

**Council on
Human Reproductive Technology
2022 Annual Statistics**

published in July 2023*

* Statistics on live birth events in relation to reproductive procedures performed in 2022 will be covered in the final version of the Annual Statistics 2022 to be available in 2024.

Table of Contents

| | |
|---|----|
| Introduction | 1 |
| Key Terms used in the Annual Statistics..... | 2 |
| Key Statistics and Charts | 4 |
| Key Statistics for 2022..... | 5 |
| Charts for selected Key Statistics | 7 |
| Chart A1 - Type of RT Procedures taken by Patients (%) (for non-donor IVF cycles only) | 7 |
| Chart A2 - Patients Diagnosis (%) (for non-donor IVF cycles only)..... | 8 |
| Chart A5(a) - Number of Patients and Treatment Cycles (for non-donor IVF cycles only)... | 9 |
| Chart A5(b) - Proportion of ICSI Cycles (%) (amongst all non-donor IVF cycles) | 10 |
| Chart B1(a) - Number of Gametes and Embryos Stored by Licensed Centres | 11 |
| Chart B1(b) - Number of Donated Gametes or Embryos Stored or Used for Research | 12 |
| Detailed Statistics Tables..... | 13 |
| Table 1 - Gamete and Embryo Donations Made in 2022 | 14 |
| Table 2 - Pregnancy and Birth Outcomes for Main Types of RT Procedures in 2022 | 15 |
| Table 3 - Pregnancy and Birth Outcomes by Age Group and Main Type of RT Procedures in 2022 (for non-donor treatment cycles only) | 17 |
| Table 4 - Effect of One/Two/Three Embryo(s) Transferred (Fresh/Frozen Cycle with or without ICSI) on Pregnancy and Birth Outcomes in 2022..... | 20 |
| Table 5 - Pregnancy and Birth Outcomes by Age Group using Fresh/Frozen Oocytes (Fresh Cycles) in 2022 (for non-donor IVF cycles only)..... | 22 |
| Table 6 - Infertility Diagnosis of Patients in 2022..... | 24 |
| Table 7 - Current Research Projects ending December 2022..... | 26 |

Introduction

The Council on Human Reproductive Technology was established under section 4 of the Human Reproductive Technology Ordinance (Cap. 561) (“the Ordinance”) in April 2001 to regulate the provision of reproductive technology (RT) procedures, the conducting of embryo research, the handling, storing or disposing of gametes or embryos used or intended to be used in connection with a RT procedure or embryo research, and surrogacy arrangement.

According to section 5(1) of the Ordinance, the Council shall keep under review information about RT activities and publish statistics and summaries concerning relevant activities which have been carried on. To this end, the *Annual Statistics* has been published since 2009.

This *2022 Annual Statistics* lists out different RT activities carried out by the licensed centres in operation in the year. It provides graphs, charts and tables that summarize information about the RT activities and its outcomes in 2022. The figures in this publication are based only on RT cycles performed in 2022 and cannot be used to calculate cumulative success rates.

As at 31.12.2022, there were a total of 40 valid licences issued by the Council, including 21 Artificial Insemination by Husband (AIH) licences, 15 Treatment licences, 3 Research licences and 1 Storage licence. This publication provides information on the reported outcomes of all RT cycles started in the licensed AIH and treatment centres.

RT cycles include any process in which (1) a RT procedure is performed or (2) frozen embryos have been thawed with the intent of transferring them to a woman. For example, an RT cycle could include an embryo transfer. Another cycle could include egg retrieval and storage of embryos.

Of the 8,941 non-donor in vitro fertilization (IVF) and frozen-thawed embryo transfer (FET) cycles reported in 2022, a total of 5,510 (61.6%) were started with the intent to transfer at least one embryo. The other 3,431 cycles (38.4%) were banking cycles, where eggs or embryos were cryopreserved (frozen) and stored for potential future use.

A patient’s chances of having a pregnancy and live-birth delivery when using RT are influenced by many factors. Some of these factors are patient-related, such as the patient’s age or the cause of infertility. This *Annual Statistics* includes the figures on infertility diagnosis of patients for the reference of readers.

This is the interim version of the *2022 Annual Statistics*. The statistics on live birth events in relation to RT procedures performed in 2022 will be covered in the final version of the *Annual Statistics 2022* to be available in 2024.

The figures in this report provide data on trends of the types of procedures performed. The figures also include RT cycles that used fresh or frozen oocytes (for non-donor IVF cycles only).

Key Terms used in the Annual Statistics

| Terms | Description |
|--|--|
| Artificial insemination by husband (AIH) | The placing of sperm inside a woman's vagina or uterus (i.e. womb) by means other than sexual intercourse. In artificial insemination by husband (AIH), the husband's sperm is used. |
| Clinical pregnancy | A pregnancy documented by one or more gestational sacs on ultrasound or the histological confirmation of gestational products in miscarriages or ectopic pregnancies. |
| Clinical pregnancy rate | Clinical pregnancy rate is expressed as number of clinical pregnancies per 100 treatment cycles started/commenced or per 100 cycles reaching the stage of attempted oocyte recovery/retrieval or embryo transfer (ET). |
| Donor insemination (DI) | Also known as artificial insemination by donor (AID). DI is an artificial insemination whereby sperm collected from a man who is not the woman's husband is used. |
| Ectopic pregnancy | A pregnancy in which implantation has taken place outside the uterine cavity. |
| Heterotopic pregnancy | Simultaneous existence of intrauterine and ectopic pregnancy. |
| In vitro fertilisation (IVF) | In vitro fertilization (a) means the fertilization of an egg by sperm outside the human body, whether or not the egg was originally removed from the body of that or any other woman; (b) includes any procedure involving the induction or aspiration of an egg, or the culture of an egg for the purposes of any such fertilization. It includes IVF without ICSI and IVF with ICSI. |
| Intracytoplasmic sperm injection (ICSI) | A method of gamete micromanipulation by which a single sperm is injected into the inner cellular structure of the egg. |
| Live birth event | For the purposes of the Code of Practice on Reproductive Technology and Embryo Research issued by the Council, live birth event shall mean an event of the birth of one or more than one live child from one single pregnancy. The birth of live twins, triplets and so on will therefore be considered as a single "live birth event". |
| Live birth event rate | Unless otherwise specified, live birth event (single and multiple live births included) rate is expressed per 100 treatment cycles started, i.e. live birth event rate = Number of live birth events/Number of treatment cycles x 100% |

| Terms | Description |
|--|--|
| Microsurgical epididymal sperm aspiration/extraction (MESA/MESE) | A surgical procedure performed with the assistance of an operating microscope to retrieve sperm from the epididymis of men with obstructive azoospermia. In the absence of optical magnification, any surgical procedure to retrieve sperm from the epididymis should also be registered as MESE. |
| Miscarriage (Spontaneous abortion) | A loss of an intrauterine pregnancy detected clinically or by ultrasound, and less than 24 weeks' gestation (as estimated by the day of embryo transfer or day of ovulation). |
| Multiple live birth event rate | Unless otherwise specified, multiple live birth event rate is expressed per 100 treatment cycles started, i.e. Multiple live birth event rate = Number of multiple live birth events/Number of treatment cycles x 100% |
| No. of no pregnancy | The number of treatment cycles started and reported by the licensed centre with an outcome of "no pregnancy", including those abandoned and those ending with elective cryopreservation of embryos. |
| Ongoing pregnancy | Ongoing pregnancy with foetal cardiac activity during the period of the year being reported on. |
| Ongoing pregnancy rate | Ongoing pregnancy rate is expressed as number of ongoing pregnancies per 100 treatment cycles started /commenced or per 100 cycles reaching the stage of attempted oocyte retrieval or embryo transfer. |
| Testicular sperm aspiration/extraction (TESA/TESE) | A surgical procedure involving one or more testicular biopsies or needle aspirations to obtain sperm for use in IVF and/or ICSI. |
| Treatment cycle | The process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period. This annual statistics only covered treatment cycles that led to (1) Gamete transfer/embryo replacement/insemination, or stopped because of (2) Elective cryopreservation of all embryos or (3) Cycle abandonment. |

Key Statistics and Charts

Key Statistics for 2022

A (for non-donor IVF cycles only)

| 1 Type of RT procedures (%) | | 2 Patient diagnosis ³ (%) | | | | | | | |
|--|-------|--------------------------------------|-----|-------------------------|------|---------------|------------------------|-----------------------|------|
| (Please refer to Chart A1) | | (Please refer to Chart A2) | | | | | | | |
| | | Single cause | | | | | Multiple causes | | |
| IVF ¹ (with ICSI ²) | 37.89 | Endometriosis | 2.5 | Male factor | 22.2 | Tubal problem | 3.0 | Female & male factors | 33.4 |
| IVF (without ICSI) | 8.79 | Immunologic problem | 0.2 | Ovulatory problem | 2.8 | Other Causes | 14.8 | Female factors only: | 6.4 |
| Frozen-thawed ET | 53.32 | | | Tubo-peritoneal problem | 2.8 | Unexplained | 11.8 | | |

| Pregnancy & Live Birth Outcomes | Age Group ⁴ | | | | | | | |
|---|------------------------|-------|-------|-------|-------|-------|-------------|--------------|
| | 25 or below | 26-30 | 31-35 | 36-40 | 41-45 | 46-50 | 51 or above | All/Overall% |
| 3 Fresh embryos from patient couple's own gametes | | | | | | | | |
| a Number of patients | 9 | 152 | 1038 | 1602 | 556 | 46 | 1 | 3404 |
| b Number of treatment cycles ⁵ | 9 | 164 | 1134 | 1916 | 856 | 90 | 5 | 4174 |
| c Number of treatment cycles with embryo transferred | 1 | 22 | 175 | 399 | 169 | 14 | 3 | 783 |
| d Average number of embryo transferred | 1.00 | 1.09 | 1.15 | 1.25 | 1.63 | 1.86 | 1.67 | 1.32 |
| e <i>Clinical pregnancy rate</i> ⁶ (%) | 11.1 | 6.7 | 5.6 | 6.8 | 4.6 | 3.3 | 0.0 | 5.9 |
| 4 Frozen embryos from patient couple's own gametes | | | | | | | | |
| a Number of patients | 10 | 154 | 1133 | 1756 | 515 | 38 | 1 | 3607 |
| b Number of treatment cycles ⁵ | 13 | 200 | 1492 | 2342 | 664 | 55 | 1 | 4767 |
| c Number of treatment cycles with embryo transferred | 13 | 197 | 1483 | 2322 | 658 | 53 | 1 | 4727 |
| d Average number of embryo transferred | 1.15 | 1.15 | 1.17 | 1.23 | 1.36 | 1.58 | 2.00 | 1.23 |
| e <i>Clinical pregnancy rate</i> ⁶ (%) | 46.2 | 56.5 | 51.5 | 44.1 | 30.6 | 10.9 | 0.0 | 44.7 |

| 5 Trends of RT Procedures | |
|---|------------------------------------|
| a Number of patients and treatment cycles | Please refer to Chart A5(a) |
| b <i>Proportion of ICSI cycles</i> (%) | Please refer to Chart A5(b) |

B

| 1 Storage of Gametes and Embryos | |
|--|------------------------------------|
| a Number of gametes and embryos stored by licensed centres | Please refer to Chart B1(a) |
| b Number of gametes or embryos stored or used for research | Please refer to Chart B1(b) |

Remarks:

NA Not applicable

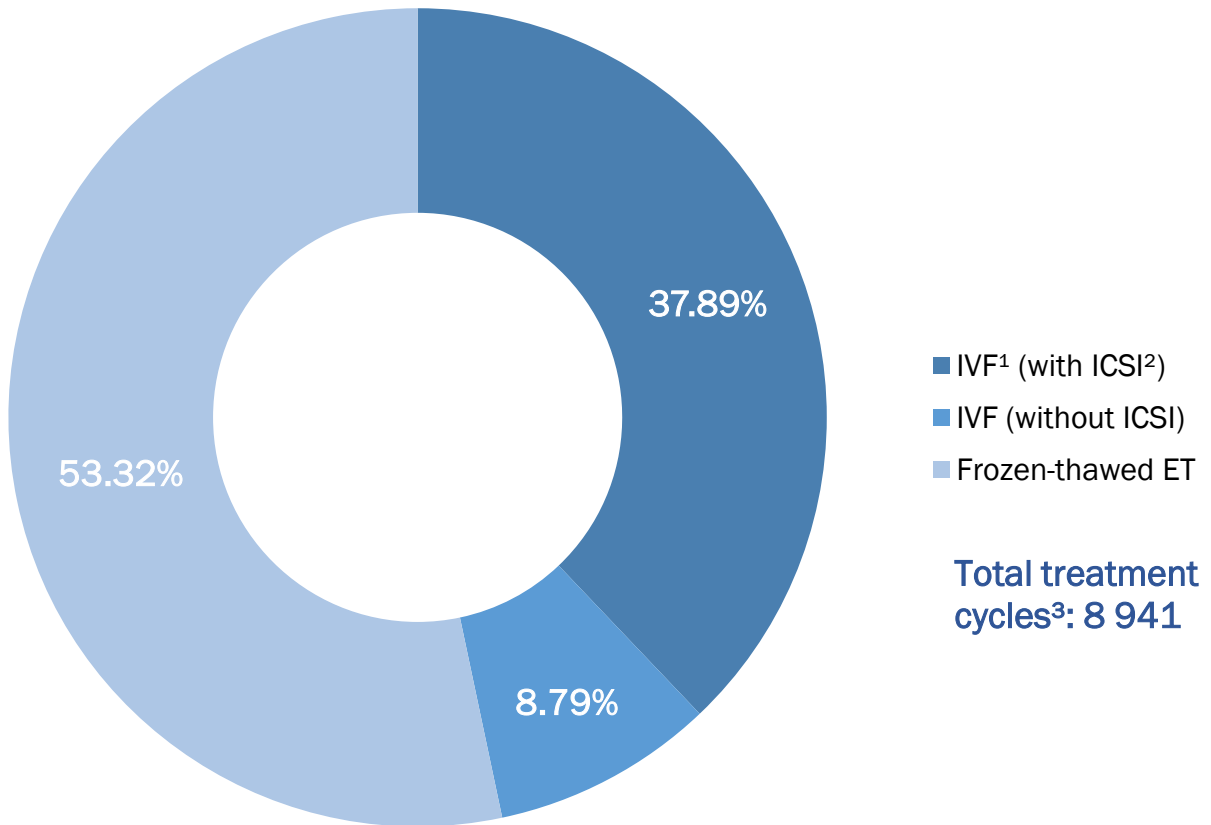
- (1) **In vitro fertilization (IVF)** (a) means the fertilization of an egg by sperm outside the human body, whether or not the egg was originally removed from the body of that or any other woman; (b) includes any procedure involving the induction or aspiration of an egg, or the culture of an egg for the purposes of any such fertilization.
It includes Conventional IVF (IVF without ICSI) and IVF with ICSI.
- (2) **Intracytoplasmic sperm injection (ICSI)** means a method of gamete micromanipulation by which a single sperm is injected into the inner cellular structure of the egg.
- (3) Total patient diagnosis percentages may be greater than 100% because more than one diagnosis can be reported for each treatment cycle.
- (4) The age of wife has been used in calculating the age of patient.
- (5) (i) **Treatment cycles** refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.

This annual statistics only covered treatment cycles that led to (1) Gamete transfer/embryo replacement/insemination, or stopped because of (2) Elective cryopreservation of all embryos or (3) Cycle abandonment.

- (ii) In this Key Statistics, the treatment cycles for (a) RT procedures involving donated gametes/embryos and (b) involving artificial insemination (i.e. AIH and DI) are excluded in the above table and separately shown in Table 2. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above table.
- (6) (i) **Clinical pregnancy** means a pregnancy documented by one or more gestational sacs on ultrasound or the histological confirmation of gestational products in miscarriages or ectopic pregnancies.
- (ii) **Clinical pregnancy rate** is expressed as number of clinical pregnancies per 100 treatment cycles started /commenced or per 100 cycles reaching the stage of attempted oocyte retrieval or embryo transfer. i.e. Clinical pregnancy rate = Number of clinical pregnancies/Number of treatment cycles x 100%
- (7) Licensed centres are required to report the details concerning outcome of pregnancy within 12 months after treatment. Information on live birth for treatment cycles carried out in the later part of 2022 is not yet available.

Charts for selected Key Statistics

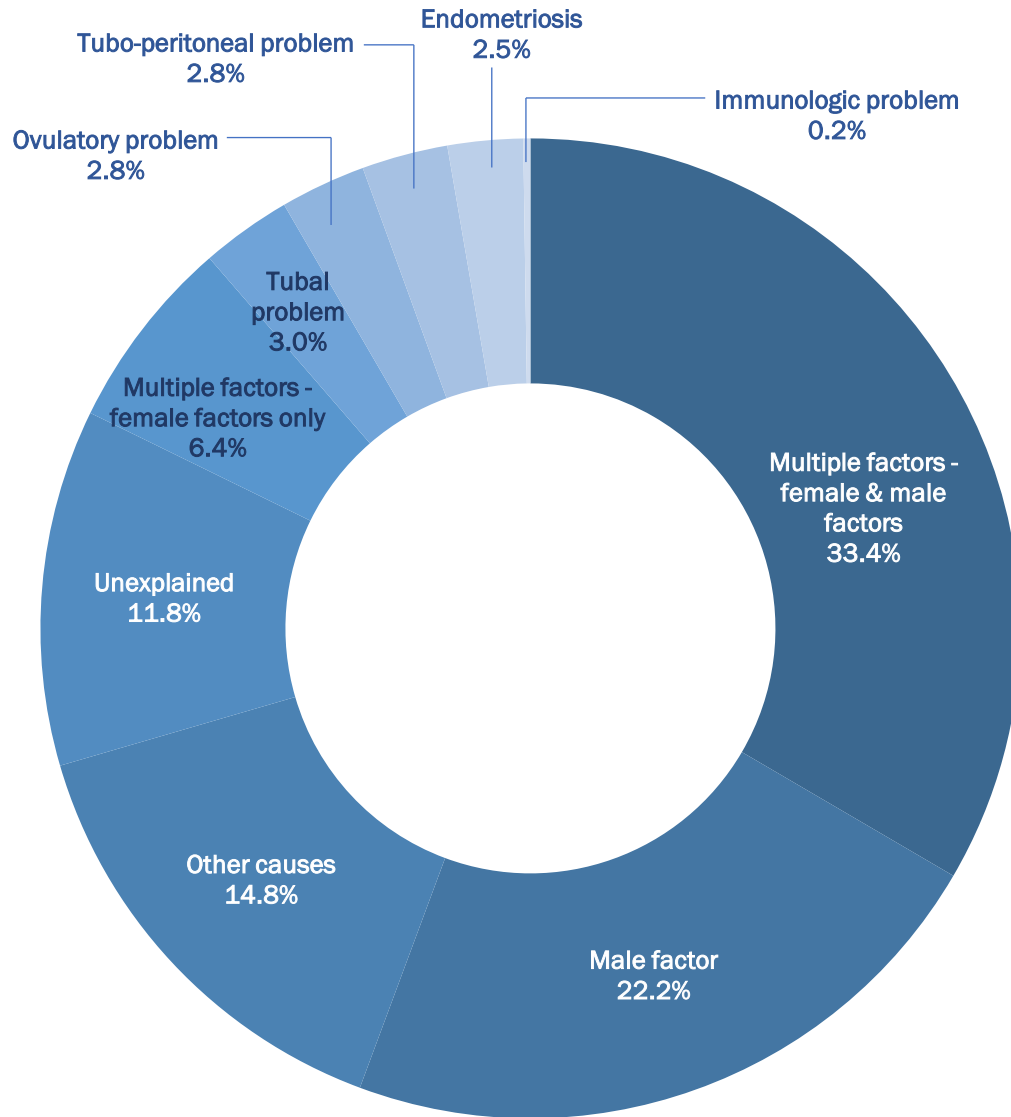
Chart A1 - Type of RT Procedures taken by Patients (%)
(for non-donor IVF cycles only)



Remarks:

- (1) **In vitro fertilization (IVF)** (a) means the fertilization of an egg by sperm outside the human body, whether or not the egg was originally removed from the body of that or any other woman; (b) includes any procedure involving the induction or aspiration of an egg, or the culture of an egg for the purposes of any such fertilization. It includes **IVF without ICSI** and **IVF with ICSI**.
- (2) **Intracytoplasmic sperm injection (ICSI)** means a method of gamete micromanipulation by which a single sperm is injected into the inner cellular structure of the egg.
- (3) (i) **Treatment cycles** refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.
(ii) In this chart, the treatment cycles for (a) RT procedures involving donated gametes/embryos and (b) involving artificial insemination (i.e. AIH and DI) are excluded in the above chart and separately shown in Table 2. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above chart.

Chart A2 - Patients Diagnosis (%)
(for non-donor IVF cycles only)

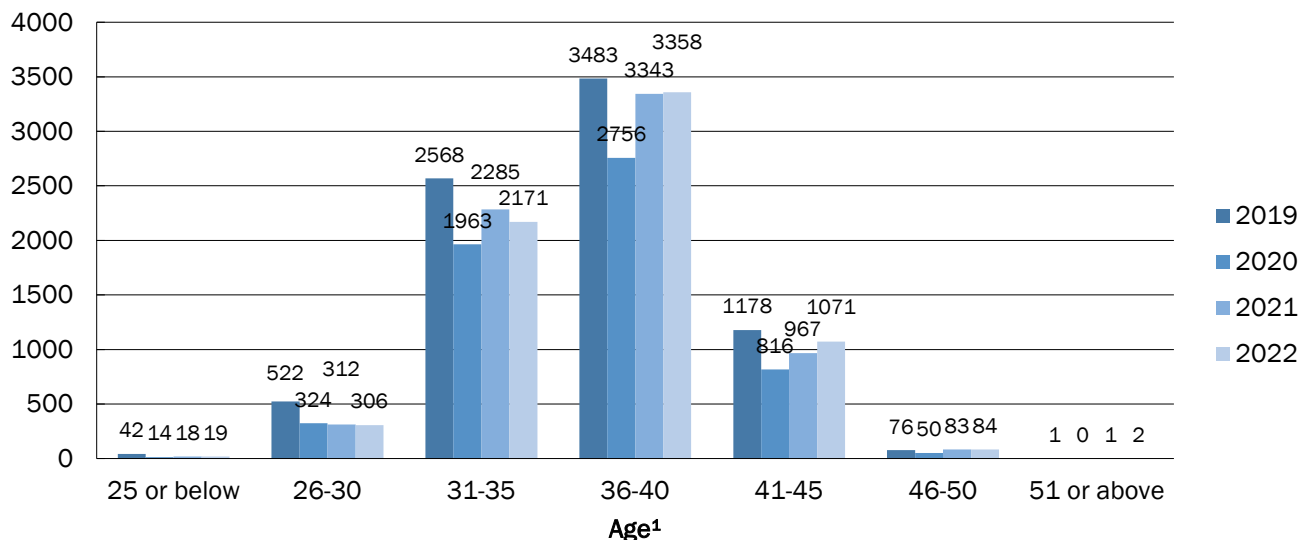


Remarks:

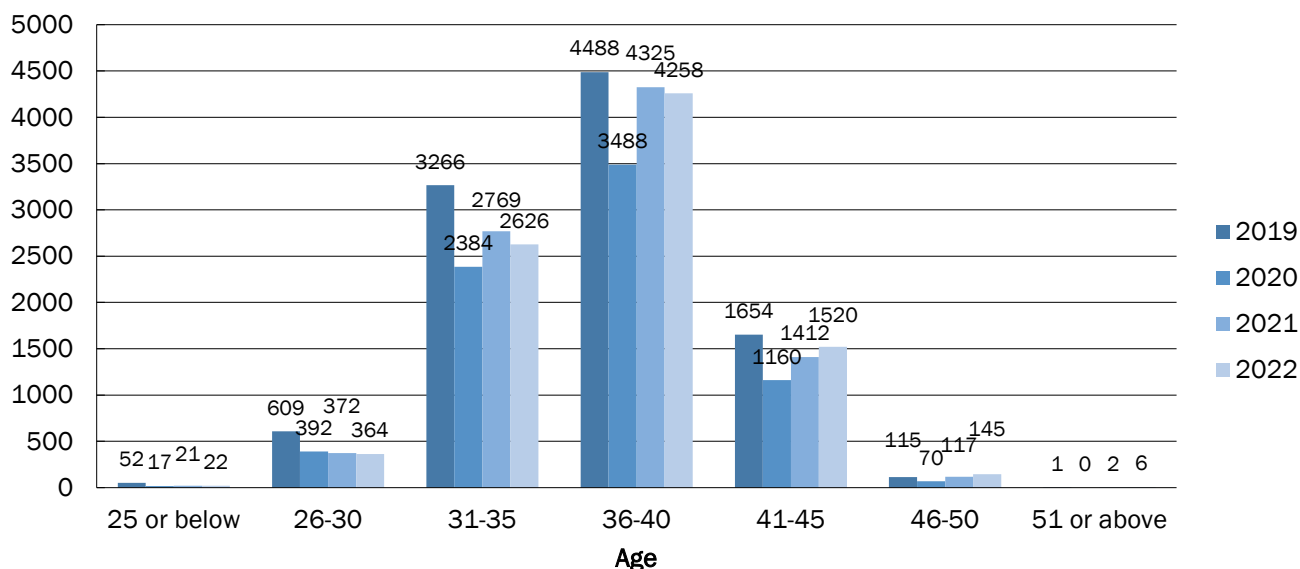
- (1) "Other causes" of infertility diagnosis reported by licensed centres included advanced maternal age, reduced ovarian reserve, coital problem, polycystic ovary syndrome, etc.

**Chart A5(a) - Number of Patients and Treatment Cycles
(for non-donor IVF cycles only)**

Number of Patients



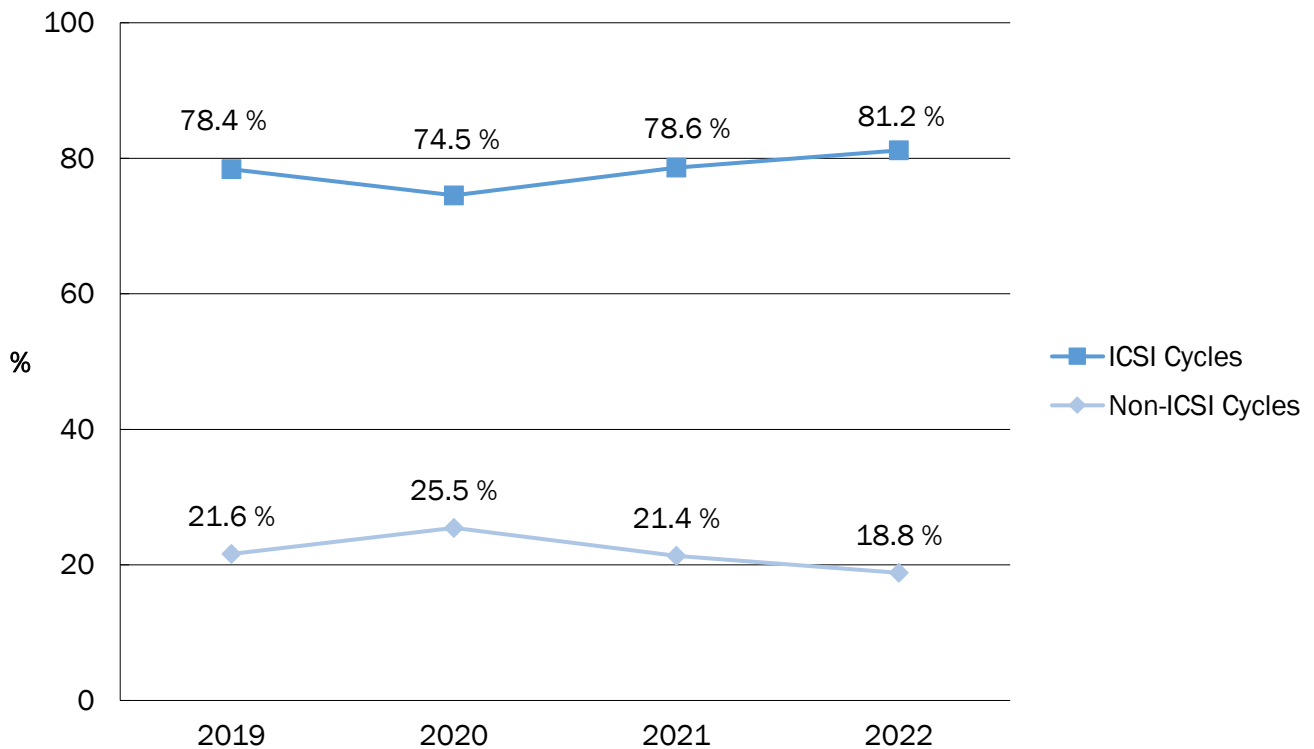
Number of Treatment Cycles²



Remarks:

- (1) The age of wife has been used in calculating the age of patient.
- (2) (i) **Treatment cycles** refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.
- (ii) In this chart, the treatment cycles for (a) RT procedures involving donated gametes/embryos and (b) involving artificial insemination (i.e. AIH and DI) are excluded from the above chart and separately shown in Table 2. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above chart.

**Chart A5(b) - Proportion of ICSI¹ Cycles (%)
(amongst all non-donor IVF cycles²)**



Remarks:

- (1) **Intracytoplasmic sperm injection (ICSI)** means a method of gamete micromanipulation by which a single sperm is injected into the inner cellular structure of the egg.
- (2) (i) **Treatment cycles** refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.
- (ii) In this chart, the treatment cycles for (a) RT procedures involving donated gametes/embryos and (b) involving artificial insemination (i.e. AIH and DI) are excluded from the above chart and separately shown in Table 2. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above chart.

Chart B1(a) - Number of Gametes and Embryos Stored by Licensed Centres

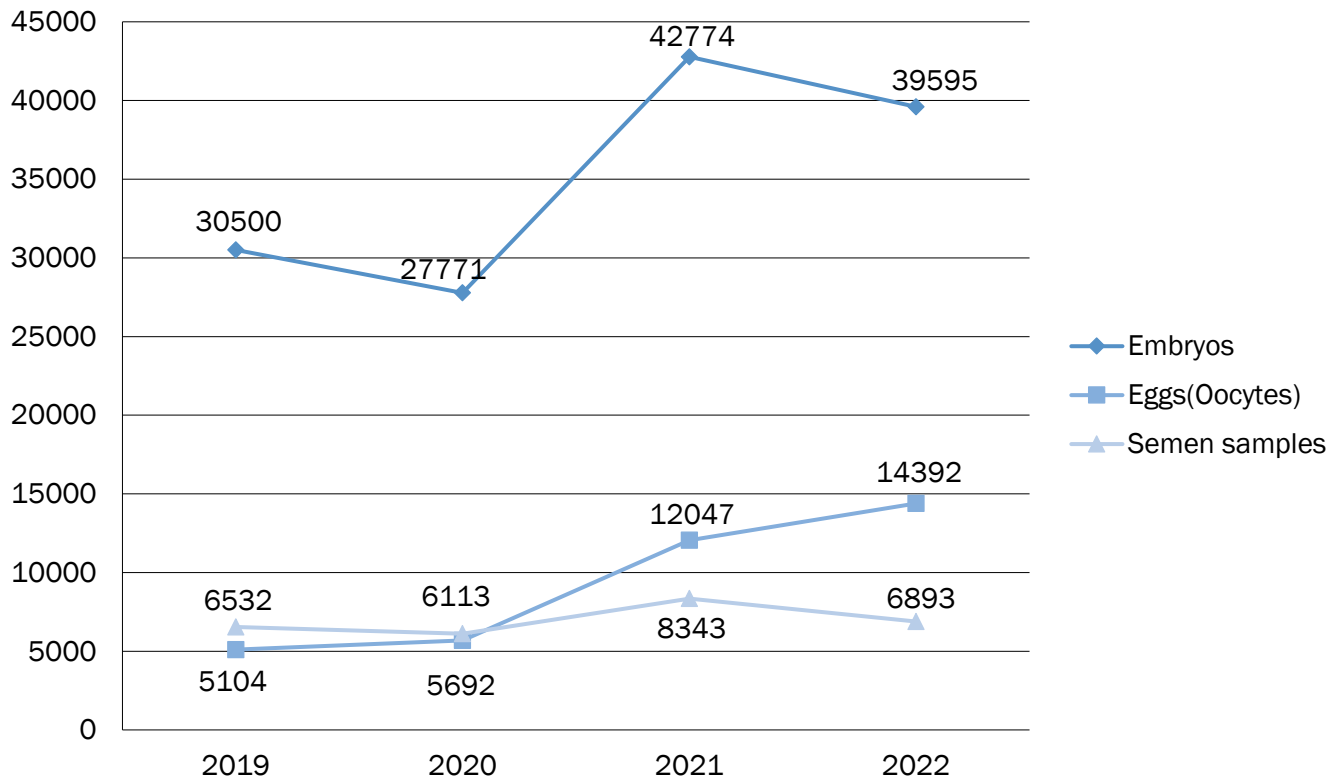
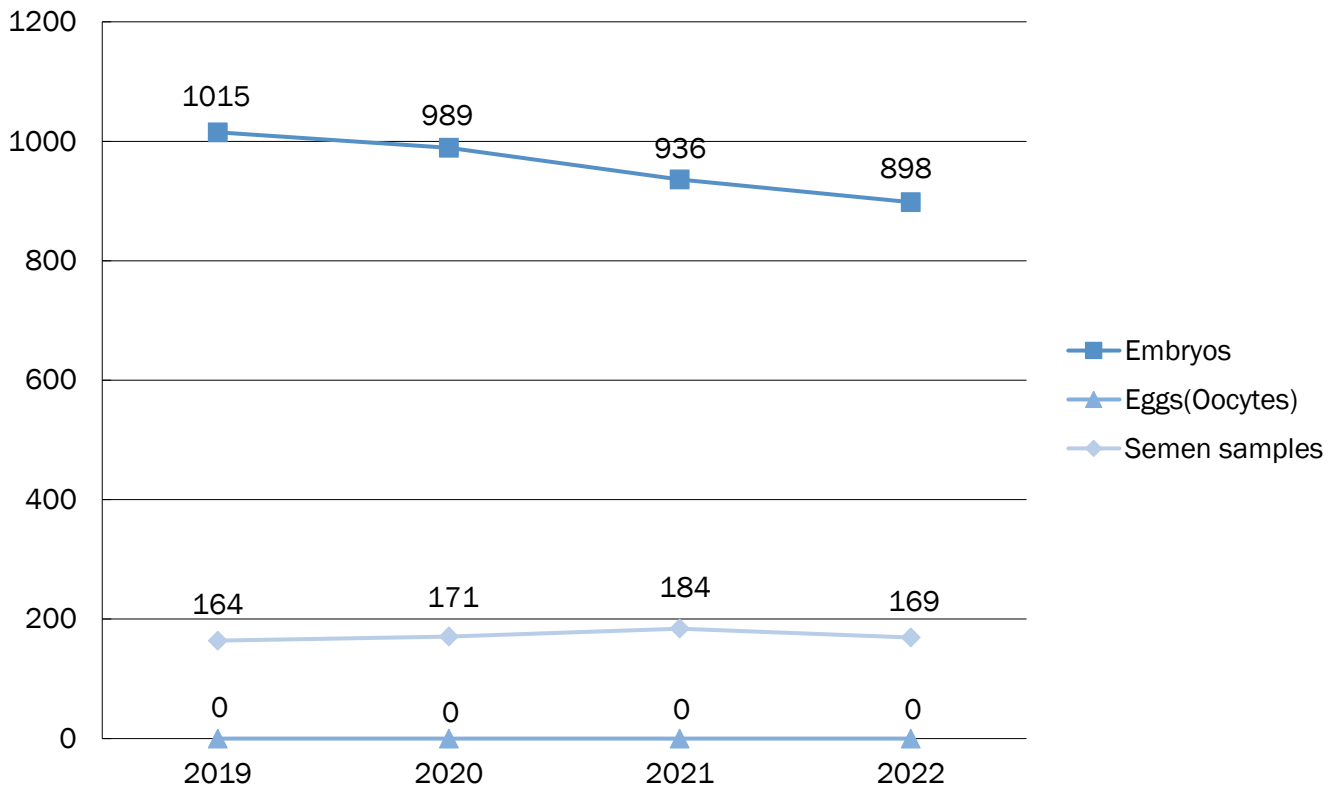


Chart B1(b) - Number of Donated Gametes or Embryos Stored or Used for Research



| | Number of Donated Embryos Used for Research | | | |
|---------|---|------|------|------|
| | 2019 | 2020 | 2021 | 2022 |
| Embryos | 96 | 75 | 0 | 3 |

Detailed Statistics Tables

Table 1 - Gamete and Embryo Donations Made in 2022

(Based on the information on Annual Statistics Forms received in the calendar year)

a) Gamete and Embryo Donors by Age Group and Sex

| Age Group | Gamete | | Embryo | | Total |
|--------------|---------------|-------------|---------------|-------------|-----------|
| | Female Donors | Male Donors | Female Donors | Male Donors | |
| 25 or below | 11 | 7 | 0 | 0 | 18 |
| 26-30 | 9 | 5 | 0 | 0 | 14 |
| 31-35 | 3 | 6 | 0 | 0 | 9 |
| 36-40 | 3 | 8 | 0 | 0 | 11 |
| 41-45 | 0 | 1 | 0 | 0 | 1 |
| 46-50 | 0 | 0 | 0 | 0 | 0 |
| 51 or above | 0 | 0 | 0 | 0 | 0 |
| Total | 26 | 27 | 0 | 0 | 53 |

b) Donors and Donated Materials

| Donated Materials | Number of Donors | Number of Donations Made |
|----------------------|------------------|--------------------------|
| Semen | 27 | 53 |
| Eggs (oocytes) | 26 | 29 |
| Embryos ¹ | 0 | 0 |

Remark:

(1) Both the female and male donors of the couple will be counted for an embryo donation.

| |
|---|
| <p>Source (for licensed centres) AS Form 8</p> |
|---|

Table 2 - Pregnancy and Birth Outcomes for Main Types of RT Procedures in 2022

(Based on the information on Data Collection Forms received in the calendar year)

| Item | | RT procedures involving patients' own gametes/embryos | | | | RT procedures involving donated gametes/embryos | |
|--------------------------------------|---|---|--------------|------------------|------------------|---|-----------------------------|
| | | IVF ¹ | | Frozen-thawed ET | AIH ³ | DI ³ | RT procedures other than DI |
| | | with ICSI ² | without ICSI | | | | |
| 1 | Number of patients | 2671 | 733 | 3607 | 2247 | 5 | 62 |
| 2 | Number of treatment cycles ⁴ | 3388 | 786 | 4767 | 3532 | 8 | 100 |
| 3 | Number of treatment cycles with embryo transferred | 551 | 232 | 4727 | NA | NA | 77 |
| 4 | Number of cycles of insemination | NA | NA | NA | 3502 | 8 | NA |
| Treatment Outcome⁵ | | | | | | | |
| 5a | Number of clinical pregnancy ⁶⁽ⁱ⁾ | 170 | 78 | 2129 | 390 | 1 | 41 |
| | i Number of ongoing pregnancy ⁷⁽ⁱ⁾ | 131 | 62 | 1771 | 339 | 1 | 35 |
| | ii Number of miscarriage ⁸ | 36 | 14 | 350 | 42 | 0 | 4 |
| | iii Number of hydatidiform mole | 0 | 0 | 0 | 0 | 0 | 0 |
| | iv Number of ectopic pregnancy ⁹ | 3 | 2 | 7 | 9 | 0 | 0 |
| | v Number of heterotopic pregnancy ¹⁰ | 0 | 0 | 0 | 0 | 0 | 0 |
| | vi Number of termination of pregnancy | 0 | 0 | 1 | 0 | 0 | 2 |
| 5b | Number of no pregnancy ¹¹ | 3218 | 708 | 2637 | 3112 | 7 | 59 |
| 5c | Number of lost to follow up ¹² | 0 | 0 | 1 | 30 | 0 | 0 |
| 5d | i <i>Clinical pregnancy rate⁶⁽ⁱⁱⁱ⁾ (per treatment cycle) (%)</i> | 5.0 | 9.9 | 44.7 | 11.0 | 12.5 | 41.0 |
| | ii <i>Clinical pregnancy rate (per treatment cycle with embryo transferred) (%)</i> | 30.9 | 33.6 | 45.0 | NA | NA | 53.2 |
| | iii <i>Clinical pregnancy rate (per cycle of insemination) (%)</i> | NA | NA | NA | 11.1 | 12.5 | NA |
| 5e | i <i>Ongoing pregnancy rate⁷⁽ⁱⁱ⁾ (per treatment cycle) (%)</i> | 3.9 | 7.9 | 37.2 | 9.6 | 12.5 | 35.0 |
| | ii <i>Ongoing pregnancy rate (per treatment cycle with embryo transferred) (%)</i> | 23.8 | 26.7 | 37.5 | NA | NA | 45.5 |
| | iii <i>Ongoing pregnancy rate (per cycle of insemination) (%)</i> | NA | NA | NA | 9.7 | 12.5 | NA |

Remarks:

NA Not applicable

- (1) **In vitro fertilization (IVF)** (a) means the fertilization of an egg by sperm outside the human body, whether or not the egg was originally removed from the body of that or any other woman; (b) includes any procedure involving the induction or aspiration of an egg, or the culture of an egg for the purposes of any such fertilization. It includes **IVF without ICSI** and **IVF with ICSI**.
- (2) **Intracytoplasmic sperm injection (ICSI)** means a method of gamete micromanipulation by which a single sperm is injected into the inner cellular structure of the egg.
- (3) **Artificial insemination** refers to the placing of sperm inside a woman's vagina or uterus (i.e. womb) by means other than sexual intercourse. In **artificial insemination by husband (AIH)**, the husband's sperm is used. In **artificial insemination by donor (AID or DI)**, sperm collected from a man who is not the woman's husband is used.

- (4) (i) **Treatment cycles** refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.
- This annual statistics only covered treatment cycles that led to (1) Gamete transfer/embryo replacement/insemination, or stopped because of (2) Elective cryopreservation of all embryos or (3) Cycle abandonment.
- (ii) In this table, the treatment cycles for RT procedures involving donated gametes/embryos and those involving artificial insemination (i.e. AIH and DI) are shown. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above table
- (5) Figures on **treatment outcome** reported in the interim statistics will be replaced when outcome of pregnancy is available in the final statistics. Licensed centres are required to report the details concerning **pregnancy outcome** within 12 months after treatment. Information on live birth for treatment cycles carried out in the later part of 2022 is not yet available.
- (6) (i) **Clinical pregnancy** means pregnancy documented by one or more gestational sacs on ultrasound or the histological confirmation of gestational products in miscarriages or ectopic pregnancies.
- (ii) **Clinical pregnancy rate** is expressed as number of clinical pregnancies per 100 treatment cycles started /commenced or per 100 cycles reaching the stage of attempted oocyte retrieval or embryo transfer.
- **Clinical pregnancy rate per treatment cycles** [Item 5d(i)] = Number of clinical pregnancies [Item 5a]/Number of treatment cycles[Item 2] x 100%
 - **Clinical pregnancy rate per treatment cycles with embryo transferred** [Item 5d(ii)] = Number of clinical pregnancies [Item 5a]/Number of treatment cycles with embryo transferred [Item 3] x 100%
 - **Clinical pregnancy rate per cycles of insemination** [Item 5d(iii)] = Number of clinical pregnancies [Item 5a]/Number of cycles of insemination [Item 4] x 100%
- (7) (i) Ongoing pregnancy means ongoing pregnancy with foetal cardiac activity during the period of the year being reported on.
- (ii) **Ongoing pregnancy rate** is expressed as number of ongoing pregnancies per 100 treatment cycles started /commenced or per 100 cycles reaching the stage of attempted oocyte retrieval or embryo transfer.
- **Ongoing pregnancy rate per treatment cycles** [Item 5e(i)] = Number of ongoing pregnancies [Item 5a(i)]/Number of treatment cycles [Item 2] x 100%
 - **Ongoing pregnancy rate per treatment cycles with embryo transferred** [Item 5e(ii)] = Number of ongoing pregnancies [Item 5a(i)]/Number of treatment cycles with embryo transferred [Item 3] x 100%
 - **Ongoing pregnancy rate per cycles of insemination** [Item 5e(iii)] = Number of ongoing pregnancies [Item 5a(i)]/Number of cycles of insemination [Item 4] x 100%
- (8) Miscarriage (Spontaneous abortion) refers to loss of an intrauterine pregnancy detected clinically or by ultrasound, and less than 24 weeks' gestation (as estimated by the day of embryo transfer or day of ovulation).
- (9) Ectopic pregnancy refers to a pregnancy in which implantation has taken place outside the uterine cavity.
- (10) Heterotopic pregnancy refers to simultaneous existence of intrauterine and ectopic pregnancy.
- (11) Number of no pregnancy refers to the number of treatment cycles started and reported by the licensed centre with an outcome of "no pregnancy", including those abandoned and those ending with elective cryopreservation of embryos.
- (12) Figures on number of lost to follow up cases will be reported in the interim statistics and it will be updated when pregnancy outcome is available in the final statistics.

Source (for licensed centres)

DC Form 1, 2, 3 & 7

Table 3 - Pregnancy and Birth Outcomes by Age Group and Main Type of RT Procedures in 2022

(for non-donor treatment cycles only)

(Based on the information on Data Collection Forms received in the calendar year)

| IVF¹ (with ICSI²) | | | | | |
|--|--------------------|---|--|--------------------------------|----------------------|
| Age Group ⁴ | Number of Patients | Number of Treatment Cycles ⁵ | Number of Treatment Cycles with Embryo Transferred | Ongoing Pregnancy ⁶ | |
| | | | | n ⁶⁽ⁱ⁾ | (%) ⁶⁽ⁱⁱ⁾ |
| 25 or below | 7 | 7 | 0 | 0 | (0.0) |
| 26-30 | 130 | 142 | 18 | 9 | (6.3) |
| 31-35 | 800 | 891 | 113 | 29 | (3.3) |
| 36-40 | 1198 | 1478 | 259 | 73 | (4.9) |
| 41-45 | 493 | 779 | 145 | 17 | (2.2) |
| 46-50 | 42 | 86 | 13 | 3 | (3.5) |
| 51 or above | 1 | 5 | 3 | 0 | (0.0) |
| Total | 2671 | 3388 | 551 | 131 | (3.9) |
| IVF (without ICSI) | | | | | |
| Age Group | Number of Patients | Number of Treatment Cycles | Number of Treatment Cycles with Embryo Transferred | Ongoing Pregnancy | |
| | | | | n | (%) |
| 25 or below | 2 | 2 | 1 | 1 | (50.0) |
| 26-30 | 22 | 22 | 4 | 1 | (4.5) |
| 31-35 | 238 | 243 | 62 | 24 | (9.9) |
| 36-40 | 404 | 438 | 140 | 30 | (6.8) |
| 41-45 | 63 | 77 | 24 | 6 | (7.8) |
| 46-50 | 4 | 4 | 1 | 0 | (0.0) |
| 51 or above | 0 | NA | NA | NA | |
| Total | 733 | 786 | 232 | 62 | (7.9) |
| All IVF (Fresh cycles) | | | | | |
| Age Group | Number of Patients | Number of Treatment Cycles | Number of Treatment Cycles with Embryo Transferred | Ongoing Pregnancy | |
| | | | | n | (%) |
| 25 or below | 9 | 9 | 1 | 1 | (11.1) |
| 26-30 | 152 | 164 | 22 | 10 | (6.1) |
| 31-35 | 1038 | 1134 | 175 | 53 | (4.7) |
| 36-40 | 1602 | 1916 | 399 | 103 | (5.4) |
| 41-45 | 556 | 856 | 169 | 23 | (2.7) |
| 46-50 | 46 | 90 | 14 | 3 | (3.3) |
| 51 or above | 1 | 5 | 3 | 0 | (0.0) |
| Total | 3404 | 4174 | 783 | 193 | (4.6) |

| Frozen-thawed ET | | | | | |
|------------------|--------------------|----------------------------|--|-------------------|---------------|
| Age Group | Number of Patients | Number of Treatment Cycles | Number of Treatment Cycles with Embryo Transferred | Ongoing Pregnancy | |
| | | | | n | (%) |
| 25 or below | 10 | 13 | 13 | 5 | (38.5) |
| 26-30 | 154 | 200 | 197 | 102 | (51.0) |
| 31-35 | 1133 | 1492 | 1483 | 672 | (45.0) |
| 36-40 | 1756 | 2342 | 2322 | 830 | (35.4) |
| 41-45 | 515 | 664 | 658 | 160 | (24.1) |
| 46-50 | 38 | 55 | 53 | 2 | (3.6) |
| 51 or above | 1 | 1 | 1 | 0 | (0.0) |
| Total | 3607 | 4767 | 4727 | 1771 | (37.2) |
| AIH ³ | | | | | |
| Age Group | Number of Patients | Number of Treatment Cycles | Number of cycles of insemination | Ongoing Pregnancy | |
| | | | | n | (%) |
| 25 or below | 9 | 15 | 15 | 1 | (6.7) |
| 26-30 | 174 | 272 | 266 | 29 | (10.7) |
| 31-35 | 1020 | 1607 | 1595 | 195 | (12.1) |
| 36-40 | 796 | 1250 | 1246 | 104 | (8.3) |
| 41-45 | 224 | 340 | 334 | 10 | (2.9) |
| 46-50 | 22 | 44 | 42 | 0 | (0.0) |
| 51 or above | 2 | 4 | 4 | 0 | (0.0) |
| Total | 2247 | 3532 | 3502 | 339 | (9.6) |

Remarks:

NA Not applicable

- (1) **In vitro fertilization (IVF)** (a) means the fertilization of an egg by sperm outside the human body, whether or not the egg was originally removed from the body of that or any other woman; (b) includes any procedure involving the induction or aspiration of an egg, or the culture of an egg for the purposes of any such fertilization. It includes **IVF without ICSI** and **IVF with ICSI**.
- (2) **Intracytoplasmic sperm injection (ICSI)** means a method of gamete micromanipulation by which a single sperm is injected into the inner cellular structure of the egg.
- (3) **Artificial insemination** refers to the placing of sperm inside a woman's vagina or uterus (i.e. womb) by means other than sexual intercourse. In **artificial insemination by husband (AIH)**, the husband's sperm is used. In **artificial insemination by donor (AID or DI)**, sperm collected from a man who is not the woman's husband is used.
- (4) The age of wife has been used in calculating the age of patient.
- (5) (i) **Treatment cycles** refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.

This annual statistics only covered treatment cycles that led to (1) gamete transfer/embryo replacement/insemination, or stopped because of (2) elective cryopreservation of all embryos or (3) cycle abandonment.

- (ii) In this table, the treatment cycles for RT procedures involving donated gametes/embryos are excluded from the above table and separately shown in Table 2. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above table.
- (6) **Ongoing pregnancy** means ongoing pregnancy with foetal cardiac activity during the period of the year being reported on.
- (i) n = Number of ongoing pregnancies
 - (ii) **Ongoing pregnancy rate** is expressed as number of ongoing pregnancies per 100 treatment cycles started /commenced or per 100 cycles reaching the stage of attempted oocyte retrieval or embryo transfer. i.e. $\text{Ongoing pregnancy rate} = \frac{\text{number of ongoing pregnancies [n]}}{\text{Number of treatment cycles}} \times 100\%$
- (7) Licensed centres are required to report the details concerning outcome of pregnancy within 12 months after treatment. Information on live birth for treatment cycles carried out in the later part of 2022 is not yet available.

Source (for licensed centres)

DC Form 1 & 7

Table 4 - Effect of One/Two/Three Embryo(s) Transferred (Fresh/Frozen Cycle with or without ICSI¹) on Pregnancy and Birth Outcomes² in 2022 (For non-donor IVF cycles only)

(Based on the information on Data Collection Forms received in the calendar year)

| One Embryo Transferred | | | | |
|-------------------------------|--------------------|---|--------------------------------|----------------------|
| Age Group ³ | Number of Patients | Number of Treatment Cycles ⁴ with Embryo Transferred | Ongoing Pregnancy ⁵ | |
| | | | n ⁵⁽ⁱ⁾ | (%) ⁵⁽ⁱⁱ⁾ |
| 25 or below | 10 | 12 | 4 | (33.3) |
| 26-30 | 151 | 187 | 97 | (51.9) |
| 31-35 | 1130 | 1375 | 587 | (42.7) |
| 36-40 | 1716 | 2108 | 704 | (33.4) |
| 41-45 | 438 | 517 | 121 | (23.4) |
| 46-50 | 31 | 36 | 1 | (2.8) |
| 51 or above | 1 | 2 | 0 | (0.0) |
| Total | 3477 | 4237 | 1514 | (35.7) |

| Two Embryos Transferred | | | | |
|--------------------------------|--------------------|---|--------------------------------|----------------------|
| Age Group ³ | Number of Patients | Number of Treatment Cycles ⁴ with Embryo Transferred | Ongoing Pregnancy ⁵ | |
| | | | n ⁵⁽ⁱ⁾ | (%) ⁵⁽ⁱⁱ⁾ |
| 25 or below | 2 | 2 | 2 | (100.0) |
| 26-30 | 29 | 32 | 14 | (43.8) |
| 31-35 | 244 | 282 | 137 | (48.6) |
| 36-40 | 522 | 591 | 225 | (38.1) |
| 41-45 | 238 | 277 | 57 | (20.6) |
| 46-50 | 17 | 19 | 3 | (15.8) |
| 51 or above | 1 | 1 | 0 | (0.0) |
| Total | 1053 | 1204 | 438 | (36.4) |

Three Embryos Transferred

| Age Group ³ | Number of Patients | Number of Treatment Cycles ⁴ with Embryo Transferred | Ongoing Pregnancy ⁵ | |
|------------------------|--------------------|---|--------------------------------|----------------------|
| | | | n ⁵⁽ⁱ⁾ | (%) ⁵⁽ⁱⁱ⁾ |
| 25 or below | 0 | NA | NA | |
| 26-30 | 0 | NA | NA | |
| 31-35 | 1 | 1 | 0 | (0.0) |
| 36-40 | 20 | 22 | 4 | (18.2) |
| 41-45 | 31 | 33 | 5 | (15.2) |
| 46-50 | 8 | 12 | 1 | (8.3) |
| 51 or above | 1 | 1 | 0 | (0.0) |
| Total | 61 | 69 | 10 | (14.5) |

Remarks:

NA Not applicable

- (1) **Intracytoplasmic sperm injection (ICSI)** means a method of gamete micromanipulation by which a single sperm is injected into the inner cellular structure of the egg.
- (2) Figures on **treatment outcome** reported in the interim statistics will be replaced when pregnancy outcome is available in the final statistics. Licensed centres are required to report the details concerning **pregnancy outcome** within 12 months after treatment. Information on live birth for treatment cycles carried out in the later part of 2022 is not yet available.
- (3) The age of wife has been used in calculating the age of patient.
- (4) (i) **Treatment cycles** refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.
This annual statistics only covered treatment cycles that led to (1) gamete transfer/embryo replacement/insemination, or stopped because of (2) elective cryopreservation of all embryos or (3) cycle abandonment.
(ii) In this table, treatment cycles for (a) RT procedures involving donated gametes/embryos and (b) involving artificial insemination (i.e. AIH and DI) are excluded from the above table and separately shown in Table 2. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above table.
- (5) **Ongoing pregnancy** means ongoing pregnancy with foetal cardiac activity during the period of the year being reported on.
 - (i) n = Number of ongoing pregnancies with single foetus and multiple foetuses.
 - (ii) **Ongoing pregnancy rate** is expressed as number of ongoing pregnancies per 100 treatment cycles started /commenced or per 100 cycles reaching the stage of attempted oocyte retrieval or embryo transfer. i.e. Ongoing pregnancy rate = number of ongoing pregnancies [n]/Number of treatment cycles with embryo transferred x 100%

Source (for licensed centres)

DC Form 1

**Table 5 - Pregnancy and Birth Outcomes by Age Group using Fresh/Frozen Oocytes (Fresh Cycles) in 2022
(For non-donor IVF cycles only)**

(Based on the information on Data Collection Forms received in the calendar year)

| Fresh Cycles using Fresh Oocytes | | | | | |
|---|--------------------|---|--|--------------------------------|----------------------|
| Age Group ¹ | Number of Patients | Number of Treatment Cycles ² | Number of Treatment Cycles with Embryo Transferred | Ongoing Pregnancy ³ | |
| | | | | n ³⁽ⁱ⁾ | (%) ³⁽ⁱⁱ⁾ |
| 25 or below | 9 | 9 | 1 | 1 | (11.1) |
| 26-30 | 143 | 150 | 22 | 10 | (6.7) |
| 31-35 | 990 | 1076 | 170 | 50 | (4.6) |
| 36-40 | 1455 | 1729 | 383 | 97 | (5.6) |
| 41-45 | 475 | 698 | 155 | 19 | (2.7) |
| 46-50 | 36 | 66 | 12 | 3 | (4.5) |
| 51 or above | 1 | 5 | 3 | 0 | (0.0) |
| Total | 3109 | 3733 | 746 | 180 | (4.8) |

| Fresh Cycles using Frozen Oocytes | | | | | |
|--|--------------------|---|--|--------------------------------|----------------------|
| Age Group ¹ | Number of Patients | Number of Treatment Cycles ² | Number of Treatment Cycles with Embryo Transferred | Ongoing Pregnancy ³ | |
| | | | | n ³⁽ⁱ⁾ | (%) ³⁽ⁱⁱ⁾ |
| 25 or below | 0 | NA | NA | NA | |
| 26-30 | 3 | 3 | 0 | 0 | (0.0) |
| 31-35 | 6 | 6 | 2 | 0 | (0.0) |
| 36-40 | 26 | 26 | 10 | 4 | (15.4) |
| 41-45 | 24 | 27 | 13 | 3 | (11.1) |
| 46-50 | 2 | 2 | 2 | 0 | (0.0) |
| 51 or above | 0 | NA | NA | NA | |
| Total | 61 | 64 | 27 | 7 | (10.9) |

Remarks:

NA Not applicable

- (1) The age of wife has been used in calculating the age of patient.
- (2) (i) Treatment cycles refers to the process in which a reproductive technology (RT) procedure is carried out, where a woman has undergone ovarian stimulation or monitoring with the intent of having RT procedure, or frozen embryos have been thawed with the intent of transferring them to a woman. A treatment cycle starts (a) on the day when superovulatory drugs are commenced or (b) from the date of the last menstrual period.
- (ii) In this table, treatment cycles for (a) RT procedures involving donated gametes/embryos and (b) involving artificial insemination (i.e. AIH and DI) are excluded from the above table and separately shown in Table 2. To avoid double counting, treatment cycles in which one patient engages in more than one type of RT procedure in one cycle (e.g. IVF and FET) are also excluded in the above table.

- (3) **Ongoing pregnancy** means ongoing pregnancy with foetal cardiac activity during the period of the year being reported on.
- (i) n = Number of ongoing pregnancies
- (ii) **Ongoing pregnancy rate** is expressed as number of ongoing pregnancies per 100 treatment cycles started /commenced or per 100 cycles reaching the stage of attempted oocyte retrieval or embryo transfer.
- i.e. Ongoing pregnancy rate = number of ongoing pregnancies [n]/Number of treatment cycles x 100%
- (4) Licensed centres are required to report the details concerning outcome of pregnancy within 12 months after treatment. Information on live birth for treatment cycles carried out in the later part of 2022 is not yet available.

Source (for licensed centres)

DC Form 1

Table 6 - Infertility Diagnosis of Patients in 2022

(Based on the information on Data Collection Forms received in the calendar year)

A) Infertility Diagnosis by Age of Wives Receiving RT Procedures (other than DI and AIH)

| Diagnosis | Age Group (Number of Patients) | | | | | | | |
|---|--------------------------------|------------|-------------|-------------|------------|-----------|-------------|-------------|
| | 25 or below | 26-30 | 31-35 | 36-40 | 41-45 | 46-50 | 51 or above | All |
| Male factor | 4 | 60 | 477 | 606 | 86 | 3 | 0 | 1236 |
| Tubal problem | 3 | 20 | 62 | 69 | 12 | 0 | 0 | 166 |
| Endometriosis | 0 | 3 | 61 | 63 | 11 | 0 | 0 | 138 |
| Immunologic problem | 0 | 0 | 5 | 6 | 2 | 0 | 0 | 13 |
| Tubo-peritoneal problem | 1 | 8 | 64 | 75 | 10 | 0 | 0 | 158 |
| Ovulatory problem | 0 | 9 | 60 | 78 | 10 | 0 | 0 | 157 |
| Unexplained | 0 | 21 | 203 | 338 | 86 | 6 | 0 | 654 |
| Other causes ³ | 2 | 27 | 192 | 352 | 220 | 30 | 1 | 824 |
| Multiple causes - female & male factors | 3 | 55 | 447 | 933 | 382 | 37 | 1 | 1858 |
| Multiple causes - female factors only | 0 | 19 | 102 | 174 | 56 | 4 | 0 | 355 |
| Total | 13 | 222 | 1673 | 2694 | 875 | 80 | 2 | 5559 |

Remark:

- (1) All treatment cycles for RT procedures involving donated gametes/embryos are excluded.

B) Infertility Diagnosis by Age of Wives Receiving AIH

| Diagnosis | Age Group (Number of Patients) | | | | | | | |
|---|--------------------------------|------------|-------------|------------|------------|-----------|-------------|-------------|
| | 25 or below | 26-30 | 31-35 | 36-40 | 41-45 | 46-50 | 51 or above | All |
| Male factor | 2 | 62 | 380 | 200 | 37 | 3 | 0 | 684 |
| Endometriosis | 0 | 3 | 21 | 18 | 0 | 0 | 0 | 42 |
| Ovulatory problem | 3 | 18 | 82 | 54 | 3 | 0 | 0 | 160 |
| Unexplained | 1 | 35 | 203 | 125 | 31 | 3 | 1 | 399 |
| Other causes ³ | 0 | 13 | 105 | 152 | 85 | 11 | 1 | 367 |
| Multiple causes - female & male factors | 2 | 40 | 195 | 204 | 61 | 4 | 0 | 506 |
| Multiple causes - female factors only | 1 | 3 | 34 | 43 | 7 | 1 | 0 | 89 |
| Total | 9 | 174 | 1020 | 796 | 224 | 22 | 2 | 2247 |

C) Reasons for Treatment by Age of Husbands - DI

| Reasons | Age Group (Number of Patients) | | | | | | | |
|---|--------------------------------|----------|----------|----------|----------|----------|-------------|----------|
| | 25 or below | 26-30 | 31-35 | 36-40 | 41-45 | 46-50 | 51 or above | All |
| Obstructive azoospermia | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Non-obstructive azoospermia | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 3 |
| Severe deficits in semen quality in couples who do not wish to undergo intracytoplasmic sperm injection | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Genetic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Infectious disease in the male partner (such as HIV) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Severe rhesus isoimmunisation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Multiple causes | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 5 |

Remarks:

- (1) Age of wife is used in calculating the age of patient in Infertility Diagnosis by Age of Patients Receiving RT Procedures (other than DI and AIH) and receiving AIH procedures while the age of husband is used in calculating the age of patient in Reasons for Treatment by Age of Patients - DI.
- (2) One patient may undergo more than one type of RT procedure during the calendar year (e.g. both IVF and AIH).
- (3) "Other causes" of infertility diagnosis reported by licensed centres included advanced maternal age, reduced ovarian reserve, coital problem, polycystic ovary syndrome, etc.

Source (for licensed centres)

DC Form 1, 7 and 3 respectively

Table 7 - Current Research Projects ending December 2022

| Name of Licensed Centre | Name of Project | Project Duration (in months) |
|---|--|------------------------------|
| Assisted Reproductive Technology Unit (IVFHK), Prince of Wales Hospital / The Chinese University of Hong Kong | A case-series study to establish preimplantation genetic screening (PGS) and its clinical application | 36 |
| Assisted Reproductive Technology Unit (IVFHK), Prince of Wales Hospital / The Chinese University of Hong Kong | Molecular analysis of culture medium samples from embryos of in-vitro fertilisation (IVF) patients | 36 |
| Department of Obstetrics & Gynaecology, HKU | Derivation of pre-Good Manufacturing Practice (pre-GMP) - quality Human Expanded Potential Stem Cells (EPSCs) from human preimplantation embryos | 36 |

Remark:

- (1) The full list of all research projects approved by the Council on Human Reproductive Technology ("the Council") could be accessed at the Council's website https://www.chrt.org.hk/english/embryo/embryo_app.html