Q-IVF
Nationellt kvalitetsregister
för assisterad befruktning

Fertility treatments in Sweden

Annual Report 2024

Refers to treatments started in 2022

RESULTS and TRENDS

Table of contents

Notes from the head of the Registry

Christina Bergh, registerhållare

The first child in the world born as a result of in vitro fertilization (IVF) was born in 1978. During the 46 years since the start of IVF, techniques has developed immensely, both in terms of birth rates and in terms of maternal and child safety. Furthermore, today IVF can be offered to a wider range of patients, and treatments have been much simplified. As a result of IVF, to date over 10 million children have been born worldwide.

Since the first child was born in Sweden as a result of IVF in 1982, legislation on assisted reproduction has been changed or amended several times. Applicable regulation on assisted reproduction can today be found in *Lagen om genetisk integritet* (The Genetic Integrity Act, SFS 2006:351).

Some milestones reached in the last twenty years in Sweden are:

- 2003: Oocyte donation becomes allowed
- 2005: IVF-treatment of lesbian couples becomes allowed
- 2016: IVF-treatment of single women becomes allowed
- 2019: The legal requirement of maintaining a genetic link between at least one parent and child is removed. Treatments where both the oocyte and the sperm have been donated now becomes allowed, as well as treatments with donated embryos
- 2019: The period during which cryopreserved embryos can be stored is extended to ten years
- 2019: It is decided that neither commercial nor altruistic surrogate motherhood is allowed in Swedish healthcare

In Sweden, both privately and publicly owned care providers perform fertility treatments. In total, just over 25 500 treatments were performed in 2022, including fresh and freeze cycles and inseminations (with donor sperm). The couple's own gametes are used in a majority of the treatments, with about 22 percent of the treatments being performed with either donated oocytes or donated sperm or both. Lately, the possibility of freezing unfertilized oocytes with good success rates has also emerged. This means that women who suffer from a disease where the cure or treatment may damage the function of the ovaries can now cryopreserve their oocytes with the possibility of having children later. This also applies to women who want to freeze oocytes for social reasons.

The National Quality Registry for Assisted Reproduction (Q-IVF) was introduced in 2007. Consequently, this years' report is the 16th from Q-IVF. It covers all treatments initiated in 2022 in Sweden´s IVF clinics, six public and 18 private clinics. Public as well as private clinics have linked up with and report to Q-IVF on a broad and reliable scale, meaning that almost 100% of treatments performed in Sweden in 2022 are accounted for in this report.

The aim of Q-IVF is to monitor treatment results and identify potential risks for women and men who have undergone IVF-treatment as well as children born as a result of IVF. The registry likewise is a valuable data source for clinics to benchmark their development and qualitative work, as well as being a base for research.

The Regional Board of Västra Götaland was at the start of Q-IVF 2007 the authority responsible for the registry and handling of personal data. This responsibility has during 2021 been transferred to Karolinska University hospital in Stockholm. The head of the Registry is Professor Christina Bergh, Gothenburg and the registry coordinator is midwife Linda Kluge (since 2024). The steering group consists of representatives from all reporting IVF clinics in Sweden, representative of patient networks, and statistician Karin Källén. Behavioural science competence is provided by Professor Gunilla Sydsjö, Linköping. The steering group meets regularly, with alternating chairpersons. The current chair is Kersti Lundin, Sahlgrenska University hospital. The register is financially supported by SKR and through fees from affiliated clinics.

From being connected to Uppsala Clinical Research Centre (UCR) during the first years, the current IT-platform is now Omda, the same IT-platform as used by the Pregnancy Registry. Q-IVF is also affiliated with Registercentrum (QRC) in Stockholm.

Over the last few years, comprehensive developmental work has been carried out concerning collection of data which is now reported “on-line” with daily updates and continuous presentation of results, replacing the previous system using yearly compilations. Furthermore, this on-line method allows individual clinics to make use of much more up-to-date data, which is supporting the clinics’ pursuit of qualitative work. New patient groups have been added, for example single women, women in need of treatment to preserve their fertility, and patients with gender dysphoria.

Data from Q-IVF is used in several research projects, including projects that involve short and long-term follow-up studies on children born as a result of IVF, and their mothers. Q-IVF reports aggregated data to the Nordic Fertility Society (NFS) and to the European Society of Human Reproduction and Embryology (ESHRE).

Christina Bergh, Head of Q-IVF

Steering board

Working group

Christina Bergh, head of the registry, MD, Professor, Sahlgrenska University Hospital, Gothenburg

Kia Borg, Registry Coordinator, Midwife, Sahlgrenska University Hospital Gothenburg

Linda Kluge, Registry Coordinator, Midwife, PhD, Livio Gothenburg

Kersti Lundin, Chair of the Steering Committee, Embryologist, Associate Professor, Sahlgrenska University Hospital, Gothenburg

Karin Källén, MD, statistician, Professor, Lund University

Representatives for participating clinics

Kersti Lundin, embryologist, Associate Professor, Sahlgrenska University Hospital

Evangelia Elenis, MD, PhD, Uppsala University Hospital

Carin Lindén, MD, PhD, Karolinska University Hospital, Huddinge

Susanne Liffner, MD, PhD, University Hospital, Linköping

Margareta Kitlinski, MD, PhD, Skåne University Hospital, Malmö

Juliane Baumgart, MD, University Hospital, Örebro

Jan Holte, MD, PhD, Carl von Linnaeus Clinic, Uppsala

Anna Karin Lind, MD, PhD, Livio

Cina Nyberg, MD, Livio

Arthur Aanesen, MD, PhD, Sophiahemmet, Stockholm

Eva Lundborg, MD, Nordic IVF Gothenburg

Pia Saldeen, MD, PhD, Nordic IVF Sweden

Sujata Lalit Kumar, MD, PhD, Stockholm IVF

Johanna Schmidt, MD, PhD, Göteborgs IVF klinik

Zahra Sabeti Rad, MD, PhD, Lund IVF Center

Renata Gustafsson, embryologist, Gynhälsan Jönköping

Other

Ulla-Britt Wennerholm, obstetrician, MD, Professor, Sahlgrenska University Hospital, Gothenburg.

Gunilla Sydsjö, Behavioral Scientist, Professor, RMC Linköping University Hospital.

A representative of the "National Association of Involuntary Childlessness".

Dictionary Terms and definitions

Assisted reproduction	Use and manipulation of gametes (oocytes and sperm) outside of the body
Biochemical pregnancy	A positive pregnancy test (urine or serum) ahead of an ultrasound verification of a gestational sac
Blastocyst	An embryo five to six days after fertilization
Clinical pregnancy	A pregnancy where a gestational sac is visible on an ultrasound
DET	Double embryo transfer: transfer of two embryos
Delivery	The complete expulsion or extraction from a woman of one or more fetuses, after at least 22 completed weeks of gestational age, irrespective of whether they are live births or stillbirths
Double donation	A treatment cycle including both donated oocytes and donated sperm
Embryo	A fertilized egg having reached the cell division stage
Embryo donation	A treatment with donated embryos
ET	Embryo transfer: transfer of an embryo or embryos into the uterus
FET	Frozen embryo transfer: transfer of a cryopreserved embryo
Freeze-all	All embryos are cryopreserved for use later, and no transfer of embryos taking place in the fresh cycle
Freeze cycle	Treatment cycle with cryopreserved embryos
Fresh IVF-cycle	A treatment cycle with or without hormone stimulation aiming for egg retrieval and embryo transfer
Gamete	Reproductive cell, an egg (oocyte) or a sperm
ICSI	Intracytoplasmic sperm injection: fertilization using microinjection, where a sperm is injected directly into the oocyte via a thin needle; a method used when the sperm count is low, where the sperm motility is low, or after a previous cycle with no or very low fertilization after St. IVF
IUI-D	Insemination with donor sperm
IVF	In vitro fertilization: fertilization occurring outside of the woman's body
Multiple birth	The complete expulsion or extraction from a woman of more than one foetus, after 22 completed weeks of gestational age, irrespective of whether it is a live birth or stillbirth. Births refer to the individual newborn; for example, a twin delivery represents two births
Multiple pregnancies	A pregnancy where the women is pregnant with multiple foetuses
OPU	Ovum pick up; oocyte retrieval from the ovaries
Own gametes	The couple's own oocytes and sperm are used in a treatment
SET	Single embryo transfer
St. IVF	Standard IVF: egg and sperm placed together in a petri dish filled with nutrient solution and the sperm fertilizing the oocyte
Treatment cycle	A treatment initiated either by hormones or by start of menstruation

Background - childlessness and its causes

Infertility, or involuntary childlessness, is defined by the WHO as pregnancy not occurring despite unprotected sexual intercourse regularly for one year. Primary infertility means that a woman has never been pregnant, or that a man via intercourse has never given rise to a pregnancy. Secondary infertility means that a woman *has* been pregnant, or that a man via intercourse *has* given rise to a pregnancy, but then has difficulty achieving another pregnancy.

Fertility problems affect 10–15% of all heterosexual couples. The cause for these problems differs. About one third of the problems are related to the man (e.g. low sperm count, low sperm motility), about one third of the problems are related to the woman (ovulation disorders, blocked fallopian tubes, endometriosis, etc.), and about one third of the problems are related to both the man *and* the woman. In some cases, no explanation is found, then called unexplained infertility.

Fertility treatment

It is estimated that about two thirds of all couples/patients can become pregnant and have children after check-ups and treatment. By treatment, we refer to various medical treatments to help a woman get pregnant, including sperm insemination and in vitro fertilization (IVF). Both insemination and IVF can be performed either using own or donated gametes.

During insemination, sperm from the husband or donor is inserted into the woman's uterus at the time of ovulation. This report only presents the results from insemination with donated sperm (IUI-D).

During IVF, oocytes are retrieved from a woman's ovaries and fertilized by sperm in a laboratory. Fertilization is achieved by adding sperm to the oocytes in a special dish (Standard IVF) or by injecting a sperm directly into the oocyte. The latter method is called microinjection or intracytoplasmic sperm injection (ICSI). If the oocytes fertilizes and an embryo is developed, it can be transferred into the uterus. In this report, we use the term IVF to denote both St IVF and ICSI, unless otherwise stated. We present data both on IVF using own and donated gametes.

In most cases, the aim of an IVF-treatment is for the woman who undergoes the treatment to get pregnant in the same treatment cycle or soon thereafter in case of freezing of all embryos. However, the treatment can also be used to retrieve oocytes for donation purposes or for oocyte/embryo freezing in order to preserve a woman's fertility (see below). Thus, not all started treatments result in an immediate transfer of an embryo into the uterus.

A treatment cycle

A fertility treatment, such as IVF, usually takes a couple of weeks, and is referred to as a treatment cycle. An IVF treatment can be performed either as a fresh treatment cycle or by transfer of frozen/thawed embryos. In recent years, more freeze cycles are made than fresh cycles. In about half of all fresh cycles, the method of fertilization is standard IVF (St IVF) and in the other half is ICSI.

How we collect data

The number of started treatments (own and donated gametes) has increased from about 3000 in 1992 to just above 25 500 in 2022. Of children born after fertility treatments in Sweden, for the present year (treatment start 2022), 5823 children have been conceived through IVF (own or donated gametes) and 252 children through donor insemination, in total representing around 5.5% of all children born in Sweden. It is important to follow up the results of the treatments to be able to perform these treatments as safe and effective as possible.
The National Quality Register for Assisted Reproduction (Q-IVF) was launched in 2007 and since then most of all treatment cycles are reported to Q-IVF. Almost all the country's clinics participate, public as well as private. Q-IVF is thus one of the world's most complete IVF registries. Reporting from the IVF clinics is done with a regular, continuous on-line transfer of data from the clinics to the registry.

How should we interpret data?

A common measure of treatment outcome is the proportion of started treatments that results in a live birth. However, IVF treatment involves many steps. There are several reasons why a started treatment does not lead to the transfer of a fertilized egg. The treatment cycle can be cancelled due to very few or no ovarian follicles being developed, the fertilization process or embryo development might fail, or there may be a risk of other complications, such as ovarian hyperstimulation (OHSS). When there is a risk of OHSS, one often chooses to cryopreserve all embryos, which reduces the risk of OHSS. The freezing methods today are very effective, with a high rate of embryo survival. The woman can then have a thawed embryo transferred later without risk of OHSS and with a remaining high chance of pregnancy and live birth.

In some cases, a treatment cycle is started without the objective of transferring an embryo, for example when women cryopreserve oocytes or embryos ahead of chemotherapy for later use. These cycles are thus excluded when calculating live birth per started cycle in this report. Comparing the number of live births per embryo transfer is another way to measure effectiveness and is used in this report. The effectiveness of the cryopreservation cycles is increasing, something that is primarily associated with extended culture to the blastocyst stage and improved cryo techniques. Culturing embryos to blastocyst stage selects embryos which are more viable. In addition, the freezing methods have improved, thus a larger part of embryos survive freezing and thawing.

How data can be used

Each participating clinic can, after secure login, access their own data via the register's website and compare against national data. An annual report is presented to the public with treatment results and trends as well as so-called "open comparisons" of birth rates and patient care at individual clinics.

In the meeting with patients, the clinics can use national data to demonstrate, for example, how the birth outcome varies in different age groups. Using Q-IVF’s yearly report, patients can also themselves check the effectiveness of the different methods of assisted reproduction. This information may make it easier to better understand the treatment and chances of getting pregnant.

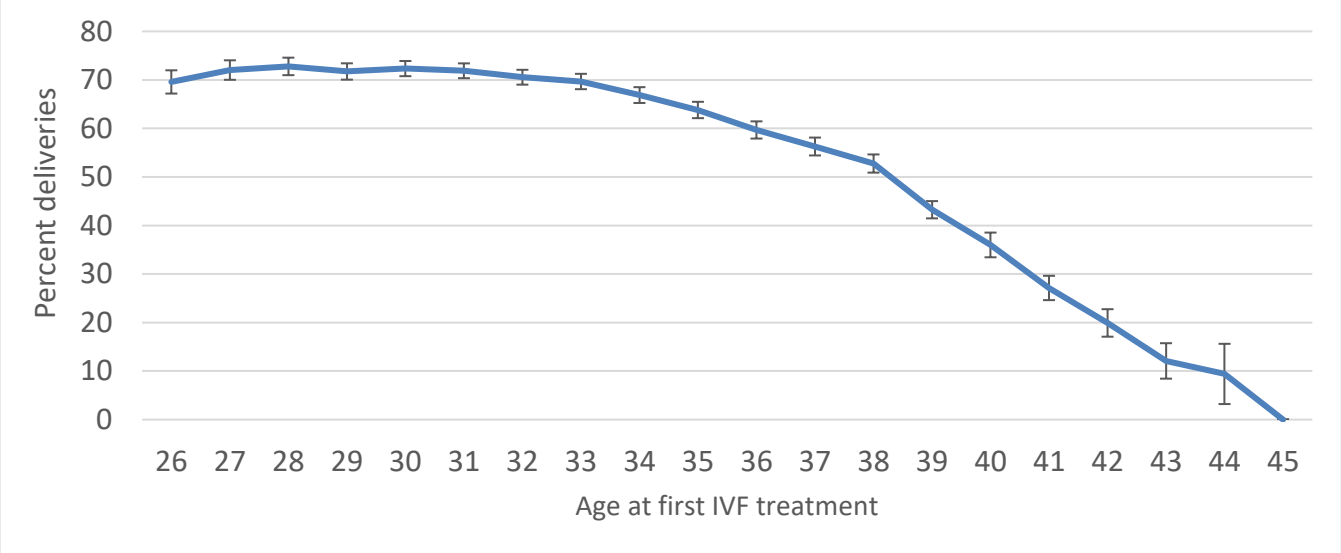
Introduction

Will we/I succeed in having a baby with IVF treatment?

This question cannot be answered with certainty. You can succeed in having a baby despite poor preconditions and you could be unsuccessful even though your preconditions are good. The different factors affecting chances of having a baby is discussed at the appointment with the treating doctor at the clinic.

The woman's age is the most important factor in determining chances of success, since the quantity and quality of a woman's oocytes becomes poorer as she ages. A man's age is also of some importance, but much less, since sperms are produced in the testicles continuously. The importance of the female age factor is shown in the graph below. The graph shows the chance of delivering a baby after an 18-month-treatment period, a period that may include one or several treatment cycles.

Figure 1 *Proportion of women achieving a delivery after treatments started within 18 months of the first IVF-treatment. Own gametes.*



The graph above includes women who underwent their first oocyte retrieval during the period 2012-01-01 to 2021-12-31. The age indicates a women's age at start of the first treatment.

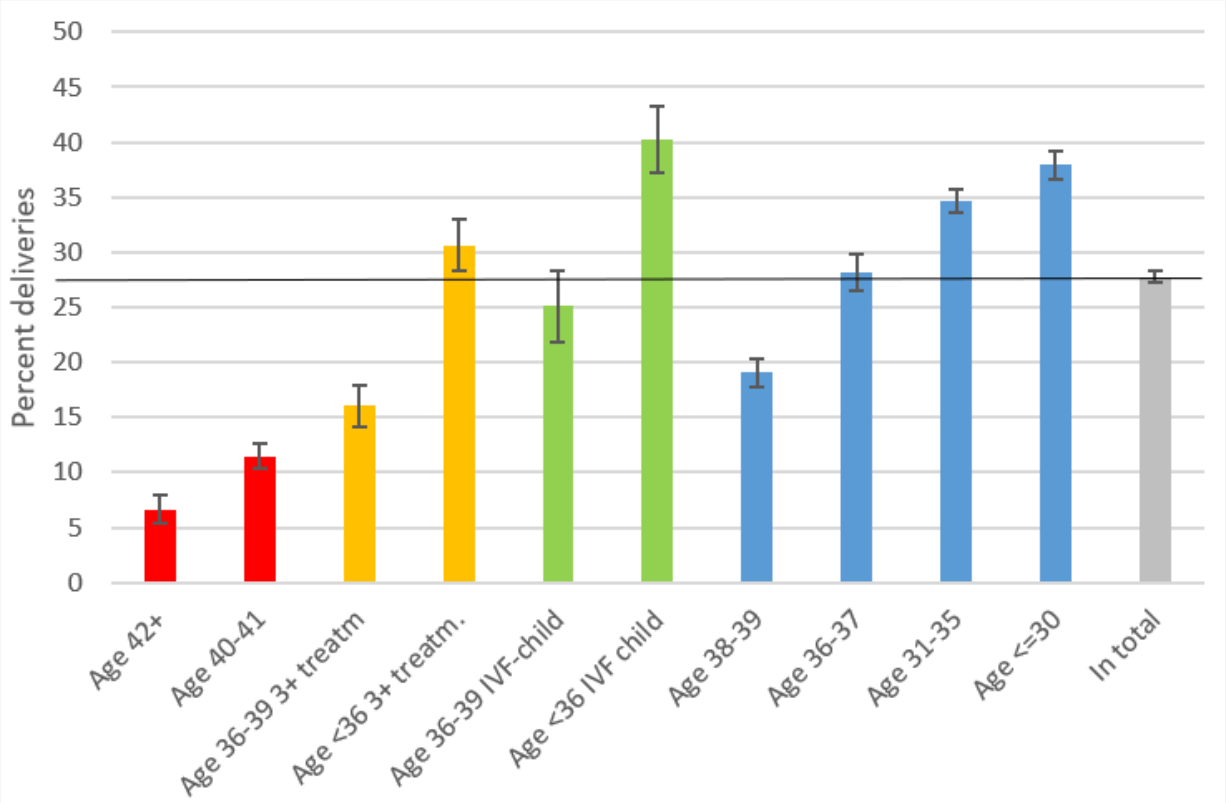
AMH (Anti Müllerian Hormone) is a substance which is measured in the blood and indicating a woman's ovarian reserve. The level of AMH is used to predict how many oocytes can be retrieved during IVF-stimulation. However, the level of AMH is not associated with the oocyte quality. Another way to evaluate a woman's ability to produce oocytes is to count the number of small (undeveloped) ovarian follicles. The level of AMH can vary greatly between different women of the same age.

Sperm quality (sperm count and motility) affects one's chance of having a baby with spontaneous conception but is less important in determining the chance of succeeding with an IVF-treatment.

How long time a couple has tried to become pregnant and have a baby is important for the assessment of when it is reasonable to initiate an IVF-treatment.

Having had an **IVF-baby** in an earlier treatment increases the chance of succeeding again. This increased success rate is shown in Figure 2, where the green bars show the probability of success for women already having IVF children. Figure 2 also shows that unsuccessful IVF-treatments do not affect one's chances very much when it comes to new attempts (yellow bars). The red bars in the chart show the impact of advanced age on success rate.

Figure 2 *Delivery rate per first embryo transfer after a fresh oocyte retrieval (with fresh transfer or, if the first treatment resulted in a so-called "freeze-all", first embryo transfer of a cryopreserved embryo). Applies for IVF with one's own egg/sperm.*



The graph above shows results from the period 2019-01-01 to 2022-06-30
The blue bars indicate the groups who have undergone one, two or three treatments. The yellow bars indicate groups who have undergone more than three treatments. The red bars indicate the groups over 40 years of age. The above-40 group is not divided into sub-categories based on the number of undergone treatments (since this would make the groups small and results more uncertain). The green bars indicate the chance of succeeding again if one already has a baby born as a result of IVF.

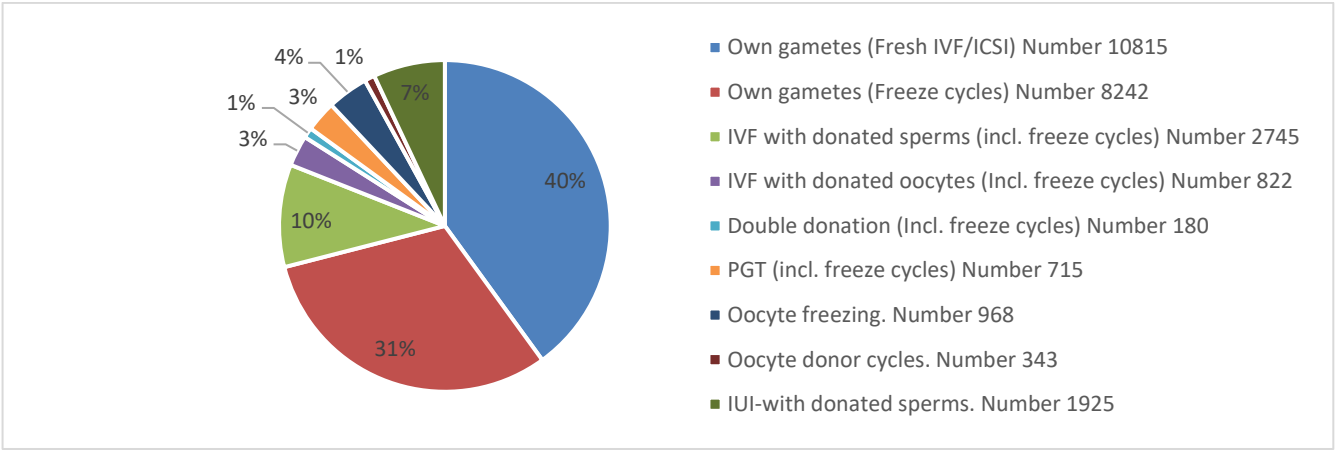
Which clinic should we/I choose?

Generally, IVF-treatments at all clinics in Sweden are of high quality and performed in a similar manner. The clinics reporting to Q-IVF can compare their results with other reporting clinics and also learn from each other. In the section "Individual clinics" (figure 34 and figure 35) of this yearly report, we have tried to show the results of the different clinics as fair and accurate as possible.

Other aspects that are important to take into consideration when choosing a clinic is a clinics' location (how long it takes to travel there), and the contact with and perception of the staff. The personal treatment by the staff at the different clinics is evaluated in this yearly report under "Patient satisfaction".

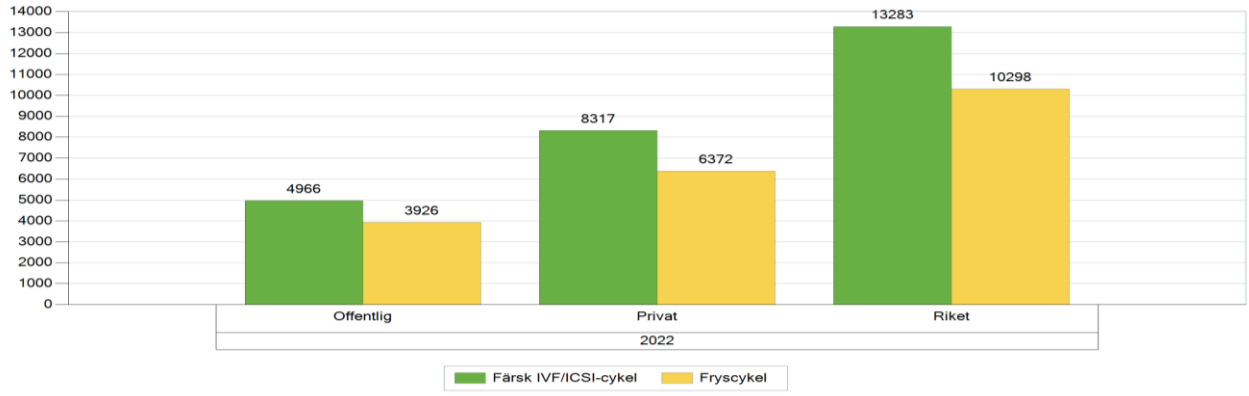
General information

Figure 3 Different types of treatments started in 2022. *Proportions of initiated treatment.*



Number of started cycles in Sweden 2022

Figure 4 *Number of started treatments public/private/total. Fresh IVF and freeze cycles. Own and donated gametes and PGT.*



Offentlig = Public, Privat = Private, Riket = In total, Färsk = Fresh, Fryscykel = Freeze cycle.

Some of the treatments given at private clinics are paid for by the state since the regional governments sometimes procure treatments from the private clinics. See Figure 7.

Figure 5 *Number of treatments started per clinic. Fresh IVF and freeze cycle (FET). Own and donated gametes and PGT.*

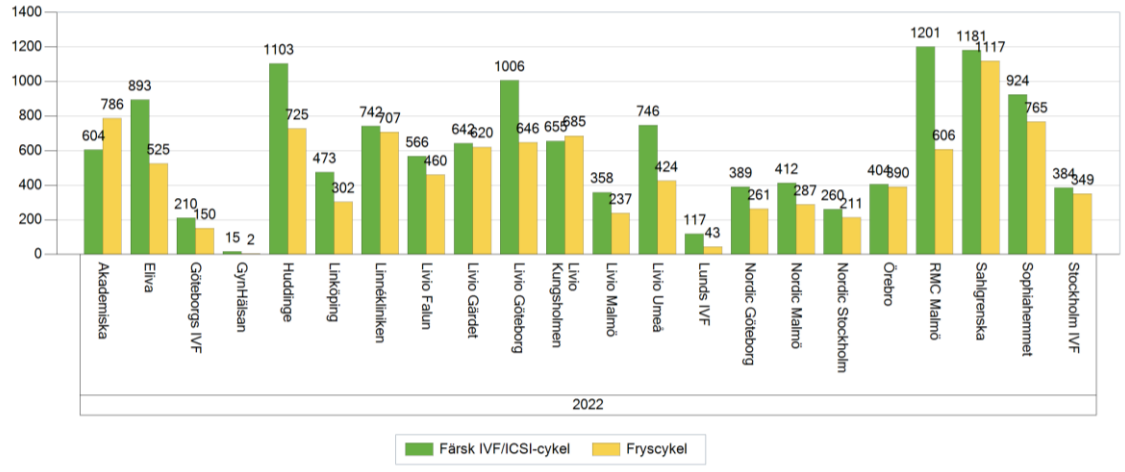
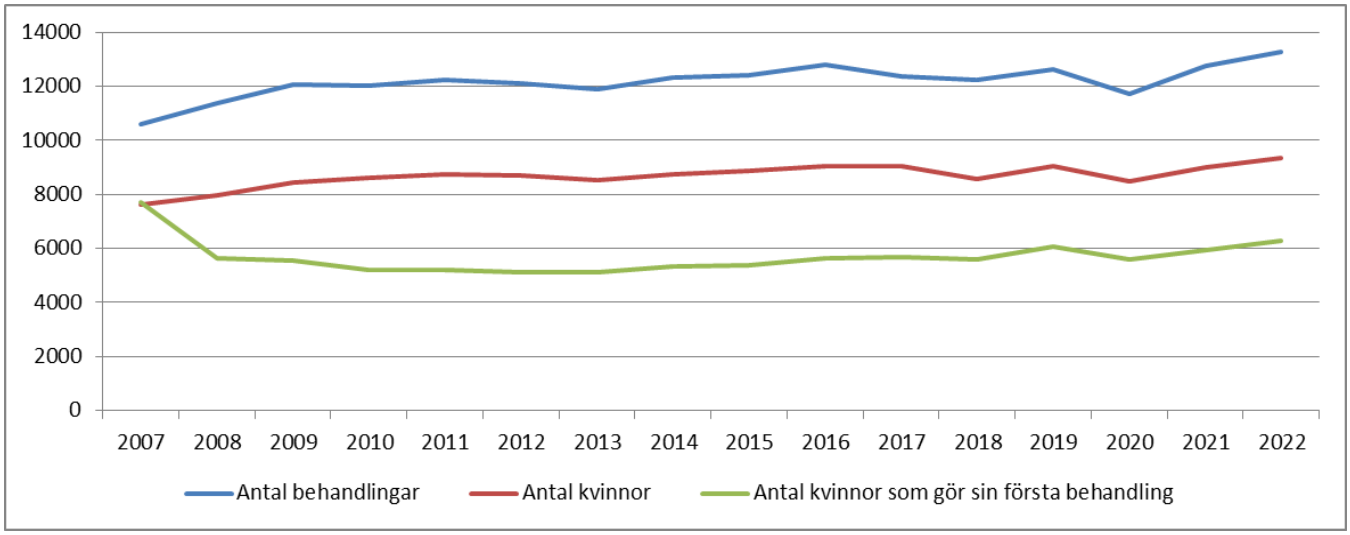


Figure 6 *Number of women who started their first IVF treatment, total number of women who underwent IVF treatment and total number of treatments. Fresh IVF with own and donated gametes and PGT.*

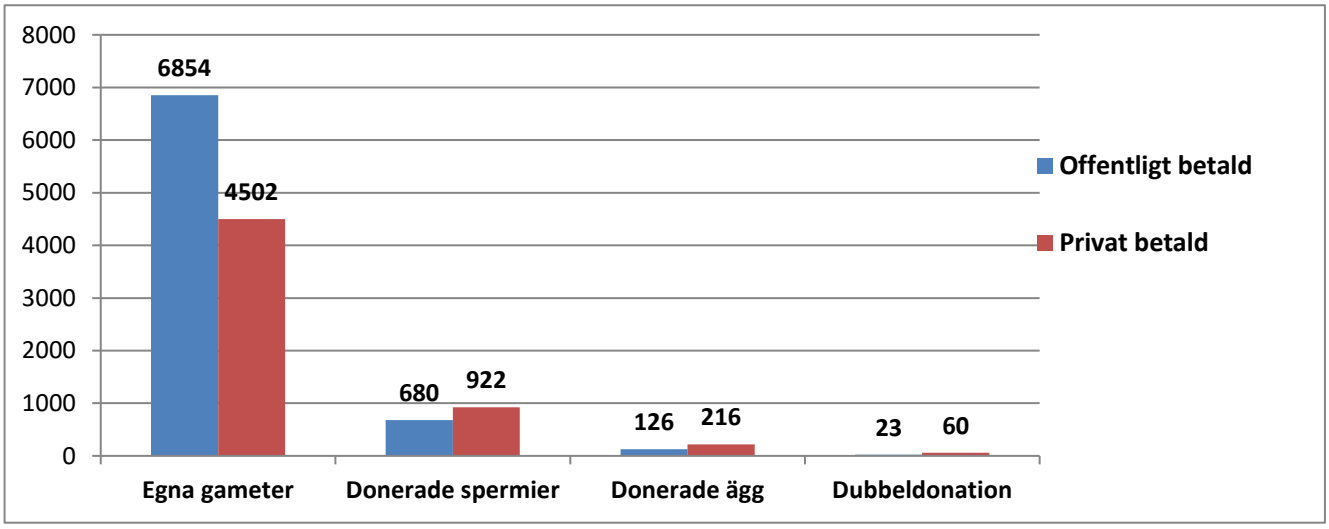


Antal behandlingar = Number of treatments, Antal kvinnor = Number of women, Antal kvinnor som gör sin första behandling = Number of women who started their first IVF treatment.

In 2007, the year in which the quality register was started, only first-time cycles were recorded.

Figure 7 *Number of publicly and privately funded treatments. Fresh IVF.*

* The figures are approximately calculated.



Offentligt betald = Publicly funded, Privat betald = Privately funded.
Egna gameter = Own gametes, Donerade spermier = Donated sperm, Donerade ägg = Donated oocytes, Dubbeldonation = Double donation.

NB! A proportion of publicly paid treatments take place in private clinics.

Table 1 *Lost to follow up 2022, IVF treatments with own or donated gametes where we do not know the result despite investigations. The reason may be because patients moved abroad.*

	Missing treatment results	Pregnancies with missing outcome	In total
Fresh IVF	31	7	38
Freeze cycle	35	20	55

IVF with own gametes (PGT not included)

A summary of the treatments started in 2022

Table 2 *Number of treatments, pregnancies, birth rates per treatment type.* Own gametes.

	St. IVF	ICSI		Fresh IVF Total	Freeze Cycle	In total Fresh and FET
		ICSI Ejaculated	ICSI epididymis/ Testicle			
Started cycles	**5120**	**5389**	**306**	**10 815**	**8242**	**19 057**
Oocyte aspirations	4771	4959	301	10 031		
Embryo transfer*	**3240**	**3178**	**188**	**6606**	**8059**	**14 665**
Positive pregnancy test	1239	1219	76	2534	3998	6532
Biochemical pregnancies	191	172	14	377	498	875
Clinical pregnancies*	**1048**	**1047**	**62**	**2157**	**3500**	**5657**
Spontaneous abortion < week 13	164	152	11	327	511	838
Spontaneous abortion Week 13-22	10	12	<3	23	38	61
Ectopic pregnancy	13	7	3	23	18	41
Number of stillborn week 22-27	<3	4	0	5	8	13
Number of stillborn ≥ week 28	5	9	0	14	13	27
Deliveries singleton†	837	848	45	1730	2856	4586
Deliveries, twins	20	27	<3	48	60	108
Deliveries, triplets	0	0	0	0	0	0
Total number of deliveries	**857**	**875**	**46**	**1778**	**2916**	**4694**
Total number of live born children	**871**	**888**	**47**	**1806**	**2952**	**4758**

**Spontaneous abortion < gestational week 13 is including a few legal abortions*

†Missing outcome of 7 clinical pregnancies; Fresh cycle 6, freeze cycles 17.

Figure 8 *Proportions of women who started a fresh IVF treatment in 2022. Separated by age. Own gametes.*

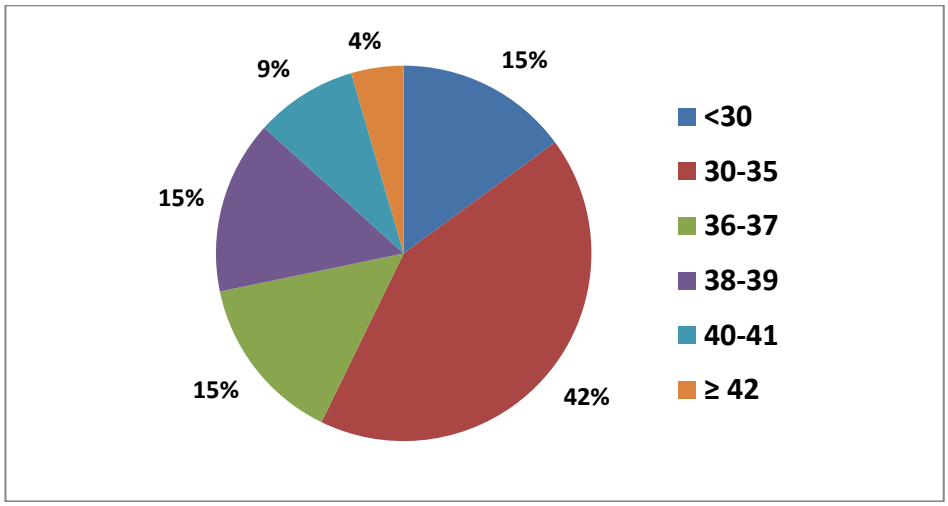
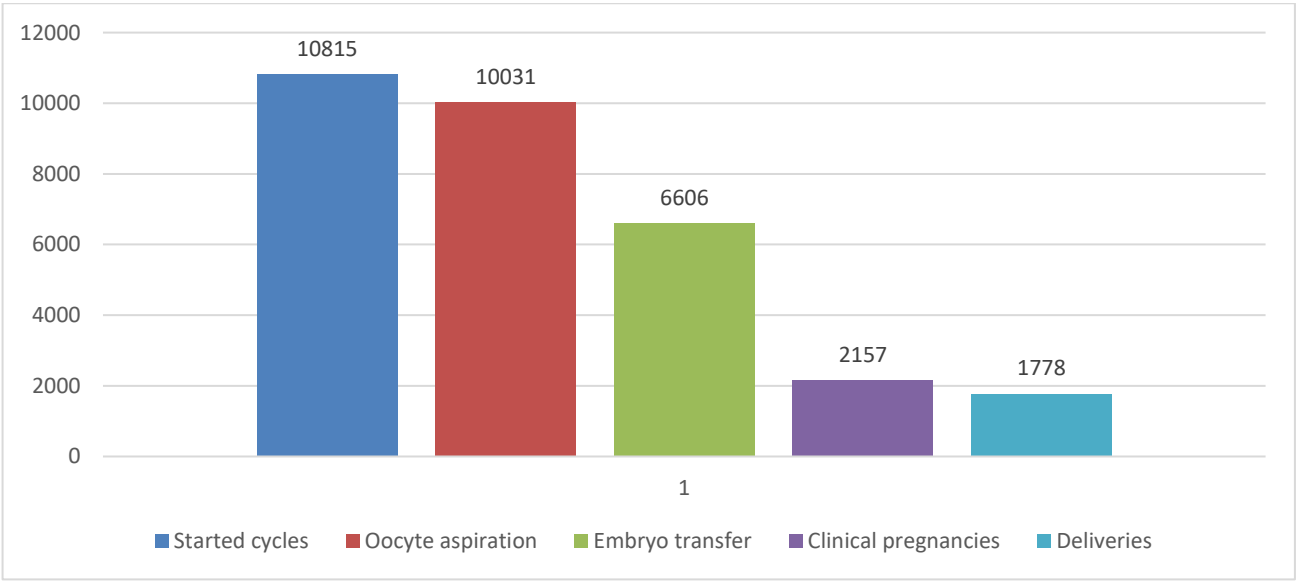


Figure 9 *Number of treatments reaching different steps in the treatment process. Fresh IVF. Own gametes.*



Many things can happen during the various treatment stages. Sometimes stimulation is disrupted before oocyte retrieval. The reasons may be that the number of ovarian follicles is too small, that the prescribed medication is not taken correctly, or for other medical or personal reasons.

Of the treatments that led to oocyte retrieval, fresh embryo transfer was performed in about 66%. The most common reason for not performing a fresh embryo transfer is that there is a risk of OHSS and all good quality embryos are frozen in order to reduce this risk. This procedure delays embryo transfer but does not reduce the chance of pregnancy. Other reasons why treatments don't lead to an embryo transfer are that no mature oocytes are obtained during oocyte retrieval, that the oocytes are not fertilized normally or that no embryo develops that is suitable for transfer. Out of the 6606 fresh embryo transfers performed, 27% resulted in childbirth.

How many embryos are transferred?

Due to the relatively high incidence of twins as a result of IVF, the Swedish National Board of Health and Welfare decided in 2003 that, as a rule, only one fertilized oocyte (embryo) should be transferred into the woman. If the risk of a twin pregnancy is estimated to be low, two fertilized embryos can be transferred. As part of this policy, if two embryos are planned to be inserted, the couple or the single woman are to be informed about the risks that twin pregnancies entail. Though most twin deliveries go well, twin pregnancies involve a significantly higher risk of complications than a single-baby delivery. Before a decision is made on the number of embryos that are to be transferred, there is an individual assessment as to whether there exist any other risk factors, including diseases and previous complications related to pregnancy or delivery, for example caesarean section.
The risk of premature delivery and low birthweight is higher for twin pregnancies than for single-baby pregnancies. Premature births and low birth weight are associated with increased medical risks for the children. Multiple pregnancies also entail an increased risk of hypertensive disorders of pregnancy and pre-eclampsia as well as other severe obstetrical complications for the mother. These increased risks are the reasons why in Sweden only one embryo at a time is transferred in most of the cycles.

Figure *10a* *Proportion of transfers of one (SET) or two (DET) embryos. Fresh IVF. Own gametes.*

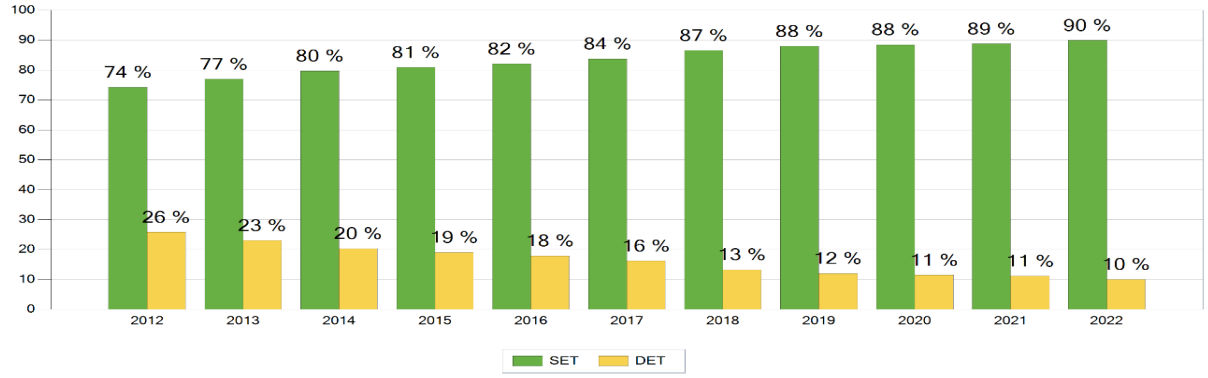


Figure 10b *Proportion of transfers of one (SET) or two (DET) embryos. Freeze cycles. Own gametes.*

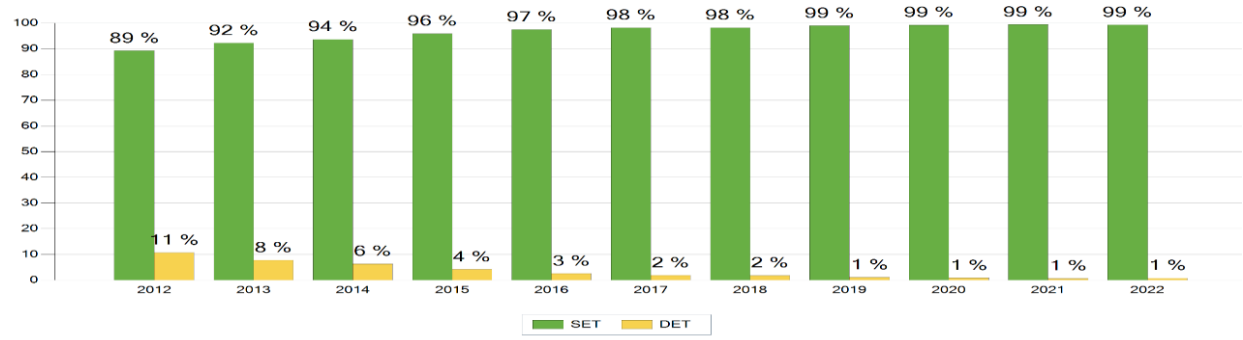
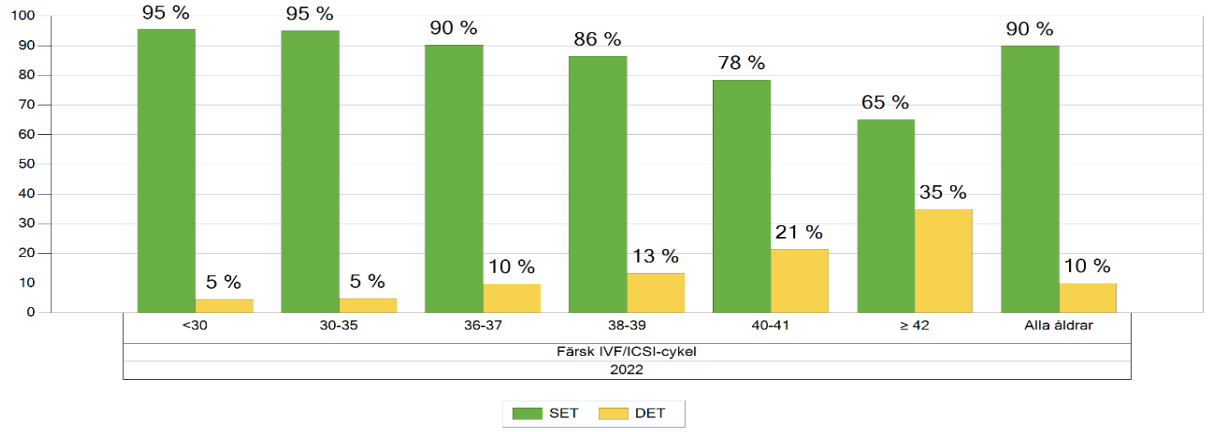


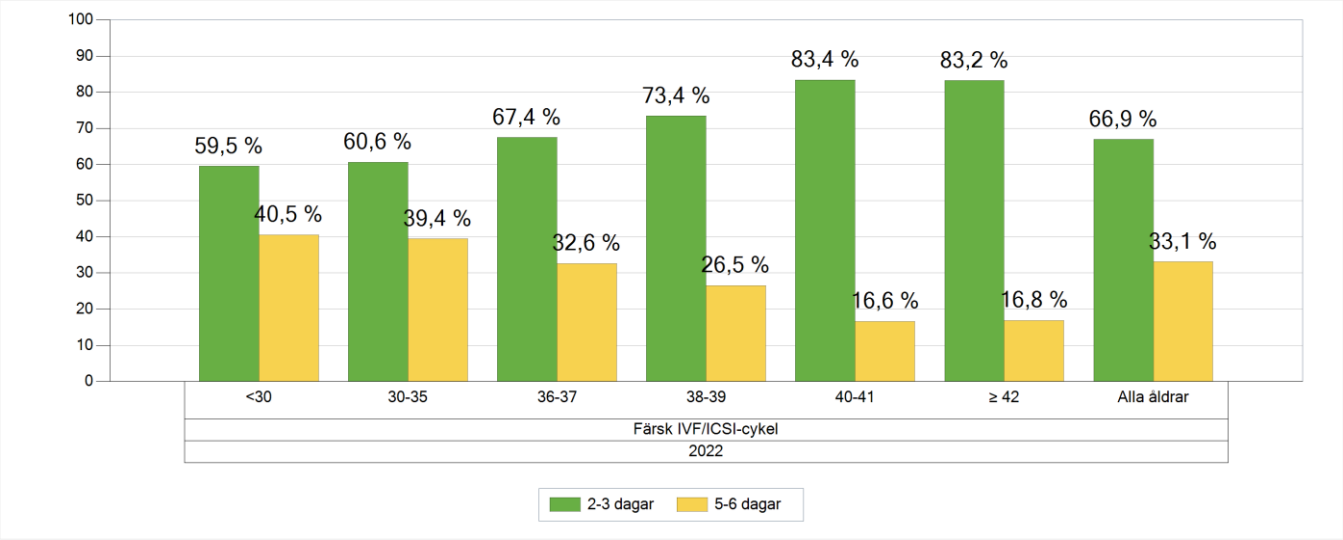
Figure 10c *Proportion of SET/DET per <u>embryo transfer</u> in different age groups. Fresh IVF. Own gametes.*



How long was the embryo cultured before transfer?

There are several reasons determining on what day an embryo is transferred. Transferring an embryo that has been cultured for 5–6 days leads to a higher chance of pregnancy per embryo transfer than of an embryo cultured for 2–3 days. This is because embryos that survive in culture until day 5–6 are more viable and therefore have a higher implantation rate. The disadvantage with day 5-6 culture is that it is not known if embryos that do not survive during the prolonged culture period would have been able to generate a child if being transferred on day 2–3. If there are only one or a few embryos by day 2–3, probably nothing is gained from extending the culture until day 5–6. Concerning embryo freezing, embryos that have been cultured for 5–6 days have a higher survival rate (97–98 %) and a better chance of leading to a pregnancy than embryos cryopreserved at day 2 or 3 (about 60% survival rate). However, the same potential disadvantages exist here i.e. viable embryos are potentially lost in the culture period from day 2-3 to day 5–6. Still, today almost 100% of all freeze cycles take place after culture for 5–6 days since the advantages of day 5–6 is believed to outweigh the disadvantages of loss in culture.

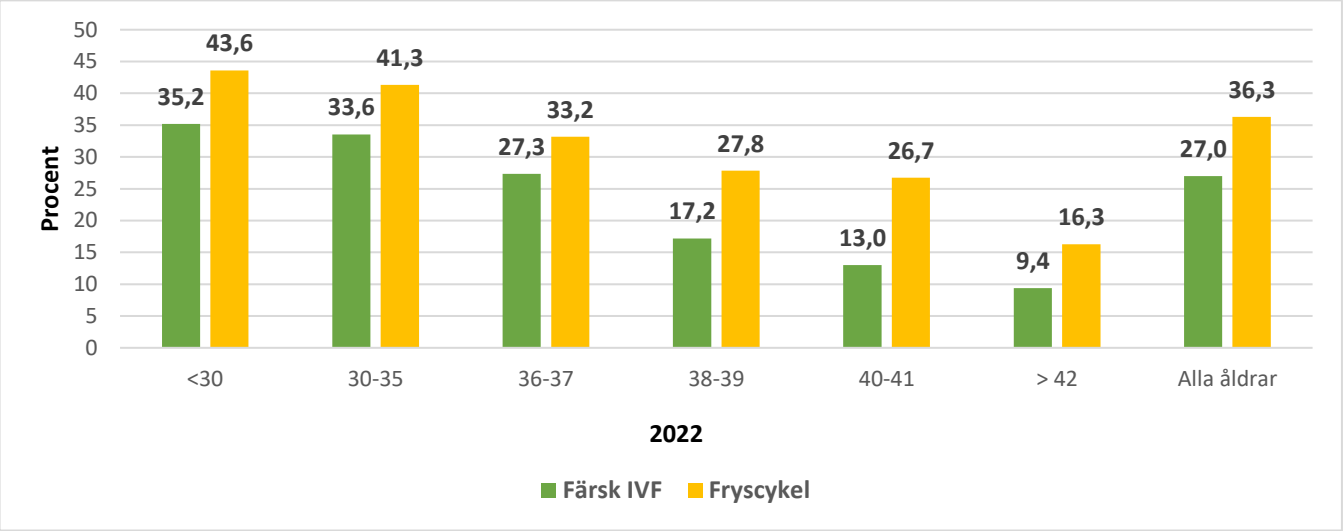
Figure 11 *Proportion of embryo transfer days 2-3 and 5-6 per age group.* Fresh IVF. Own gametes.



Result

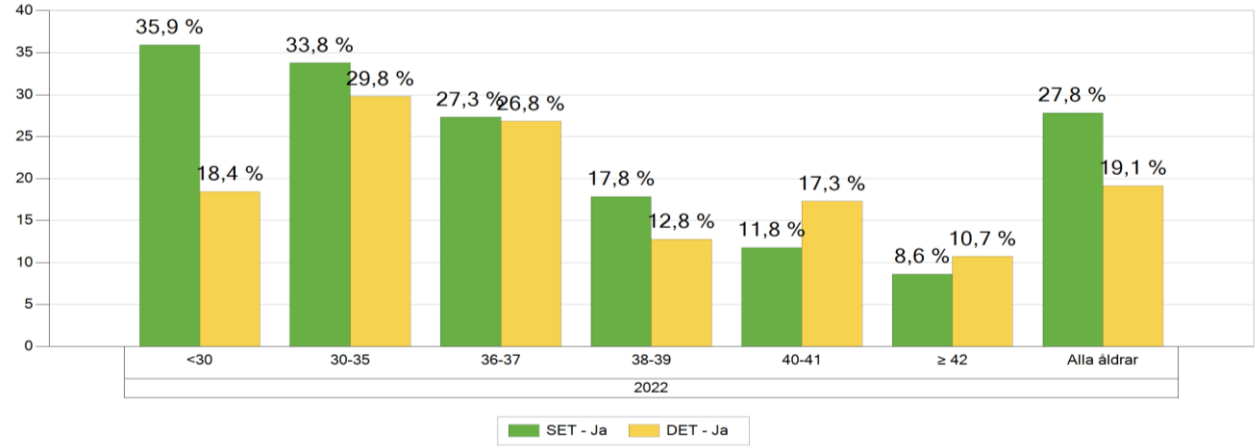
The results from fresh IVF-treatments have been stable over the years, while the results from freeze cycles have improved in recent years. This is largely associated with extended culture duration aimed for the blastocyst stage and to improved freezing methods. Younger women have a higher chance, while older women have a lower chance of pregnancy and live birth. The woman's age is the most important factor for the chance of becoming pregnant and having a child. At a higher age, both the oocyte numbers and the quality of the oocytes decrease.

Figure 12 *Proportion of deliveries per embryo transfer in different age groups. Fresh IVF and FET. Own gametes.*



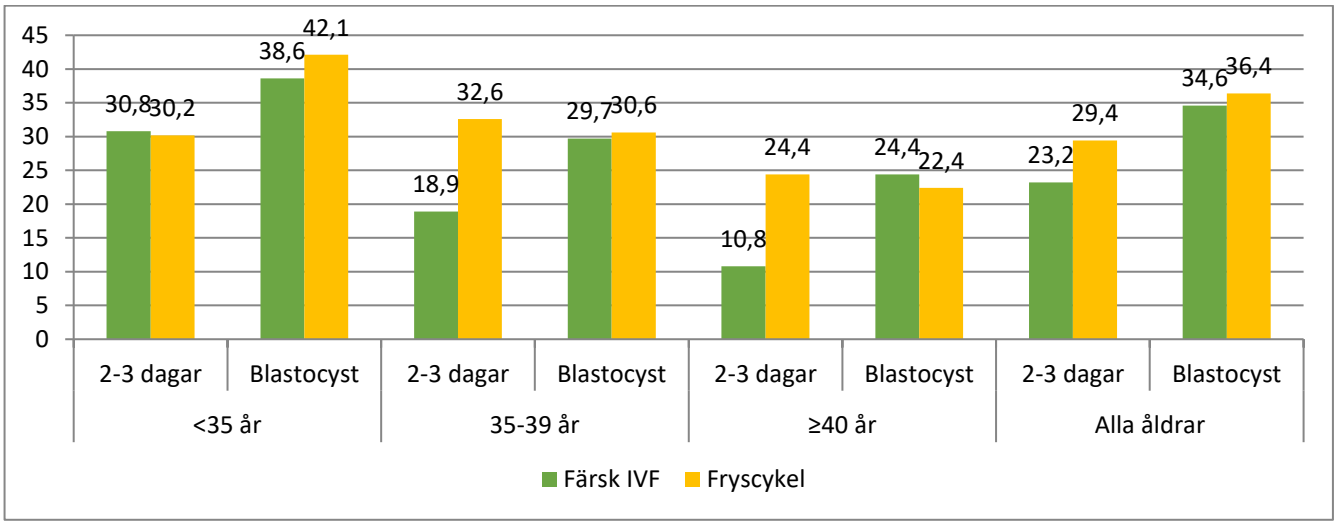
The reason for seeing a higher proportion of deliveries after FET compared to fresh treatment is that a higher proportion of the transfers consist of blastocysts compared to fresh cycles. In addition, the embryo may have been frozen at a younger age, which can be important especially if the woman is older at the time of transfer. A third reason why a higher birth rate appears to exist in freeze cycles is that a larger proportion of women in the fresh cycle group only have one fresh embryo and no extra embryos that can be frozen. More available embryos are a positive predictor of birth. The results should therefore not be interpreted as meaning that it is "better to freeze".

Figure 13 *Proportion of deliveries per embryo transfer and SET/DET in different age groups. Fresh IVF/ICSI. Own gametes.*



The birth rate is not directly comparable between SET and DET in the different age groups because the reason why one or two embryos is transferred varies with the prognosis of the individual patient. Therefore, one cannot draw the conclusion that SET yields a higher delivery rate than DET for different age groups nor for all age groups combined. The difference is instead due to that patients with a better prognosis have received SET and patients with somewhat less good prognosis have received DET.

Figure 14 *Delivery rate per culture time, day 2-3 and blastocysts, and per age group. Fresh IVF/ICSI versus FET. Own gametes.*



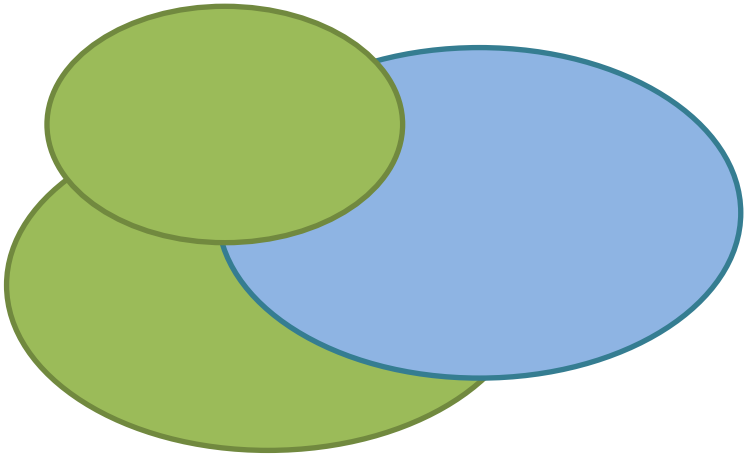
The figure shows that if one separate treatments in day 2-3 and blastocysts, no major differences exist in delivery rates between fresh and FET when a blastocyst was transferred.

IVF with donated gametes (sperm and oocytes)

Sperm and oocyte donation for IVF purposes became legal in Sweden in 2003. However, until 2019 it was only allowed at university hospitals. In 2019, it became allowed also for private clinics to offer IVF-treatments with donated sperm/oocytes.

For the year 2022, the chance of becoming pregnant and having a child, as a result of IVF with one's own oocytes and donated sperm, was 25% after a fresh transfer and 35% after a FET. In a similar way as for IVF with own gametes, the result should not be interpreted as that FET cycles give higher birth rate compared to fresh treatments, as the percentage of blastocyst transfers is much higher in frozen than in fresh cycles. And blastocysts are associated with higher live birth rates.
Further, the patient groups may be different in terms of age and other prognostic factors.

The chance of becoming pregnant and having a baby with an embryo that stems from a donated oocyte is not influenced by age of the women who receives the embryo. The donor's age, however, is important. Consequently, the donors are mostly younger women.
For donated oocytes, the delivery rate per FET was 33% in 2022. Overall, for fresh and FET after oocyte donation, the delivery rate was approximately 34% per ET, which is a very good result.



Summary of treatments performed in 2022

Table 3 *Number of treatments, pregnancies, deliveries and children by treatment type. IVF with donor sperm/eggs or double donation (IVF with both donor sperm and eggs).*

	IVF with donated sperm		IVF with donated oocytes		IVF with double donation	
	Fresh IVF	**Freeze Cycle**	**Fresh IVF**	**Freeze Cycle**	**Fresh IVF**	**Freeze Cycle**
Started cycles	1596	1149	342	541	83	97
Embryo transfer	1031	1132	102	530	18	93
Positive pregnancy test	388	574	65	261	14	58
Biochemical pregnancies	52	82	12	54	<3	4
Clinical pregnancies	336	492	53	208	13	54
Spontaneous abortion <week 13*	71	86	8	32	<3	7
Spontaneous abortion, week 13–22	3	5	<3	3	<3	<3
Ectopic pregnancy	<3	3	<3	0	0	0
Stillborn gestational week 22–27	0	<3	0	0	0	0
Stillborn gestational week ≥ 28	<3	<3	0	<3	0	<3
Deliveries, singleton†	253	388	42	168	10	46
Deliveries, twins	6	7	<3	5	0	0
Deliveries, triplets	0	0	0	0	0	0
Total number of deliveries	259	395	43	173	10	46
Total number of live born children	264	398	44	177	10	45

**Miscarriage before week 13 includes some legal abortions*
†There are missing outcomes of 4 clinical pregnancies: 1 fresh IVF with sperm donation and 3 freeze cycles (sperm donation)

Results IVF with donated sperm

Figure 15 *Delivery per embryo transfer for different age groups. Fresh IVF and FET. Donated sperm.*

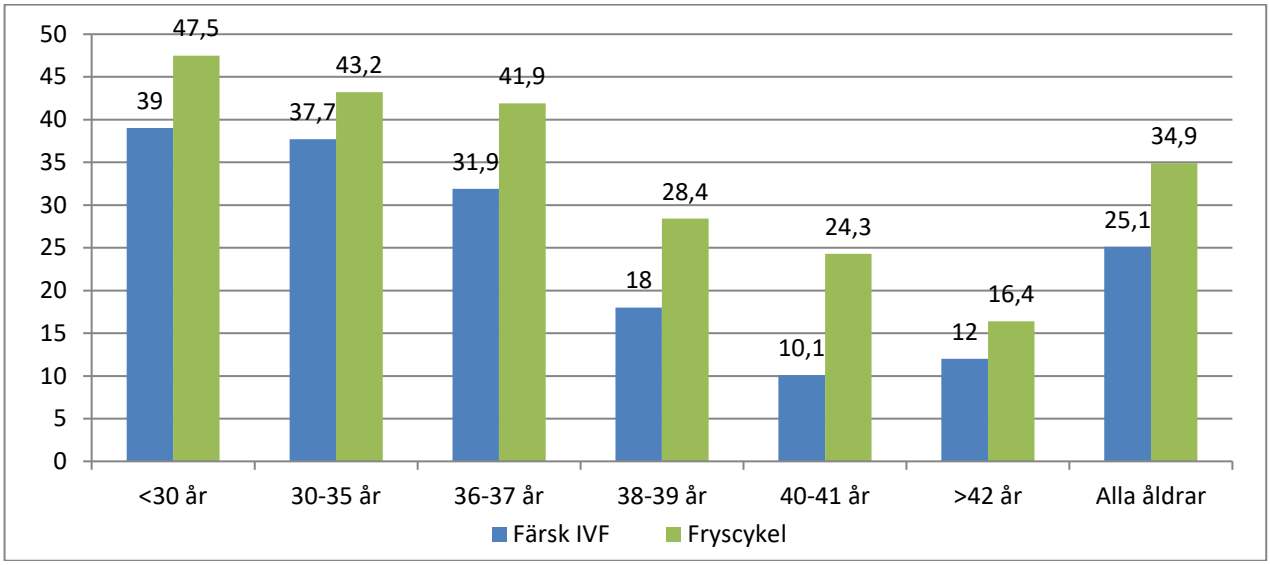
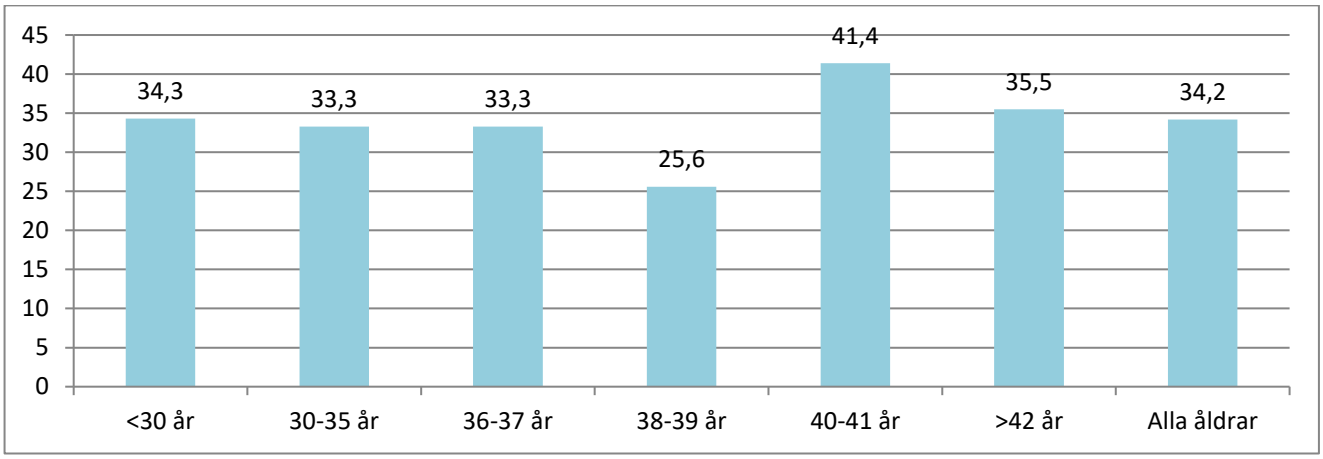


Table 4 *Number of embryo transfers and deliveries in different age groups. Fresh IVF and FET. Donated sperm.*

Age	Number of ET Fresh IVF	Number of deliveries Fresh IVF	Number of ET Freeze cycles	Number of deliveries Freeze cycles
<30	59	23	80	38
30-35	284	107	380	164
36-37	166	53	167	70
38-39	278	50	222	63
40-41	169	17	173	42
≥ 42	75	9	110	18

Results: IVF with donated oocytes

Figure 16 *Proportion of deliveries per embryo transfer and age, 2022 (total, fresh IVF and FET) Donated oocytes.*

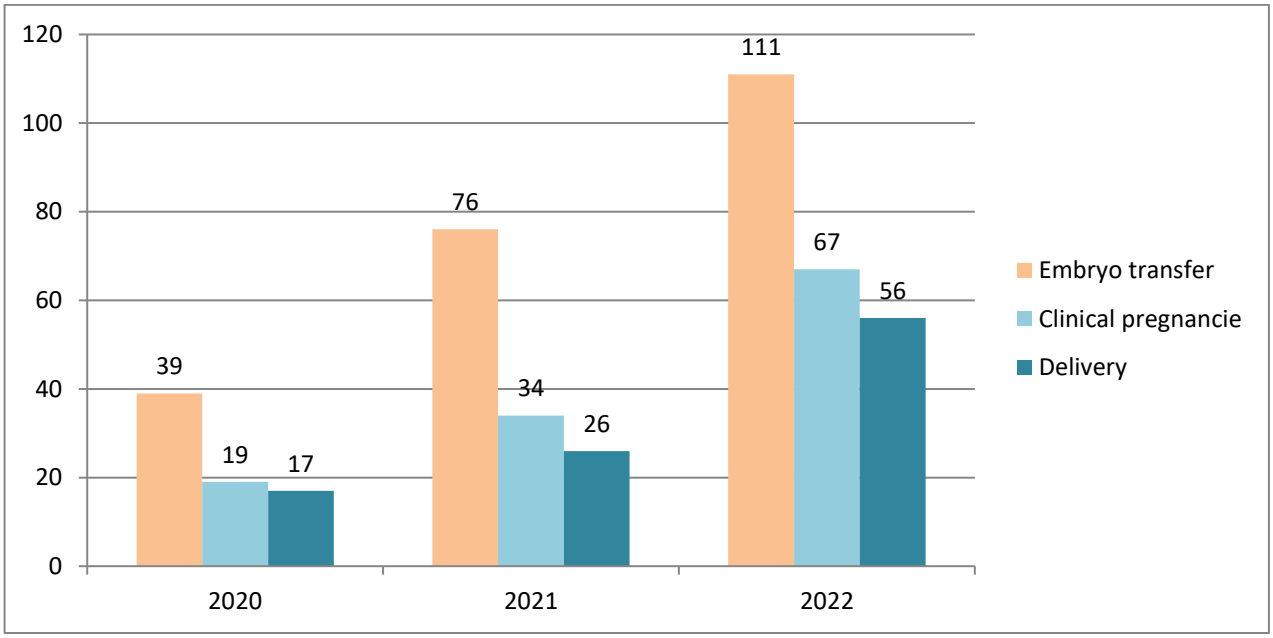


For donated oocytes, the age of the woman who is attempting to become pregnant is not as important for the result of the treatment as when using own gametes. The oocyte donor's age is more important. Please note that the number of oocyte donation treatments in different age groups is low and that the presented rates therefore may be uncertain.

Table 5 *Number of embryo transfers and deliveries in different age groups. Fresh IVF and FET. Donated oocytes.*

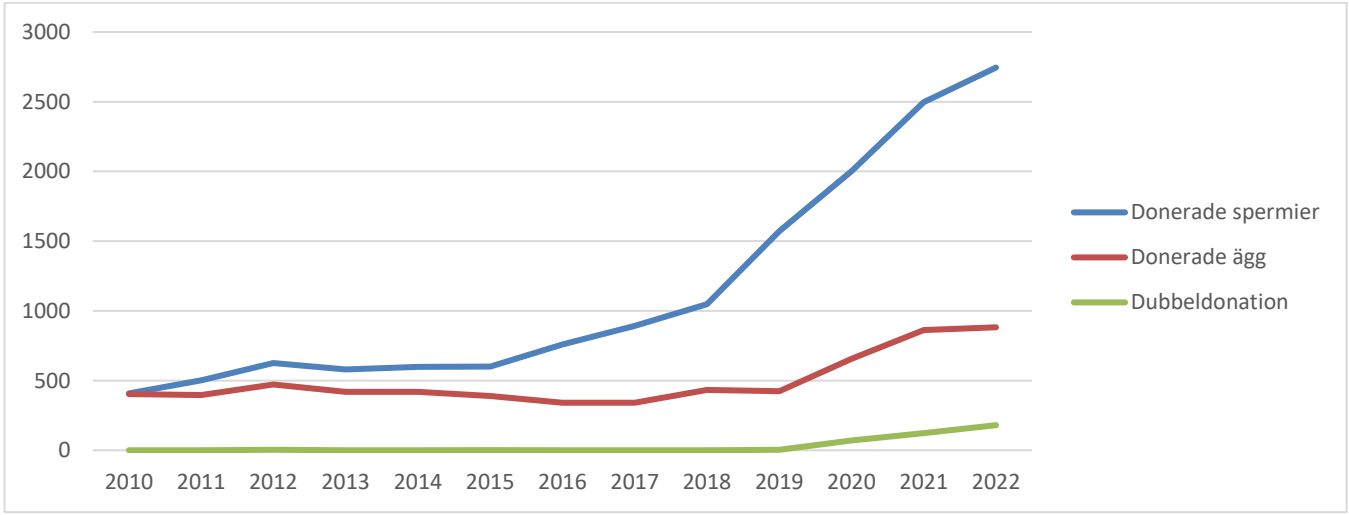
Age	Number of ET Fresh IVF	Number of deliveries Fresh IVF	Number of ET FET	Number of deliveries FET
<30	8	4	27	8
30-35	37	15	116	36
36-37	12	3	45	16
38-39	18	6	72	17
40-41	8	3	91	38
≥ 42	19	12	178	58

Figure 17 *Number of treatments with double donation 2020 – 2022.*



Double donation means that both eggs and sperm are donated, this was legalized in Sweden in 2019 and in that year 4 treatments were carried out. An annual increase is noted thereafter. Most of these treatments are performed at private clinics and paid by the patient. See Figure 32.
Single women underwent 16 embryo transfers with double donation in 2020. This number increased to 37 in 2021 and 43 in 2022.

Figure 18 *Number of started IVF treatments (Fresh and FET) with donated gametes over the years.*



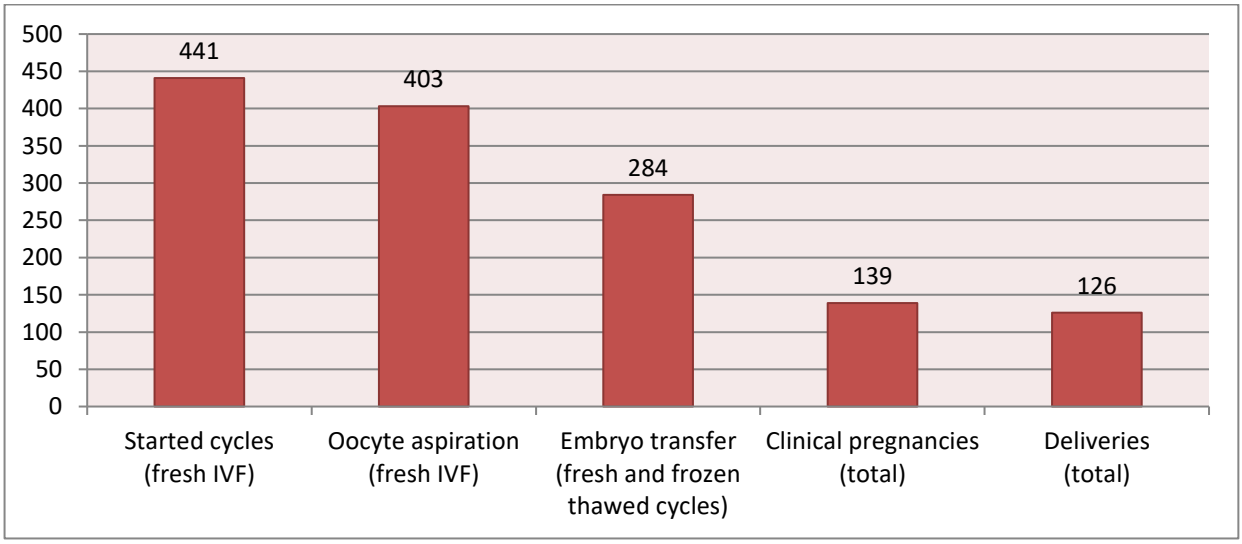
PGT - Preimplantation Genetic Testing

Preimplantation genetic testing (PGT) was introduced in 1989 as an alternative to prenatal diagnostics for severe hereditary diseases and the first child after PGT was born in 1992. The technique has recently changed its abbreviation from PGD (preimplantation genetic diagnosis) and PGS (preimplantation genetic screening) to PGT-M (monogenic disorders), PGT-SR (structural rearrangement) and PGT-A (aneuploidy screening). PGT-A is a parallel method where the aim is to select an embryo without chromosomal abnormalities and thus increase the birth rate. In these cases, the analysis is not performed due to a known severe hereditary.

PGT-M and PGT-SR are offered to couples with monogenic diseases and hereditary chromosomal abnormalities, while PGT-A is only allowed in Sweden within clinical trials. During PGT, an embryo biopsy is performed, where one to 10 cells from the growing embryo are taken out and analyzed using PCR (polymerase chain reaction), FISH (fluorescence in situ hybridization) technique, array-based technique or NGS (next generation sequencing).

An embryo that, upon testing, is considered healthy with regard to the specific disease, can be transferred into the uterus. This reduces the risk of a baby being born with the disease in question from 25%–50% to 0.1%–0.5%. The first child in Sweden born from a process involving PGT was born in Gothenburg in 1996 and in 2022 more than 800 children in Sweden had been born from a process involving PGT. PGT is performed in Gothenburg and in Stockholm.

Figure 19 *Number of fresh PGT treatments started in 2022 and combined results for embryo transfers for both fresh IVF and frozen/thawed cycle.*



If the biopsy is performed at the blastocyst stage, which is the most used method today, the embryos are cryopreserved, and transfer is performed in a frozen/thawed cycle.

Incidence of multiple births because of IVF-treatments

There has been a dramatic decline in multiple births in Sweden in the last twenty years due to the one-embryo-transfer policy being introduced and broadly adopted. Despite only one embryo now being transferred at a time, the total delivery rate has remained stable or increased. The increased delivery rate is particularly apparent for IVF with FET and is associated with long term embryo culture and vitrification as cryopreservation method.

The multiple birth rate in Sweden after IVF is among the lowest in the world. Several countries still have multiple birth rates of 20-25%. The frequency of multiple births in spontaneous conception is about 1%. Multiple births can occur even though only one embryo is transferred. In some cases, an embryo may divide after being transferred to the uterus. Identical twins also occur after spontaneous pregnancy. The table below shows the number of multiple births in total and when single embryo transfer was performed. Multiple births after SET occur more often for freeze cycles.

Figure 20a *Multiple birth rate per delivery. Fresh IVF and Frozen/thawed cycles with own and donated gametes and PGT.*

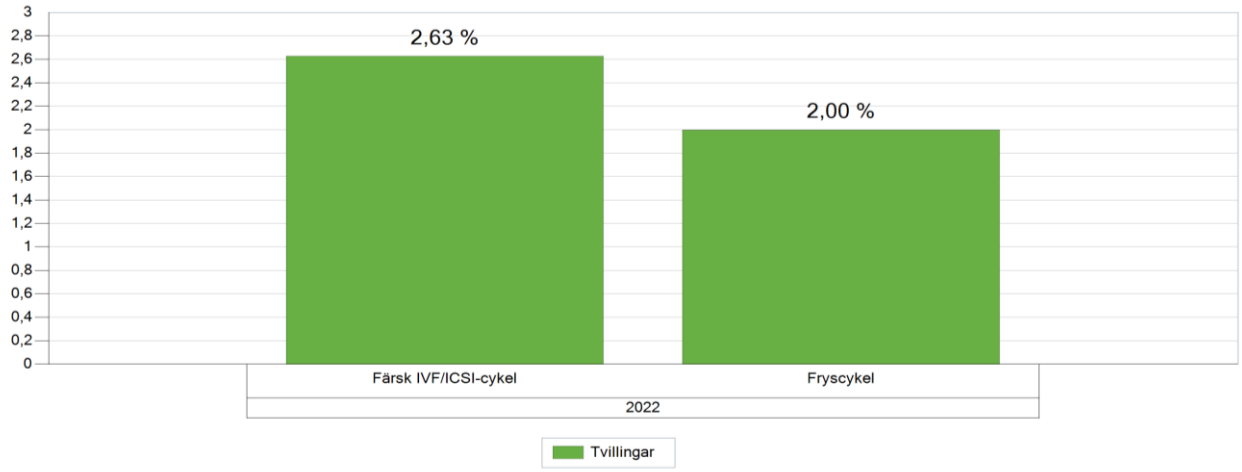


Figure 20b *Multiple birth rate per delivery at transfer of single embryo (SET). Fresh and Frozen/thawed cycles with own and donated gametes and PGT.*

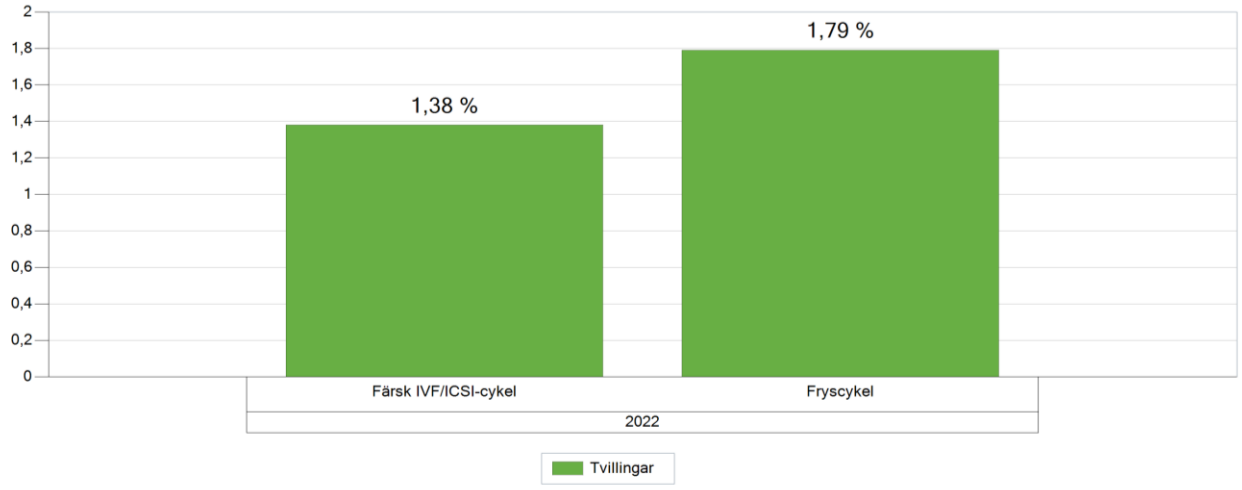
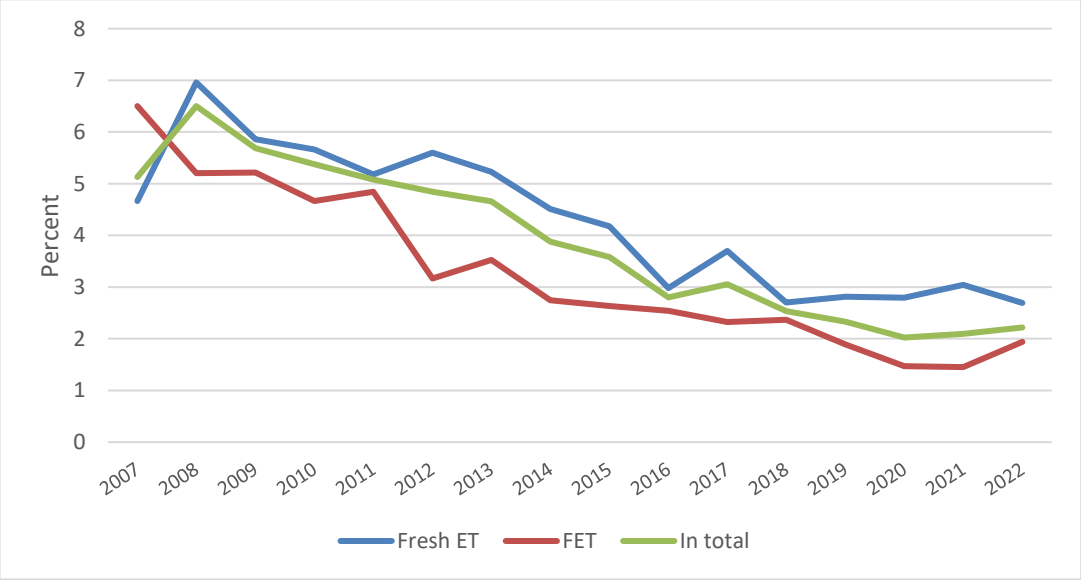


Table 6 Number of multiple births, in total and *after transfer of one embryo (SET). IVF with own and donated gametes and PGT for the years 2021 and 2022.*

2021	Twin deliveries	Triplet deliveries		Twin deliveries	Triplet deliveries
Fresh IVF – Total	56	<3	*If SET*	22	<3
Freeze cycles - Total	44	<3	*If SET*	41	<3
2022					
Fresh IVF – Total	55	0	*If SET*	27	0
Freeze cycles - Total	73	0	*If SET*	65	0

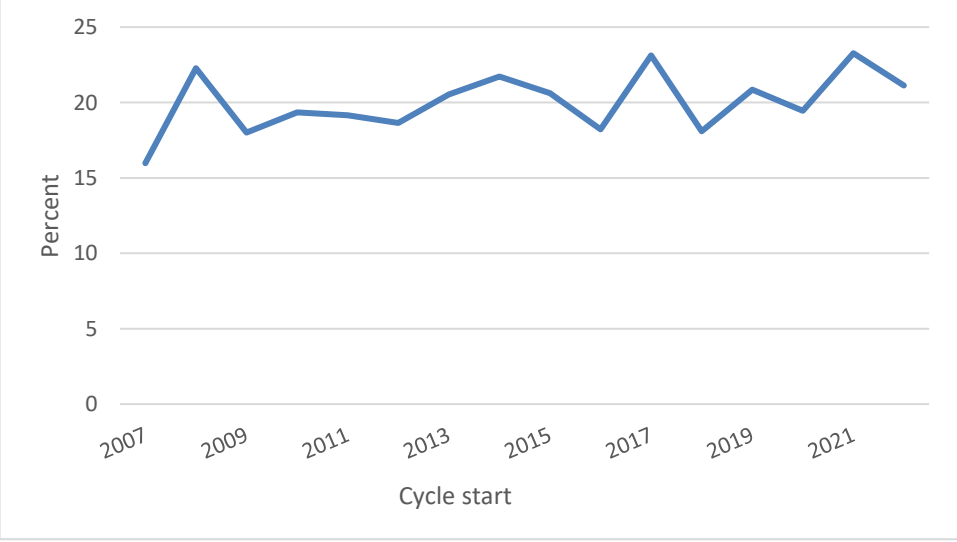
A slight increase in multiple births is noted after *freeze cycles*, despite the fact that 99% of *freeze cycles* are SET. As shown in the table, almost 90% of the twins within *freeze* cycles are SET twins. It is known that blastocyst transfers (which is more common in *freeze cycles*) is linked to monozygotic twins.

Figure 21a *Multiple birth rate* per year. Fresh IVF, freeze cycles and in total.* Own gametes.



*The multiple birth rate is calculated per delivery.

Figure 21b *Multiple birth rate when two embryos are transferred. Total for fresh IVF and freeze cycles.* Own gametes.



The multiple birth rate in Sweden has thus decreased continuously, but for those who receive two embryos, the multiple birth rate remains steady at around 20%. Meaning that we have not improved in selecting women for double embryo transfer without risk of multiple birth.

Complications arising from IVF treatments

Generally, complications arising from IVF-treatments are few, the most common being OHSS. This syndrome may show up in women with high AMH levels, and in women with many ovarian follicles in their ovaries. During OHSS, blood vessels start leaking fluid into the abdomen. Milder forms of OHSS are quite common and occur in up to 10 % of women. Moderate or severe forms of OHSS are observed in 1%–5% of women. The fluid leaking into the abdomen will eventually be resorbed and returned to the blood stream, but sometimes it is beneficial for the patient if the fluid is drained.

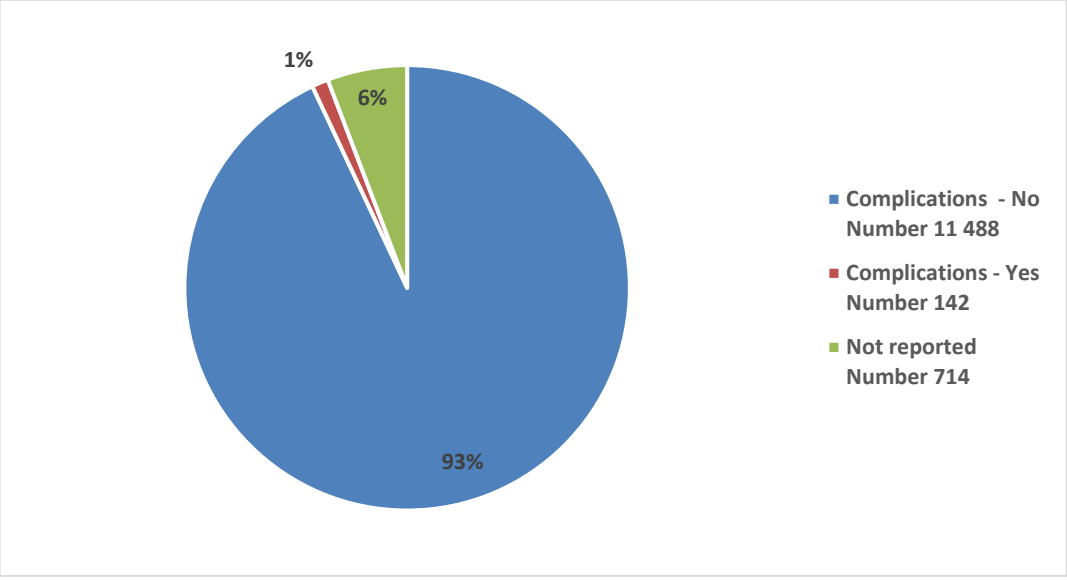
Severe forms of OHSS can today in most cases be prevented through different treatment strategies. The risk of thrombosis increases in case of OHSS and in some cases medical drugs preventing thrombosis are administrated. Severe forms of OHSS resulting in hospitalization or draining of fluid from the abdomen are reported to Q-IVF.

The risk of infection in the ovaries or abdomen after oocyte retrieval is low, about 0.3%. Prophylactic antibiotics are not generally administered but are given if there is an increased risk of infection.

Minor bleeding after egg retrieval is common, either as bleeding from the vagina or as a minor bleeding in the abdomen that stops and disappears on its own. In 1-2 cases out of 1000 oocyte retrievals, a major bleeding occurs in the abdomen that requires observation in hospital and sometimes surgical/medical intervention.

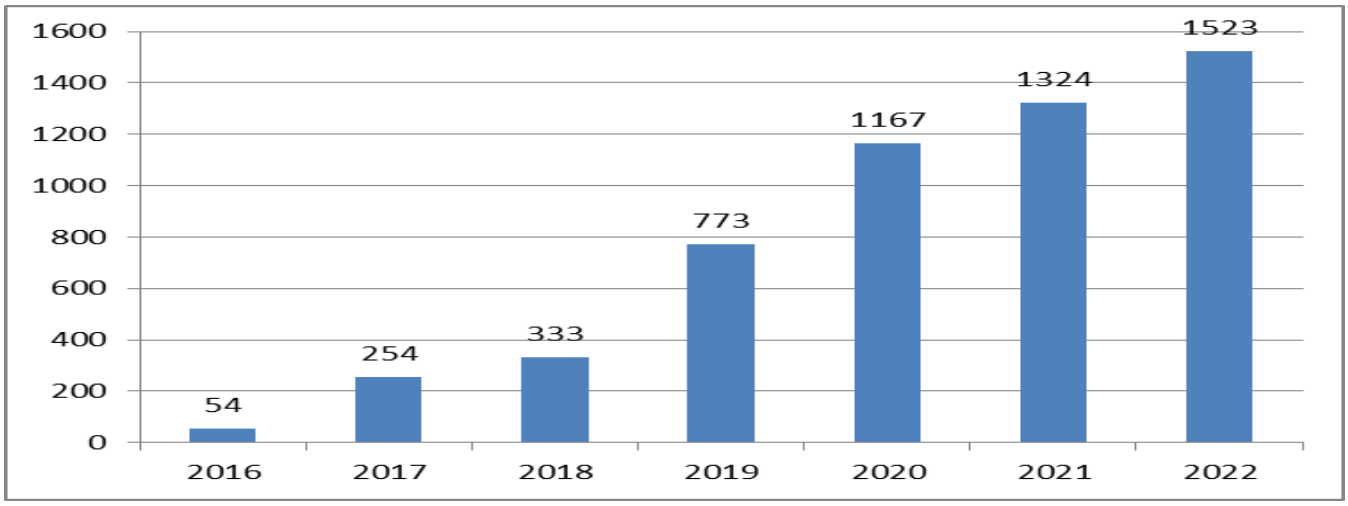
Among the reported complications from fresh IVF-treatments initiated in 2022, there were 37 hospitalized cases of OHSS, 6 cases of bleeding, 7 cases of infection and 4 cases of ovarian torsion, a situation when the ovary has twisted around its own stem.

Figure 22 *Proportion of reported complications in IVF with own or donated gametes and PGT.*



The above does not include 1311 treatments with oocyte freezing or egg donor treatments. For these treatments, <3 complications in total have been reported.

Figure 23 *Number of cycles with "freeze-all" due to the risk of OHSS. Fresh IVF with own and donated gametes and PGT.*



Increasing numbers of treatments are performed where all embryos are cryopreserved and no fresh embryo transfer takes place. These ”freeze-all” cycles result in similar pregnancy and delivery rates as fresh cycles, probably associated with use of blastocyst culture and new cryopreservation methods-vitrification. The advantage with ”freeze-all” is the almost complete elimination of OHSS and the method has thereby become popular for clinics as well as patients The increasing number of ”freeze-all” cycles reflects this development and is thus not a sign of an increasing rate of OHSS.

Trends

Figure 24 *Number of embryo transfers per year for various treatment methods. Own gametes.*

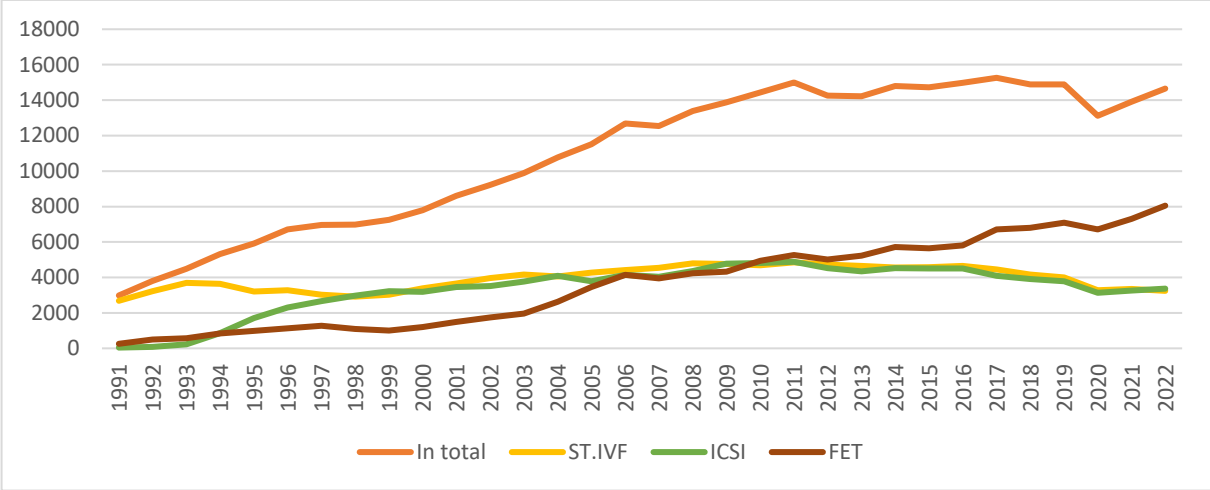


Figure 25 *Proportion of deliveries per embryo transfer and year of treatment for various treatment methods. Own gametes.*

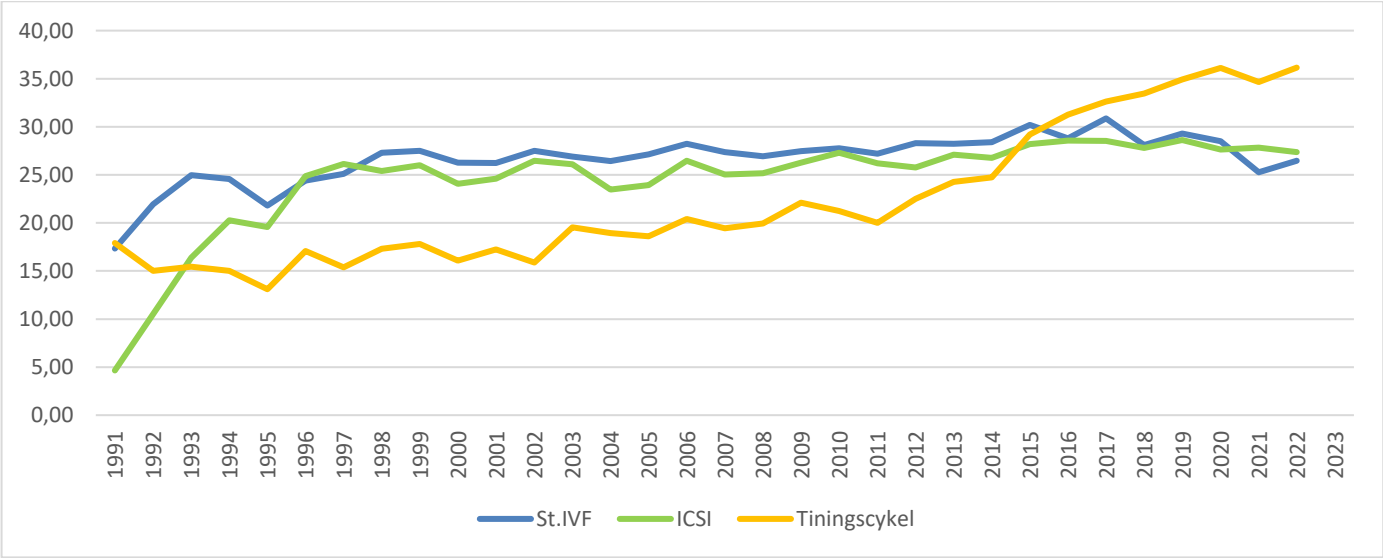


Figure 26a *Proportion of deliveries per embryo transfer - multiple births and SET per year. Fresh IVF. Own gametes.*

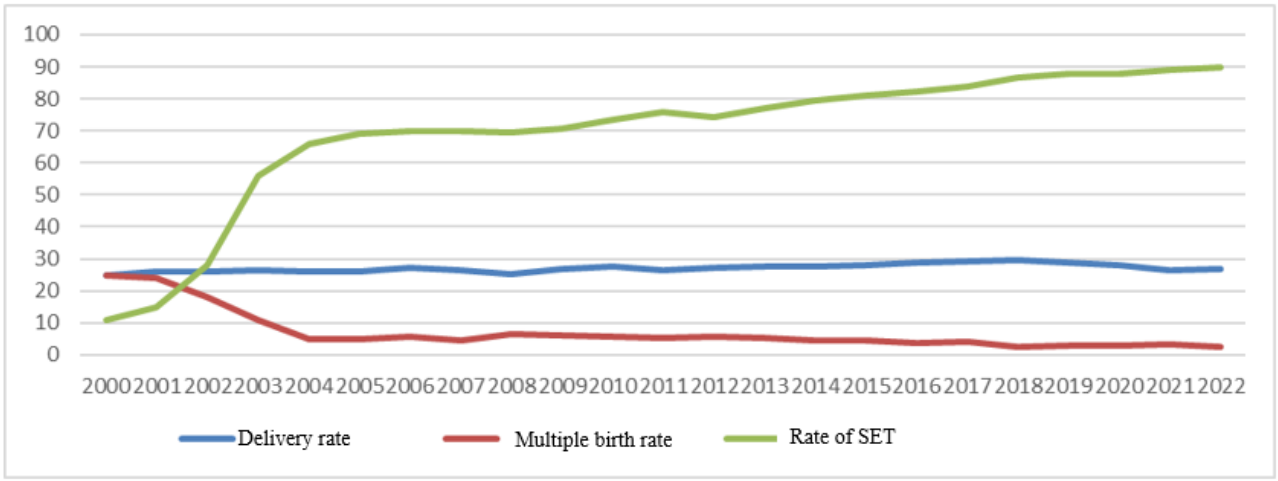
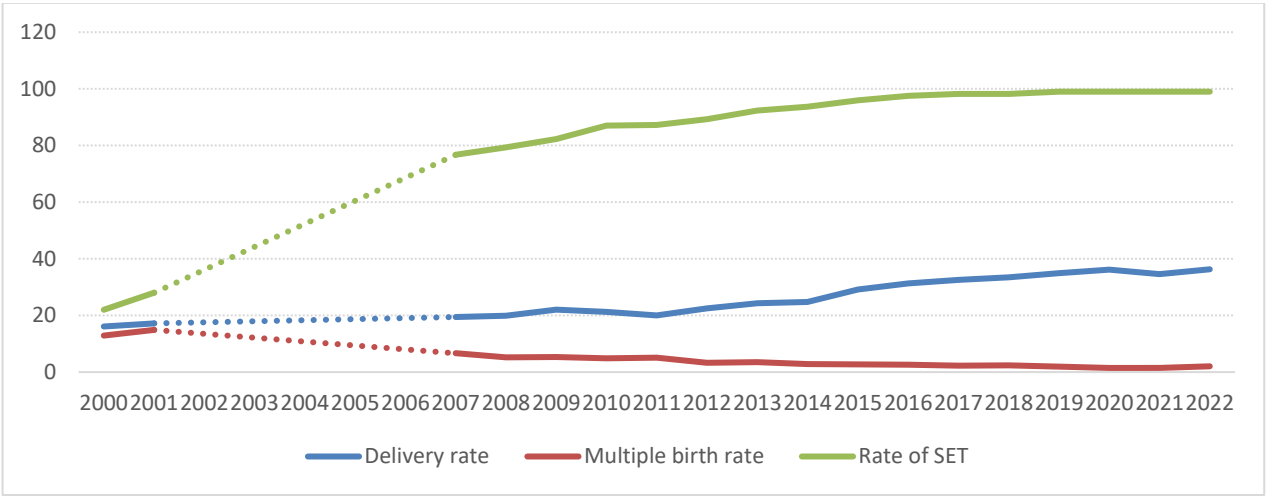
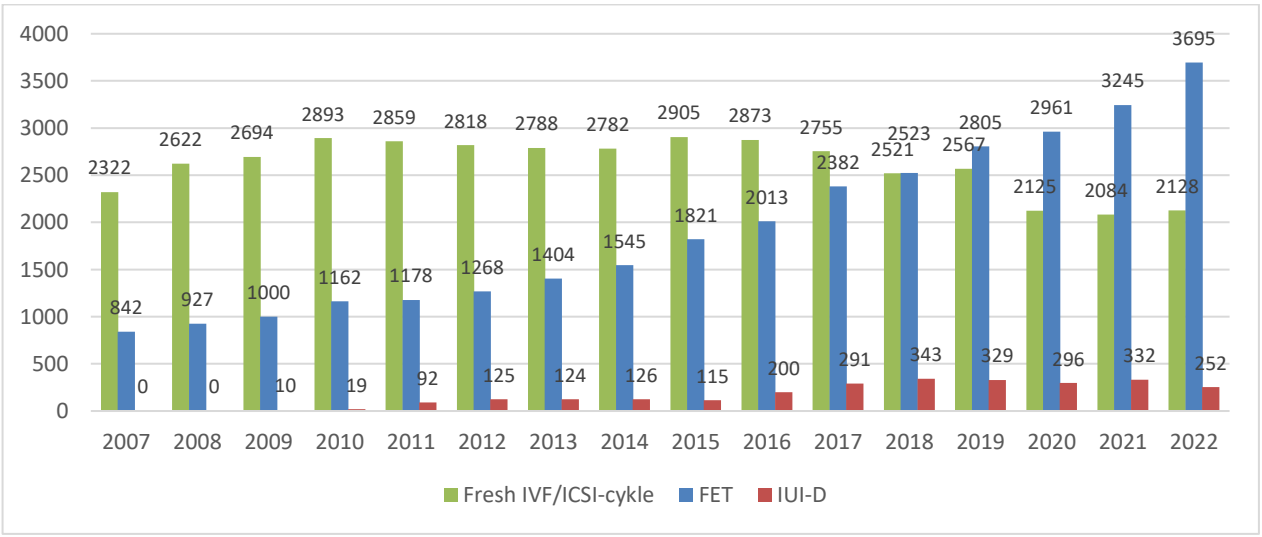


Figure 26b *Proportion of deliveries per embryo transfer, multiple births and SET per year. Freeze cycles. Own gametes.*



Data for the years 2002-2006 are missing, the data points from 2001-2007 are linked with a straight dotted line.

Figure 27 *Number of live born children per year, fresh IVF and freeze cycles with own and donated gametes, PGT and insemination with donated sperm (IUI-D).*

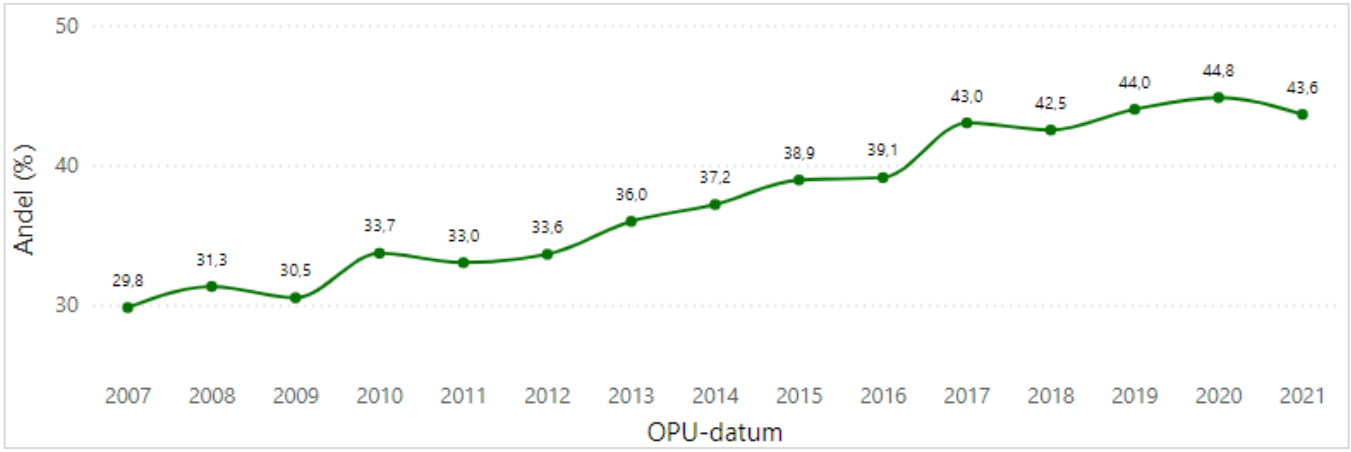


Cumulative results

Cumulative live birth rate is here defined as live birth rate per oocyte retrieval, including one fresh cycle (with or without a fresh transfer) and all subsequent embryo transfers from the same oocyte retrieval within one year after the oocyte retrieval.

This way to present data may be regarded the most accurate way. When results are assessed per embryo transfer, the number of transferred embryos may vary as well as culture days, both known to affect the results.

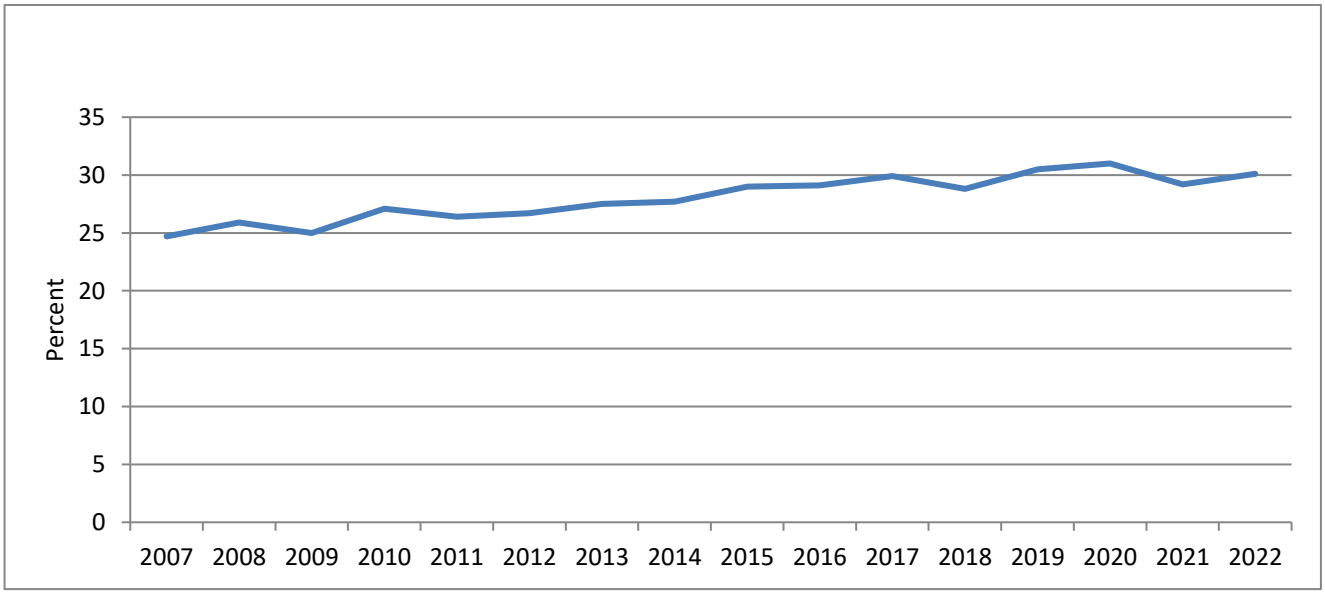
Figure 28a *Cumulative delivery rate per oocyte retrieval, including all embryo transfers (fresh/frozen) within one year. IVF with own gametes.*



This figure presents results per year for all oocyte retrievals performed until December 30, 2021.

One can also count the delivery rate per oocyte retrieval (OPU) and the first embryo transfer (fresh or frozen) within 6 months of the current oocyte retrieval.

Figure 28b *Delivery rate per oocyte retrieval and first embryo transfer (fresh or frozen) within 6 months. IVF with own gametes.*



This figure presents results for all oocyte retrievals performed until June 30, 2022, and takes into account the increasing number of "Freeze all" in a better way than reporting births per started fresh cycle.

Table 7 *Number of deliveries and number of live born children. All kind of treatments.*

	Number of deliveries	Number of deliveries with live born children	Number of multiple deliveries	Total number of live born children	Number of live born children after multiple births
2007	3155	3001	165	3164	326
2008	3356	3333	218	3549	433
2009	3736	3492	212	3704	423
2010	3896	3863	211	4074	421
2011	3954	3930	198	4129	397
2012	4061	4018	199	4211	390
2013	4160	4115	204	4316	404
2014	4344	4288	172	4453	335
2015	4746	4680	166	4841	326
2016	4996	4947	138	5086	276
2017	5341	5274	162	5428	315
2018	5324	5262	129	5387	252
2019	5640	5576	127	5701	252
2020	5312	5274	103	5375	204
2021	5563	5504	110	5614	217
2022	5995	5944	132	6075	263

Between 2007 and 2022, there has been a sharp increase in the number of deliveries, almost a doubling. Correspondingly, the number of live born children has increased. The percentage of multiple deliveries has decreased from 5.2% to 2.2%.

Insemination with donor sperm (IUI-D)

In April 2016, a change in the Swedish legislation made it possible for single women to undergo assisted reproduction. In connection with the change in the law, private clinics could obtain permission from the Health and Social Care Inspectorate (IVO) to perform insemination with donated sperm (IUI-D). For lesbian couples, this opportunity has been available in public clinics since 2005. Among heterosexual couples this treatment is available for couples where the man for some reason lacks functional sperm.

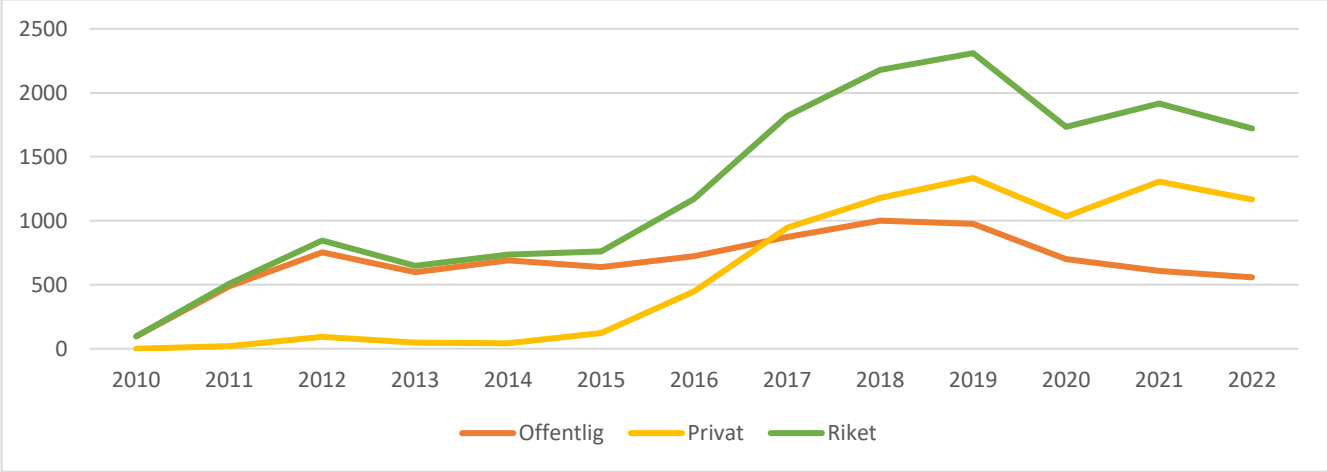
Summary of treatments performed in 2022

Table 8 *Number of treatments, pregnancies, deliveries and children born.*

Insemination with donated sperm IUI-D	
Started cycles	1925
Insemination	1722
Positive pregnancy test	332
Biochemical pregnancies	43
Clinical pregnancies†	292
Miscarriage <week13*	38
Miscarriage week 13-22	3
Ectopic pregnancy	<3
Stillborn week 22-27	0
Stillborn ≥week 28	<3
Delivery singletons†	245
Delivery twins	4
Delivery triplets	0
Total number of deliveries	**249**
Total number of live born children	**252**

**Miscarriage before gestational week 13 also includes some legal abortions*
†Missing outcome of 1 clinical pregnancy

Figure 29 *Number of IUI-D (insemination with donated sperm) per year*



Offentlig = Public, Privat = Private, Riket = In total

Figure 30 *Delivery per insemination (IUI-D) in different age groups.*

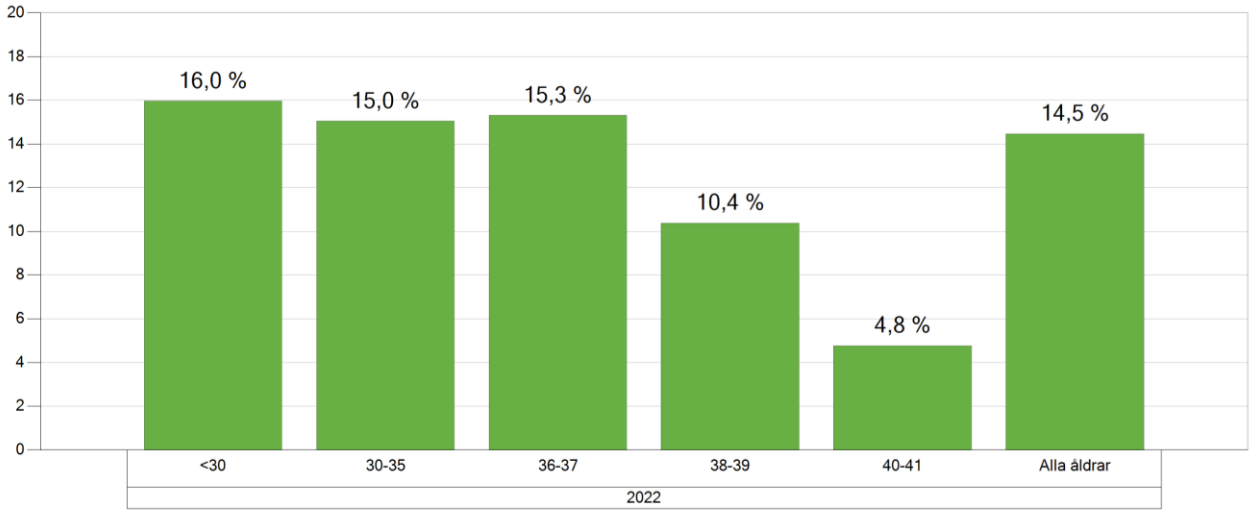
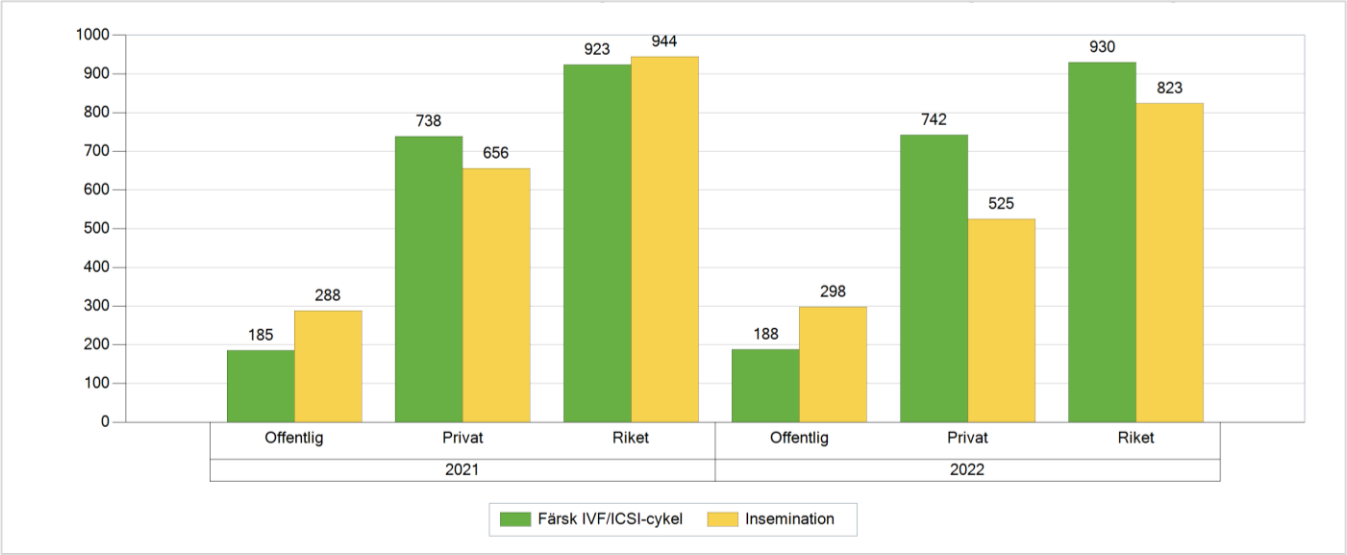


Table 9 *Number of inseminations and deliveries in different age groups in 2022.*

Age	< 30 years	30-35 years	36-37 years	38-39 years	40-41 years	≥ 42 years
Number of IUI-D	257	1024	268	106	42	25
Number of deliveries	41	154	41	11	<3	0

Figure 31 *Number of IVF and IUI-D treatments started in single women in 2021 and 2022. In total, public clinics and private clinics.*



Offentlig = Public, Privat = Private, Riket = In total

Oocyte freezing

The technique of cryopreserving embryos (fertilized eggs) is reliable and has been used for many years. However, it has been much more difficult to freeze unfertilized oocytes. Today the technique of vitrification makes it possible to cryopreserve oocytes more effectively than earlier. Oocyte cryopreservation can be done for medical reasons or non-medical reasons. One medical reason to cryopreserve oocytes is to preserve fertility in cases where a woman suffers from cancer and needs to undergo chemotherapy and/or radiation, since the cancer treatment may be harmful to ovaries and oocytes ("oncological indication"). Other medical reasons may be sex reassignment, surgery/gender confirmation surgery, severe endometriosis or risk of premature menopause. Non-medical reasons for women to cryopreserve oocytes could be the desire to delay the starting of a family. It is also possible to cryopreserve donor oocytes to more easily coordinate an oocyte donation cycle with a recipient cycle.

Oocyte freezing is reported in the registry for oncological reasons, other medical reasons, non-medical reasons and oocyte freezing before gender reassignment. In 2022, 159 oocyte freezing treatments were performed on basis of oncological indication, which is an increase compared to the previous year. There were 743 oocyte freezing treatments for non-medical reasons, which is a decrease compared to last year.

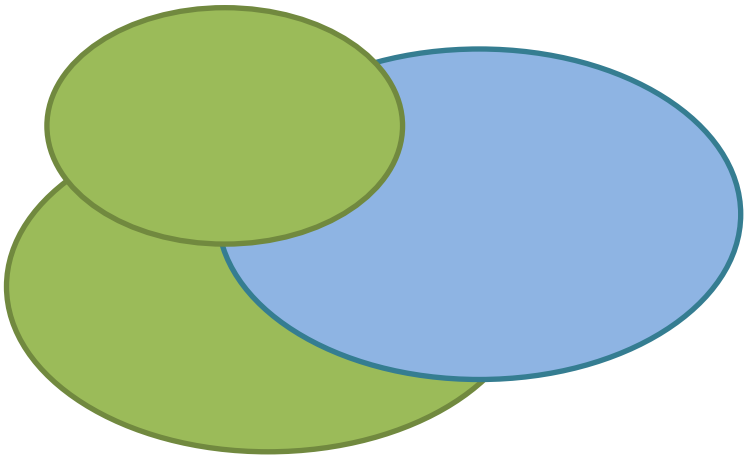
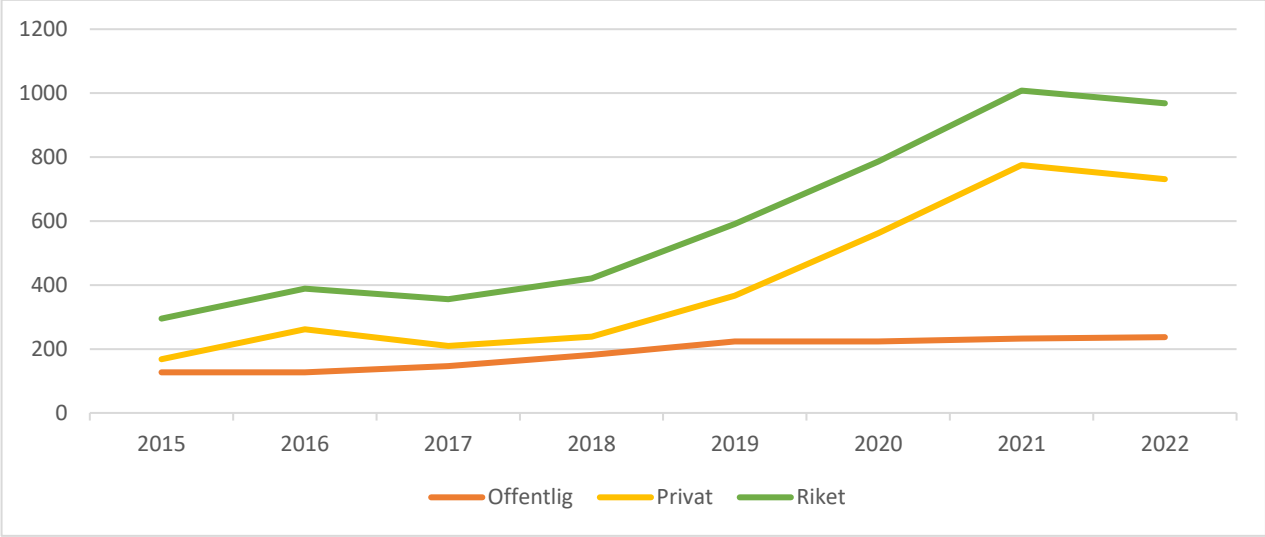
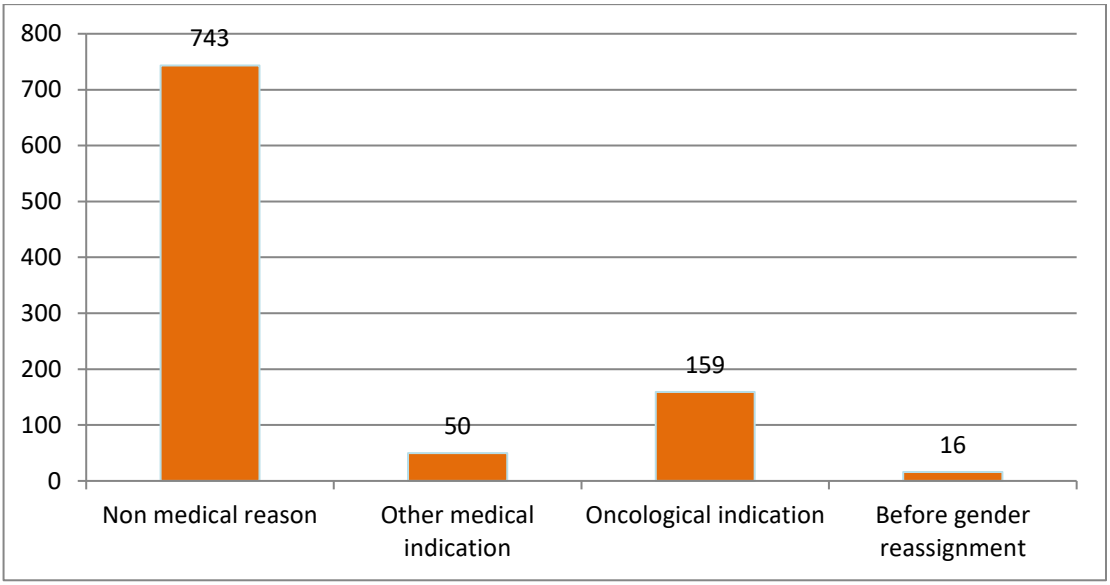


Figure 32 *Number of cycles with freezing of own oocytes. Public/private/in total.*



Offentlig = Public, Privat = Private, Riket = In total

Figure 33 *Reasons for oocyte freezing in 2022.*



Individual clinics

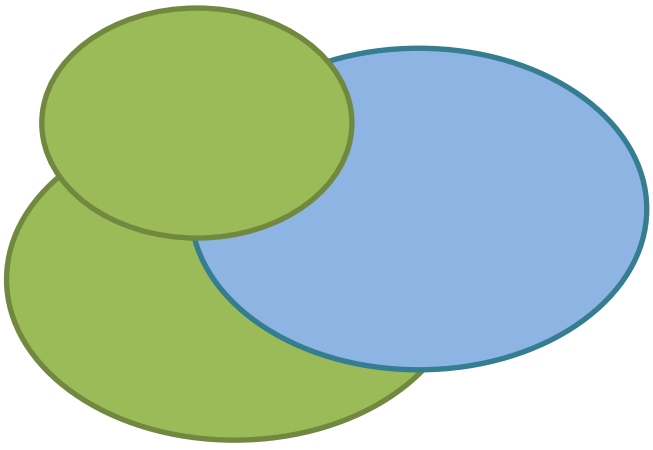
In this yearly report, we present results from individual clinics. The reader should consider that the clinics perform treatments in different types of patients and different age groups. A clinic that performs treatments on younger patients will have better results than a clinic that performs treatments on somewhat older women. Furthermore, women who have already had a baby because of IVF, and who then undergo another IVF-treatment, have better chances of success than women who have not had an IVF-baby earlier. In addition, the number of patients treated in each clinic influences the reliability of the results.

How important are the group sizes?

We present many of the results separated into different age groups. When looking at results between groups, one should consider how large the groups are. The larger the groups, the more reliable results, and the smaller the groups, the more unreliable results. In addition, group sizes vary by year and between clinics. If, for example, there are 300 deliveries from 1 000 treatment cycles in the youngest age group one year, the delivery rate is 30%. If, in the same year, only ten treatment cycles are performed in the oldest age group, and they result in three deliveries, the delivery rate for this group is also 30%. Given that the number of treatment cycles for both the youngest and the oldest age group stays the same, one less birth in the youngest age group yields a birth rate of 29.9% (almost no change), while one less birth in the oldest age group would yield a birth rate of only 20% (seemingly a considerable decline).

To achieve more reliable results, data from several years have been combined. Still, the 95% confidence intervals for the estimates of delivery rates are wide for most clinics. Regarding the number of days an embryo has been cultured, the graphs do not discriminate the results between day 2–3 embryos and day 5–6 embryos (blastocysts). Concerning fresh embryo transfers, day 2–3 embryos make up a considerable proportion of all embryo transfers, while in freeze cycles day 5–6 embryos are most common (99%). In Figure 34, results from the first embryo transfer are presented, irrespective of whether it is done in a fresh or in a freeze cycle. The reason for this is the growing number of cycles where all embryos have been cryopreserved and where the first transfer becomes a freeze transfer. The spectrum of treated patients and variation in the number of culture days and other treatment strategies may differ between clinics and could lead to somewhat different results.

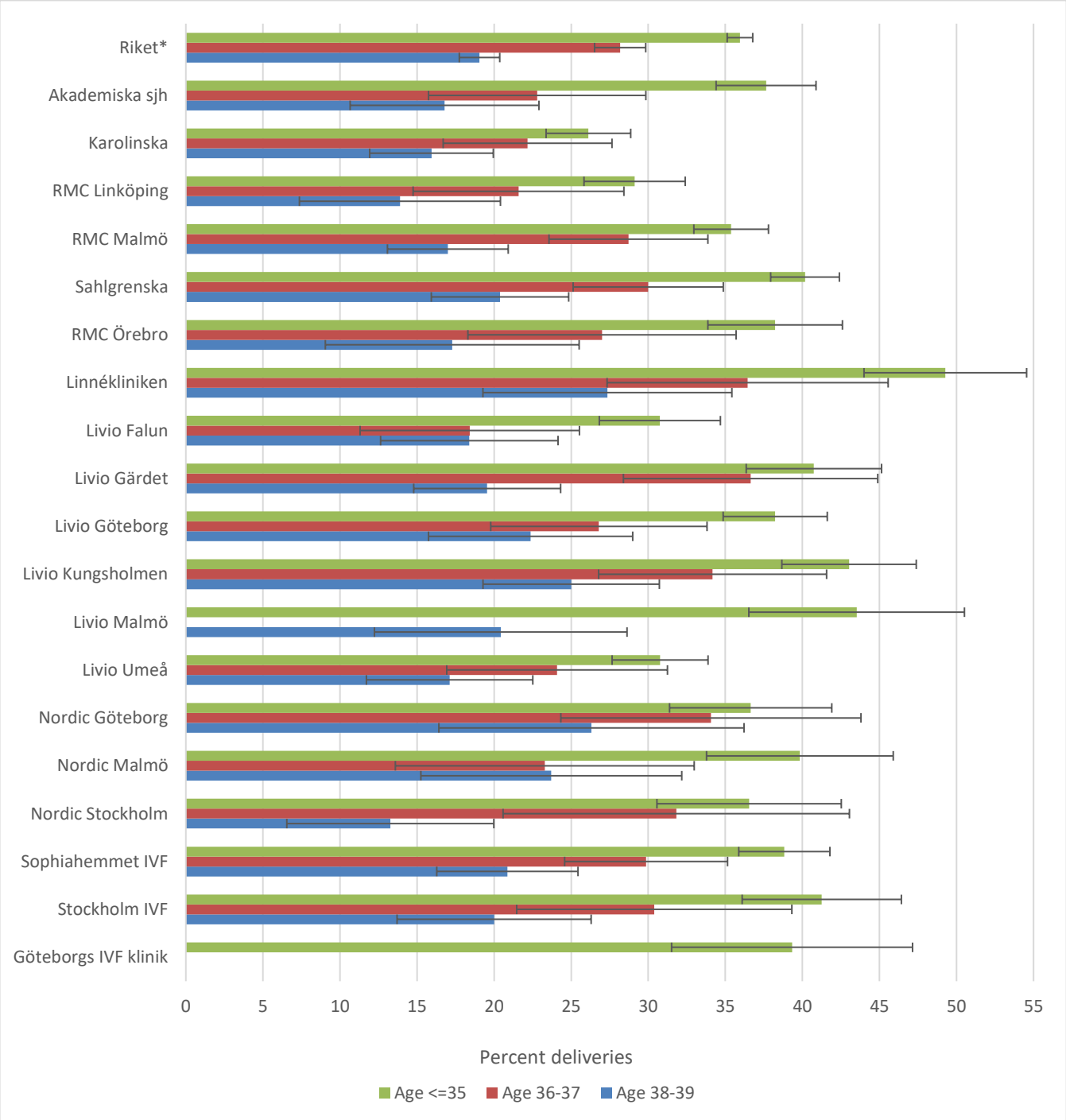
As explained above, the reliability of the results varies due to the number of embryo transfers, and as reliability indication, the confidence intervals are shown as a black line across the top of every bar. The longer the black line is, the less embryo transfers are included, and the less reliable are the results. The national results for Sweden are very reliable, since treatments from all clinics are included in these results. New clinics are not always included in this presentation, since the number of treatments they have performed may be low in the presented groups.



Individual clinics per oocyte retrieval

Figure 34. *Proportion of deliveries per oocyte retrieval and first embryo transfer (fresh transfer or first embryo transfer with a cryopreserved embryo if the fresh treatment resulted in "freeze-all") within 6 months after oocyte retrieval (Includes also oocyte retrievals that has not resulted in any embryo transfer).*

The compilation only applies for those women doing cycle number 1–3 and who have not had children earlier as a result of IVF. **Applies to oocyte retrieval with autologous gametes during the period January 1, 2020, to June 30, 2022.**



** Eliva Clinic is included in the total number of reported treatments (Riket) but has declined to be included in Individual clinics.*
For clinics where the number of treatments in each age group is less than 50, the results are only shown in tables, as the number of treatments and the number of deliveries. No percentages and no confidence intervals are given. See also Table 10.

Confidence interval: The lines in the bars denote the confidence intervals. The confidence interval is an estimation of the reliability of the estimates of delivery rates. The longer the line, the more unreliable are the estimates of delivery rates. The factor affecting reliability is the number of treatments per age group.

Table 10 *Number of oocyte retrievals included in the figure above. Only applies to those who have oocyte retrieval number 1-3 and have not previously had a child through IVF. Fresh IVF, own gametes.*

University Clinics

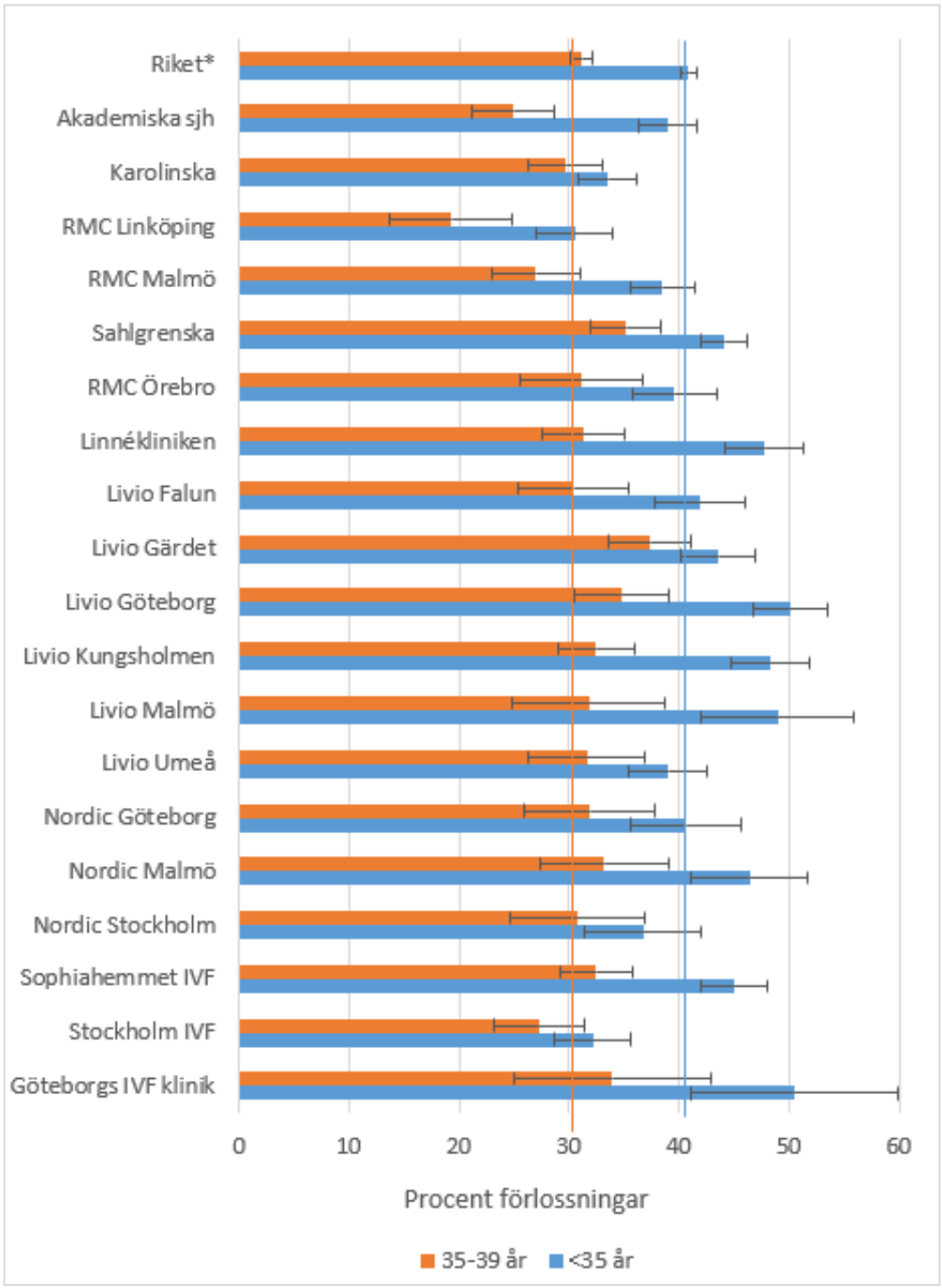
Age	≤35 years		36-37 years		38-39 years	
	Number of treatments	Number of births	Number of treatments	Number of births	Number of treatments	Number of births
Akademiska Uppsala	858	323	136	31	143	24
Karolinska Stockholm	984	257	221	49	320	51
RMC Linköping	735	214	139	30	108	15
RMC Malmö	1498	530	296	85	353	60
Sahlgrenska Göteborg	1857	746	340	102	314	64
RMC Örebro	476	182	100	27	81	14

Private clinics

Age	≤35 years		36-37 years		38-39 years	
	Number of treatments	Number of births	Number of treatments	Number of births	Number of treatments	Number of births
Linnékliniken	345	170	107	39	117	32
Livio Falun	530	163	114	21	174	32
Livio Gärdet	481	196	131	48	266	52
Livio Göteborg	795	304	153	41	152	34
Livio Kungsholmen	495	213	158	54	220	55
Livio Malmö	193	84	48	20	93	19
Livio Umeå	845	260	137	33	187	32
Nordic Göteborg	322	118	91	31	76	20
Nordic Malmö	251	100	73	17	97	23
Nordic Stockholm	249	91	66	21	98	13
Sophiahemmet	1043	405	288	86	302	63
Stockholm IVF	349	144	102	31	155	31
Göteborgs IVF klinik	150	59	33	12	45	12
Lunds IVF Center	29	10	9	3	7	0

Individual clinics freeze cycles

Figure 35 *Proportion of deliveries per embryo transfer of frozen/thawed embryos. The woman's age at the time of the oocyte retrieval is applied.* ***Freeze cycles with own gametes 2020-2022.***



**Eliva Clinic is included in the total number of treatments (Riket) but has declined to be included in Individual clinics.*
For those clinics where the number of treatments in an age category is less than 50, the results are shown only in tables, as the number of treatments and the number of deliveries. No percent figures and no confidence intervals are given. See Table 11.

Confidence interval: The lines in the bars denote the confidence intervals. The confidence interval is an estimation of the reliability of the estimates of delivery rates. The longer the line, the more unreliable are the estimates of delivery rates. The factor affecting reliability is the number of treatments per age group.

Table 11 *Number of embryo transfers included in the figure above (figure 35).* ***Freeze cycles.*** *Own gametes.*

University Clinics

Age	<35 years		35-39 years	
	Number of treatments	Number of births	Number of treatments	Number of births
Akademiska Uppsala	1310	510	529	132
Karolinska Stockholm	1253	420	684	203
RMC Linköping	685	209	197	38
RMC Malmö	1061	408	478	129
Sahlgrenska Göteborg	2067	912	853	300
RMC Örebro	611	242	270	84

Private clinics

Age	<35 years		35-39 years	
	Number of treatments	Number of births	Number of treatments	Number of births
Linnékliniken	758	362	595	186
Livio Falun	552	231	325	99
Livio Gärdet	822	358	637	238
Livio Göteborg	837	419	463	161
Livio Kungsholmen	775	374	700	227
Livio Malmö	198	97	173	55
Livio Umeå	690	269	288	91
Nordic Göteborg	366	149	238	76
Nordic Malmö	334	155	253	84
Nordic Stockholm	316	116	218	67
Sophiahemmet	1058	476	754	245
Stockholm IVF	694	223	451	123
Göteborgs IVF klinik	109	55	109	37
Lunds IVF Center	24	10	20	4

Research

Q-IVFs' data offers great possibilities for researchers. Approval from the ethical committee and a "secrecy assessment" are required. Application forms to access data from Q-IVF can be found on our homepage.

Many studies based on Q-IVF data have been performed in Sweden. In many of these studies, the researchers have cross-linked with data from the Medical Birth Registry, the Registry of Birth Defects, the Cancer Registry, the Patient Registry, or other health or national quality registries. In this way, it has been possible to detect what type of risks IVF-children and IVF-mothers may run, compared to children born from spontaneous conception and their mothers. Globally, the largest risk involved in IVF is the large proportion of multiple pregnancies that lead to babies being born prematurely and with low birth weight. In Sweden, we have been able to drastically reduce the number of multiple pregnancies through the one-embryo-transfer policy. This makes Sweden one of the leading countries in the world in this area of IVF. Though some risks remain, these risks are quite limited, and most children born because of IVF in Sweden are healthy. Additionally, research into how patients experience the IVF-treatment is performed, especially when the treatment fails. Both childlessness and the IVF-treatment itself are known to be stressful.

Patient satisfaction

KUPP (Quality from a Patient's Perspective) is a patient survey often used in Swedish health care. All of Sweden's IVF clinics use a variant of this survey named IVF-KUPP, containing specific questions for IVF-patients. The survey is scientifically validated.

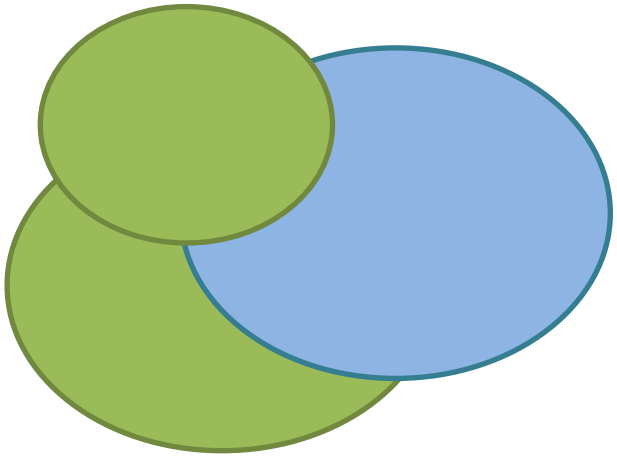
The patients answer different types of questions. They are asked to assess how the clinic and the staff handle different parts of the IVF treatment. They are also asked to assess how important the handling and the specific parts of the treatment were to themselves.

The survey is administered by Q-IVF and performed in all of Sweden's IVF-clinics at a 1½-2-year interval. The answers of the survey constitute data on which the presentations of IVF clinics in this report are based. The same presentation can also be found on Q-IVF's homepage.

In 2023 (during a period of three months), the survey IVF-KUPP was performed for the sixth time, using questionnaires. Each of the clinics is given the results of the questionnaires filled out by their own patients as well as national data, in order to learn and make improvements.

In total, more than 5 000 questionnaires were sent out to women and partners undergoing treatment. The response rate was 74.3% for women and 55.4% for the partner.

59.4% did their first treatment and the remaining 40.6% had undergone IVF treatment earlier. Responses did not differ between these two groups. The group with IVF and donated gametes continues to increase and this time 17,5% answered that they used donates gametes (egg/sperm) in their IVF treatment.

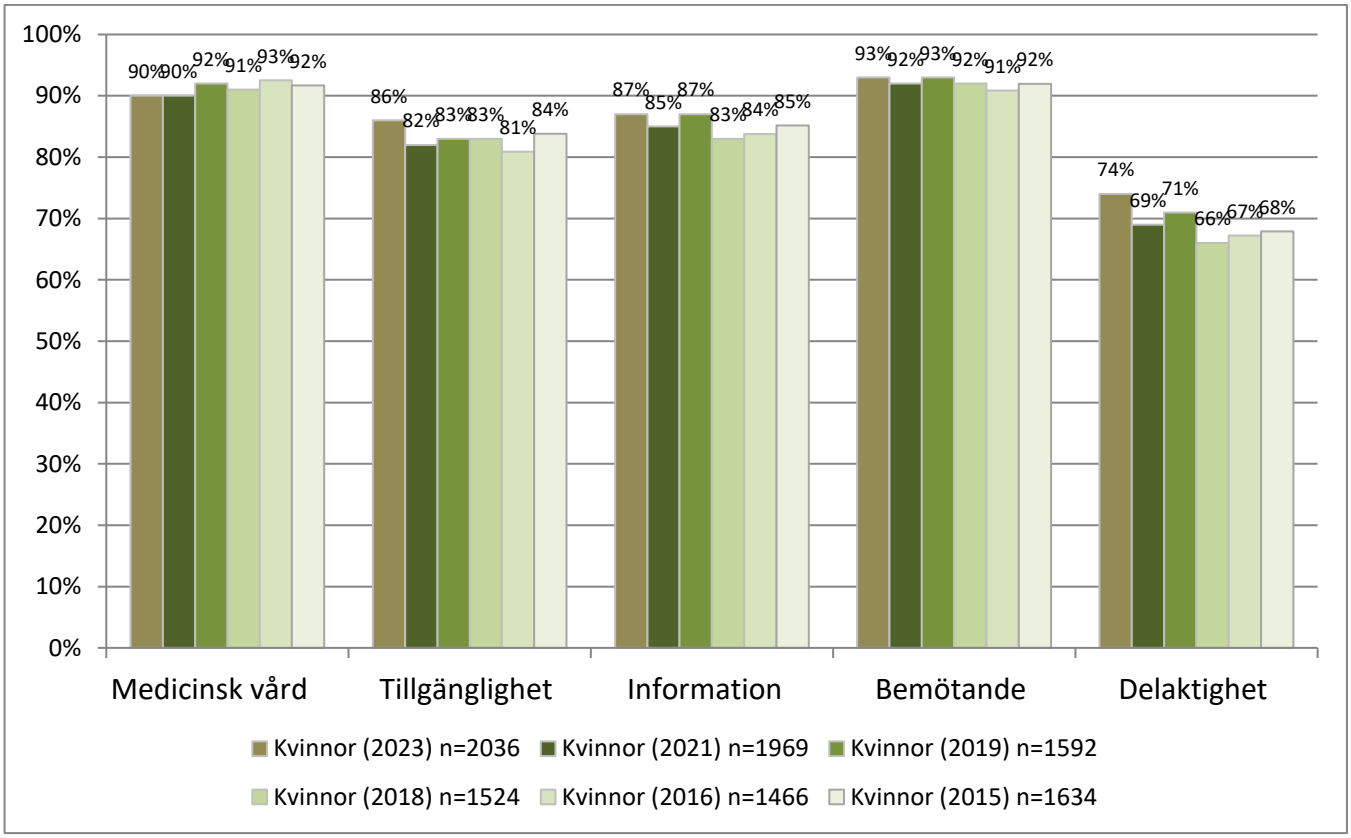


The presentation is divided into five main categories.

- Medical care: We received the best possible health care as far as we can tell (1 question)
- Accessibility: It was easy to get in touch with the clinic, easy to get an appointment (2 questions)
- Information: Treatment, medications, results of examinations, complications (5 questions)
- Treatment: Empathy, respect, engagement (6 questions)
- Participation: Participation in decisions (2 questions)

The answers apply to the proportion of respondents who answered “completely agree” or “mostly agree” to the selected questions from the survey.

Figure 36 *Average for all clinics in Sweden and comparison to previous years.*



Concluding remarks

Q-IVF is one of the world's most complete quality registries for assisted reproduction with just over 330,000 registered cycles (2007 - 2022), from both private and public healthcare providers.
In 2022, approximately 27,000 treatments were started, which is an increase compared to 2021.

The chance of getting pregnant after a fresh IVF treatment has remained at the same level during the last years (2022, 27% per embryo transfer). The chance for a woman of achieving a pregnancy is, however, strongly related the woman’s age. The chance of getting pregnant from a transfer of a cryopreserved embryo has increased, mostly associated with new, effective methods of freezing and extended culture of excess embryos. The proportion of multiple births in Sweden is very low due to only one embryo being transferred in most of the cycles.

In the last years, extended culture of embryos has increased, particularly of embryos for freezing. Transfer of blastocysts now constitutes 99% of all transfers with cryopreserved embryos.

Freezing of unfertilized oocytes, a technique very much improved in recent years, is used by both public and private clinics. Since the woman’s age is very important in determining the quality of her oocytes, oocyte freezing is increasing mainly among women younger than 39 years.

Since the change in the Swedish legislation April 2016 that made it possible for single women to undergo assisted reproduction, insemination with donated sperm has increased. In this report, we present the proportion of these treatments performed in single women.

Having children is a central part of most people's lives and those undergoing IVF treatment usually have high expectations for the treatment. In recent years, we have been able to measure in a validated manner how well the profession meets these expectations through the national quality survey KUPP. We are proud to be able to show that we meet expectations well and strive to become even better. This report is one tool to help the IVF providers make the improvements they aim for.