National Perinatal Epidemiology and Statistics Unit (NPESU)

Assisted Reproductive Technology in New Zealand 2022

June 2025

Foreword

The Advisory Committee on Assisted Reproductive Technology (ACART) is pleased to present this report, Assisted Reproductive Technology in New Zealand 2022, the fourteenth New Zealand-specific report based on the Australian and New Zealand Assisted Reproduction Database (ANZARD). The report provides a quantitative summary of the numbers, types and outcomes of assisted reproductive technology (ART) in Aotearoa New Zealand.

ACART commissions this report every year as part of its statutory role to monitor the outcomes of ART in Aotearoa New Zealand.

We trust that the report will be useful to the sector including consumers, and researchers of ART health outcomes.

It is interesting to note the overall increase in use of ART cycles throughout recent years. The number of cycles per 1,000 women of reproductive age has risen from 6.5 in 2014 to 8.4 in 2022.

This is also the fourth ANZARD report to include reporting on outcomes by ethnicity which is consistent with other reporting in Aotearoa New Zealand. While it is still too early to identify trends in this ethnicity data, we hope that this will provide useful insights in the coming years.

ACART thanks the Ministry of Health for procuring this report. We also thank the National Perinatal Epidemiology and Statistics Unit at the University of New South Wales for collaborating with ACART to develop the report.

Debbie Wilson
Chair, Advisory Committee on Assisted Reproductive Technology

August 2025

Acknowledgments

The authors of this report acknowledge the Traditional Owners of Country throughout Australia. We pay our respects to the people, the culture, and the Elders past and present. We acknowledge Māori as the tangata whenua of Aotearoa and recognise our responsibility under Te Tiriti o Waitangi to deliver better health outcomes for iwi, hapū, whānau Māori and Māori communities.

The Australian and New Zealand Assisted Reproduction Database (ANZARD) is a collaborative effort between the National Perinatal Epidemiology and Statistics Unit (NPESU), the Fertility Society of Australia and New Zealand (FSANZ), and fertility clinics in Australia and New Zealand. The NPESU is a unit within the Centre for Big Data Research in Health and the School of Clinical Medicine of the University of New South Wales (UNSW), Sydney.

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

Abbreviations

ANZARD	Australian and New Zealand Assisted Reproduction Database
ART	assisted reproductive technology
DET	double embryo transfer
DI	donor sperm insemination
FSANZ	Fertility Society of Australia and New Zealand
FSH	follicle stimulating hormone
GIFT	gamete intrafallopian transfer
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
PGT	preimplantation genetic testing
RTAC	Reproductive Technology Accreditation Committee
SD	standard deviation
SET	single embryo transfer

UNSW	University of New South Wales
WHO	World Health Organization

Symbols

..	not applicable

Terminology

In this report, the terms ‘woman’, ‘women’ and ‘female patient’ refer to individuals recorded as ‘female’ in ANZARD, which is based on sex at birth. Information on gender is not recorded in ANZARD.

It is acknowledged that this report may include individuals who do not identify as women and that individual patients and families may use different words to those used in this report. This may include women, transgender men, intersex people, non-binary and gender diverse people.

Contents

Summary

ART treatment cycles

There were 8,652 assisted reproductive technology (ART) treatment cycles reported from New Zealand fertility clinics in 2022. This represented 8.4 cycles per 1,000 women of reproductive age (15-44 years) in New Zealand. Women used their own oocytes/embryos (autologous) in 93.5% of treatments and 49.5% of these autologous cycles involved frozen/thawed embryos.

Treatment outcomes and number of babies

Of all the ART treatments in 2022, 29.8% (2,574) resulted in a clinical pregnancy, 23.9% (2,069) resulted in a birth, and 23.7% (2,048) in a live birth. There were 2,073 liveborn babies, of which 86% (1,782) were singletons at term (gestational age of 37-41 weeks) with normal birthweight (≥ 2,500 grams).

Women's age and parity

The average age of women undertaking autologous and oocyte/embryo recipient cycles was 35.6 years. For women undergoing oocyte/embryo recipient cycles, the mean age was 39.5 years, four years older than for autologous cycles (mean 35.4 years). Of all autologous and oocyte/embryo recipient cycles, 19.7% were undertaken by women aged 40 years or older. Where parity was stated, 55.1% of autologous cycles were undertaken by nulliparous women compared with 39.8% for oocyte/embryo recipient cycles.

Autologous fresh cycles

The overall live birth rate per autologous fresh embryo transfer cycle was 28.6%. The highest live birth rate per autologous fresh embryo transfer cycle was in women aged less than 30 years (42.1%) and declined with an increase in women's age. Overall, 98.1% of autologous fresh embryo transfer cycles were single embryo transfer (SET) cycles, 1.9% were double embryo transfer (DET) cycles. The rates of clinical pregnancy and live birth were higher in blastocyst transfer cycles than in cleavage stage embryo transfer cycles regardless of a woman's age.

Autologous thaw cycles

The overall live birth rate per autologous thaw embryo transfer cycle was 37.7%. The highest live birth rate per embryo transfer cycle was in women aged less than 30 years (45.8%). Of the 3,978 frozen/thawed embryo transfer cycles, 98% were SET cycles and 2% were DET cycles. The rates of clinical pregnancy and live birth overall, were higher in blastocyst transfer cycles than in cleavage stage embryo transfer cycles.

Births by plurality and maternal age

Of the 2,042 births following autologous and recipient cycles in 2022, 1.3% were multiple gestation births. The proportion of multiple gestation births was less than 2% in all age groups.

Cumulative live birth rates

ANZARD includes data items which make it possible to follow a woman from her first fresh ART treatment cycle through subsequent fresh and thaw cycles. There were 2,359 women identified as having their first fresh autologous cycle in 2020. These women were followed through their subsequent fresh and thaw cycles until 31st December 2022 or until they achieved a live birth (up to October 2023). For women identified in this cohort, the cumulative live birth rate was 32.8% after the first cycle, increasing to 47.7% after two cycles, 56.4% after three cycles, 60.5% after four cycles, and 62.2% after five cycles.

1 Introduction

Estimates suggest that approximately one in six people of reproductive age experience infertility in their lifetime (World Health Organization, 2023). Infertility is a disease condition or status characterised by any of the following (Australian and New Zealand Society for Reproductive Endocrinology and Infertility, 2024):

1. The inability to achieve a successful pregnancy based on a patient's medical, sexual, and reproductive history, age, physical findings, diagnostic testing, or any combination of those factors.

2. The need for medical intervention, including, but not limited to, the use of donor gametes or donor embryos in order to achieve a successful pregnancy either as an individual or with a partner.

3. In patients having regular, unprotected intercourse and without any known aetiology for either partner suggestive of impaired reproductive ability, evaluation should be initiated at 12 months when the female partner is under 35 years of age and at 6 months when the female partner is 35 years of age or older.

Infertility is increasingly being overcome through advancements in fertility treatment, such as assisted reproductive technologies (ARTs). 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 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 facilitate national and international comparisons.

The Fertility Society of Australia and New Zealand (FSANZ), in collaboration with the University of New South Wales (UNSW), are committed to providing informative annual statistics on ART treatments and is pleased to present the annual report on the use of ART in New Zealand in 2022.

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. Controlled ovarian hyperstimulation during which an ovarian stimulation regimen, typically using follicle stimulating hormone (FSH) or gonadotrophins, is administered to a woman over a number of days to induce the maturation of multiple oocytes (eggs).
2. Oocyte pick-up (OPU) where mature oocytes are aspirated from ovarian follicles.
3. Fertilisation of the collected oocytes using the male intending parent or donor sperm.
4. Embryo maturation 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 a 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 hyperstimulation protocols and numerous variations to the typical fresh IVF treatment cycle described above. Some of these variations include:

- intracytoplasmic sperm injection (ICSI) – when a single sperm is injected directly into the oocyte
- assisted hatching – when the outer layer of the embryo, the zona pellucida, is either thinned or perforated in the laboratory to aid 'hatching' of the embryo
- gamete intrafallopian transfer (GIFT) – when mature oocytes and sperm are placed directly into a woman's fallopian tubes so that fertilisation may take place *in vivo* (inside the body). While once popular, this procedure now accounts for only a very small percentage of ART cycles.
- preimplantation genetic 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 intending parent, intends to donate or donates her oocytes/embryos to others, or where a female intending parent provides oocytes/embryos to a female partner who is also an intending parent.
- oocyte/embryo recipient – when a female patient who is an intending parent receives oocytes/embryos from another individual/couple who is not an intending parent, or where a female intending parent receives oocytes/embryos from a female partner who is also an intending 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 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 'intending parent(s)', with the intention that the child will be raised by the intending parent(s). The oocytes and/or sperm used to create the embryo(s) in the cycle can be either from the intending parent(s) or from a donor(s).

Along with ART, there are other fertility treatments that are undertaken in New Zealand. Artificial insemination is one such treatment by which sperm are placed into the female genital tract (for example, intracervical or intrauterine), and can be used with controlled ovarian hyperstimulation or in natural cycles. Artificial insemination can be undertaken using a partner's sperm, or donated sperm, also known as 'donor sperm insemination' (DI). 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 and the resulting pregnancy and birth outcomes. Also included is an analysis of trends in ART treatments and outcomes in the five years from 2018 to 2022. The data presented in this report were supplied by seven fertility centres and compiled into the Australian and New Zealand Assisted Reproduction Database (ANZARD). 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 for treatments performed from 2020 to accommodate new treatment types and reflect different types of patients involved in ART treatments. ANZARD 3.0 collects more information about the intending parents, causes of infertility, period of infertility, PGT, lab-only cycles and fertility preservation.

A more detailed description of ANZARD 3.0 can be found in Appendix B.

Structure of this report

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

Chapter 2 – 'Overview of ART treatment in 2022', provides an outline of the numbers and outcomes of all ART treatments undertaken in New Zealand.

Chapter 3 – 'Autologous and donation/recipient cycles in 2022', presents data on women undergoing treatment, cycle types, and the outcomes of treatment.

Chapter 4 – 'Pregnancy and birth outcomes following autologous and recipient cycles in 2022', presents data on the outcomes of clinical pregnancies and births following autologous and recipient cycles including a description of perinatal outcomes.

Chapter 5 – 'Preimplantation genetic testing in 2022', includes information on the numbers of embryos that had cells removed and analysed for chromosomal disorders or genetic diseases before transfer.

Chapter 6 – 'Donor insemination cycles in 2022', presents data on DI cycles and their outcomes, including a description of pregnancy and perinatal outcomes.

Chapter 7 – 'Trends in ART treatment and outcomes 2018-2022', presents trends in ART treatment over the last five years of data collection in New Zealand.

Chapter 8 – 'Cumulative success rates for women undertaking autologous treatment 2020-2022', presents information on all women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020.

Chapter 9 – 'Cumulative success rates for women undertaking autologous treatment 2019-2022', presents information on all women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019.

Appendices – Appendix A lists the contributing fertility clinics. Appendix B provides an overview of the ANZARD 3.0 data collection that was used to prepare this report.

2 Overview of ART treatment in 2022

There were 8,652 assisted reproductive technology (ART) treatment cycles reported from New Zealand clinics in 2022 (Table 1). This represented 8.4 cycles per 1,000 women of reproductive age (15-44 years) in New Zealand (Statistics New Zealand, 2024). Of these, 8,090 (93.5%) were autologous cycles (where a woman used or intended to use her own oocytes or embryos).

Of the 8,090 autologous cycles, 4,087 (50.5%) were fresh cycles and 4,003 (49.5%) were thaw cycles. Other treatment cycles accounted for a small proportion of cycles comprising 3.4% oocyte recipient cycles, 0.9% embryo recipient cycles, 1.4% oocyte/embryo donation cycles and 0.8% surrogacy cycles.

Of all the ART cycles in 2022 in New Zealand, 2,574 (29.8%) resulted in a clinical pregnancy, 2,069 (23.9%) resulted in a birth and 2,048 (23.7%) resulted in a live birth. Of the 2,073 liveborn babies, 1,782 (86%) were singletons at term (gestational age of 37-41 weeks) with normal birthweight (≥ 2,500 grams).

Table 1: Number of initiated ART treatment cycles by treatment type, New Zealand, 2022

Treatment type	Number of initiated ART cycles	Percent of treatment types	Number of clinical pregnancies	Number of live births	Number of liveborn babies	Number of liveborn singletons at term with normal birthweight
Autologous	8,090	93.5	2,380	1,897	1,920	1,656
Fresh	*4,087*	*47.2*	*510*	*398*	*401*	*352*
Thaw	*4,003*	*46.3*	*1,870*	*1,499*	*1,519*	*1,304*
Oocyte recipient	293	3.4	125	96	97	77
Embryo recipient	81	0.9	36	28	29	24
Oocyte donation	107	1.2	..	..	..	..
Embryo donation	14	0.2	..	..	..	..
Surrogacy arrangement cycles	67	0.8	33	27	27	25
Commissioning cycles[(a)]	*1*	*0.0*	..	..	..	..
Gestational carrier cycles[(b)]	*66*	*0.8*	*33*	*27*	*27*	*25*
Total	**8,652**	**100.0**	**2,574**	**2,048**	**2,073**	**1,782**

(a) A variety of cycle types undertaken as part of surrogacy arrangements, e.g. cycles undertaken by intending parent(s) providing their oocytes or embryos for use by the surrogate gestational carrier.
(b) A cycle undertaken by a female patient who carries, or intends to carry, a child on behalf of the intending parent(s) with an agreement that the child will be raised by the intending parent(s).
Note: 'not applicable' is denoted by ..

2.1 Ethnicity

In 2022, there were 5,167 women that undertook 8,585 initiated ART treatment cycles (excluding surrogacy cycles) (Table 2 and Table 3). The largest proportion of these cycles was undertaken by women of European ethnicity (55.6%), followed by women of Asian ethnicity (23.5%) (Table 2).

In 2022, there were 121 oocyte/embryo donation cycles and 374 oocyte/embryo recipient cycles. Noting that, oocytes or embryos in a recipient cycle may be from a donation cycle that occurred in 2022, or a previous treatment year or may have been received from overseas.

Table 2: Number of initiated ART treatment cycles (excluding surrogacy) by ethnicity, New Zealand, 2022

Ethnicity[a]	Autologous							
	Fresh	Thaw	Oocyte recipient	Embryo recipient	Oocyte donation	Embryo donation	Total	Mean age (years)[b]
				n				
European	2,213	2,249	184	44	73	6	4,769	35.4
Māori	172	173	15	9	5	1	375	34.3
Pacific Peoples	96	85	6	0	0	0	187	34.7
Asian	1,027	930	42	4	10	2	2,015	36.1
Middle Eastern/Latin American/African	174	160	9	0	3	0	346	36.2
Other ethnicity	26	43	6	0	3	1	79	36.0
Residual categories[c]	379	363	31	24	13	4	814	35.9
Total	**4,087**	**4,003**	**293**	**81**	**107**	**14**	**8,585**	**35.6**
				%				
European	54.1	56.2	62.8	54.3	68.2	42.9	55.6	n/a
Māori	4.2	4.3	5.1	11.1	4.7	7.1	4.4	n/a
Pacific Peoples	2.3	2.1	2.0	0.0	0.0	0.0	2.2	n/a
Asian	25.1	23.2	14.3	4.9	9.3	14.3	23.5	n/a
Middle Eastern/Latin American/African	4.3	4.0	3.1	0.0	2.8	0.0	4.0	n/a
Other ethnicity	0.6	1.1	2.0	0.0	2.8	7.1	0.9	n/a
Residual categories[c]	9.3	9.1	10.6	29.6	12.1	28.6	9.5	n/a
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	n/a

(a) Ethnicity groups descriptions are sourced from the Ministry of Health, New Zealand website.
(b) Age at start of initiated treatment cycle.
(c) Cycles where ethnicity was reported as “Don’t know”, “Refused to answer”, “Response unidentifiable” or “Not stated”.

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

In 2022, a total of 5,167 women undertook at least one ART treatment cycle (excluding surrogacy). Of these, 2,021 women (39.1%) had a live birth. The mean age of women undertaking ART treatment cycles was 35.6 years. Women of European ethnicity made up almost two thirds (59.6%) of the women who had a live birth (Table 3).

Table 3: Number of women undertaking ART treatment cycles (excluding surrogacy) by ethnicity, New Zealand, 2022

	Women		Women who had a live birth[b]		Mean age (years) [c]
Ethnicity[a]	**n**	**%**	**n**	**%**	
European	2,808	54.3	1,205	59.6	35.4
Māori	239	4.6	93	4.6	34.5
Pacific Peoples	124	2.4	43	2.1	34.8
Asian	1,227	23.7	403	19.9	36.0
Middle Eastern/Latin American/African	202	3.9	83	4.1	36.4
Other ethnicity	57	1.1	24	1.2	36.6
Residual categories[d]	502	9.7	166	8.2	36.1
Multiple ethnicities[e]	8	0.2	4	0.2	35.1
Total	**5,167**	**100.0**	**2,021**	**100.0**	**35.6**

(a) Ethnicity groups descriptions are sourced from the Ministry of Health, New Zealand website.
(b) Excludes oocyte donation cycles because oocyte donation cycles do not involve an embryo transfer in that woman.
(c) Age at start of the first initiated treatment cycle in the treatment year.
(d) Cycles where ethnicity was reported as “Don’t know”, “Refused to answer”, “Response unidentifiable” or “Not stated”.
(e) Women reported at least two different ethnicities across two or more cycles.

3 Autologous and donation/recipient cycles in 2022

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

An ‘autologous cycle’ is defined as an ART treatment cycle in which a female intending 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 intending parent, intends to donate or donates, her oocytes/embryos to others or where a female intending parent provides oocytes/embryos to a female partner who is also an intending parent. The use of donor sperm does not influence the donor status of the cycle.

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

Age of women and their partners

The average age of women undertaking autologous and oocyte/embryo recipient cycles was 35.6 years (SD 4.5). For women undergoing oocyte/embryo recipient cycles, the mean age was 39.5 years (SD 5.5); four years older than women undertaking autologous cycles (mean 35.4 years; SD 4.2). Of all autologous and oocyte/embryo recipient cycles, 19.7% were undertaken by women aged 40 years or older (Table 4). The average age of male partners was 37.8 years (SD 6.3), with about one-third (30.1%) aged 40 years or older (Table 5). The average of female partners was 37.2 years (SD 5.8). For 10% of autologous and oocyte/embryo recipient cycles, the male partner's age was not stated, no partner was involved, or the partner was female.

Table 4: Number of autologous and recipient cycles by women's age group and treatment type, New Zealand, 2022

	Autologous							
	Fresh		Thaw		Oocyte/Embryo Recipient		All	
Age group (years)[(a)]	n	%	n	%	n	%	n	%
<30	360	8.8	359	9.0	11	2.9	730	8.6
30-34	1,244	30.4	1,322	33.0	67	17.9	2,633	31.1
35-39	1,714	41.9	1,631	40.7	91	24.3	3,436	40.6
40-44	734	18.0	656	16.4	131	35.0	1,521	18.0
≥45	35	0.9	35	0.9	74	19.8	144	1.7
Total	**4,087**	**100.0**	**4,003**	**100.0**	**374**	**100.0**	**8,464**	**100.0**

(a) Age at start of treatment cycle.
Note: Data are collected for each treatment cycle. Therefore, some individuals may be counted more than once.

Table 5: Number of autologous and recipient cycles by women's male partners' age group and treatment type, New Zealand, 2022

	Autologous							
	Fresh		Thaw		Oocyte/Embryo Recipient		All	
Age group (years)[(a)]	n	%	n	%	n	%	n	%
<30	217	5.3	219	5.5	9	2.4	445	5.3
30-34	921	22.5	990	24.7	40	10.7	1,951	23.1
35-39	1,220	29.9	1,382	34.5	67	17.9	2,669	31.5
40-44	723	17.7	780	19.5	80	21.4	1,583	18.7
≥45	414	10.1	451	11.3	102	27.3	967	11.4
Not stated	592	14.5	181	4.5	76	20.3	849	10.0
Total	**4,087**	**100.0**	**4,003**	**100.0**	**374**	**100.0**	**8,464**	**100.0**

(a) Age at start of treatment cycle.
Note: Data are collected for each treatment cycle. Therefore, some individuals may be counted more than once.

Parity

Parity is the number of previous pregnancies of 20 weeks or more gestation experienced by a woman. A woman who has had no previous pregnancies of 20 or more weeks gestation is called nulliparous. A woman who has had at least one previous pregnancy of 20 weeks or more gestation is described as parous. Where parity was stated, 55.1% of autologous cycles compared with 39.8% of oocyte/embryo recipient cycles, were undertaken by nulliparous women (Table 6).

Table 6: Number of autologous and recipient cycles by parity and treatment type, New Zealand, 2022

	Autologous							
	Fresh		Thaw		Oocyte/Embryo Recipient		All	
Parity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Nulliparous	2,807	68.7	1,654	41.3	149	39.8	4,610	54.5
Parous	1,280	31.3	2,349	58.7	225	60.2	3,854	45.5
Total	**4,087**	**100.0**	**4,003**	**100.0**	**374**	**100.0**	**8,464**	**100.0**

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

Intracytoplasmic sperm injection (ICSI) procedures

Of the 3,248 autologous fresh cycles where fertilisation was attempted, 1,690 (52%) used ICSI procedures and 1,558 (48%) used IVF procedures.

Table 7: Number of autologous and recipient cycles with fertilisation attempted by treatment type and procedure, New Zealand, 2022

	Autologous				Oocyte/Embryo Recipient			
	Fresh[(a)]		Thaw[(b)]		Fresh[(a)]		Thaw[(b)]	
Procedure	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
IVF	1,558	48.0	1,946	48.9	10	50.0	153	43.2
ICSI[(c)]	1,690	52.0	2,032	51.1	7	35.0	198	55.9
Not stated	0	0.0	0	0.0	3	15.0	3	0.8
Total	**3,248**	**100.0**	**3,978**	**100.0**	**20**	**100.0**	**354**	**100.0**

(a) Fresh cycles where fertilisation was attempted.
(b) Thaw cycles where embryos were transferred.
(c) Mixed IVF/ICSI cycles were classed as ICSI cycles.

Number of embryos transferred

Of the 5,725 fresh and thawed autologous and recipient embryo transfer cycles, 98.1% were single embryo transfer (SET) cycles, 1.9% were double embryo transfer (DET) cycles and there were no cycles involving the transfer of three or more embryos. In women aged under 35, 98.8% of embryo transfer cycles were SET cycles and 1.2% were DET cycles. In women aged 35 or older, 97.6% of cycles were SET cycles and 2.4% were DET cycles (Table 8).

Table 8: Number of embryo transfer cycles by number of embryos transferred per cycle and women's age group, New Zealand, 2022

	Number of embryos transferred							
	One		Two		Three or more		All	
Age group (years)[(a)]	n	%	n	%	n	%	n	%
<30	460	99.1	4	0.9	0	0.0	464	100.0
30-34	1,744	98.8	22	1.2	0	0.0	1,766	100.0
35-39	2,302	98.5	35	1.5	0	0.0	2,337	100.0
40-44	995	95.8	44	4.2	0	0.0	1,039	100.0
≥45	113	95.0	6	5.0	0	0.0	119	100.0
Total	**5,614**	**98.1**	**111**	**1.9**	**0**	**0.0**	**5,725**	**100.0**

(a) Age at start of a treatment cycle.

Stage of embryo development

Of the 5,725 embryo transfer cycles, 88.9% involved the transfer of blastocysts (day 5-6 embryos) with the remaining transfers involving cleavage stage embryos (day 2-4 embryos). Of autologous cycles, blastocyst transfers made up 99% of thaw cycles compared with 57.9% of fresh cycles (Table 9).

Table 9: Number of embryo transfer cycles by treatment type and stage of embryo development, New Zealand, 2022

	Autologous				Oocyte/embryo recipient			
	Fresh		Thaw		Fresh		Thaw	
Type and procedure	n	%	n	%	n	%	n	%
Cleavage embryo	585	42.1	39	1.0	2	40.0	8	2.3
Blastocyst	806	57.9	3,939	99.0	3	60.0	343	97.7
Total	**1,391**	**100.0**	**3,978**	**100.0**	**5**	**100.0**	**351**	**100.0**

Transfer of cryopreserved embryos

Embryos created in a fresh cycle can be cryopreserved by either slow freezing or ultra-rapid cryopreservation (vitrification) methods. Slow frozen and vitrified embryos can be thawed/warmed and then transferred in subsequent cycles. Of the 4,329 frozen/thawed embryo transfer cycles, 97.7% involved the transfer of vitrified embryos (Table 10).

Table 10: Number of embryo transfer cycles by freezing method and stage of embryo development, New Zealand, 2022

	Autologous				Oocyte/embryo recipient			
	Cleavage embryo		Blastocyst		Cleavage embryo		Blastocyst	
Type and procedure	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Slow frozen embryo	24	61.5	67	1.7	4	50.0	5	1.5
Vitrified embryo[(a)]	15	38.5	3,872	98.3	4	50.0	338	98.5
Total	**39**	**100.0**	**3,939**	**100.0**	**8**	**100.0**	**343**	**100.0**

(a) Ultra-rapid cryopreservation.

3.2 Autologous fresh cycles

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

The highest live birth rate per embryo transfer cycle was in women aged less than 30 years (42.1%). The overall live birth rate per autologous fresh embryo transfer cycle was 28.6% and the overall live birth rate per initiated autologous fresh cycle (excluding freeze-all) was 19.2% (Table 11).

Table 11: Outcomes of autologous fresh cycles by women's age group, New Zealand, 2022

	Age group (years) [a]					
Stage/outcome of treatment	**< 30**	**30-34**	**35-39**	**40-44**	**≥ 45**	**All**
Initiated cycles	360	1,244	1,714	734	35	4,087
Freeze-all cycles	237	703	783	285	4	2,012
Cycles with OPU	349	1,176	1,568	633	30	3,756
Embryo transfers	95	386	634	263	13	1,391
Clinical pregnancies	51	182	228	49	0	510
Live births	40	157	171	30	0	398
Live births per initiated cycle (%)	*11.1*	*12.6*	*10.0*	*4.1*	*0.0*	*9.7*
Live births per initiated cycle (excluding freeze-all) (%)	*32.5*	*29.0*	*18.4*	*6.7*	*0.0*	*19.2*
Live births per embryo transfer cycle (%)	*42.1*	*40.7*	*27.0*	*11.4*	*0.0*	*28.6*
Live births per clinical pregnancy (%)	*78.4*	*86.3*	*75.0*	*61.2*	..	*78.0*

(a) Age at start of a treatment cycle.
(b) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
.. not applicable

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

Overall, 98.1% of autologous fresh embryo transfer cycles were SET cycles and 1.9% were DET cycles. Overall, the live birth rate per embryo transfer cycle was 28.6% for SET cycles and 30.8% for DET cycles (Table 12).

Table 12: Outcomes of autologous fresh embryo transfer cycles by women's age and number of embryos transferred, New Zealand, 2022

	Age group (years)[a]							
	< 35		**35-39**		**≥ 40**		**All**	
Stage/outcome of treatment	**SET[b]**	**DET[c]**	**SET[b]**	**DET[c]**	**SET[b]**	**DET[c]**	**SET[b]**	**DET[c]**
Embryo transfer cycles	478	3	626	8	261	15	1,365	26
Clinical pregnancies	231	2	225	3	46	3	502	8
Live births	195	2	168	3	27	3	390	8
Clinical pregnancies per embryo transfer cycle (%)	*48.3*	*66.7*	*35.9*	*37.5*	*17.6*	*20.0*	*36.8*	*30.8*
Live births per embryo transfer cycle (%)	*40.8*	*66.7*	*26.8*	*37.5*	*10.3*	*20.0*	*28.6*	*30.8*

(a) Age at start of a treatment cycle.
(b) SET: single embryo transfer.
(c) DET: double embryo transfer.

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

The rates of clinical pregnancy and live birth were higher in blastocyst transfer cycles than in cleavage stage embryo transfer cycles regardless of a woman's age (Table 13). Overall, the live birth rate for blastocyst transfer cycles (34.2%) was 13 percentage points higher than for cleavage stage embryo transfer cycles (20.9%).

Table 13: Outcomes of autologous fresh embryo transfer cycles by women's age and stage of embryo development, New Zealand, 2022

	Age group (years)[a]							
	< 35		35-39		≥ 40		All	
Stage/outcome of treatment	**CL[b]**	**BL[c]**	**CL[b]**	**BL[c]**	**CL[b]**	**BL[c]**	**CL[b]**	**BL[c]**
Embryo transfer cycles	152	329	260	374	173	103	585	806
Clinical pregnancies	58	175	81	147	26	23	165	345
Live births	50	147	56	115	16	14	122	276
Clinical pregnancies per embryo transfer cycle (%)	*38.2*	*53.2*	*31.2*	*39.3*	*15.0*	*22.3*	*28.2*	*42.8*
Live births per embryo transfer cycle (%)	*32.9*	*44.7*	*21.5*	*30.7*	*9.2*	*13.6*	*20.9*	*34.2*

(a) Age at start of a treatment cycle.
(b) CL: cleavage stage embryo.
(c) BL: blastocyst.

3.3 Autologous thaw cycles

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

The overall live birth rate per autologous thaw embryo transfer cycle was 37.7%. The highest live birth rate per embryo transfer cycle (45.8%) and per clinical pregnancy (85.9%) was in women aged less than 30 years (Table 14). It is important to note that embryos thawed during a thaw cycle were created during 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.

Table 14: Outcomes of autologous thaw cycles by women's age group, New Zealand, 2022

	Age group (years) [a]					
Stage/outcome of treatment	**<30**	**30-34**	**35-39**	**40-44**	**≥ 45**	**All**
Initiated cycles	359	1,322	1,631	656	35	4,003
Embryo transfers	358	1,317	1,619	650	34	3,978
Clinical pregnancies	191	693	737	239	10	1,870
Live births	164	556	588	185	6	1,499
Live births per initiated cycle (%)	*45.7*	*42.1*	*36.1*	*28.2*	*17.1*	*37.4*
Live births per embryo transfer cycle (%)	*45.8*	*42.2*	*36.3*	*28.5*	*17.6*	*37.7*
Live births per clinical pregnancy (%)	*85.9*	*80.2*	*79.8*	*77.4*	*60.0*	*80.2*

(a) Age at start of a treatment cycle.

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

Of the 3,978 autologous thaw embryo transfer cycles, 98% were SET cycles and 2% were DET cycles. There were no cycles where three or more embryos were transferred. In total, there were 1,870 clinical pregnancies and 1,499 live births. SET cycles had a higher percentage of live births per embryo transfer cycle (37.8%) than DET cycles (30.4%) (Table 15).

Table 15: Outcomes of autologous thaw embryo transfer cycles by women's age and number of embryos transferred, New Zealand, 2022

	Age group (years) [a]							
	<35		**35-39**		**≥ 40**		**All**	
Stage/outcome of treatment	**SET[b]**	**DET[c]**	**SET[b]**	**DET[c]**	**SET[b]**	**DET[c]**	**SET[b]**	**DET[c]**
Embryo transfer cycles	1,652	23	1,593	26	654	30	3,899	79
Clinical pregnancies	871	13	724	13	238	11	1,833	37
Live births	710	10	579	9	186	5	1,475	24
Clinical pregnancies per embryo transfer cycle (%)	*52.7*	*56.5*	*45.4*	*50.0*	*36.4*	*36.7*	*47.0*	*46.8*
Live births per embryo transfer cycle (%)	*43.0*	*43.5*	*36.3*	*34.6*	*28.4*	*16.7*	*37.8*	*30.4*

(a) Age at start of a treatment cycle.
(b) SET: single embryo transfer.
(c) DET: double embryo transfer.

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

The live birth rate was higher for blastocyst transfer cycles than for cleavage stage embryo transfer cycles regardless of a woman's age. Overall, the rate of live birth for blastocyst transfer cycles (37.9%) was 25 percentage points higher than for cleavage stage embryo transfer cycles (12.8%) (Table 16).

Table 16: Outcomes of autologous thaw embryo transfer cycles by women's age and stage of embryo development, New Zealand, 2022

	Age group (years) [a]							
	<35		35-39		≥ 40		All	
Stage/outcome of treatment	**CL[b]**	**BL[c]**	**CL[b]**	**BL[c]**	**CL[b]**	**BL[c]**	**CL[b]**	**BL[c]**
Embryo transfer cycles	13	1,662	15	1,604	11	673	39	3,939
Clinical pregnancies	7	877	3	734	1	248	11	1,859
Live births	3	717	1	587	1	190	5	1,494
Clinical pregnancies per embryo transfer cycle (%)	*53.8*	*52.8*	*20.0*	*45.8*	*9.1*	*36.8*	*28.2*	*47.2*
Live births per embryo transfer cycle (%)	*23.1*	*43.1*	*6.7*	*36.6*	*9.1*	*28.2*	*12.8*	*37.9*

(a) Age at start of a treatment cycle.
(b) CL: cleavage stage embryo.
(c) BL: blastocyst.

3.4 Donation and recipient cycles

Oocyte/embryo donation cycles

Of the 121 cycles where the intention was to donate oocytes or embryos to a recipient/intending parent(s), all but three cycles proceeded to OPU (97.5%) and 102 (84.3%) of these resulted in oocytes or embryos being donated. The average age of women donating oocytes or embryos was 32.8 years with 37.2% of donation cycles undertaken by women aged 35 or older (Table 17).

Table 17: Number of oocyte/embryo donation cycles by donor's age group, New Zealand, 2022

Age group (years)[(a)]	Initiated cycles (number)	Cycles with OPU performed (number)	Cycles with OPU performed (percent)	Cycles with oocytes/embryos donated (number)	Cycles with oocytes/embryos donated (percent)
< 30	22	22	100.0	22	100.0
30-34	54	53	98.1	45	83.3
35-39	40	39	97.5	33	82.5
≥40	5	4	80.0	2	40.0
Total	**121**	**118**	**97.5**	**102**	**84.3**

(a) Age at start of a treatment cycle.

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

There were 374 oocyte/embryo recipient cycles in 2022, the majority of which were oocyte recipient cycles (78.3%). Of the 293 cycles involving donated oocytes, 94.2% were thaw cycles (Table 18). Of the 274 thaw oocyte recipient cycles that proceeded to embryo transfer, 34.7% resulted in a live birth. The live birth rate per embryo transfer for embryo recipient cycles was 35%.

Table 18: Outcomes of oocyte/embryo recipient cycles by treatment type, New Zealand, 2022

Stage/outcome of treatment	Oocyte recipient		Embryo recipient	All
	Fresh	Thaw		
Initiated cycles	17	276	81	374
Embryo transfers	2	274	80	356
Clinical pregnancies	1	124	36	161
Live births	1	95	28	124
Live births per initiated cycle (%)	*5.9*	*34.4*	*34.6*	*33.2*
Live births per embryo transfer cycle (%)	*50.0*	*34.7*	*35.0*	*34.8*
Live births per clinical pregnancy (%)	*100.0*	*76.6*	*77.8*	*77.0*

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

The live birth rates of recipient cycles varied by recipients' age group. The overall live birth rate per initiated cycle was 33.2%. Across the five age groups, live birth rates per initiated cycle ranged between 27.5% and 45.5% (Table 19). Recipients aged less than 30 years of age had the highest live birth rate per embryo transfer cycle (45.5%). These rates are higher compared to live birth rates in Table 11 for autologous fresh cycles (42.1%) and similar to live birth rates in Table 14 for autologous thaw cycles (45.8%) for women aged less than 30 years.

Table 19: Outcomes of oocyte/embryo recipient cycles by recipient's age group, New Zealand, 2022

	Age group (years)[a]					
Stage/outcome of treatment	**< 30**	**30-34**	**35-39**	**40-44**	**≥ 45**	**All**
Initiated cycles	11	67	91	131	74	374
Embryo transfers	11	63	84	126	72	356
Clinical pregnancies	6	26	32	65	32	161
Live births	5	22	25	50	22	124
Live births per initiated cycle (%)	*45.5*	*32.8*	*27.5*	*38.2*	*29.7*	*33.2*
Live births per embryo transfer cycle (%)	*45.5*	*34.9*	*29.8*	*39.7*	*30.6*	*34.8*
Live births per clinical pregnancy (%)	*83.3*	*84.6*	*78.1*	*76.9*	*68.8*	*77.0*

(a) Age at start of a treatment cycle.

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

The overall live birth rate per embryo transfer cycle was 34.8%. Across age categories, the live birth rate per initiated cycle ranged between 26.2% and 45.5%, with the highest live birth rate in the 40 years old and over age group, noting fewer initiated cycles in this age group (Table 20).

Table 20: Outcomes of oocyte/embryo recipient cycles by donor's age group, New Zealand, 2022

	Age group (years)[a]				
Stage/outcome of treatment	**< 30**	**30-34**	**35-39**	**≥ 40**	**All**
Initiated cycles	100	141	122	11	374
Embryo transfers	94	134	117	11	356
Clinical pregnancies	42	65	47	7	161
Live births	34	53	32	5	124
Live births per initiated cycle (%)	*34.0*	*37.6*	*26.2*	*45.5*	*33.2*
Live births per embryo transfer cycle (%)	*36.2*	*39.6*	*27.4*	*45.5*	*34.8*
Live births per clinical pregnancy (%)	*81.0*	*81.5*	*68.1*	*71.4*	*77.0*

(a) Age at start of treatment cycle.

4 Pregnancy and birth outcomes following autologous and recipient cycles in 2022

There were 2,541 clinical pregnancies following autologous and recipient embryo transfer cycles in 2022. Four out of five clinical pregnancies (80.4%) 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 10 clinical pregnancies were not known because the patient could not be followed up or contacted by the fertility centre.

Early pregnancy loss

Of the 489 early pregnancy losses, 91.4% were miscarriages, 4.1% were due to termination of pregnancy, and 4.5% were ectopic/heterotopic pregnancies. Pregnancies following SET resulted in a lower rate of early pregnancy loss (19.1%) than pregnancies following DET (28.6%).

Table 21: Early pregnancy losses by pregnancy outcome and treatment type, New Zealand, 2022

	Autologous							
	Fresh		Thaw		Oocyte/embryo recipient		All	
	n	%	n	%	n	%	n	%
Early pregnancy loss	108	21.2	345	18.4	36	22.4	489	19.2
Miscarriage	*93*	*18.2*	*324*	*17.3*	*30*	*18.6*	*447*	*17.6*
Termination	*5*	*1.0*	*13*	*0.7*	*2*	*1.2*	*20*	*0.8*
Ectopic or heterotopic pregnancy	*10*	*2.0*	*8*	*0.4*	*4*	*2.5*	*22*	*0.9*
Birth	401	78.6	1517	81.1	124	77.0	2,042	80.4
Not stated	1	0.2	8	0.4	1	0.6	10	0.4
Total	**510**	**100.0**	**1,870**	**100.0**	**161**	**100.0**	**2,541**	**100.0**

Birth outcomes and treatment type

There were 2,042 women who gave birth to at least one baby of 20 weeks or more gestation or at least 400 grams birthweight following embryo transfer cycles. Of these, 99% (2,021) gave birth to at least one liveborn baby (live birth) (Table 22).

Table 22: Births by birth outcome and treatment type, New Zealand, 2022

	Autologous							
	Fresh		Thaw		Oocyte/embryo recipient		All	
	n	%	n	%	n	%	n	%
Live birth	398	99.3	1499	98.8	124	100.0	2,021	99.0
< 37 weeks	*34*	*8.5*	*139*	*9.2*	*18*	*14.5*	*191*	*9.4*
≥ 37 weeks	*364*	*90.8*	*1,360*	*89.7*	*85.5*	*85.5*	*1,830*	*89.6*
Gestational age unknown	*0*	*0.0*	*0*	*0.0*	*0.0*	*0.0*	*0*	*0.0*
Stillbirth[(a)]	1	0.2	7	0.5	0.0	0.0	8	0.4
Not stated	2	0.5	11	0.7	0.0	0.0	13	0.6
Total	**401**	**100.0**	**1,517**	**100.0**	**100.0**	**100.0**	**2,042**	**100.0**

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

Births by plurality and maternal age

The average age of women at the time of birth was 35.7 years. Of the 2,042 autologous and recipient births, 1.3% were multiple gestation births (Table 23).

Table 23: Births by plurality and maternal age, New Zealand, 2022

	Age group (years)[a]								
	< 35			35-39			≥ 40		
	One embryo	Two embryos	All	One embryo	Two embryos	All[b]	One embryo	Two embryos	All[b]
				n					
Singleton	796	7	803	818	8	826	376	11	387
Multiple	9	3	12	4	3	7	4	3	7
Twin	*9*	*3*	*12*	*4*	*3*	*7*	*4*	*3*	*7*
Higher order multiple	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total	**805**	**10**	**815**	**822**	**11**	**833**	**380**	**14**	**394**
				%					
Singleton	98.9	70.0	98.5	99.5	72.7	99.2	98.9	78.6	98.2
Multiple	1.1	30.0	1.5	0.5	27.3	0.8	1.1	21.4	1.8
Twin	*1.1*	*30.0*	*1.5*	*0.5*	*27.3*	*0.8*	*1.1*	*21.4*	*1.8*
Higher order multiple	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Age at time of birth.
(b) Includes three or more embryos.

Gestational age of babies

The average gestational age of babies born following autologous and recipient embryo transfer cycles was 38.5 weeks (Table 24). One in ten babies (10.5%) were preterm (less than 37 weeks gestation); the average gestational age of ART singletons was 38.5 weeks, while the average gestational age for ART twins was 35.2 weeks.

Table 24: Babies by gestational age and plurality, New Zealand, 2022

Gestational age (weeks)	Singletons		Twins		Higher order multiples		Total	
Mean (SD)	*38.5 (2.2)*		*35.2 (2.6)*		-		*38.5 (2.3)*	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
≤ 27	17	0.8	2	3.8	0	0.0	19	0.9
28-31	17	0.8	0	0.0	0	0.0	17	0.8
32-36	143	7.1	38	73.1	0	0.0	181	8.8
≥ 37	1,839	91.2	12	23.1	0	0.0	1,851	89.5
Total	**2,016**	**100.0**	**52**	**100.0**	**0**	**0.0**	**2,068**	**100.0**

Birth outcomes

The average birthweight for liveborn babies to women who had autologous and recipient embryo transfer cycles was 3,351 grams. Of all liveborn babies, 7.2% were low birthweight (less than 2,500 grams) (Table 25). The average birthweight was 3,375 grams and 2,446 grams for liveborn ART singletons and twins, respectively. Low birthweight was reported for 5.8% of liveborn singletons following SET.

Table 25: Liveborn babies by birthweight group and plurality, New Zealand, 2022

	Singletons				
Birthweight (grams)	**SET[a]**	**DET[b]**	**Twins**	**Higher order multiples**	**Total**
			n		
< 1,000	*9*	*1*	*2*	*0*	*12*
1,000-1,499	*11*	*0*	*1*	*0*	*12*
1,500-1,999	*21*	*0*	*8*	*0*	*29*
2,000-2,499	*74*	*2*	*19*	*0*	*95*
< 2,500	115	3	30	0	148
2,500-2,999	295	6	11	0	312
3,000-3,499	704	5	8	0	717
3,500-3,999	600	9	2	0	611
≥ 4,000	250	1	0	0	251
Not stated	7	0	0	0	7
Total	**1,971**	**24**	**51**	**0**	**2,046**
			%		
< 1,000	*0.5*	*4.2*	*3.9*	..	*0.6*
1,000-1,499	*0.6*	*0.0*	*2.0*	..	*0.6*
1,500-1,999	*1.1*	*0.0*	*15.7*	..	*1.4*
2,000-2,499	*3.8*	*8.3*	*37.3*	..	*4.6*
< 2,500	5.8	12.5	58.8	..	7.2
2,500-2,999	15.0	25.0	21.6	..	15.2
3,000-3,499	35.7	20.8	15.7	..	35.0
3,500-3,999	30.4	37.5	3.9	..	29.9
≥ 4,000	12.7	4.2	0.0	..	12.3
Not stated	0.4	0.0	0.0	..	0.3
Total	**100.0**	**100.0**	**100.0**	..	**100.0**

(a) SET: single embryo transfer.
(b) DET: double embryo transfer.
.. not applicable

5 Preimplantation genetic testing in 2022

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).

In 2022, PGT was performed in 954 cycles, representing 12.8% of cycles in which embryos were created or thawed. Among the 954 PGT cycles, 421 (44.1%) were part of a freeze-all cycle. Of the 533 PGT cycles (excluding freeze-all cycles), 529 (99.2%) had embryos transferred, resulting in 257 (48.2%) clinical pregnancies and 220 (41.3%) live births.

Table 26: Number of cycles with PGT by type of embryo, New Zealand, 2022

	Stage of treatment			
Type of embryo	**Number of cycles with fresh or thawed embryos**	**Number of cycles with PGT**	**Number of embryo transfers following PGT**	**Number of live births following PGT**
Fresh	3,125	463	40	9
Freeze-all cycles	*1,557*	*421*	..	..
Thaw	4,357	491	489	211
Total	**7,482**	**954**	**529**	**220**

.. not applicable
PGT: Preimplantation genetic testing
Note: The ANZARD 2.0 PGT definition was applied to the ANZARD 3.0 data used to create this table.

6 Donor insemination cycles in 2022

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

In 2022, there were 288 DI cycles reported. Of all DI cycles, 21.2% resulted in a clinical pregnancy and 17.4% resulted in a live birth (Table 27). There were six multiple births following DI cycles in 2022. The average age of women who had a DI cycle was 35 years. The clinical pregnancy rate and live birth rate per DI cycle were highest in women aged less than 30 years. Of the DI cycles in women aged under 35 years, 21.5% resulted in a live birth, compared with 5% of DI cycles in women aged 40 years or older (Table 27).

Table 27: Outcomes of DI cycles by women's age group, New Zealand, 2022

	Age group (years)[(a)]				
	< 30	**30-34**	**35-39**	**≥ 40**	**Overall**
DI cycles	26	109	113	40	288
Controlled ovarian hyperstimulation	*0*	*3*	*2*	*0*	*5*
Unstimulated cycles	*26*	*106*	*111*	*40*	*283*
Clinical pregnancies	7	25	27	2	61
Live births	7	22	19	2	50
Clinical pregnancies per DI cycle (%)	*26.9*	*22.9*	*23.9*	*5.0*	*21.2*
Live births per DI cycle (%)	*26.9*	*20.2*	*16.8*	*5.0*	*17.4*
Live births per clinical pregnancy (%)	*100.0*	*88.0*	*70.4*	*100.0*	*82.0*

(a) Age at start of treatment cycle.
DI: Donor sperm insemination

Clinical pregnancies

Of the 61 clinical pregnancies following DI cycles, 11 (18%) ended in early pregnancy loss. Of the 50 births, all were live births. Of the live births, 44 (88%) were singleton births, 5 (10%) were twin births, and one (2%) was a quadruplet birth.

Perinatal outcomes of babies

There were 58 babies born to women who had DI treatment; 57 were liveborn babies. Of these, 9 were born preterm (less than 37 weeks gestation). The mean birthweight of liveborn babies was 3,092 grams (SD 855 grams). There were 13 liveborn babies (22.8%) born with low birthweight (less than 2,500 grams).

7 Trends in ART treatment and outcomes 2018-2022

This section includes autologous cycles, donation/recipient cycles, and surrogacy cycles undertaken in New Zealand from 2018 to 2022. It does not include DI cycles or lab-only cycles.

In 2022, 8,652 initiated fresh or thaw ART treatment cycles were undertaken in New Zealand. This was a decrease of 2.4% compared to 2021 and an increase of 12% from 2018 (Table 28). Between 2018 and 2022, the live birth rates per initiated cycle ranged from 21.9% to 23.7%. In the same time period, the live birth rate per initiated cycle (excluding freeze-all) has ranged between 26.4% and 30.8% (Table 28).

Table 28: Number of fresh and thaw cycles by stage/outcome of treatment, New Zealand, 2018-2022

Stage/outcome of treatment	2018	2019	2020	2021	2022
Initiated cycles[(a)]	7,723	7,880	8,382	8,861	8,652
Cycles with OPU[(b)]	3,502	3,537	3,882	4,090	3,877
Freeze-all	1,213	1,327	1,687	1,945	2,012
Embryo transfers	5,416	5,457	5,852	6,065	5,791
Clinical pregnancies	2,194	2,276	2,460	2,553	2,574
Live births	1,755	1,729	1,987	2,021	2,048
Clinical pregnancies per initiated cycle (%)	*28.4*	*28.9*	*29.3*	*28.8*	*29.8*
Clinical pregnancies per embryo transfer (%)	*40.5*	*41.7*	*42.0*	*42.1*	*44.4*
Live births per initiated cycle (%)	*22.7*	*21.9*	*23.7*	*22.8*	*23.7*
Live births per initiated cycle (excluding freeze-all[(c)]) (%)	*27.0*	*26.4*	*29.7*	*29.2*	*30.8*
Live births per embryo transfer (%)	*32.4*	*31.7*	*34.0*	*33.3*	*35.4*

(a) Included autologous cycles, oocyte donation cycles, oocyte/embryo recipient cycles, and surrogacy cycles.
(b) Cycles with OPU included cycles where no oocytes were collected during the procedure.
(c) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.

8 Cumulative success rates for women undertaking autologous treatment 2020-2022

This section presents information on all women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020. The first cycle is identified according to first stimulation data reported by clinics plus the first occurrence of the woman's autologous fresh cycle in 2020. Women were followed from the start of their first autologous fresh cycle through subsequent fresh and thaw cycles, excluding freeze-all cycles, until 31st December 2022 or until they achieved a live birth (a birth of at least one liveborn baby) up to and including 31st October 2023. This longitudinal perspective provides a measure of the outcomes of successive ART treatment cycles undertaken by the same woman up to her first birth following ART treatment. These women might have had additional treatment cycles after 2022 and their treatment information and resulting outcomes will be captured in subsequent annual reports. Therefore, in this dynamic cohort of women undergoing their first autologous fresh ART treatment between 1st January 2020 and 31st December 2020, the cumulative success rates may increase over time as women return for treatment at a later date.

ART treatment cycles presented in Tables 29 to 34 include all initiated autologous fresh and thaw cycles, excluding freeze-all cycles. Cycles which were cancelled at any stage and did not proceed to oocyte collection or embryo transfer are included. Donor sperm insemination cycles, oocyte/embryo recipient cycles, oocyte/embryo donation cycles, surrogacy arrangement cycles, and gamete intrafallopian transfer (GIFT) cycles are not included. A pregnancy that ends before 20 weeks gestation or a stillbirth are not counted as a live birth.

Table 29 presents the number of cycles by women's age group. Tables 30 to 34 present cycle-specific live birth rates, non-progression rates, and cumulative live birth rates for all age groups and women aged under 30 years, between 30-34 years, between 35-39 years and over 40 years. Only the first five cycles are presented due to the small number of women undertaking six or more treatment cycles between 1st January 2020 and 31st December 2022.

Definitions and calculations

- The cycle-specific live birth rate for a specific number of cycles is calculated as the number of live births resulting from the specific number of cycles divided by the number of women who undertook that cycle number. For instance, in Table 30, the cycle-specific live birth rate of 28.1% for cycle number three represents the proportion of women who undertook a third cycle and achieved a live birth in that cycle.
- The non-progression rate for a specific cycle is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that cycle. For example, the non-progression rate of 22.6% for a third cycle represents the proportion of women who did not achieve a live birth in their third cycle and did not progress to a fourth cycle (Table 30). The reasons surrounding a woman's or couple's choice to not return to or progress with further treatment, include poor prognosis, natural pregnancy, migration, financial, psychological, and other unrelated reasons; these are not collected by ANZARD.

The cumulative live birth rate for a specific cycle is calculated as the total number of live births following this cycle and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020. For example, the cumulative live birth rate of 56.4% for the third cycle represents the proportion of women who started ART treatment in 2020 and achieved a live birth following their first three cycles (Table 30). Note that only the first birth to a woman is counted in cumulative live birth rates.

Table 29: Number of cycles by women's age group for all women who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2020 and 31st December 2020, New Zealand

	Age group (years)[b]				
Cycle number	**< 30**	**30-34**	**35-39**	**≥ 40**	**All**
			n		
One	124	394	401	159	1,078
Two	59	185	235	75	554
Three	45	116	119	42	322
Four	25	72	91	23	211
Five or more	8	71	94	21	194
Total	**261**	**838**	**940**	**320**	**2,359**
			%		
One	47.5	47.0	42.7	49.7	45.7
Two	22.6	22.1	25.0	23.4	23.5
Three	17.2	13.8	12.7	13.1	13.6
Four	9.6	8.6	9.7	7.2	8.9
Five or more	3.1	8.5	10.0	6.6	8.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Age at start of first autologous fresh ART treatment cycle undertaken in 2020.

Note: Women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020 were followed through subsequent fresh and thaw cycles (excluding freeze-all cycles) until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023. 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 30: Cycle-specific and cumulative live birth rates for all women who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2020 and 31st December 2020, New Zealand, 2020-2022

Cycle Number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	2,359	774	32.8	304	19.2	32.8
Two	1,281	352	27.5	202	21.7	47.7
Three	727	204	28.1	118	22.6	56.4
Four	405	98	24.2	113	36.8	60.5
Five	194	39	20.1	54	34.8	62.2

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2020 and 31st December 2020. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 31: Cycle-specific and cumulative live birth rates for women aged less than 30 years who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2020 and 31st December 2020, New Zealand, 2020-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	261	102	39.1	22	13.8	39.1
Two	137	48	35.0	11	12.4	57.5
Three	78	38	48.7	7	17.5	72.0
Four	33	15	45.5	10	55.6	77.8
Five	8	0	0.0	2	25.0	77.8

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2020 and 31st December 2020. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 32: Cycle-specific and cumulative live birth rates for women aged 30-34 years who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2020 and 31st December 2020, New Zealand, 2020-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	838	335	40.0	59	11.7	40.0
Two	444	140	31.5	45	14.8	56.7
Three	259	83	32.0	33	18.8	66.6
Four	143	43	30.1	29	29.0	71.7
Five	71	14	19.7	17	29.8	73.4

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2020 and 31st December 2020. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 33: Cycle-specific and cumulative live birth rates for women aged 35-39 years who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2020 and 31st December 2020, New Zealand, 2020-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	940	286	30.4	115	17.6	30.4
Two	539	141	26.2	94	23.6	45.4
Three	304	69	22.7	50	21.3	52.8
Four	185	37	20.0	54	36.5	56.7
Five	94	24	25.5	26	37.1	59.3

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2020 and 31st December 2020. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 34: Cycle-specific and cumulative live birth rates for women aged 40 years and over who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2020 and 31st December 2020, New Zealand, 2020-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	320	51	15.9	108	40.1	15.9
Two	161	23	14.3	52	37.7	23.1
Three	86	14	16.3	28	38.9	27.5
Four	44	3	6.8	20	48.8	28.4
Five	21	1	4.8	9	45.0	28.8

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2020 and 31st December 2020. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2020 and 31st December 2020.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

9 Cumulative success rates for women undertaking autologous treatment 2019-2022

This section presents information on all women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019. The first cycle is identified according to first stimulation data reported by clinics plus the first occurrence of the woman's autologous fresh cycle in 2019. Women were followed from the start of their first autologous fresh cycle through subsequent fresh and thaw cycles, excluding freeze-all cycles, until 31st December 2022 or until they achieved a live birth (a birth of at least one liveborn baby) up to and including 31st October 2023. This longitudinal perspective provides a measure of the outcomes of successive ART treatment cycles undertaken by the same woman up to her first birth following ART treatment. These women might have had additional treatment cycles after 2022 and their treatment information and resulting outcomes will be captured in subsequent annual reports. Therefore, in this dynamic cohort of women undergoing their first autologous fresh ART treatment between 1st January 2019 and 31st December 2019, the cumulative success rates may increase over time as women return for treatment at a later date.

ART treatment cycles presented in Tables 35 to 40 include all initiated autologous fresh and thaw cycles, excluding freeze-all cycles. Cycles which were cancelled at any stage and did not proceed to oocyte collection or embryo transfer are included. Donor sperm insemination cycles, oocyte/embryo recipient cycles, oocyte/embryo donation cycles, surrogacy arrangement cycles, and gamete intrafallopian transfer (GIFT) cycles are not included. A pregnancy that ends before 20 weeks gestation or a stillbirth are not counted as a live birth.

Table 35 presents the number of cycles by women's age group. Tables 36 to 40 present cycle-specific live birth rates, non-progression rates, and cumulative live birth rates for all age groups and women aged under 30 years, between 30-34 years, between 35-39 years and over 40 years.

Definitions and calculations

- The cycle-specific live birth rate for a specific number of cycles is calculated as the number of live births resulting from the specific number of cycles divided by the number of women who undertook that cycle number. For instance, in Table 36, the cycle-specific live birth rate of 23.5% for cycle number three represents the proportion of women who undertook a third cycle and achieved a live birth in that cycle.
- The non-progression rate for a specific cycle is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that cycle. For example, the non-progression rate of 23.1% for a third cycle represents the proportion of women who did not achieve a live birth in their third cycle and did not progress to a fourth cycle (Table 36). The reasons surrounding a woman's or couple's choice to not return to or progress with further treatment, include poor prognosis, natural pregnancy, migration, financial, psychological, and other unrelated reasons; these are not collected by ANZARD.

  The cumulative live birth rate for a specific cycle is calculated as the total number of live births following this cycle and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st

January 2019 and 31st December 2019. For example, the cumulative live birth rate of 53.7% for the third cycle represents the proportion of women who started ART treatment in 2019 and achieved a live birth following their first three cycles (Table 36). Note that only the first birth to a woman is counted in cumulative live birth rates.

Table 35: Number of cycles by women's age group for all women who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2019 and 31st December 2019, New Zealand

	Age group (years)[b]				
Cycle number	**< 30**	**30-34**	**35-39**	**≥ 40**	**All**
			n		
One	128	319	267	129	843
Two	64	165	193	87	509
Three	20	83	106	45	254
Four	15	48	64	22	149
Five or more	24	58	107	25	214
Total	**251**	**673**	**737**	**308**	**1,969**
			%		
One	51.0	47.4	36.2	41.9	42.8
Two	25.5	24.5	26.2	28.2	25.9
Three	8.0	12.3	14.4	14.6	12.9
Four	6.0	7.1	8.7	7.1	7.6
Five or more	9.6	8.6	14.5	8.1	10.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Age at start of first autologous fresh ART treatment cycle undertaken in 2019.

Note: Women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019 were followed through subsequent fresh and thaw cycles (excluding freeze-all cycles) until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023. 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 36: Cycle-specific and cumulative live birth rates for all women who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2019 and 31st December 2019, New Zealand, 2019-2022

Cycle Number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	1,969	602	30.6	241	17.6	30.6
Two	1,126	310	27.5	199	24.4	46.3
Three	617	145	23.5	109	23.1	53.7
Four	363	86	23.7	63	22.7	58.0
Five	214	53	24.8	46	28.6	60.7

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2019 and 31st December 2019. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 37: Cycle-specific and cumulative live birth rates for women aged less than 30 years who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2019 and 31st December 2019, New Zealand, 2019-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	251	113	45.0	15	10.9	45.0
Two	123	43	35.0	21	26.3	62.2
Three	59	14	23.7	6	13.3	67.7
Four	39	10	25.6	5	17.2	71.7
Five	24	10	41.7	4	28.6	75.7

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2019 and 31st December 2019. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 38: Cycle-specific and cumulative live birth rates for women aged 30-34 years who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2019 and 31st December 2019, New Zealand, 2019-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	673	268	39.8	51	12.6	39.8
Two	354	124	35.0	41	17.8	58.2
Three	189	59	31.2	24	18.5	67.0
Four	106	35	33.0	13	18.3	72.2
Five	58	13	22.4	15	33.3	74.1

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2019 and 31st December 2019. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 39: Cycle-specific and cumulative live birth rates for women aged 35-39 years who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2019 and 31st December 2019, New Zealand, 2019-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	737	190	25.8	77	14.1	25.8
Two	470	121	25.7	72	20.6	42.2
Three	277	57	20.6	49	22.3	49.9
Four	171	33	19.3	31	22.5	54.4
Five	107	28	26.2	18	22.8	58.2

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2019 and 31st December 2019. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Table 40: Cycle-specific and cumulative live birth rates for women aged 40 years and over who started their first autologous fresh cycle (excluding freeze-all cycles[a]) between 1st January 2019 and 31st December 2019, New Zealand, 2019-2022

Cycle number[b]	Number of women starting cycle	Number of women who had a live birth[c]	Cycle-specific live birth rate (%)[d]	Number of women who did not progress to next treatment	Non-progression rate (%)[e]	Cumulative live birth rate (%)[f]
One	308	31	10.1	98	35.4	10.1
Two	179	22	12.3	65	41.4	17.2
Three	92	15	16.3	30	39.0	22.1
Four	47	8	17.0	14	35.9	24.7
Five	25	2	8.0	9	39.1	25.3

(a) Freeze-all cycles are fresh ART treatment cycles where all oocytes or embryos are cryopreserved, and an embryo transfer does not take place.
(b) Cycle one represents a woman's first autologous (excluding freeze-all) fresh ART treatment cycle between 1st January 2019 and 31st December 2019. Cycles two to five could be either a fresh or thaw cycle (excluding freeze-all cycles) undertaken by a woman until 31st December 2022 or birth of a liveborn baby up to and including 31st October 2023.
(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 cycle-specific live birth rate is calculated as the number of live births resulting from a specific 'cycle number' divided by the number of women who undertook that same 'cycle number'.
(e) The non-progression rate for a specific 'cycle number' is calculated as the number of women who did not return for further ART treatment cycles before 31st December 2022 divided by the number of women who did not have a live birth in that 'cycle number'.
(f) The cumulative live birth rate for a specific 'cycle number' is calculated as the total number of live births following this 'cycle number' and all previous cycles divided by the total number of women who started their first autologous fresh ART treatment cycle between 1st January 2019 and 31st December 2019.

Note: Further treatment cycles after the fifth 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 and measures of statistical variance are not supplied.

Appendix A: Contributing fertility clinics

Fertility Associates Auckland, Auckland (Dr Simon Kelly)

Fertility Associates Christchurch, Christchurch (Dr Sarah Wakeman)

Fertility Associates Dunedin, Dunedin (Associate Professor Wayne Gillett)

Fertility Associates Hamilton, Hamilton (Dr VP Singh)

Fertility Associates Wellington, Wellington (Dr Andrew Murray)

Fertility Plus, Auckland (Professor Cindy Farquhar)

Repromed Auckland, Auckland (Dr Devashana Gupta)

Appendix B: Data used in this report

The data presented in this report are supplied by seven fertility clinics in 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.

This report presents information on ART and DI treatment cycles that took place in fertility clinics in New Zealand in 2022, and the resulting pregnancies and births. The babies included in this report were conceived through treatment cycles undertaken in 2022 and were born in either 2022 or 2023.

Data validation

Most fertility centres have computerised data information management systems and provide the National Perinatal Epidemiology and Statistics Unit (NPESU) with high-quality data. All data processed by NPESU undergo a validation process, with data queries being followed up with fertility centre staff.

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

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

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

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

Data limitations

Follow-up of pregnancy and birth outcomes is limited because the ongoing care of pregnant patients is often carried out by non-ART practitioners. The method of follow-up varies by

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

Note that some contributing ART Units may have closed or changed their name since 2022. The medical director listed is based on information provided by the FSANZ at the time this report was prepared.

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 controlled ovarian hyperstimulation or in unstimulated cycles. These techniques are referred to as 'donor insemination' (DI) in this report.

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

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.

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

Cryopreservation: freezing embryos for potential future ART treatment.

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 intending parent, intends to donate or donates her oocytes/embryos to others, or where a female intending parent provides oocytes/embryos to a female partner who is also an intending 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: involves a laboratory procedure with no planned patient involvement and includes the following scenarios:

- receipt of donor oocytes with the intention of fertilisation and freezing of all resulting embryos
- attempted/actual oocyte thaw with intention of fertilisation and freezing of all resulting embryos
- PGT cycles where embryos are thawed and refrozen with no intention of embryo transfer in the reported cycle.

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 intending parent receives oocytes/embryos from another individual/couple who is not an intending parent, or where a female intending parent receives oocytes/embryos from a female partner who is also an intending 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 'intending parent(s)', with the intention that the child will be raised by the intending parent(s). The oocytes and/or sperm used to create the embryo(s) in the surrogacy cycle can be either from the intending 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 tables