' age

The clinical pregnancy and live birth rates of recipient cycles varied by recipients' age. The overall live birth rate per initiated recipient cycle was 27.9%, varying between 22.1% and 36.8% by recipients' age (Table 25).

**Table 25: Outcomes of oocyte/embryo recipient cycles by recipient age, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | | | |
|---|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **< 30** | **30–34** | **35–39** | **40–44** | **≥ 45** | **All** |
| Initiated cycles | 193 | 536 | 778 | 1,121 | 1,052 | 3,680 |
| Embryo transfer cycles | 177 | 483 | 712 | 1,009 | 976 | 3,357 |
| Clinical pregnancies | 85 | 225 | 305 | 385 | 305 | 1,305 |
| Live births | 71 | 188 | 250 | 286 | 233 | 1,028 |
| *Live births per initiated cycle (%)* | *36.8* | *35.1* | *32.1* | *25.5* | *22.1* | *27.9* |
| *Live births per embryo transfer cycle (%)* | *40.1* | *38.9* | *35.1* | *28.3* | *23.9* | *30.6* |
| *Live births per clinical pregnancy (%)* | *83.5* | *83.6* | *82.0* | *74.3* | *76.4* | *78.8* |

(a) Recipient age at start of a treatment cycle.

## Clinical pregnancies and live births from oocyte/embryo recipient cycles by donors' age

The clinical pregnancy and live birth rates of recipient cycles varied by donors' age. The highest live birth rate per initiated recipient cycle was in donors aged less than 30 years (30.2%). The live birth rate per initiated recipient cycle in which the donor's age was 40 years or more was 16.4% (Table 26).

**Table 26: Outcomes of oocyte/embryo recipient cycles by donor age, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | | |
|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **< 30** | **30–34** | **35–39** | **≥ 40** | **All[b]** |
| Initiated cycles | 1,360 | 1,176 | 929 | 177 | 3,680 |
| Embryo transfers | 1,257 | 1,080 | 844 | 144 | 3,357 |
| Clinical pregnancies | 509 | 421 | 323 | 42 | 1,305 |
| Live births | 411 | 332 | 246 | 29 | 1,028 |
| *Live births per initiated cycle (%)* | *30.2* | *28.2* | *26.5* | *16.4* | *27.9* |
| *Live births per embryo transfer cycle (%)* | *32.7* | *30.7* | *29.1* | *20.1* | *30.6* |
| *Live births per clinical pregnancy (%)* | *80.7* | *78.9* | *76.2* | *69.0* | *78.8* |

(a) Donor age at the time of their OPU.

(b) Includes 38 cycles where the donor's age was unknown.

## Clinical pregnancies and live births from oocyte/embryo recipient cycles by number of embryos transferred

Of the 3,357 oocyte/embryo recipient cycles where embryos were transferred, 95.9% were SET, 4.1% were DET and there were no cycles where three or more embryos were transferred.

Overall, the live birth rate per oocyte/embryo recipient cycle where embryos were transferred was 26.6% in DET cycles compared with 30.8% in SET cycles (Table 27).

Caution should be taken when comparing live birth rates following SET and DET cycles because patient characteristics and prognoses are different between these groups.

**Table 27: Outcomes of oocyte/embryo recipient embryo transfer cycles by stage of embryo development and number of embryos transferred, Australia and New Zealand, 2023**

| | Cleavage | | Blastocyst | | All | |
|---|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **SET[a]** | **DET[b]** | **SET[a]** | **DET[b]** | **SET[a]** | **DET[b]** |
| Embryo transfer cycles | 309 | 44 | 2,909 | 95 | 3,218 | 139 |
| Clinical pregnancies | 82 | 10 | 1,173 | 40 | 1,255 | 50 |
| Live births | 64 | 6 | 927 | 31 | 991 | 37 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *26.5* | *22.7* | *40.3* | *42.1* | *39.0* | *36.0* |
| *Live births per embryo transfer cycle (%)* | *20.7* | *13.6* | *31.9* | *32.6* | *30.8* | *26.6* |

(a) SET: single embryo transfer.
(b) DET: double embryo transfer.

## Clinical pregnancies and live births from oocyte/embryo recipient cycles by stage of embryo development and embryo freezing methods

The majority (98.7%) of oocyte/embryo recipient thaw cycles where a blastocyst was transferred used vitrified embryos, compared with 91.6% of cycles where a cleavage-stage embryo was transferred. Overall, the live birth rate per embryo transfer was higher for the transfer of slow-frozen embryos (32.7%) compared to vitrified embryos (29.3%) (Table 28).

**Table 28: Outcomes of oocyte/embryo recipient thaw cycles by stage of embryo development and embryo freezing methods, Australia and New Zealand, 2023**

| | Stage of embryo development | | | | | |
|---|---|---|---|---|---|---|
| | Cleavage embryo | | Blastocyst | | All | |
| **Stage/outcome of treatment** | **Slow freezing** | **Vitrification** | **Slow freezing** | **Vitrification** | **Slow freezing** | **Vitrification** |
| Embryo transfer cycles | 20 | 217 | 32 | 2,377 | 52 | 2,594 |
| Clinical pregnancies | 7 | 48 | 12 | 918 | 19 | 966 |
| Live births | 6 | 35 | 11 | 726 | 17 | 761 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *35.0* | *22.1* | *37.5* | *38.6* | *36.5* | *37.2* |
| *Live births per embryo transfer cycle (%)* | *30.0* | *16.1* | *34.4* | *30.5* | *32.7* | *29.3* |

# 4 Pregnancy and birth outcomes following autologous and recipient embryo transfer cycles in 2023

## 4.1 Clinical pregnancies

### Clinical pregnancies overview

There were 64,646 autologous and recipient embryo transfer cycles undertaken in Australian and New Zealand ART Units, of which 24,677 (38.2%) resulted in a clinical pregnancy. Of these clinical pregnancies, 22,120 (89.6%) were reported from ART Units in Australia and 2,557 (10.4%) from New Zealand Units. Clinical pregnancies that resulted from other ART treatment cycles are described in Chapters 5 and 6.

Of the 24,677 clinical pregnancies, 80.5% resulted in a birth and 19.2% resulted in early pregnancy loss (less than 20 weeks gestation and less than 400 grams birthweight). The outcomes of 76 (0.3%) clinical pregnancies were not known because women could not be followed up or contacted by ART Units.

## Early pregnancy loss

There were 4,737 early pregnancy losses (less than 20 weeks gestation and less than 400 grams birthweight) following embryo transfers, representing 19.2% of clinical pregnancies (Table 29). There was a larger proportion of early pregnancy loss following double embryo transfer cycles (27.3%) than single embryo transfer cycles (18.9%).

**Table 29: Early pregnancy loss by pregnancy outcome and maternal age and number of embryos transferred, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | < 35 | | 35–39 | | ≥ 40 | | All | |
| **Pregnancy outcome** | **One embryo** | **Two embryos[b]** | **One embryo** | **Two embryos[b]** | **One embryo** | **Two embryos[b]** | **One embryo** | **Two embryos[b]** |
| | | | | | n | | | |
| Early pregnancy loss | 1,567 | 32 | 1,805 | 89 | 1,099 | 145 | 4,471 | 266 |
| *Miscarriage* | *1,414* | *30* | *1,644* | *79* | *997* | *132* | *4,055* | *241* |
| *Reduction or termination* | *56* | *2* | *82* | *5* | *60* | *9* | *198* | *16* |
| *Ectopic or heterotopic pregnancy* | *97* | *0* | *79* | *5* | *42* | *4* | *218* | *9* |
| Birth | 8,835 | 211 | 7,632 | 279 | 2,693 | 214 | 19,160 | 704 |
| Not stated | 33 | 2 | 28 | 1 | 10 | 2 | 71 | 5 |
| **Total pregnancies** | **10,435** | **245** | **9,465** | **369** | **3,802** | **361** | **23,702** | **975** |
| | | | | | % | | | |
| Early pregnancy loss | 15.0 | 13.1 | 19.1 | 24.1 | 28.9 | 40.2 | 18.9 | 27.3 |
| *Miscarriage* | *13.6* | *12.2* | *17.4* | *21.4* | *26.2* | *36.6* | *17.1* | *24.7* |
| *Reduction or termination* | *0.5* | *0.8* | *0.9* | *1.4* | *1.6* | *2.5* | *0.8* | *1.6* |
| *Ectopic or heterotopic pregnancy* | *0.9* | *0.0* | *0.8* | *1.4* | *1.1* | *1.1* | *0.9* | *0.9* |
| Birth | 84.7 | 86.1 | 80.6 | 75.6 | 70.8 | 59.3 | 80.8 | 72.2 |
| Not stated | 0.3 | 0.8 | 0.3 | 0.3 | 0.3 | 0.6 | 0.3 | 0.5 |
| **Total pregnancies** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

(a) Age at start of treatment cycle.

(b) Includes three or more embryos.

# 4.2 Births

There were 19,864 female patients who gave birth to at least one baby of 20 weeks or more gestation or at least 400 grams birthweight following embryo transfer cycles. Of these, 98.9% (19,637) gave birth to at least one liveborn baby (live birth). The proportion of term live births (≥ 37 weeks) among all births was higher for autologous cycles than for oocyte/embryo recipient cycles (Table 30). The overall proportion of term live births following autologous and recipient cycles was 88.9% which is slightly lower than the proportion of term live birth in Australia (91%) (AIHW 2025).

**Table 30: Births by birth outcome and treatment type, Australia and New Zealand, 2023**

| | Autologous | | | | Oocyte /embryo recipient | | All | |
|---|---|---|---|---|---|---|---|---|
| | Fresh | | Thaw | | | | | |
| **Birth outcome** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Live birth | 5,380 | 98.8 | 13,229 | 98.9 | 1,028 | 98.6 | 19,637 | 98.9 |
| *< 37 weeks* | *568* | *10.4* | *1,268* | *9.5* | *140* | *13.4* | *1,976* | *9.9* |
| *≥ 37 weeks* | *4,812* | *88.4* | *11,961* | *89.4* | *888* | *85.1* | *17,661* | *88.9* |
| *Gestational age unknown* | *0* | *0.0* | *0* | *0.0* | *0* | *0.0* | *0* | *0.0* |
| Stillbirth[(a)] | *48* | *0.9* | *114* | *0.9* | *12* | *1.2* | *174* | *0.9* |
| Not stated | 16 | 0.3 | 34 | 0.3 | 3 | 0.3 | 53 | 0.3 |
| **Total** | **5,444** | **100.0** | **13,377** | **100.0** | **1,043** | **100.0** | **19,864** | **100.0** |

(a) Stillbirth is reported by patients to ART Unit staff. These data are not official vital statistics.

## Births by gestation and maternal age and number of embryos transferred

Of the 19,864 births in 2023, 2.2% were multiple births (Table 31), a lower proportion than in 2022 (2.7%) (Newman et al. 2024). By comparison, the proportion of multiple births in Australia from all conceptions in 2023 was 1.5% (AIHW 2025).

Twin births accounted for 2.2% of births following embryo transfer cycles in 2023. Of the 434 twin births, 35.3% resulted from the transfer of two embryos and 64.7% from the transfer of one embryo. Of births following DET, the proportion of multiple births was higher for women aged under 35 (32%) compared with females aged 35–39 (22.9%) and females aged 40 or older (14.2%) (Table 31).

The average age of female patients at the time of birth who conceived using ART was 36 years. This is five years older than the average age (31.3 years) of all women who gave birth in Australia in 2023 (AIHW 2025).

**Table 31: Births by gestation and maternal age and number of embryos transferred, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | < 35 | | 35–39 | | ≥ 40 | | All | | |
| Gestation | One embryo | Two embryos[b] | One embryo | Two embryos[b] | One embryo | Two embryos[b] | One embryo | Two embryos[b] | Total |
| | | | | | n | | | | |
| Singleton | 7,448 | 121 | 7,926 | 205 | 3,502 | 223 | 18,876 | 549 | 19,425 |
| Multiple | 119 | 57 | 115 | 61 | 50 | 37 | 284 | 155 | 439 |
| *Twin* | *118* | *56* | *113* | *60* | *50* | *37* | *281* | *153* | *434* |
| *Higher order multiple* | *1* | *1* | *2* | *1* | *0* | *0* | *3* | *2* | *5* |
| **Total** | **7,567** | **178** | **8,041** | **266** | **3,552** | **260** | **19,160** | **704** | **19,864** |
| | | | | | % | | | | |
| Singleton | *98.4* | *68.0* | *98.6* | *77.1* | *98.6* | *85.8* | *98.5* | *78.0* | *97.8* |
| Multiple | *1.6* | *32.0* | *1.4* | *22.9* | *1.4* | *14.2* | *1.5* | *22.0* | *2.2* |
| *Twin* | *1.6* | *31.5* | *1.4* | *22.6* | *1.4* | *14.2* | *1.5* | *21.7* | *2.2* |
| *Higher order multiple* | *0.0* | *0.6* | *0.0* | *0.4* | *0.0* | *0.0* | *0.0* | *0.3* | *0.0* |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

(a) Age at time of birth.

(b) Includes three or more embryos.

## Caesarean section

More than half (57.4%) of births following embryo transfer cycles were by caesarean section (Table 32). The high rate of caesarean section following ART treatment may be related to several factors, including that on average, female patients receiving ART treatment were five years older than women who gave birth in Australia in 2023 (AIHW 2025) and that there were more multiple births following ART treatment.

The caesarean section rate increased with advancing female age at birth: 46% of females aged less than 30 had a caesarean section compared with 83.4% of females aged 45 or older (Table 32).

The caesarean section rate varied by plurality, with 56.8% for singleton births and 84.5% for multiple births (twins and triplets). The caesarean section rate for women having a baby in Australia in 2023 was 40.6% (AIHW 2025).

**Table 32: Births by method of birth and maternal age, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | | | |
|---|---|---|---|---|---|---|
| **Method of birth** | **< 30** | **30–34** | **35–39** | **40–44** | **≥ 45** | **Total** |
| | | | **n** | | | |
| Caesarean section | 705 | 3,169 | 4,884 | 2,283 | 367 | 11,408 |
| Not stated | 21 | 70 | 90 | 33 | 3 | 217 |
| Other | 806 | 2,974 | 3,333 | 1,056 | 70 | 8,239 |
| **Total** | **1,532** | **6,213** | **8,307** | **3,372** | **440** | **19,864** |
| | | | **%** | | | |
| Caesarean section | 46.0 | 51.0 | 58.8 | 67.7 | 83.4 | 57.4 |
| Not stated | 1.4 | 1.1 | 1.1 | 1.0 | 0.7 | 1.1 |
| Other | 52.6 | 47.9 | 40.1 | 31.3 | 15.9 | 41.5 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

(a) Age at time of birth.

## 4.3 Perinatal outcomes of babies

The babies described in this section were those born at 20 weeks or more gestational age or at least 400 grams birthweight following autologous and recipient embryo transfer cycles. The outcomes of babies born from other ART cycles are described in Chapter 5.

There were 20,309 babies born to females who had autologous and recipient embryo transfer cycles. Of these, 89.9% (18,253) were reported from ART Units in Australia and 10.1% (2,056) from ART Units in New Zealand. Of the 20,309 babies, 95.7% were singletons, 4.3% were twins and < 1% were triplets. There were 20,068 liveborn babies. The birth status was not reported for 53 (0.3%) babies.

### Sex distribution in liveborn babies

There were 10,297 (51.3%) liveborn male babies, 9,666 (48.2%) liveborn female babies and 105 (0.5%) liveborn babies where sex was not stated. For the 19,963 liveborn babies where the baby's sex was stated, the sex ratio was 106.5 male babies for every 100 female babies. The sex ratio for all Australian liveborn babies born in 2023 was 105.3 male liveborn babies per 100 female liveborn babies (AIHW 2025).

Liveborn babies following cleavage-stage embryo transfers had a sex ratio of 114.9 male babies for every 100 female babies. Liveborn babies following blastocyst transfers had a sex ratio of 106.3 male babies for every 100 female babies.

## Gestational age of babies

The overall proportions of preterm (less than 37 weeks gestation) singletons (9.3%) and twins (72.4%) born to women who had embryo transfer cycles in 2023 were higher than the overall proportions of preterm singletons and twins born in Australia in 2023 (6.7% and 62.4% respectively) (AIHW 2025).

The median gestational age of babies born following autologous and recipient embryo transfer cycles was 38 weeks (Table 33). This is lower than the median gestational age of 39 weeks for all babies born in Australia in 2023 (AIHW 2025).

Following autologous and recipient embryo transfer cycles, there were 12.1% of babies born preterm, which is higher than the proportion of preterm babies born in Australia in 2023 (8.4%) (AIHW 2025).

**Table 33: Babies by gestational age and plurality, Australia and New Zealand, 2023**

| Gestational age (weeks) | Singletons | | Twins | | Higher order multiples | | Total | |
|---|---|---|---|---|---|---|---|---|
| *Median* | *38* | | *35* | | *30* | | *38* | |
| | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| *≤ 27* | *233* | *1.2* | *42* | *4.8* | *3* | *18.8* | *278* | *1.4* |
| *28–31* | *189* | *1.0* | *56* | *6.5* | *7* | *43.8* | *252* | *1.2* |
| *32–36* | *1,392* | *7.2* | *530* | *61.1* | *6* | *37.5* | *1,928* | *9.5* |
| ≤ 36 | 1,814 | 9.3 | 628 | 72.4 | 16 | 100.0 | 2,458 | 12.1 |
| ≥ 37 | 17,611 | 90.7 | 240 | 27.6 | 0 | 0.0 | 17,851 | 87.9 |
| Not stated | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Total** | **19,425** | **100.0** | **868** | **100.0** | **16** | **100.0** | **20,309** | **100.0** |

## Birthweight of liveborn babies

The average birthweight for liveborn babies to women who had autologous and recipient embryo transfer cycles was 3,262 grams. This is comparable to the average birthweight of all liveborn babies (3,333 grams) in Australia in 2023 (AIHW 2025). Less than one in ten (8.8%) of the 20,068 liveborn babies were low birthweight (less than 2,500 grams) (Table 34).

The average birthweight was 3,307 grams and 2,267 grams for liveborn ART singletons and twins respectively. Low birthweight was reported for 7.9% of liveborn singletons following fresh cycles and 5.9% of liveborn singletons following thaw cycles. For ART twins, 60.7% were reported as low birthweight in comparison with 52.6% of twin births in Australia in 2023 (AIHW 2025).

**Table 34: Liveborn babies by birthweight group and plurality, Australia and New Zealand, 2023**

| | Fresh | | | Thaw | | |
|---|---|---|---|---|---|---|
| **Birthweight (grams)** | **Singletons** | **Twins** | **Higher order multiples** | **Singletons** | **Twins** | **Higher order multiples** |
| | | | **n** | | | |
| < 1,500 | 72 | 28 | 0 | 161 | 44 | 4 |
| 1,500–2,499 | 363 | 133 | 0 | 644 | 311 | 9 |
| 2,500–3,499 | 3,218 | 86 | 0 | 7,242 | 220 | 0 |
| 3,500–4,500 | 1,701 | 0 | 0 | 5,244 | 5 | 0 |
| > 4,500 | 37 | 0 | 0 | 181 | 0 | 0 |
| Not stated | 109 | 11 | 0 | 233 | 12 | 0 |
| **Total** | **5,500** | **258** | **0** | **13,705** | **592** | **13** |
| | | | **%** | | | |
| < 1,500 | 1.3 | 10.9 | 0.0 | 1.2 | 7.4 | 30.8 |
| 1,500–2,499 | 6.6 | 51.6 | 0.0 | 4.7 | 52.5 | 69.2 |
| 2,500–3,499 | 58.5 | 33.3 | 0.0 | 52.8 | 37.2 | 0.0 |
| 3,500–4,500 | 30.9 | 0.0 | 0.0 | 38.3 | 0.8 | 0.0 |
| > 4,500 | 0.7 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 |
| Not stated | 2.0 | 4.3 | 0.0 | 1.7 | 2.0 | 0.0 |
| **Total** | **100.0** | **100.0** | **0.0** | **100.0** | **100.0** | **100.0** |

## Perinatal mortality

Perinatal mortality is a summary measure of stillbirths and neonatal deaths. A neonatal death is defined as the death of liveborn infants within 28 days of birth.

There were 242 reported perinatal deaths, including 188 stillbirths and 54 neonatal deaths. The perinatal mortality rate in 2023 was 11.9 deaths per 1,000 births (Table 35), which was higher than the rate of 11 per 1,000 births for all births in Australia in 2023 (AIHW 2025). Singletons had a markedly lower perinatal mortality rate (11.1 deaths per 1,000 births) compared with multiples (30.5 deaths per 1,000 births) (Table 35).

These data should be interpreted with caution because of the small numbers and potential variability in case reporting, which is compounded by the self-reported nature of ART birth outcome data. In 2023, information relating to birth outcomes was not stated for 53 births.

**Table 35: Perinatal mortality of babies by type of death and plurality, Australia and New Zealand, 2023**

| | | | Stillbirths[a] | | Neonatal deaths[b] | | Perinatal deaths[a][b] | |
|---|---|---|---|---|---|---|---|---|
| Plurality | All births | Live births | **n** | **Rate[c][e]** | **n** | **Rate[d][f]** | **n** | **Rate[c][g]** |
| Singletons | 19,425 | 19,205 | 167 | 8.6 | 48 | 2.5 | 215 | 11.1 |
| Multiples | 884 | 863 | 21 | 23.8 | 6 | 7.0 | 27 | 30.5 |
| **Total** | **20,309** | **20,068** | **188** | **9.3** | **54** | **2.7** | **242** | **11.9** |

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

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

(c) Stillbirth and perinatal mortality rates were calculated using all births (live births and stillbirths) as the denominator.

(d) Neonatal death rate was calculated using live births as the denominator.

(e) Stillbirths per 1,000 births.

(f) Neonatal deaths per 1,000 live births.

(g) Perinatal deaths per 1,000 births.

*Note*: The birth status was not adequately reported for 53 births.

# 5 Other cycle types, procedures and treatment complications in 2023

## 5.1 Surrogacy arrangements

A surrogacy arrangement is an arrangement between the intended parent(s) and a female patient, known as the ‘gestational carrier’ or ‘surrogate’. The surrogate/gestational carrier agrees to carry a child for another person or couple, known as the ‘intended parent(s)’, with the intention that the child will be raised by the intended parent(s). The oocytes and/or sperm used to create the embryo(s) can be either from the intended parents or from a donor(s).

There were 405 surrogacy arrangement cycles in 2023, including 307 surrogate/gestational carrier cycles and 98 commissioning cycles. Commissioning cycles include a variety of cycle types involved in the provision of oocytes or embryos by either the intended parents or donors. Among the 307 surrogate/gestational carrier cycles, all but one cycle resulted in an embryo transfer, of which all were single embryo transfers. Of the embryo transfer cycles, 131 (42.8%) resulted in a clinical pregnancy and 104 (34%) resulted in a live birth (Table 36).

**Table 36: Outcomes of surrogate/gestational carrier cycles by number of embryos transferred, Australia and New Zealand, 2023**

| Outcome | SET | DET | Total |
|---|---|---|---|
| Embryo transfer cycles | 306 | 0 | 306 |
| Clinical pregnancies | 131 | .. | 131 |
| Live births | 104 | .. | 104 |
| *Singletons* | 102 | .. | 102 |
| *Multiples* | 2 | .. | 2 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *42.8* | .. | *42.8* |
| *Live births per embryo transfer cycle (%)* | *34.0* | .. | *34.0* |
| *Live births per clinical pregnancy (%)* | *79.4* | .. | *79.4* |

# 5.2 Preimplantation genetic testing

Preimplantation genetic testing (PGT) is a procedure where DNA from oocytes or embryos is tested for chromosomal disorders or genetic diseases before embryo transfer. This term includes PGT for aneuploidies (PGT-A), PGT for monogenic/single gene defects (PGT-M) and PGT for chromosomal structural rearrangements (PGT-SR).

There were 9,865 autologous, recipient, surrogacy and lab-only cycles where PGT was performed in 2023 (Table 37), representing 8.8% of these cycles (Table 1). Of the 8,749 fresh cycles where PGT was performed in 2023, 83.9% (7,338) were freeze-all cycles, 15.4% (1,351) were fresh embryo transfer cycles where the embryo transferred did not undergo PGT (not all embryos were tested), 0.7% (57) of the cycles did not proceed to embryo transfer, and <0.1% (3) were fresh embryo transfer cycles where the embryo transferred underwent PGT in the same cycle.

Of the 331 PGT cycles involving frozen embryos, 310 had fresh and/or frozen embryos tested in the same cycle. Of the 331 PGT cycles, 37.2% (123) did not result in an embryo transfer, 2.1% (7) had embryos thawed, tested and re-frozen, one cycle (0.3%) had embryos thawed, re-tested, with no embryo transfer or refreezing, and 60.4% (200) resulted in an embryo transfer.

**Table 37: Number of autologous, recipient, surrogacy and lab-only cycles with PGT performed in that cycle, by main reason for PGT, Australia and New Zealand, 2023**

| Indication | Fresh embryo/s | Frozen embryo/s | Lab-only cycles | Total |
|---|---|---|---|---|
| Aneuploidy | 7,027 | 261 | 631 | 7,919 |
| Single gene variation | 1,111 | 52 | 91 | 1,254 |
| Chromosomal structural arrangements | 530 | 17 | 42 | 589 |
| Other | 81 | 1 | 21 | 103 |
| **Total** | **8,749** | **331** | **785** | **9,865** |

Almost one third of PGT cycles were performed in women aged 40 years or more (29.3%) (Table 38). It is important to note that embryos thawed in a thaw or lab-only cycle were created in an earlier initiated fresh cycle; therefore, a woman's age at the start of a thaw or lab-only cycle is older than her age when the embryo was created.

**Table 38: Number of autologous, recipient, surrogacy and lab-only cycles with PGT performed in that cycle, by female intended parent age, Australia and New Zealand, 2023**

| Female age group (years)[(a)] | Fresh embryo/s | Frozen embryo/s | Lab-only cycles | Total |
|---|---|---|---|---|
| < 30 | 413 | 12 | 48 | 473 |
| 30–34 | 1,918 | 62 | 147 | 2,127 |
| 35–39 | 3,912 | 161 | 282 | 4,355 |
| 40–44 | 2,384 | 91 | 235 | 2,710 |
| ≥ 45 | 122 | 5 | 47 | 174 |
| **Total** | **8,749** | **331** | **759** | **9,839** |

(a) Female age at start of cycle. Table 38 excludes cycles where there was no female intended parent.

There were 8,268 autologous, recipient and gestational carrier cycles initiated in 2023 where PGT embryos were transferred. Of these, 50.4% resulted in a clinical pregnancy and 43.6% resulted in a live birth (Table 39). The PGT procedure could have occurred in 2023 or previous years for thaw cycles.

**Table 39: Stage/outcome of autologous, recipient and surrogacy cycles with PGT performed, by treatment type, Australia and New Zealand, 2023**

| Stage/Outcome of PGT-tested embryos | Fresh | Frozen | Total |
|---|---|---|---|
| Embryo transfers | 3 | 8,265 | 8,268 |
| Clinical pregnancies | 2 | 4,163 | 4,165 |
| Live births | 2 | 3,599 | 3,601 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *66.7* | *50.4* | *50.4* |
| *Live births per embryo transfer cycle (%)* | *66.7* | *43.5* | *43.6* |

Over two thirds (69.3%) of the embryo transfer cycles where PGT embryos were transferred were undertaken in women aged 35–44 years. The highest live birth rate per embryo transfer cycle was in women aged 30–34 years (47.4%) followed by women aged less than 30 years (44%) (Table 40). It is important to note that embryos thawed in a thaw cycle were created in an earlier initiated fresh cycle; therefore, a woman's age at the start of a thaw cycle may be older than her age when the embryo was created.

**Table 40: Stage/outcome of autologous, recipient and surrogacy cycles with PGT performed, by female patient age, Australia and New Zealand, 2023**

| | Age group (in years)[(a)] | | | | | |
|---|---|---|---|---|---|---|
| Stage/Outcome of PGT-tested embryos | < 30 | 30–34 | 35–39 | 40–44 | ≥ 45 | Total |
| Embryo transfers | 432 | 1,953 | 3,817 | 1,910 | 156 | 8,268 |
| Clinical pregnancies | 217 | 1,065 | 1,910 | 921 | 52 | 4,165 |
| Live births | 190 | 926 | 1,656 | 784 | 45 | 3,601 |
| *Clinical pregnancies per embryo transfer cycle (%)* | *50.2* | *54.5* | *50.0* | *48.2* | *33.3* | *50.4* |
| *Live births per embryo transfer cycle (%)* | *44.0* | *47.4* | *43.4* | *41.0* | *28.8* | *43.6* |

(a) Age at start of treatment cycle.

## 5.3 Assisted hatching

Assisted hatching is an ART procedure where the outer layer of the embryo, the zona pellucida, is either thinned or perforated in the laboratory to aid ‘hatching’ of the embryo.

There were 6,868 assisted hatching cycles reported in 2023 that did not occur in an autologous or recipient cycle where PGT was performed in 2023. Of these, 2,623 (38.2%) were fresh cycles and 4,245 (61.8%) were thaw cycles. Embryos were transferred in 5,588 (81.4%) of assisted hatching cycles, resulting in 2,199 (32%) clinical pregnancies and 1,754 (25.5%) live births. There were 1,784 babies born following assisted hatching cycles, including 1,725 singletons, 28 twins, and 1 triplet.

# 6 Donor sperm insemination cycles in 2023

Donor sperm insemination (DI) covers a range of techniques of placing sperm into the female genital tract using donated sperm from a male who is not an intended parent. The information presented in this section only describes DI cycles undertaken in ART Units in Australia and New Zealand and does not include DI undertaken outside of this setting.

Information on ART cycles using donated sperm are presented in Supplementary Tables which accompany this report.

## Number and outcomes of DI cycles

In 2023, there were 2,862 DI cycles reported. Of all DI cycles, 16.2% resulted in a clinical pregnancy and 13.2% resulted in a live birth (Table 41). The multiple birth rate from births following DI cycles was 3.9%.

The average age of women who had a DI cycle was 35 years. The clinical pregnancy and live birth rates decreased with age (Table 41).

**Table 41: Outcomes of DI cycles by female patient age, Australia and New Zealand, 2023**

| | Age group (years)[a] | | | | |
|---|---|---|---|---|---|
| **Stage/outcome of treatment** | **< 30** | **30–34** | **35–39** | **≥ 40** | **Total** |
| DI cycles | 425 | 958 | 1,093 | 386 | 2,862 |
| Clinical pregnancies | 86 | 176 | 174 | 29 | 465 |
| Live births | 79 | 144 | 138 | 17 | 378 |
| *Clinical pregnancies per DI cycle (%)* | *20.2* | *18.4* | *15.9* | *7.5* | *16.2* |
| *Live births per DI cycle (%)* | *18.6* | *15.0* | *12.6* | *4.4* | *13.2* |
| *Live births per clinical pregnancy (%)* | *91.9* | *81.8* | *79.3* | *58.6* | *81.3* |

(a) Age at start of a treatment cycle.

## Clinical pregnancies following DI cycles

Of the 465 clinical pregnancies following DI cycles, 82.1% resulted in a birth and 17.9% ended in early pregnancy loss (including 15.7% miscarriages, 1.1% ectopic/heterotopic pregnancies, and 1.1% reductions/termination). Of the 382 births, 367 (96.1%) were singleton births, 14 (3.7%) were twin births, and 1 was a triplet birth (0.3%).

## Perinatal outcomes of babies following DI cycles

There were 398 babies born to females who had DI treatment. Of these, 390 were liveborn, 6 were stillborn and 2 were neonatal deaths. Of the liveborn babies, 38 (9.7%) were born preterm (less than 37 weeks gestation). The mean birthweight of liveborn babies following DI treatment was 3,311 grams. This was higher than the mean birthweight of liveborn babies following autologous and recipient embryo transfer cycles (3,262 grams). Thirty-one liveborn babies (8%) were born with low birthweight (less than 2,500 grams).

# 7 Trends in ART treatment and outcomes: 2019–2023

This section includes autologous cycles, donation/recipient cycles, surrogacy cycles and GIFT cycles undertaken in Australia and New Zealand from 2019 to 2023. It does not include DI cycles or lab-only cycles.

## ART treatment and outcomes

In 2023, there were 110,955 initiated ART cycles in Australia and New Zealand. This represents a 3.4% increase from 2022 (Table 42 and Table 43).

The proportion of initiated fresh cycles reaching embryo transfer decreased from 45.1% in 2019 to 32.5% in 2023 partly due to changes in clinical practice, including an increase in the proportion of freeze-all cycles. Since 2019, there has been an average 17.1% yearly increase in the number of freeze-all cycles (Table 42).

Between 2019 and 2023, the live birth rate per initiated fresh non-freeze-all cycle has decreased from 16% in 2019 to 14.3% in 2023 (Table 42). The live birth rate per embryo transfer cycle has been stable from 25.5% in 2019 to 25.7% in 2023.

**Table 42: Number of fresh cycles by stage/outcome of treatment, Australia and New Zealand, 2019–2023**

| Stage/outcome of treatment | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| Initiated cycles[(a)] | 53,736 | 56,691 | 67,632 | 65,113 | 67,395 |
| Cycles with OPU[(b)] | 47,410 | 50,694 | 59,629 | 56,752 | 59,820 |
| *Oocyte freeze-all cycles*[(c)] | *3,395* | *4,179* | *6,460* | *7,124* | 9,269 |
| *Embryo freeze-all cycles*[(c)] | *11,684* | *13,760* | *16,249* | *16,975* | 18,841 |
| Embryo transfers | 24,206 | 24,154 | 26,771 | 23,001 | 21,877 |
| Clinical pregnancies | 7,934 | 7,906 | 8,772 | 7,606 | 7,302 |
| Live births | 6,177 | 6,138 | 6,833 | 5,968 | 5,630 |
| *Clinical pregnancy per embryo transfer (%)* | *32.8* | *32.7* | *32.8* | *33.1* | *33.4* |
| *Clinical pregnancies per initiated cycle (%)* | *14.8* | *13.9* | *13.0* | *11.7* | *10.8* |
| *Live births per embryo transfer (%)* | *25.5* | *25.4* | *25.5* | *25.9* | *25.7* |
| *Live births per initiated cycle (%)* | *11.5* | *10.8* | *10.1* | *9.2* | *8.4* |
| *Live births per initiated non-freeze-all cycle (%)*[(d)] | *16.0* | *15.8* | *15.2* | *14.6* | *14.3* |

(a) Included autologous cycles, oocyte donation cycles, oocyte/embryo recipient cycles, GIFT cycles and surrogacy cycles.
(b) Cycles with OPU include cycles where no oocytes were collected during the procedure.
(c) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved for potential future use.
(d) Live births per initiated non-freeze-all *cycle* is calculated using live births as the numerator and initiated cycles minus freeze-all cycles as the denominator.

There were 43,560 initiated thaw cycles undertaken in 2023, an increase of 3.2% since 2022 (Table 43). The live birth rate per initiated thaw cycle increased from 28.8% in 2019 to 32.4% in 2023 (Table 43).

**Table 43: Number of thaw cycles by stage/outcome of treatment, Australia and New Zealand, 2019–2023**

| Stage/outcome of treatment | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| Initiated cycles[(a)] | 35,193 | 37,649 | 42,208 | 42,203 | 43,560 |
| Embryo transfers | 34,116 | 36,964 | 41,397 | 41,617 | 43,080 |
| Clinical pregnancies | 12,734 | 14,248 | 16,256 | 16,709 | 17,506 |
| Live births | 10,133 | 11,532 | 13,009 | 13,346 | 14,111 |
| *Clinical pregnancy per embryo transfer (%)* | *37.3* | *38.5* | *39.3* | *40.1* | *40.6* |
| *Clinical pregnancies per initiated cycle (%)* | *36.2* | *37.8* | *38.5* | *39.6* | *40.2* |
| *Live births per embryo transfer (%)* | *29.7* | *31.2* | *31.4* | *32.1* | *32.8* |
| *Live births per initiated cycle (%)* | *28.8* | *30.6* | *30.8* | *31.6* | *32.4* |

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

The clinical pregnancy and live birth rates per OPU provide an estimate of the chances of success following a single OPU cycle. For this measure, all OPUs and fresh and thaw embryo transfers were performed in 2023 and embryo transfers were not linked to the OPU from which they originated. The calculation is the sum of all clinical pregnancies or live births from fresh and thaw cycles performed in 2023 as the numerator and the number of OPUs performed in 2023 as the denominator.

Between 2019 and 2023, the live birth rate from fresh and thaw cycles per OPU cycle has varied between 33% and 35% (Table 44).

**Table 44: Outcomes of fresh and thaw cycles following OPU, Australia and New Zealand, 2019–2023**

| Outcome of treatment | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| Cycles with OPU[(a)] | 47,410 | 50,694 | 56,629 | 56,752 | 59,820 |
| Clinical pregnancies | 20,668 | 22,154 | 25,028 | 24,315 | 24,808 |
| Live births | 16,310 | 17,670 | 19,842 | 19,314 | 19,741 |
| *Clinical pregnancies from fresh and thaw cycles per OPU cycles[(b)]* | *43.6* | *43.7* | *44.2* | *42.8* | *41.5* |
| *Live births from fresh and thaw cycles per OPU cycle[(c)]* | *34.3* | *34.9* | *35.0* | *34.0* | *33.0* |

(a) Cycles with OPU include cycles where no oocytes were collected during the procedure.
(b) Clinical pregnancies from fresh and thaw cycles per OPU cycle is calculated using clinical pregnancies from fresh and thaw cycles as the numerator and cycles with OPU as the denominator.
(c) Live births from fresh and thaw cycles per OPU cycle is calculated using live births from fresh and thaw cycles as the numerator and cycles with OPU as the denominator.

## Multiple gestation births

The proportion of multiple births decreased from 2.9% in 2019 to 2.2% in 2023 (Table 45). This low rate is primarily the result of the single embryo transfers (Table 49).

**Table 45: Number of births following ART treatment by gestation, Australia and New Zealand, 2019–2023**

| Gestation | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Singleton | 15,962 | 97.1 | 17,375 | 97.2 | 19,467 | 97.0 | 18,982 | 97.3 | 19,529 | 97.8 |
| Multiple | 480 | 2.9 | 502 | 2.8 | 605 | 3.0 | 534 | 2.7 | 441 | 2.2 |
| *Twin* | *475* | *2.9* | *493* | *2.8* | *592* | *2.9* | *526* | *2.7* | *436* | *2.2* |
| *Higher order multiple* | *5* | *0.0* | *9* | *0.1* | *13* | *0.1* | *8* | *0.0* | *5* | *0.0* |
| **Total[(a)]** | **16,442** | **100.0** | **17,877** | **100.0** | **20,072** | **100.0** | **19,516** | **100.0** | **19,970** | **100.0** |

(a) Includes cycles in which gestation was unknown.

## Women's age for autologous cycles

Women aged 35 to 39 were the largest age group undertaking autologous cycles between 2019 and 2023. The average age of women having autologous cycles remained stable over the period, at 36 years. The proportion of autologous cycles in women aged 40 and older ranged between 23% and 24.3% between 2019 and 2023 (Table 46).

**Table 46: Number of fresh and thaw autologous cycles by women's age group, Australia and New Zealand, 2019–2023**

| Age group (years)[(a)] | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Mean* | *36* | | *36* | | *36* | | *36* | | *36* | |
| | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| < 30 | 8,334 | 9.9 | 8,899 | 9.8 | 9,337 | 8.9 | 8,926 | 8.7 | 9,091 | 8.6 |
| 30–34 | 23,961 | 28.5 | 25,820 | 28.5 | 29,514 | 28.1 | 28,652 | 28.1 | 29,760 | 28.1 |
| 35–39 | 32,038 | 38.1 | 34,971 | 38.6 | 40,583 | 38.7 | 39,777 | 39.0 | 41,489 | 39.2 |
| 40–44 | 18,173 | 21.6 | 19,238 | 21.3 | 23,409 | 22.3 | 22,555 | 22.1 | 23,300 | 22.0 |
| ≥ 45 | 1,575 | 1.9 | 1,601 | 1.8 | 2,074 | 2.0 | 2,103 | 2.1 | 2,215 | 2.1 |
| **Total** | **84,081** | **100.0** | **90,529** | **100.0** | **104,917** | **100.0** | **102,013** | **100.0** | **105,855** | **100.0** |

(a) Age at start of treatment cycle.

## Types of ART treatment and stage of embryo development

The proportion of embryo transfer cycles that used embryos fertilised using ICSI has decreased from 58.2% in 2019 to 55.4% in 2023. The proportion of blastocyst transfer cycles increased from 88.3% in 2019 to 93.3% in 2023 (Table 47).

**Table 47: Number of embryo transfer cycles by treatment type, Australia and New Zealand, 2019–2023**

| Treatment type[a] and procedure | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| **Fertilisation procedure** | | | | | | | | | | |
| IVF | 24,405 | 41.8 | 26,815 | 43.9 | 30,249 | 44.4 | 28,497 | 44.1 | 28,960 | 44.6 |
| ICSI[b] | 33,917 | 58.2 | 34,299 | 56.1 | 37,919 | 55.6 | 36,116 | 55.9 | 35,992 | 55.4 |
| Not stated/GIFT | 0 | 0.0 | 4 | 0.0 | 0 | 0.0 | 5 | 0.0 | 5 | 0.0 |
| **Total** | **58,322** | **100.0** | **61,118** | **100.0** | **68,168** | **100.0** | **64,618** | **100.0** | **64,957** | **100.0** |
| **Stage of embryo development** | | | | | | | | | | |
| Cleavage stage | 6,833 | 11.7 | 6,495 | 10.6 | 5,803 | 8.5 | 4,971 | 7.7 | 4,324 | 6.7 |
| Blastocyst[c] | 51,489 | 88.3 | 54,619 | 89.4 | 62,365 | 91.5 | 59,642 | 92.3 | 60,628 | 93.3 |
| Not stated/GIFT | 0 | 0.0 | 4 | 0.0 | 0 | 0.0 | 5 | 0.0 | 5 | 0.0 |
| **Total** | **58,322** | **100.0** | **61,118** | **100.0** | **68,168** | **100.0** | **64,618** | **100.0** | **64,957** | **100.0** |

(a) Includes autologous cycles, oocyte/embryo recipient cycles, and surrogacy cycles.
(b) Includes cycles where both ICSI and IVF fertilised embryos were transferred.
(c) Includes cycles where both cleavage-stage embryos and blastocysts were transferred.

## Types of cryopreservation and stage of embryo development

The proportion of thaw embryo transfer cycles that used vitrified embryos increased for blastocysts between 2019 and 2023 (Table 48). In 2023, 98.1% of blastocyst transfers and 80.8% of cleavage-stage transfers used vitrified embryos.

**Table 48: Number of thaw embryo transfer cycles by cryopreservation method and stage of embryo development, Australia and New Zealand, 2019–2023**

| Treatment type and procedure | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| **Cleavage stage** | | | | | | | | | | |
| Slow frozen | 486 | 30.7 | 322 | 19.0 | 294 | 25.5 | 209 | 19.1 | 179 | 19.2 |
| Vitrification[(a)] | 1,095 | 69.3 | 1,370 | 81.0 | 859 | 74.5 | 884 | 80.7 | 752 | 80.8 |
| Not stated | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Total** | **1,581** | **100.0** | **1,692** | **100.0** | **1,153** | **100.0** | **1,093** | **100.0** | **931** | **100.0** |
| **Blastocyst** | | | | | | | | | | |
| Slow frozen | 1,478 | 4.5 | 1,265 | 3.6 | 1,121 | 2.8 | 885 | 2.2 | 806 | 1.9 |
| Vitrification[(a)] | 31,055 | 95.5 | 34,007 | 96.4 | 39,123 | 97.3 | 39,639 | 97.8 | 41,343 | 98.1 |
| Not stated | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Total** | **32,533** | **100.0** | **35,272** | **100.0** | **40,244** | **100.0** | **40,524** | **100.0** | **42,149** | **100.0** |

(a) Includes cycles were both vitrified and slow-frozen embryos were transferred.

## Number of embryos transferred per embryo transfer cycle

The proportion of SET cycles has increased from 91.9% of embryo transfer cycles in 2019 to 94.9% of embryo transfer cycles in 2023 (Table 49).

**Table 49: Percentage of embryo transfer cycles by number of embryos transferred, Australia and New Zealand, 2019–2023**

| Number of embryos transferred | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| One embryo | 91.9 | 93.0 | 93.6 | 94.2 | 94.9 |
| Two embryos | 8.0 | 6.9 | 6.4 | 5.7 | 5.1 |
| Three or more embryos | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 |

# 8 Women undertaking autologous treatment in 2023

This section presents the number of women who underwent autologous ART treatment in 2023. The number of cycles undertaken by a woman included both fresh and thaw cycles. For some women, if their fresh cycles were undertaken in previous years, only their thaw cycles were reported and presented.

## Women who undertook autologous treatment

There were 55,783 women who undertook 105,855 autologous fresh and/or thaw cycles in Australia and New Zealand in 2023. Of these women, 50,886 had treatment in Australia, 4,918 in New Zealand, including 21 having treatment in both Australia and New Zealand.

On average, 1.9 fresh and/or thaw cycles per woman were undertaken in 2023, with more cycles per woman in Australia (1.9 cycles per woman) than in New Zealand (1.7 cycles per woman). In Australia, more than half (51.1%) of the women had two or more autologous treatment cycles compared with 46.7% of women in New Zealand. In line with this, 10.4% of women in Australia had four or more cycles in 2023 compared with 4.9% of women in New Zealand (Table 50).

**Table 50: Women undertaking autologous fresh and/or thaw cycles by number of cycles, Australia and New Zealand, 2023**

| Number of cycles | Australia | | New Zealand | | All | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| One | 24,867 | 48.9 | 2,622 | 53.3 | 27,465 | 49.2 |
| Two | 14,151 | 27.8 | 1,502 | 30.5 | 15,651 | 28.1 |
| Three | 6,601 | 13.0 | 553 | 11.2 | 7,152 | 12.8 |
| Four or more | 5,267 | 10.4 | 241 | 4.9 | 5,515 | 9.9 |
| **Total** | **50,886** | **100.0** | **4,918** | **100.0** | **55,783** | **100.0** |

*Note*: Only women who undertook cycles in 2023 are included. Twenty-one women had treatment in both Australia and New Zealand.

## Women who undertook autologous fresh cycles

There were 65,283 fresh cycles undertaken by 43,563 women in Australia and New Zealand in 2023, an average of 1.5 fresh cycles per woman. One in four (25.4%) women aged less than 35 had two or more autologous fresh cycles compared to one in three (37.2%) women aged 35 or more. This partly reflects the higher success rate per initiated fresh autologous cycle among women aged less than 35, and the fact that women aged less than 35 tend to have more cryopreserved embryos available for subsequent thaw cycles. About one percent of women aged under 30 had four or more cycles. This proportion increased to 2% for women aged 30 to 34 years, 3.6% for women aged 35 to 39 years and 8.6% for women aged 40 to 44 years (Table 51).

**Table 51: Women undertaking autologous fresh cycles by number of cycles, Australia and New Zealand, 2023**

| | Age group (years)[(a)] | | | | | |
|---|---|---|---|---|---|---|
| **Number of cycles** | **< 30** | **30–34** | **35–39** | **40–44** | **≥ 45** | **All** |
| | | | **n** | | | |
| One | 3,265 | 9,627 | 11,504 | 4,622 | 392 | 29,410 |
| Two | 768 | 2,488 | 3,799 | 2,131 | 202 | 9,388 |
| Three | 171 | 642 | 1,145 | 998 | 68 | 3,024 |
| Four or more | 58 | 259 | 620 | 731 | 73 | 1,741 |
| **Total** | **4,262** | **13,016** | **17,068** | **8,482** | **735** | **43,563** |
| | | | **%** | | | |
| One | 76.6 | 74.0 | 67.4 | 54.5 | 53.3 | 67.5 |
| Two | 18.0 | 19.1 | 22.3 | 25.1 | 27.5 | 21.6 |
| Three | 4.0 | 4.9 | 6.7 | 11.8 | 9.3 | 6.9 |
| Four or more | 1.4 | 2.0 | 3.6 | 8.6 | 9.9 | 4.0 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

(a) Age at start of first autologous fresh cycle in 2023.

## Women who undertook autologous thaw cycles

There were 40,572 thaw cycles undertaken by 28,043 women in Australia and New Zealand in 2023, an average of 1.4 thaw cycles per woman. Thirty-four percent of women aged under 30 had two or more thaw cycles compared with 18% of women aged 45 or older (Table 52).

Advancing women's age was associated with a decrease in the proportion of women having two or more thaw cycles, while advancing women's age saw an increase in the proportion of women having two or more fresh cycles (Table 51 and Table 52).

**Table 52: Women undertaking autologous thaw cycles by number of cycles, Australia and New Zealand, 2023**

| | Age group (years)[(a)] | | | | | |
|---|---|---|---|---|---|---|
| **Number of cycles** | **< 30** | **30–34** | **35–39** | **40–44** | **≥ 45** | **All** |
| | | | **n** | | | |
| One | 1,649 | 5,599 | 7,657 | 3,845 | 393 | 19,143 |
| Two | 592 | 2,001 | 2,454 | 1,099 | 63 | 6,209 |
| Three | 184 | 653 | 818 | 304 | 15 | 1,974 |
| Four or more | 82 | 243 | 281 | 103 | 8 | 717 |
| **Total** | **2,507** | **8,496** | **11,210** | **5,351** | **479** | **28,043** |
| | | | **%** | | | |
| One | 65.8 | 65.9 | 68.3 | 71.9 | 82.0 | 68.3 |
| Two | 23.6 | 23.6 | 21.9 | 20.5 | 13.2 | 22.1 |
| Three | 7.3 | 7.7 | 7.3 | 5.7 | 3.1 | 7.0 |
| Four or more | 3.3 | 2.9 | 2.5 | 1.9 | 1.7 | 2.6 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

(a) Age at start of first autologous thaw cycle in 2023.

# 9 Cycle-specific and cumulative live birth rates

This chapter provides a longitudinal perspective on the outcomes of success for ART treatment undertaken by the same woman. The analysis includes women who started their first autologous ART treatment cycle between 1 January 2020 and 31 December 2021 and subsequent ART treatments they had up until 31 December 2023, or until they achieved a live birth (a birth of at least one liveborn baby).

Donor sperm insemination cycles, oocyte/embryo recipient cycles, oocyte/embryo donation cycles, surrogacy arrangement cycles and GIFT cycles were excluded. Only the first six ART cycles are presented due to the small number of women undertaking seven or more treatment cycles between 1 January 2020 and 31 December 2023.

**How to interpret Tables 53 to 59**

- The following tables report on women who started their first ART ovarian stimulation cycle in Australia or New Zealand between 1 January 2020 and 31 December 2021, and reports on all subsequent ART treatments and outcomes until 31 December 2023. This allows for a minimum of two years and a maximum of four years of follow-up for each woman.

- Table 53 presents the number of complete cycles by the age-group of women who undertook their first ovarian stimulation cycle in 2020-2021. Figure 7 and Tables 54 to 59 present the cycle specific and cumulative live birth rates from *complete ART cycles*. A complete ART cycle is defined as an initiated ART ovarian stimulation cycle including all fresh and frozen/thaw embryo transfers associated with that ovarian stimulation. Ovarian stimulation cycles where no eggs are retrieved or embryos created are still counted as complete ART cycles.

- Complete ART cycles are not included in the tables if all eggs/embryos were frozen (freeze-all cycles) and the women did not return to transfer embryos in subsequent frozen/thaw cycles before 31 December 2023.

- Only the first live birth to a woman is counted. Any subsequent ART treatments by the same woman are not included.

- The *discontinuation rate* is the percentage of women who did not achieve a live birth and did not return for further ART treatment before 31 December 2023. For example, 30.7% of women who did not achieve a live birth by their second complete cycle did not return for a third cycle (Table 54).

- The *cycle specific live birth rate* is calculated as the percentage of women who had a live birth in a specific complete ART cycle after previous failed treatment attempts. For example, 22.1% of women who undertook a third complete ART cycle achieved a live birth in that cycle (Table 54).

- The *conservative cumulative live birth rate* assumes that women who discontinued treatment would have zero probability of achieving a live birth if they had continued with ART treatment. It is calculated as the cumulative probability of achieving a live birth for women who continued treatment up to a specific complete ART cycle. For example, 56.3% of women who commenced ART treatment in 2020-2021 and undertook three complete ART cycles, achieved a live birth (Table 54).

- The *optimal cumulative live birth rate* assumes that women who discontinued treatment had an equal chance of achieving a live birth as those who continued with ART treatment. For example, it assumes that the 30.7% of women who discontinued treatment after their second failed cycle, would have a 22.1% chance of having a baby in their third complete ART cycle, resulting in a theoretical cumulative live birth rate of 65.8% after three complete ART cycles (Table 54).

**Table 53: Number of complete cycles by women's age group for all women who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1 January 2020 and 31 December 2021, Australia and New Zealand**

| Complete cycle number | Age group (years)[b] | | | | | |
|---|---|---|---|---|---|---|
| | < 30 | 30–34 | 35–39 | 40–44 | ≥ 45 | All |
| | | | n | | | |
| One | 1,359 | 3,630 | 3,658 | 1,529 | 221 | 10,397 |
| Two | 1,734 | 4,090 | 4,149 | 1,623 | 142 | 11,738 |
| Three | 928 | 2,359 | 2,403 | 1,087 | 72 | 6,849 |
| Four | 549 | 1,416 | 1,631 | 770 | 38 | 4,404 |
| Five | 353 | 896 | 1,024 | 510 | 22 | 2,805 |
| Six | 193 | 580 | 714 | 359 | 12 | 1,858 |
| Seven | 124 | 377 | 489 | 240 | 8 | 1,238 |
| Eight | 77 | 230 | 311 | 162 | 6 | 786 |
| Nine | 58 | 149 | 206 | 110 | 1 | 524 |
| Ten or more | 58 | 230 | 408 | 242 | 6 | 944 |
| **Total** | **5,433** | **13,957** | **14,993** | **6,632** | **528** | **41,543** |
| | | | % | | | |
| One | 25.0 | 26.0 | 24.4 | 23.1 | 41.9 | 25.0 |
| Two | 31.9 | 29.3 | 27.7 | 24.5 | 26.9 | 28.3 |
| Three | 17.1 | 16.9 | 16.0 | 16.4 | 13.6 | 16.5 |
| Four | 10.1 | 10.1 | 10.9 | 11.6 | 7.2 | 10.6 |
| Five | 6.5 | 6.4 | 6.8 | 7.7 | 4.2 | 6.8 |
| Six | 3.6 | 4.2 | 4.8 | 5.4 | 2.3 | 4.5 |
| Seven | 2.3 | 2.7 | 3.3 | 3.6 | 1.5 | 3.0 |
| Eight | 1.4 | 1.6 | 2.1 | 2.4 | 1.1 | 1.9 |
| Nine | 1.1 | 1.1 | 1.4 | 1.7 | 0.2 | 1.3 |
| Ten or more | 1.1 | 1.6 | 2.7 | 3.6 | 1.1 | 2.3 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are frozen and an embryo transfer does not take place before 31 December 2023.

(b) Age at start of first autologous fresh ART treatment cycle (excluding freeze-all cycles) undertaken in 2020-2021.

*Note*: Women who started their first autologous fresh non-freeze-all ART treatment cycle between 1 January 2020 and 31 December 2021 were followed through subsequent fresh and thaw cycles, excluding freeze-all cycles, until 31 December 2023 or birth of a liveborn baby up to 31 October 2024.Totals and subtotals may not equal 100.0 due to rounding. Data should be interpreted with caution due to small numbers in certain cells.

**Table 54: Cycle-specific and cumulative live birth rates (complete cycle) for all women who started their first autologous fresh cycle in Australia and New Zealand during 2020-2021[(a)] and followed until 31 December 2023 or the first treatment-dependent live birth**

| Complete ART cycle number[(b)] | Number of women starting cycle | Number of live births[(c)] | Discontinuation rate[(d)] | Cycle specific live birth rate[(e)] | Conservative cumulative live birth rate[(f)] | Optimal cumulative live birth rate[(g)] |
|---|---|---|---|---|---|---|
| One | 41,543 | 16,184 | 27.3% | 39.0% | 39.0% | 39.0% |
| Two | 18,446 | 5,182 | 30.7% | 28.1% | 51.4% | 56.1% |
| Three | 9,194 | 2,030 | 31.6% | 22.1% | 56.3% | 65.8% |
| Four | 4,900 | 828 | 32.6% | 16.9% | 58.3% | 71.6% |
| Five | 2,744 | 392 | 31.9% | 14.3% | 59.3% | 75.6% |
| Six | 1,602 | 179 | 35.0% | 11.2% | 59.7% | 78.4% |

(a) The first autologous fresh cycle is defined as the first initiated ovarian stimulation cycle undertaken by a woman in an Australian or New Zealand ART clinic.

(b) A complete ART cycle is defined as the initial ovarian stimulation cycle and subsequent frozen/thaw embryo transfers associated with that ovarian stimulation. Ovarian stimulation cycles where all eggs/embryos were frozen (freeze-all cycles) and no eggs/embryos were used in subsequent thaw cycles up until 31 December 2023 are not counted. Cycles with intended or actual egg retrieval but without ovarian stimulation are excluded from the analysis.

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

(d) The discontinuation rate after a specific cycle is calculated as the number of women who did not return for a further ovarian stimulation cycle before 31 December 2023 divided by the number of women who did not have a live birth in that complete ART cycle. Reasons that a woman did not progress to the next treatment, such as poor prognosis, spontaneous pregnancy, migration, financial, psychological and other unrelated reasons, are not collected in ANZARD.

(e) The cycle-specific live birth rate for a specific complete ART cycle is calculated as the number of live births achieved from that specific complete ART cycle divided by the number of women who commenced at that cycle.

(f) The conservative cumulative live birth rate for a specific ART cycle is calculated as the number of women who achieved a live birth up to and including that complete ART cycle divided by the total number of women who commenced complete ART cycle 1.

(g) The optimal cumulative live birth rate is calculated by assuming that women who discontinued treatment would have had the same chance of a live birth in a particular cycle as those who continued.

*Note*: Further treatment cycles after the sixth cycle and resulting live births are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells.

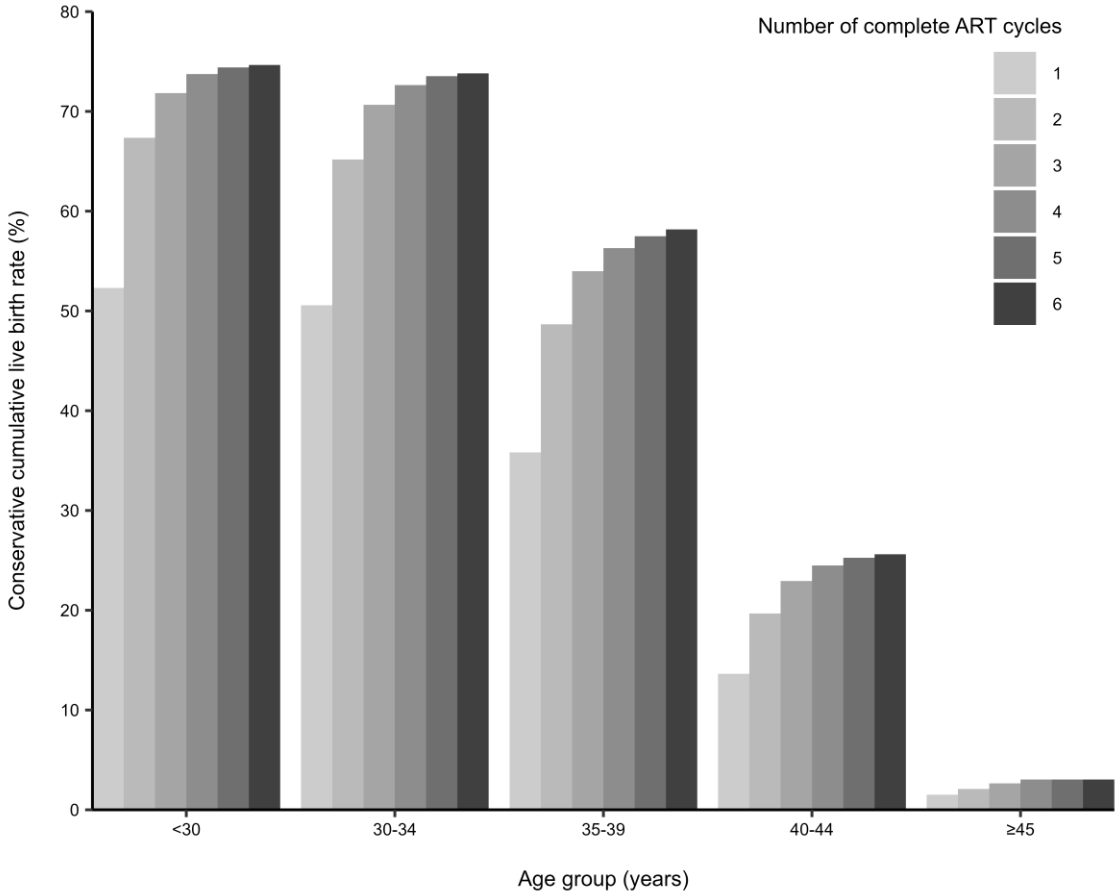



**Figure 7: Conservative cumulative live birth rates (complete cycle) for all women who started their first autologous fresh cycle in Australia and New Zealand during 2020-2021 and followed until 31 December 2023 or the first treatment-dependent live birth**

**Table 55: Cycle-specific and cumulative live birth rates (complete cycle) for women aged less than 30 who started their first autologous fresh cycle in Australia and New Zealand during 2020-2021[(a)] and followed until 31 December 2023 or the first treatment-dependent live birth**

| Complete ART cycle number[(b)] | Number of women starting cycle | Number of live births[(c)] | Discontinuation rate[(d)] | Cycle specific live birth rate[(e)] | Conservative cumulative live birth rate[(f)] | Optimal cumulative live birth rate[(g)] |
|---|---|---|---|---|---|---|
| One | 5,433 | 2,842 | 28.0% | 52.3% | 52.3% | 52.3% |
| Two | 1,866 | 817 | 33.9% | 43.8% | 67.3% | 73.2% |
| Three | 693 | 244 | 35.4% | 35.2% | 71.8% | 82.6% |
| Four | 290 | 103 | 39.0% | 35.5% | 73.7% | 88.8% |
| Five | 114 | 37 | 42.9% | 32.5% | 74.4% | 92.4% |
| Six | 44 | 13 | 48.4% | 29.5% | 74.7% | 94.7% |

(a) The first autologous fresh cycle is defined as the first initiated ovarian stimulation cycle undertaken by a woman in an Australian or New Zealand ART clinic.

(b) A complete ART cycle is defined as the initial ovarian stimulation cycle and subsequent frozen/thaw embryo transfers associated with that ovarian stimulation. Ovarian stimulation cycles where all eggs/embryos were frozen (freeze-all cycles) and no eggs/embryos were used in subsequent thaw cycles up until 31 December 2023 are not counted. Cycles with intended or actual egg retrieval but without ovarian stimulation are excluded from the analysis.

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

(d) The discontinuation rate after a specific cycle is calculated as the number of women who did not return for a further ovarian stimulation cycle before 31 December 2023 divided by the number of women who did not have a live birth in that complete ART cycle. Reasons that a woman did not progress to the next treatment, such as poor prognosis, spontaneous pregnancy, migration, financial, psychological and other unrelated reasons, are not collected in ANZARD.

(e) The cycle-specific live birth rate for a specific complete ART cycle is calculated as the number of live births achieved from that specific complete ART cycle divided by the number of women who commenced at that cycle.

(f) The conservative cumulative live birth rate for a specific ART cycle is calculated as the number of women who achieved a live birth up to and including that complete ART cycle divided by the total number of women who commenced complete ART cycle 1.

(g) The optimal cumulative live birth rate is calculated by assuming that women who discontinued treatment would have had the same chance of a live birth in a particular cycle as those who continued.

*Note*: Further treatment cycles after the sixth cycle and resulting live births are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells.

**Table 56: Cycle-specific and cumulative live birth rates (complete cycle) for women aged 30-34 who started their first autologous fresh cycle in Australia and New Zealand during 2020-2021[(a)] and followed until 31 December 2023 or the first treatment-dependent live birth**

| Complete ART cycle number[(b)] | Number of women starting cycle | Number of live births[(c)] | Discontinuation rate[(d)] | Cycle specific live birth rate[(e)] | Conservative cumulative live birth rate[(f)] | Optimal cumulative live birth rate[(g)] |
|---|---|---|---|---|---|---|
| One | 13,957 | 7,058 | 25.5% | 50.6% | 50.6% | 50.6% |
| Two | 5,140 | 2,038 | 27.8% | 39.6% | 65.2% | 70.2% |
| Three | 2,240 | 767 | 30.6% | 34.2% | 70.7% | 80.4% |
| Four | 1,022 | 275 | 31.2% | 26.9% | 72.6% | 85.7% |
| Five | 514 | 124 | 35.4% | 24.1% | 73.5% | 89.1% |
| Six | 252 | 41 | 41.2% | 16.3% | 73.8% | 90.9% |

(a) The first autologous fresh cycle is defined as the first initiated ovarian stimulation cycle undertaken by a woman in an Australian or New Zealand ART clinic.

(b) A complete ART cycle is defined as the initial ovarian stimulation cycle and subsequent frozen/thaw embryo transfers associated with that ovarian stimulation. Ovarian stimulation cycles where all eggs/embryos were frozen (freeze-all cycles) and no eggs/embryos were used in subsequent thaw cycles up until 31 December 2023 are not counted. Cycles with intended or actual egg retrieval but without ovarian stimulation are excluded from the analysis.

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

(d) The discontinuation rate after a specific cycle is calculated as the number of women who did not return for a further ovarian stimulation cycle before 31 December 2023 divided by the number of women who did not have a live birth in that complete ART cycle. Reasons that a woman did not progress to the next treatment, such as poor prognosis, spontaneous pregnancy, migration, financial, psychological and other unrelated reasons, are not collected in ANZARD.

(e) The cycle-specific live birth rate for a specific complete ART cycle is calculated as the number of live births achieved from that specific complete ART cycle divided by the number of women who commenced at that cycle.

(f) The conservative cumulative live birth rate for a specific ART cycle is calculated as the number of women who achieved a live birth up to and including that complete ART cycle divided by the total number of women who commenced complete ART cycle 1.

(g) The optimal cumulative live birth rate is calculated by assuming that women who discontinued treatment would have had the same chance of a live birth in a particular cycle as those who continued.

*Note*: Further treatment cycles after the sixth cycle and resulting live births are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells.

**Table 57: Cycle-specific and cumulative live birth rates (complete cycle) for women aged 35-39 who started their first autologous fresh cycle in Australia and New Zealand during 2020-2021[(a)] and followed until 31 December 2023 or the first treatment-dependent live birth**

| Complete ART cycle number[(b)] | Number of women starting cycle | Number of live births[(c)] | Discontinuation rate[(d)] | Cycle specific live birth rate[(e)] | Conservative cumulative live birth rate[(f)] | Optimal cumulative live birth rate[(g)] |
|---|---|---|---|---|---|---|
| One | 14,993 | 5,372 | 25.8% | 35.8% | 35.8% | 35.8% |
| Two | 7,141 | 1,923 | 29.8% | 26.9% | 48.7% | 53.1% |
| Three | 3,661 | 800 | 29.7% | 21.9% | 54.0% | 63.4% |
| Four | 2,011 | 345 | 31.3% | 17.2% | 56.3% | 69.6% |
| Five | 1,144 | 180 | 31.6% | 15.7% | 57.5% | 74.4% |
| Six | 659 | 101 | 33.9% | 15.3% | 58.2% | 78.3% |

(a) The first autologous fresh cycle is defined as the first initiated ovarian stimulation cycle undertaken by a woman in an Australian or New Zealand ART clinic.

(b) A complete ART cycle is defined as the initial ovarian stimulation cycle and subsequent frozen/thaw embryo transfers associated with that ovarian stimulation. Ovarian stimulation cycles where all eggs/embryos were frozen (freeze-all cycles) and no eggs/embryos were used in subsequent thaw cycles up until 31 December 2023 are not counted. Cycles with intended or actual egg retrieval but without ovarian stimulation are excluded from the analysis.

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

(d) The discontinuation rate after a specific cycle is calculated as the number of women who did not return for a further ovarian stimulation cycle before 31 December 2023 divided by the number of women who did not have a live birth in that complete ART cycle. Reasons that a woman did not progress to the next treatment, such as poor prognosis, spontaneous pregnancy, migration, financial, psychological and other unrelated reasons, are not collected in ANZARD.

(e) The cycle-specific live birth rate for a specific complete ART cycle is calculated as the number of live births achieved from that specific complete ART cycle divided by the number of women who commenced at that cycle.

(f) The conservative cumulative live birth rate for a specific ART cycle is calculated as the number of women who achieved a live birth up to and including that complete ART cycle divided by the total number of women who commenced complete ART cycle 1.

(g) The optimal cumulative live birth rate is calculated by assuming that women who discontinued treatment would have had the same chance of a live birth in a particular cycle as those who continued.

*Note*: Further treatment cycles after the sixth cycle and resulting live births are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells.

**Table 58: Cycle-specific and cumulative live birth rates (complete cycle) for women aged 40-44 who started their first autologous fresh cycle in Australia and New Zealand during 2020-2021[(a)] and followed until 31 December 2023 or the first treatment-dependent live birth**

| Complete ART cycle number[(b)] | Number of women starting cycle | Number of live births[(c)] | Discontinuation rate[(d)] | Cycle specific live birth rate[(e)] | Conservative cumulative live birth rate[(f)] | Optimal cumulative live birth rate[(g)] |
|---|---|---|---|---|---|---|
| One | 6,632 | 904 | 29.9% | 13.6% | 13.6% | 13.6% |
| Two | 4,017 | 401 | 32.1% | 10.0% | 19.7% | 22.3% |
| Three | 2,454 | 216 | 32.6% | 8.8% | 22.9% | 29.1% |
| Four | 1,508 | 103 | 33.8% | 6.8% | 24.5% | 33.9% |
| Five | 930 | 51 | 29.1% | 5.5% | 25.3% | 37.6% |
| Six | 623 | 24 | 33.4% | 3.9% | 25.6% | 40.0% |

(a) The first autologous fresh cycle is defined as the first initiated ovarian stimulation cycle undertaken by a woman in an Australian or New Zealand ART clinic.

(b) A complete ART cycle is defined as the initial ovarian stimulation cycle and subsequent frozen/thaw embryo transfers associated with that ovarian stimulation. Ovarian stimulation cycles where all eggs/embryos were frozen (freeze-all cycles) and no eggs/embryos were used in subsequent thaw cycles up until 31 December 2023 are not counted. Cycles with intended or actual egg retrieval but without ovarian stimulation are excluded from the analysis.

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

(d) The discontinuation rate after a specific cycle is calculated as the number of women who did not return for a further ovarian stimulation cycle before 31 December 2023 divided by the number of women who did not have a live birth in that complete ART cycle. Reasons that a woman did not progress to the next treatment, such as poor prognosis, spontaneous pregnancy, migration, financial, psychological and other unrelated reasons, are not collected in ANZARD.

(e) The cycle-specific live birth rate for a specific complete ART cycle is calculated as the number of live births achieved from that specific complete ART cycle divided by the number of women who commenced at that cycle.

(f) The conservative cumulative live birth rate for a specific ART cycle is calculated as the number of women who achieved a live birth up to and including that complete ART cycle divided by the total number of women who commenced complete ART cycle 1.

(g) The optimal cumulative live birth rate is calculated by assuming that women who discontinued treatment would have had the same chance of a live birth in a particular cycle as those who continued.

*Note*: Further treatment cycles after the sixth cycle and resulting live births are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells.

**Table 59: Cycle-specific and cumulative live birth rates (complete cycle) for women aged 45 or more who started their first autologous fresh cycle in Australia and New Zealand during 2020-2021[(a)] and followed until 31 December 2023 or the first treatment-dependent live birth**

| Complete ART cycle number[(b)] | Number of women starting cycle | Number of live births[(c)] | Discontinuation rate[(d)] | Cycle specific live birth rate[(e)] | Conservative cumulative live birth rate[(f)] | Optimal cumulative live birth rate[(g)] |
|---|---|---|---|---|---|---|
| One | 528 | 8 | 45.8% | 1.5% | 1.5% | 1.5% |
| Two | 282 | 3 | 47.7% | 1.1% | 2.1% | 2.6% |
| Three | 146 | 3 | 51.7% | 2.1% | 2.7% | 4.6% |
| Four | 69 | 2 | 37.3% | 2.9% | 3.0% | 7.3% |
| Five | 42 | 0 | 42.9% | 0.0% | 3.0% | 7.3% |
| Six | 24 | 0 | 29.2% | 0.0% | 3.0% | 7.3% |

(a) The first autologous fresh cycle is defined as the first initiated ovarian stimulation cycle undertaken by a woman in an Australian or New Zealand ART clinic.

(b) A complete ART cycle is defined as the initial ovarian stimulation cycle and subsequent frozen/thaw embryo transfers associated with that ovarian stimulation. Ovarian stimulation cycles where all eggs/embryos were frozen (freeze-all cycles) and no eggs/embryos were used in subsequent thaw cycles up until 31 December 2023 are not counted. Cycles with intended or actual egg retrieval but without ovarian stimulation are excluded from the analysis.

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

(d) The discontinuation rate after a specific cycle is calculated as the number of women who did not return for a further ovarian stimulation cycle before 31 December 2023 divided by the number of women who did not have a live birth in that complete ART cycle. Reasons that a woman did not progress to the next treatment, such as poor prognosis, spontaneous pregnancy, migration, financial, psychological and other unrelated reasons, are not collected in ANZARD.

(e) The cycle-specific live birth rate for a specific complete ART cycle is calculated as the number of live births achieved from that specific complete ART cycle divided by the number of women who commenced at that cycle.

(f) The conservative cumulative live birth rate for a specific ART cycle is calculated as the number of women who achieved a live birth up to and including that complete ART cycle divided by the total number of women who commenced complete ART cycle 1.

(g) The optimal cumulative live birth rate is calculated by assuming that women who discontinued treatment would have had the same chance of a live birth in a particular cycle as those who continued.

*Note*: Further treatment cycles after the sixth cycle and resulting live births are not presented in this table due to small numbers. Data should be interpreted with caution due to small numbers in certain cells.

# Appendix A: Contributing ART Units

## Australian Capital Territory

COMPASS Fertility, Barton (Dr Nicole Sides)

Genea Canberra, Deakin (A/Prof Mark Bowman)

IVF Australia Canberra, Deakin (Dr Frank Quinn)

## New South Wales

Adora Fertility, Sydney, Surry Hills (Dr Paul Atkinson)

Albury IVF, Albury (Dr Scott Giltrap)

City Fertility Centre – Gregory Hills, Gledswood Hills (Dr Devora Lieberman)

City Fertility Centre – Miranda, Caringbah (Dr Devora Lieberman)

City Fertility Centre – Sydney, Liverpool (Dr Devora Lieberman)

City Fertility Centre – Sydney City (Dr Devora Lieberman)

Connect IVF – Sydney (Dr Julie Lukic)

Demeter Fertility, Hurstville (Dr David Knight)

Fertility First, Hurstville (Dr Anne Clark)

Genea – Bella Vista, Bella Vista (Dr Derek Lok)

Genea – Liverpool, Liverpool (Dr Derek Lok)

Genea – Newcastle, Merewether (Dr Myvanwy McIlveen)

Genea – Orange, Orange (Dr Mark Livingstone)

Genea – RPAH, Camperdown (Dr Ying Li)

Genea – Sydney CBD (Dr Mark Livingstone)

Genea – Wollongong, Wollongong (A/Prof Mark Bowman)

IVF Australia – Eastern Suburbs, Alexandria (Dr Frank Quinn)

IVF Australia – Hunter IVF, New Lambton Heights (Dr Frank Quinn)

IVF Australia – North Shore, Greenwich (Dr Frank Quinn)

IVF Australia – Western Sydney, Westmead (Dr Frank Quinn)

IVF Australia – Wollongong, Wollongong (Dr Frank Quinn)

Monash IVF – Albury, Albury (Prof Luk Rombauts)

Monash IVF – Bondi Junction, Bondi Junction (Dr Michael Costello)

Monash IVF – Parramatta, Parramatta (Dr Michael Costello)

Monash IVF – Penrith, Kingswood (Dr Michael Costello)

Monash IVF – Sydney City (Dr Michael Costello)

Riverina IVF, Wagga Wagga (Dr Scott Giltrap)

Royal Hospital for Women – Fertility & Research Centre, Randwick (Dr Rachael Rodgers)

The Fertility Centre – Liverpool, Liverpool (Dr Frank Quinn)

The Fertility Centre – Nepean, Kingswood (Dr Frank Quinn)

Westmead Fertility Centre, Westmead (A/Prof Warren Chan)

## Northern Territory

Repromed Darwin, Tiwi (Dr Juliette Koch)

## Queensland

Adora Fertility, Brisbane (Dr Paul Atkinson)

Care Fertility, Greenslopes (Dr Clare Boothroyd)

City Fertility Centre – Brisbane, Newstead (Dr Simone Campbell)

City Fertility Centre – Gold Coast, Robina (Dr Neil Astill)

City Fertility Centre – Southside, Sunnybank (Dr Neil Astill)

City Fertility Centre – Toowoomba, Toowoomba (Dr Neil Astill)

Coastal IVF, Maroochydore (Dr Paul Stokes)

Genea – Brisbane, Bowen Hills (Dr John Esler)

Life Fertility Clinic, Bowen Hills (Dr Glenn Sterling)

Monash IVF Brisbane, Spring Hill (Dr Ross Turner)

Monash IVF Bundaberg, Bundaberg West (Dr Ross Turner)

Monash IVF Cairns, Cairns (Dr Ross Turner)

Monash IVF Gold Coast, Southport (Dr Ross Turner)

Monash IVF Rockhampton, Rockhampton (Dr Ross Turner)

Monash IVF Sunshine Coast, Buderim (Dr Ross Turner)

Monash IVF Townsville, Townsville (Dr Ross Turner)

QFG Brisbane, Spring Hill (Prof Hayden Homer)

QFG Cairns, Cairns (Prof Hayden Homer)

QFG Gold Coast, Benowa (Prof Hayden Homer)

QFG Mackay, North Mackay (Prof Hayden Homer)

QFG Sunshine Coast, Birtinya (Prof Hayden Homer)

QFG Toowoomba, Toowoomba (Prof Hayden Homer)

QFG Townsville, Hyde Park (Prof Hayden Homer)

The Fertility Centre, Springwood (Prof Hayden Homer)

## South Australia

Family Fertility Centre, Ashford (Dr Marcin Stankiewicz)

Flinders Fertility, Glenelg (Dr  Neil Johnson)

Genea Fertility SA, Adelaide (Dr Bruno Radesic)

Repromed Adelaide, Dulwich (Dr Juliette Koch)

## Tasmania

Fertility Tasmania, Hobart (Dr Irena Nikakis)

TasIVF, Hobart (Dr Manuela Toledo)

## Victoria

Adora Fertility Melbourne, Greensborough (Dr Paul Atkinson)

Ballarat IVF, Wendouree (Dr Russell Dalton)

City Fertility Centre Bundoora, Bundoora (Dr Alex Eskander)

City Fertility Centre Melbourne, Melbourne (Dr Anne Poliness)

City Fertility Centre Notting Hill, Notting Hill (Dr David Wilkinson)

Create Fertility, Mount Waverly (Dr Russell Dalton)

Genea Heidelberg, Heidelberg (Dr Kate McIlwaine)

Genea Melbourne City, North Melbourne (Dr John Esler)

Life Fertility Clinic – Melbourne, Fitzroy (Dr Glenn Sterling)

Melbourne IVF, Reproductive Services Parkville (Dr Fleur Cattrall) – now closed

Melbourne IVF, East Melbourne (Dr Raelia Lew)

Monash IVF Bendigo, Bendigo (Prof Luk Rombauts)

Monash IVF Clayton, Clayton (Prof Luk Rombauts)

Monash IVF Geelong, Geelong (Prof Luk Rombauts)

Monash IVF Hawthorn, Hawthorn (Prof Luk Rombauts)

Monash IVF Mildura, Mildura (Prof Luk Rombauts)

Monash IVF Sale, Sale (Prof Luk Rombauts)

Monash IVF Sunshine, St Albans (Prof Luk Rombauts)

Newlife IVF, Box Hill North (Dr Nicole Hope)

Number 1 Fertility, East Melbourne (Dr Lynn Burmeister)

The Royal Women's Hospital, Parkville (Dr Rashi Kalra)

## Western Australia

Adora Fertility Perth, Craigie (Dr Paul Atkinson)

Concept Fertility Centre, Subiaco (Dr Kevin Artley)

Fertility North, Joondalup (Dr Vince Chapple)

Fertility Specialists of WA, Applecross (Prof Roger Hart)

Fertility Specialists of WA, Claremont (Prof Roger Hart)

Genea Perth, Wembley (A/Prof Mark Bowman)

Monash IVF West, West Leederville (Dr Tamara Hunter)

## New Zealand

Fertility Associates Auckland, Auckland (Dr Andrew Murray)

Fertility Associates Christchurch, Christchurch (Dr Andrew Murray)

Fertility Associates Dunedin, Dunedin (Dr Andrew Murray)

Fertility Associates Hamilton, Hamilton (Dr Andrew Murray)

Fertility Associates Wellington, Wellington (Dr Andrew Murray)

Fertility Plus, Auckland (Prof Cynthia Farquhar)

Repromed Auckland, Auckland (Dr Devashana Gupta)

# Appendix B: Data used in this report

The data presented in this report are supplied by 100 ART Units in Australia and New Zealand and are compiled into ANZARD 3.0. ANZARD 3.0 includes autologous treatment cycles, treatment involving donated oocytes or embryos, and treatment involving surrogacy arrangements. ANZARD 3.0 collects data on the use of ART techniques such as ICSI, oocyte/embryo freezing methods, PGT and cleavage/blastocyst transfers. In addition to ART procedures, ANZARD 3.0 also collects data on artificial insemination cycles using donated sperm (DI) from ART Units. The outcomes of pregnancies, births and babies born following ART and DI treatments are also maintained in ANZARD 3.0. This includes the method of birth, birth status, birthweight, gestational age, plurality, perinatal mortality and selected information on maternal morbidity.

## Data validation

Most ART Units have computerised data information management systems and can provide NPESU with high-quality data. All data processed by NPESU undergoes a validation process, with data queries being followed up with ART Unit staff.

The Reproductive Technology Accreditation Committee (RTAC) of the Fertility Society of Australia and New Zealand (FSANZ) also plays a role in ensuring the quality of ANZARD 3.0 data. ANZARD submissions from ART Units are audited by certifying bodies according to the RTAC Code of Practice. This includes selected records against ART Unit files in their annual inspections. All ART cycles and DI undertaken in Australia and New Zealand must be reported to ANZARD as part of their accreditation by the RTAC of the FSANZ.

## Data presentation

Chapters 2 to 7 of this report present information on ART and DI treatment cycles that took place in ART Units in Australia and New Zealand in 2023 and the resulting pregnancies and births. The babies included in this report were conceived following treatment cycles undertaken in 2023 and were born in either 2023 or 2024. Data presented in Chapters 2 to 7 are for treatment cycles and not women. It is possible for an individual woman to undergo more than one treatment cycle in a year or experience more than one pregnancy. This means that information reported about patient characteristics in Chapters 2 to 7, such as age, parity and cause of infertility, is based on calculations in which individuals may be counted more than once. The rates of clinical pregnancy and live birth in Chapters 2 to 7 were measured per initiated cycle. Where the number of initiated cycles was not available, the rates were calculated per embryo transfer cycle.

Chapter 8 presents information on women undergoing ART treatment cycles in 2023.

Chapter 9 presents longitudinal information on the cohort of women who were identified as starting their first autologous (non-freeze-all) fresh ART cycle in 2020-2021.

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

## Data limitations

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

Note that some contributing ART Units may have closed or changed their name since 2023. The medical director listed is based on information provided by the FSANZ at the time this report was prepared.

# Appendix C: ANZARD 3.0 data items

| Variable | Data domain |
|---|---|
| **PATIENT AND INTENDED PARENT (S) DETAILS** | |
| ANZARD Unit identifier | 3-digit code for ART Units provided by NPESU. May consist of more than one ART Unit |
| ART unit identifier | 3-digit code for ART Units provided by RTAC. A facility with a laboratory collecting or preparing human gametes and/or embryos for therapeutic service, possibly across a range of sites of clinical activity. |
| Sex (at birth) of the intended parents | 1=a female-male couple<br>2=a single female<br>3=a female-female couple<br>4=a single male<br>5= a male-male couple |
| Unit patient ID/medical record number | ART Unit-issued unique patient identifier. |
| Female patient first two letters of first name | First two letters of female patient first name. |
| Female patient first two letters of surname | First two letters of female patient surname. |
| Female patient date of birth | DD/MM/YYYY. |
| Female patient height | Female patient height (in centimetres) at the time of treatment |
| Female patient weight | Female patient weight (in kilograms) at the time of treatment |
| Male intended parent first two letters of first name | First two letter of male intended parent's first name |
| Male intended parent first two letters of surname | First two letters of male intended parent's surname |
| Male intended parent date of birth | DD/MM/YYYY. |
| Non-patient female intended parent date of birth | DD/MM/YYYY. |
| Second male intended parent date of birth | DD/MM/YYYY. |
| Postcode | Postcode of patient residential area. |
| **CYCLE DETAILS** | |
| Cycle ID | Unique cycle identifier, allocated by the ART Unit. |
| Cycle date | DD/MM/YYYY<br>Cycle date is coded by:<br>1. The first date where FSH/stimulation drug was administered<br>2. The date of last menstrual period (LMP) for unstimulated cycles (including natural fresh cycles, thaw cycles and donor insemination)<br>3. The date of oocyte/embryo thawing for lab-only cycles |
| Cycle type | 1=Autologous: female-male couple, single female, female-female couple<br>2=Non-autologous: female-female couple<br>3=Non-autologous: oocyte/embryo donation<br>4=Non-autologous: oocyte recipient<br>5=Non-autologous: embryo recipient<br>6=Surrogacy – intended parent(s): Oocyte/embryo provision<br>7=Surrogacy – gestational carrier: Transfer (or thawing with the intention of transfer) of embryos to a gestational carrier<br>8=Lab-only cycle |
| Surrogacy arrangement | No – if cycle is not part of a surrogacy arrangement.<br>Yes – if cycle is part of a surrogacy arrangement. |

| Variable | Data domain |
|---|---|
| Fertility preservation | 1=No – cycle is not being undertaken for fertility preservation purposes<br>2=Yes – cycle is being undertaken for fertility preservation purposes |
| Reason for fertility preservation | 1=Medical reason – cancer diagnosis<br>2=Medical reason – other<br>3=Non-medical reason |
| Period of infertility | DD/MM/YYYY<br>The month and year that the female intended parent started trying to conceive (applies to female-male couples only) |
| Any pregnancies ≥ 20 weeks | No – if the female patient has had no previous pregnancy of 20 complete weeks or more<br>Yes – if the female patient has had a pregnancy of 20 complete weeks or more by ART or by a different partner. |
| ART treatment being undertaken for reasons other than to treat clinical infertility | No – ART treatment being undertaken to treat clinical infertility<br>Yes – ART treatment being undertaken for reasons other than to treat clinical infertility |
| Cause of infertility: tubal disease | No – in the opinion of the treating clinician or ART Unit, the cause of infertility is not due to tubal disease.<br>Yes – in the opinion of the treating clinician or ART Unit, the cause of infertility is due to tubal disease. |
| Cause of infertility: endometriosis | No – in the opinion of the treating clinician or ART Unit, the cause of infertility is not due to endometriosis.<br>Yes – in the opinion of the treating clinician or ART Unit, the cause of infertility is due to endometriosis. |
| Cause of infertility: other female factors | No – in the opinion of the treating clinician or ART Unit, the cause of infertility is not due to other female factors.<br>Yes – in the opinion of the treating clinician or ART Unit, the cause of infertility is due to other female factors. |
| Polycystic ovarian syndrome | 1=No – the treating clinician or ART Unit does not consider that the female intended parent has PCOS<br>2=Yes – the treating clinician or ART Unit considers that the female intended parent has PCOS, regardless of whether it is contributing to infertility<br>3=Unknown – the treating clinician or ART Unit has not assessed the female intended parent for PCOS |
| Cause of infertility: male factor | No – in the opinion of the treating clinician or ART Unit, the cause of infertility is not due to male factors.<br>Yes – in the opinion of the treating clinician or ART Unit, the cause of infertility is due to male factors. |
| Primary cause of male factor infertility diagnosis | 1=Idiopathic<br>2=Genetic – Klinefelter<br>3=Genetic – Y deletion<br>4=Genetic – other aneuploidies, single gene<br>5=Testis damage – cancer treatment<br>6=Testis damage – other<br>7=Gonadotrophin deficiency<br>8=Vasectomy<br>9=Congenital absence of the vas deferens/cystic fibrosis<br>10=Obstructive disorder (other)<br>11=Erectile dysfunction<br>12=Ejaculatory disorders |
| Cause of infertility: unexplained | No – in the opinion of the treating clinician or ART Unit, the cause of infertility is not unexplained in the intended parents<br>Yes – in the opinion of the treating clinician or ART Unit, the cause of infertility is unexplained in the intended parents. |
| Ovarian stimulation via follicle stimulating hormone (FSH) | No – FSH was not administered<br>Yes – FSH administered. Does not include clomiphene or hCG alone unless FSH was also given. |

| Variable | Data domain |
|---|---|
| First ever FSH stimulated cycle for OPU | No – not the patient's first ever FSH stimulated cycle<br>Yes – the current cycle is the patient's first ever FSH stimulated cycle with the intention of OPU. |
| Date of cancellation for cancelled OPU | Date of the last day FSH is administered in a cancelled cycle.<br>DD/MM/YYYY. |
| OPU date | Date of oocyte pickup.<br>DD/MM/YYYY. |
| Number of eggs retrieved | Number of eggs retrieved at OPU. |
| In-vitro maturation (IVM) | Whether IVM took place during the treatment cycle<br>1=No<br>2=Yes |
| Source of sperm | 1=a male intended parent<br>2=a sperm donor outside of the intended parents |
| Site of sperm used | Site of sperm extraction: ejaculated, epididymal (whether by open biopsy or by PESA), testicular or other. |
| Sperm quality | The concentration of sperm |
| **DONATION AND RECIPIENT DETAILS** | |
| Age of oocyte/embryo donor | Completed age at time of OPU. |
| Number of fresh eggs donated | Number of fresh eggs donated to someone else. |
| Number of fresh eggs received | Number of fresh eggs received from someone else. |
| Number of fresh embryos donated | Records the number of fresh embryos donated to another patient/couple |
| Number of fresh embryos received | Records the number of fresh embryos that a patient/couple received from another patient/couple. |
| **OOCYTE CRYOPRESERVATION DETAILS** | |
| Number of oocytes slow frozen | Number of oocytes frozen by slow freezing method in this cycle. |
| Number of oocytes vitrified | Number of oocytes frozen by vitrification in this cycle. |
| Number of slow frozen oocytes thawed | Number of slow frozen oocytes thawed in this cycle. |
| Number of vitrified oocytes warmed | Number of vitrified oocytes warmed in this cycle. |
| Initial cryopreservation date of thawed/warmed oocytes | DD/MM/YYYY. |
| **FERTILISATION DETAILS** | |
| Number of eggs GIFT | Number of eggs replaced in a GIFT procedure. |
| Number of eggs IVF | Number of eggs treated (inseminated) with IVF. |
| Number of eggs ICSI | Number of eggs treated with ICSI. |
| Number of eggs fertilised normally | Number of eggs fertilised normally. |
| Intrauterine insemination date | Date of intrauterine insemination procedure (using donated sperm only)<br>DD/MM/YYYY. |
| Assisted hatching | No – assisted hatching not performed.<br>Yes – where assisted hatching in any form has been performed on any of the embryos (transferred or not). |
| **PRE-IMPLANTATION GENETIC TESTING** | |
| Number of embryos biopsied for invasive PGT | Number of embryos biopsied for invasive PGT |
| Number of embryos biopsied for non-invasive PGT | Number of embryos biopsied for non-invasive PGT |
| Number of invasive PGT embryos transferred | Number of invasive PGT embryos transferred |
| Number of non-invasive PGT embryos transferred | Number of non-invasive PGT embryos transferred |

| Variable | Data domain |
|---|---|
| Number of embryos thawed that had invasive PGT performed in a previous cycle | Number of embryos thawed that had invasive PGT performed in a previous cycle |
| Number of embryos thawed that had non-invasive PGT performed in a previous cycle | Number of embryos thawed that had non-invasive PGT performed in a previous cycle |
| Primary reason for PGT | 1=Aneuploidy screening<br>2=Single gene variation<br>3=Chromosomal structural rearrangements (e.g. translocations)<br>4=Other |
| **EMBRYO CRYOPRESERVATION DETAILS** | |
| Number of cleavage-stage embryos slow frozen | Number of cleavage-stage embryos frozen by slow freezing method in this cycle. |
| Number of cleavage-stage embryos vitrified | Number of cleavage-stage embryos frozen by vitrification in this cycle. |
| Number of blastocysts slow frozen | Number of blastocysts frozen by slow freezing method in this cycle. |
| Number of blastocysts vitrified | Number of blastocysts frozen by vitrification method in this cycle. |
| Number of slow frozen cleavage embryos thawed | Number of slow frozen cleavage embryos thawed for use in the cycle |
| Number of vitrified cleavage embryos warmed | Number of vitrified cleavage embryos warmed for use in the cycle |
| Number of slow frozen blastocysts thawed | Number of slow frozen blastocysts thawed for use in the cycle |
| Number of vitrified blastocysts warmed | Number of vitrified blastocyst embryos for use in the cycle |
| Freezing date of thawed/warmed embryos | Initial cryopreservation date of thawed/warmed embryos. |
| **EMBRYO TRANSFER DETAILS** | |
| Embryo transfer date | DD//MM/YYYY<br>Data embryo transfer occurred. |
| Number of cleavage-stage embryos transferred | Number of cleavage-stage embryos transferred. |
| Number of blastocysts transferred | Number of blastocyst stage embryos transferred. |
| Transferred embryos fertilised via ICSI | No – no transferred embryos were fertilised by ICSI.<br>Yes – any embryos transferred were fertilised by ICSI. |
| **PREGNANCY DETAILS** | |
| Clinical pregnancy | A pregnancy that fulfils at least one of the following criteria:<br>1. Known to be ongoing at 20 weeks<br>2. Evidence by ultrasound of an intrauterine sac (with or without a fetal heart)<br>3. Examination of products of conception reveal chorionic villi<br>4. A definite ectopic pregnancy that has been diagnosed laparoscopically or by ultrasound. |
| Date pregnancy ended | Date on which birth, miscarriage or termination takes place. |
| Number of fetal hearts | Number of fetal hearts seen on first ultrasound (intrauterine only). |
| Ectopic pregnancy | If this pregnancy is an ectopic pregnancy, or a combined ectopic and uterine pregnancy (heterotopic).<br>n–Neither ectopic nor heterotopic<br>e–Ectopic<br>h–Heterotopic |
| Elective termination of pregnancy | No–pregnancy not terminated.<br>Yes–pregnancy is terminated. |
| Selective reduction performed | No–If no selective reduction has been performed.<br>Yes–If selective reduction has been performed due to fetal abnormality/other reasons. |

| Variable | Data domain |
|---|---|
| Fetal abnormality in a pregnancy ending < 20 weeks or by selective reduction | Fetal abnormality in a pregnancy ending < 20 weeks or by selective reduction. |
| Maternal complications of pregnancy | Maternal complications of pregnancy. |
| **BIRTH DETAILS** | |
| Number of babies born | Include all liveborn and stillborn babies after 20 weeks gestation or at least 400 grams birthweight. |
| Caesarean birth | No–other.<br>Yes–birth by planned or emergency caesarean section. |
| Baby 1 outcome | Liveborn, stillborn or neonatal death. |
| Baby 1 sex | Male or female. |
| Baby 1 birthweight | Weight in grams. |
| Baby 1 abnormality | Describes any known congenital malformation. |
| Baby 1 date of neonatal death | Date of neonatal death. |
| Baby 2 outcome | Liveborn, stillborn or neonatal death. |
| Baby 2 sex | Male or female. |
| Baby 2 weight | Weight in grams. |
| Baby 2 abnormality | Describes any known congenital malformation. |
| Baby 2 date of neonatal death | Date of neonatal death. |
| Baby 3 outcome | Liveborn, stillborn or neonatal death. |
| Baby 3 sex | Male or female. |
| Baby 3 weight | Weight in grams. |
| Baby 3 abnormality | Describes any known congenital malformation. |
| Baby 3 date of neonatal death | Date of neonatal death. |
| Baby 4 outcome | Liveborn, stillborn or neonatal death. |
| Baby 4 sex | Male or female. |
| Baby 4 weight | Weight in grams. |
| Baby 4 abnormality | Describes any known congenital malformation. |
| Baby 4 date of neonatal death | Date of neonatal death. |
| **TREATMENT COMPLICATIONS** | |
| Admitted with ART morbidity | No – patient was not admitted to hospital with any ART morbidity<br>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. |
| Ovarian hyperstimulation syndrome (OHSS) | No – OHSS did not occur<br>Yes – OHSS occurred |
| Morbidity information and detail | Describes any information related to the female patient's hospital admission or cause of morbidity |
| Comments | Any comments on this cycle. |

# Glossary

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

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

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

**ART Unit:** a facility with a laboratory collecting or preparing human gametes and/or embryos for therapeutic service, possibly across a range of sites of clinical activity. Where the collection of gametes/embryos takes place at a different site to the preparation, the two sites are considered to be a single ART Unit.

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

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

**Birth:** a birth event in which one or more babies of 20 weeks or more gestation or of 400 grams or more birthweight is born, either liveborn or stillborn.

**Blastocyst:** an embryo comprising around 100 cells usually developed by five or six days after fertilisation.

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

**Cleavage-stage embryo:** an embryo comprising about eight cells usually developed two to four days after fertilisation.

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

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

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

**Cryopreservation:** freezing embryos for potential future ART treatment.

**Cycle:** when a medical procedure is attempted or takes place, or when certain laboratory procedures are undertaken. This is further broken down to specific terms, 'treatment cycles' and 'lab-only cycles.' Please refer to the glossary for definitions of these specific terms.

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

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

**Donation cycle:** an ART treatment cycle where a female patient who is not an intended parent, intends to donate or donates her oocytes/embryos to others, or where a female intended parent provides oocytes/embryos to a female partner who is also an intended parent. A donation cycle may result in the donation of either oocytes or embryos to a recipient(s). The use of donor sperm does not alter the donor status of the cycle.

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

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

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

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

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

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

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

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

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

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

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

**Lab-only cycle:** where there is no patient under monitoring or receiving treatment in the cycle and no intention to transfer an embryo in the cycle and only laboratory procedures are performed.

**Live birth:** according to the World Health Organization (WHO) definition, a live birth is defined as "the complete expulsion or extraction from the mother of a baby, irrespective of the duration of the pregnancy, which, 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" (AIHW 2022). In this report, live births are included if they meet the WHO definition and if they are of 20 weeks or more gestation or 400 grams or more birthweight. Live births are counted as birth events, e.g. the birth of one or more liveborn infants. For example, where a multiple birth (twins, triplets) results in a liveborn and a stillborn baby, this is still considered one live birth.

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

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

**OHSS (ovarian hyperstimulation syndrome):** the complication of ovulation stimulation therapy, which involves the administration of follicle stimulating hormone (FSH). OHSS symptoms include abdominal pain and fluid retention.

**Oocyte (egg):** a female reproductive cell.

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

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

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

**PGT (preimplantation genetic testing):** a procedure where DNA from oocytes or embryos is tested for chromosomal disorders or genetic diseases before embryo transfer. This term includes PGT for aneuploidies (PGT-A); PGT for monogenic/single gene defects (PGT-M); and PGT for chromosomal structural rearrangements (PGT-SR).

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

**Preterm:** a gestation of less than 37 weeks.

**Recipient cycle:** an ART treatment cycle in which a female patient who is an intended parent receives oocytes/embryos from another individual/couple who is not an intended parent, or where a female intended parent receives oocytes/embryos from a female partner who is also an intended parent, to achieve a pregnancy.

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

**Singleton:** refers to the birth of only one child during a single birth event.

**Stillbirth:** the birth of an infant after 20 or more weeks gestation or 400 grams or more birthweight that shows no signs of life.

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

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

**Thawed embryo:** an embryo thawed after cryopreservation. It is used in thaw cycles or lab-only cycles.

**Treatment cycle:** involves an attempted/actual medical procedure being carried out on a female patient and includes the following scenarios:

- ovarian stimulation with the intention of oocyte collection in autologous or donation cycle
- attempted/actual oocyte collection, whether in a stimulated or unstimulated, autologous or donation cycle
- attempted/actual oocyte thaw with the intention of fertilisation and embryo transfer
- attempted/actual embryo thaw with the intention of embryo transfer
- insemination of donated sperm as part of an intrauterine insemination (IUI) cycle.

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

*Note:* The International Committee Monitoring Assisted Reproductive Technologies (ICMART) has published an Infertility and Fertility Care glossary for the terms used in ART data collections (Zegers-Hochschild et al. 2017). However, the terminology used in this report may differ from that in the ICMART glossary.

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# List of Figures

# List of Tables

There were **112,707** ART cycles reported from Australian and New Zealand fertility clinics in 2023, resulting in **20,174** liveborn babies.