

Fertility treatments in Sweden

National report 2022

Refers to treatments started in 2020

RESULTS and TRENDS



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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 more than forty years since the start of IVF, techniques have 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 IVF. In total, just over 20 000 treatments are performed yearly, including both fresh and frozen embryo treatments. The couple's own gametes are used in a majority of the treatments, with about five percent of the treatments being performed with either donated oocytes or donated sperm (www.qivf.se). Lately, the possibility of freezing unfertilized oocytes with good success rates has also emerged. Among other things, this means that women who suffer from a disease where the cure or treatment may hurt the function of the ovaries can now cryopreserve their oocytes with the possibility of having children at a later date.

The National Quality Registry for Assisted Reproduction (Q-IVF) was introduced in 2007. Consequently, this year's report is the 14th from Q-IVF. It covers all treatments initiated in 2020 in Sweden's - at that time - 20 IVF clinics. Out of the 20 clinics, six were public and 14 were private. 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 2020 are accounted for in this report.

The aim of Q-IVF is to monitor treatment results and identify potential risks for men and women 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 scientific research.

The year 2020 was special due to the increasing SARS-CoV-2 pandemic and particularly before effective vaccines were available. The effect of the pandemic on reproductive medicine was partly closed IVF clinics and a decreasing number of IVF treatments performed, around 10% less on a national level. IVF personnel, at least from public funded units, were relocated to work at covid wards. Outpatient care was managed by digital systems as much as possible and partners were not allowed to participate if not absolutely necessary, which resulted in frustration among patients.

The Regional Board of Västra Götaland has since the start of Q-IVF been the authority responsible for the registry and handling of personal data. This responsibility has during 2021 been transferred to Karolinska University hospital. The head of the Registry is professor Christina Bergh, Gothenburg and the registry coordinator is midwife Kia Borg. The steering group consists of representatives of the various IVF clinics in Sweden, representatives of patient networks, and statistician Karin Källén. Behavioral 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 registry is financially supported by Sweden's regional governments, SKR.

From being connected to Uppsala Clinical Research Center (UCR) during the first years, the current IT-platform is now MedSciNet, 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 development work has been carried out aiming at reporting and presenting data “on-line” with daily updates and continuous presentation of results, replacing the previous system using yearly compilations. The new method is now used by all IVF clinics and is working well. 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

Board of directors

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Kia Borg, Registry coordinator

Representative of "The National Association of Involuntary Childlessness"

Terms and definitions

IUI-D	Insemination with donor sperm: donor sperm is placed directly into the uterus
Assisted reproduction	Use and manipulation of gametes (both oocytes and sperm) outside of the body. Thus IUI-D is not included in ART
Biochemical pregnancy	A positive pregnancy test (urine or serum) ahead of an ultrasound verification of a gestational sac
Birth	The complete expulsion or extraction from a woman of a fetus after 22 completed weeks of gestational age, irrespective of whether it is a live birth or stillbirth, A single birth refers to an individual newborn; and a delivery of multiple births, such as a twin delivery, would be registered as two births.
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. A delivery of either a single or multiple newborn is considered as one delivery.
Delivery rate	The number of deliveries expressed per 100 initiated cycles, aspiration cycles, or embryo transfer cycles. When delivery rates are recorded, the denominator (initiated, aspirated or embryo transfer cycles) must be specified. It includes deliveries that resulted in the birth of one or more live births and/or stillbirths. The delivery of a singleton, twin or other multiple pregnancy is registered as one delivery.
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 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 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 there is low sperm motility, or after a previous cycle with no or very low fertilization
IVF	In vitro fertilization: fertilization occurring outside of the woman's body
Live birth	The complete expulsion or extraction from a woman of a product of fertilization, after 22 completed weeks of gestational age; Live births refer to the individual newborn; for example, a twin delivery represents two live births.

Live birth delivery rate	The number of deliveries that resulted in at least one live birth, expressed per 100 cycle attempts. When delivery rates are given, the denominator (initiated, inseminated, aspirated or embryo transfer cycles) must be specified.
Multiple pregnancies	A pregnancy where the women is pregnant with multiple fetuses
Multiple birth	The complete expulsion or extraction from a woman of more than one fetus, 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.
OPU	Ovum pick up; oocyte retrieval from the ovaries
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.
Own gametes	The couple's own oocytes and sperm are used in a treatment
Treatment cycle	A treatment initiated either by hormones or by start of menstruation
Freeze-all	All embryos are cryopreserved for use at a later date, and no transfer of embryos taking place in the fresh cycle

Background (childlessness and its causes)

Infertility, or involuntary childlessness, is defined by the WHO as pregnancy not occurring despite a woman having 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, 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 checkups 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 oocyte fertilize and cleave and an embryo is developed, it can be transferred into the uterus. In this report, we use the term IVF to denote both 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. However, the treatment can also be used to retrieve oocytes for donation purposes or for oocyte freezing in order to preserve a woman's fertility (see below). For this reason, not all started treatments result in a transfer of an embryo into the uterus.

A treatment cycle

A fertility treatment, such as an IVF-treatment, usually takes a couple of weeks, and is known as a treatment cycle. An IVF treatment can be either in the form of a so-called fresh treatment cycle or by transfer of frozen/thawed embryos. In 2020, for the first time, more cycles were performed as frozen-thawed cycles as compared to fresh cycles. In about half of all fresh cycles, the method of fertilization is standard IVF (ST. IVF), and in the other half ICSI.

How we collect data

IVF is an established clinical practice in the field of medicine. The number of treatments in Sweden has increased from around 3 000 in 1992 to just over 22 000 today. Out of all children born in Sweden in the year referenced in this report (2020), almost 5000 children have been born as a result of IVF and almost 300 children through donor insemination. It is important to follow up the results of the treatments, to be able to perform these treatments as safely and as effectively as possible.

Q-IVF was launched in 2007, and since then all treatment cycles are reported to Q-IVF. All public as well as privately owned clinics in the country performing IVF-treatments participate. For this reason, Q-IVF is one of the most complete, national IVF registries in the world, with above 300 000 registered treatments to date. Reporting from the IVF-clinics to Q-IVF was previously done once a year, but since 2020 there is a regular and 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 resulted in a live birth. However, an IVF-treatment involves several steps and there are several reasons why a started treatment may not lead to transfer of an embryo. The treatment cycle could 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 syndrome (OHSS). When there is a risk of OHSS, one often chooses to cryopreserve all embryos, which will lower the risk. Methods for embryo freezing are very effective today, with a high rate of embryo survival. The woman can then have a thawed embryo transferred at a later date 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. Only looking at the proportion of started treatments that ended in a live birth can therefore be a misleading way of measuring how effective IVF-treatments are. Comparing the number of live births per embryo transfer is another way to measure effectiveness, and is used in this report. We also observe that the effectiveness of the cryopreservation cycles is increasing, something that is primarily associated with extended culture to the blastocyst stage. Culturing embryos to the blastocyst stage selects embryos which are more viable. In addition, the freezing methods have improved, thus a larger share of embryos survive freezing and thawing.

How data can be used

Each of the participating clinics has a secured login and can access their own data via Q-IVF's website, and compare themselves to the results for the country as a whole. A yearly report containing treatment results, birth rates and other relevant statistics and trends is published for public access.

When seeing patients, the clinics can use birth rates for Sweden as a whole to demonstrate how results vary in different age groups. Using Q-IVF's yearly report, patients can also themselves look up the effectiveness of the different methods of assisted reproduction. This information may make it easier to understand what the treatments are about and what the chances of getting pregnant are.

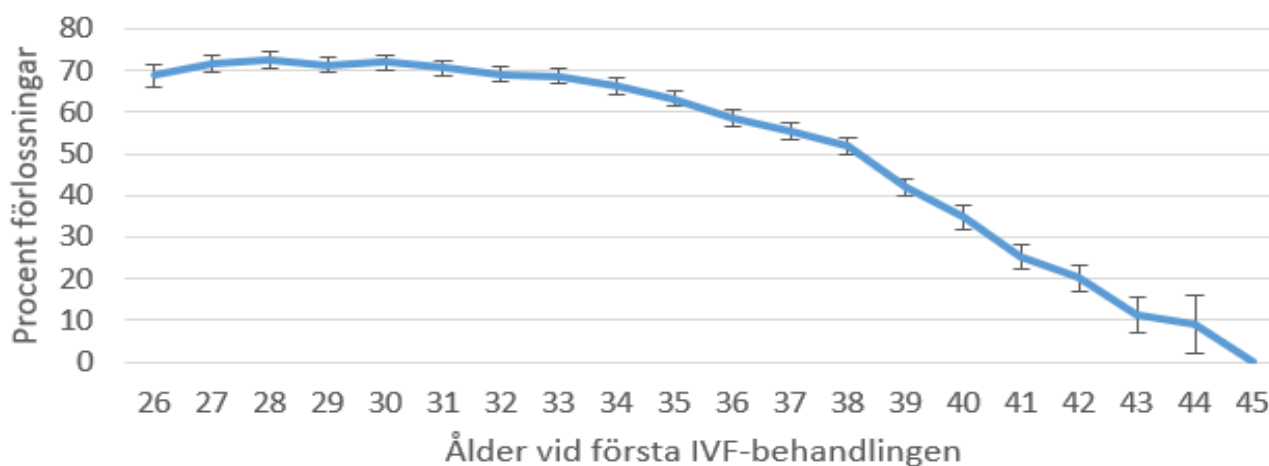
Introduction

Will we/I succeed in having a baby with an 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.

A **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 sperm are produced in the testicles continuously. The importance of the 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 treatments.

Figure 1. *Proportion of women achieving a delivery after treatment started within 18 months of the first IVF-treatment (own oocytes).*



The graph above includes women who underwent their first oocyte retrieval from January 1, 2012 to June 30, 2019. The numbers 26 to 45 in the graph indicate a woman's age at the start of the first treatment.

AMH (Anti-Mullerian Hormone) is a substance which is measured in the blood and showing 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.

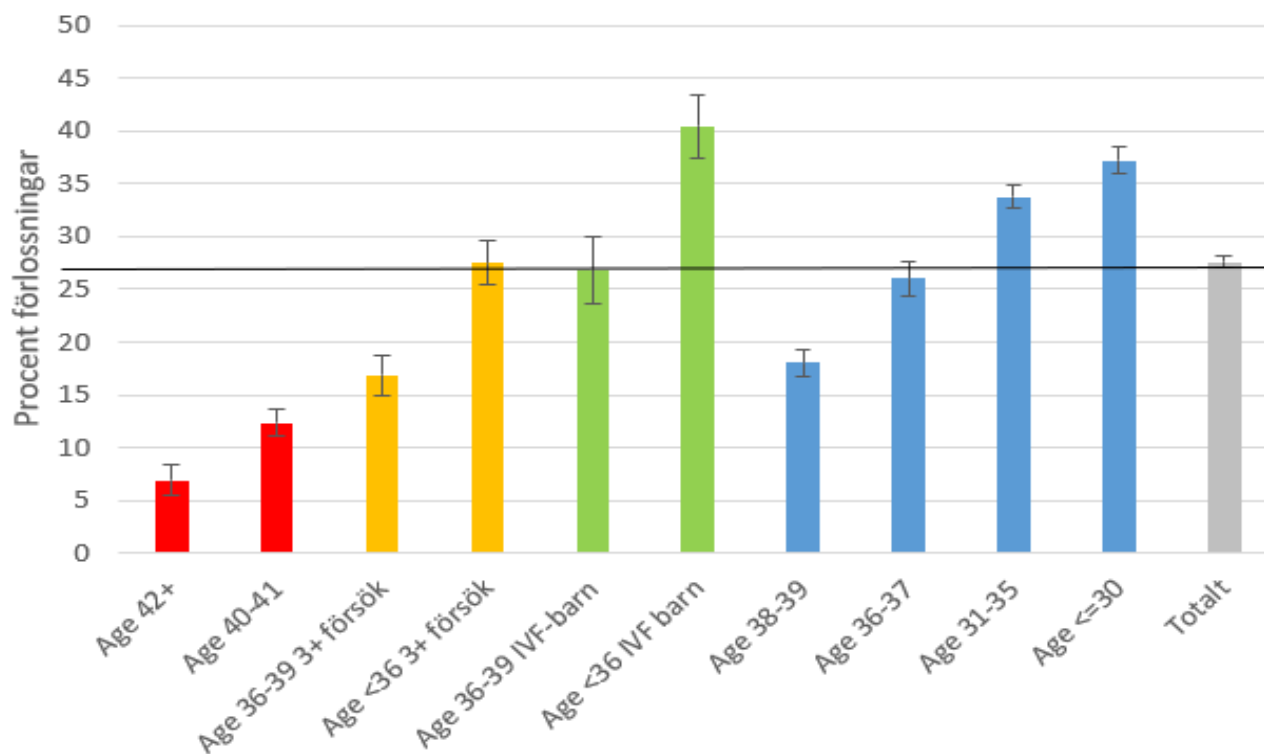
The sperm quality (sperm count and motility) also affects one's chance of having a baby with spontaneous conception, but is less important in determining the chance of succeeding with an IVF-treatment.

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 June 1 2018 to June 30 2020. 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, all IVF-treatments at all clinics in Sweden are of high quality and done in a similar manner. The clinics reporting to Q-IVF are able to benchmark against other clinics and thereby 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”.

IVF with the patient's own gametes (autologous)

A summary of the treatments started in 2020

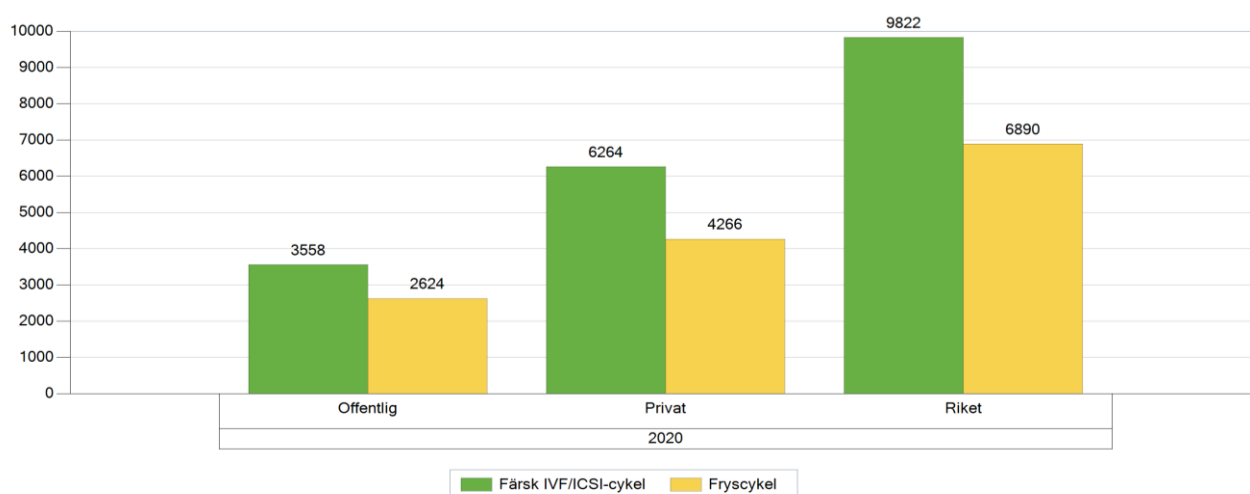
Table 1 Number of treatments, pregnancies, birth rates per treatment type. IVF/ICSI with own gametes (PGT not included).

	St.IVF	ICSI Ejaculated	ICSI Epididymis/Te sticle	St.IVF and ICSI	Freeze cycles	Total Fresh and Freeze cycles
Started cycles	4995	4541	286	9822	6890	16 712
Oocyte aspirations	4707	4163	283	9153		
Embryo transfer	3278	2953	185	6415	6710	13 125
Positive pregnancy tests	1318	1080	63	2462	3229	5691
Biochemical pregnancies	169	123	16	308	407	715
Clinical pregnancies	1149	957	49	2157	2822	4979
Spontaneous abortion < gestational week 13	232	161	9	402	491	893
Spontaneous abortion gestational week 13-22	12	6	1	19	21	40
Ectopic pregnancy	20	6	0	26	19	45
Stillborn, gestational week 22-27	3	0	0	3	4	7
Stillborn, gestational week 28+	5	4	0	9	11	20
Deliveries, singleton	907	795	42	1743	2380	4123
Deliveries, twins	22	27	2	51	36	87
Deliveries, triplets	0	0	0	0	1	1
Total number of deliveries	929	822	44	1795	2417	4212
Total number of live born children	943	844	44	1831	2439	4270
Lost to follow up	8	4	0	12	17	29

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

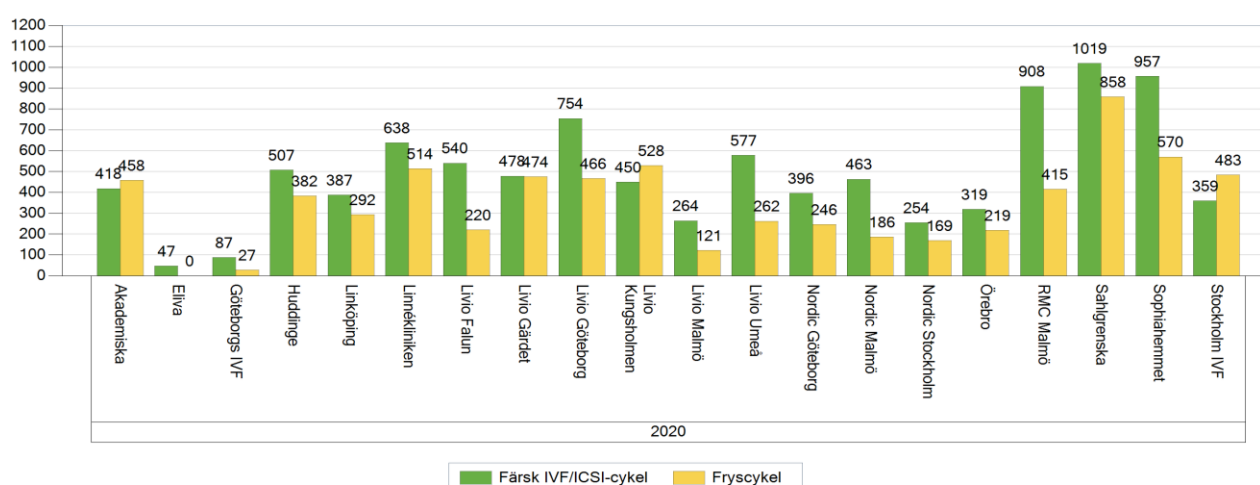
Number of started cycles in Sweden 2020

Figure 3. Number of started treatments public /private /total. Fresh IVF and freeze cycles. Own gametes.



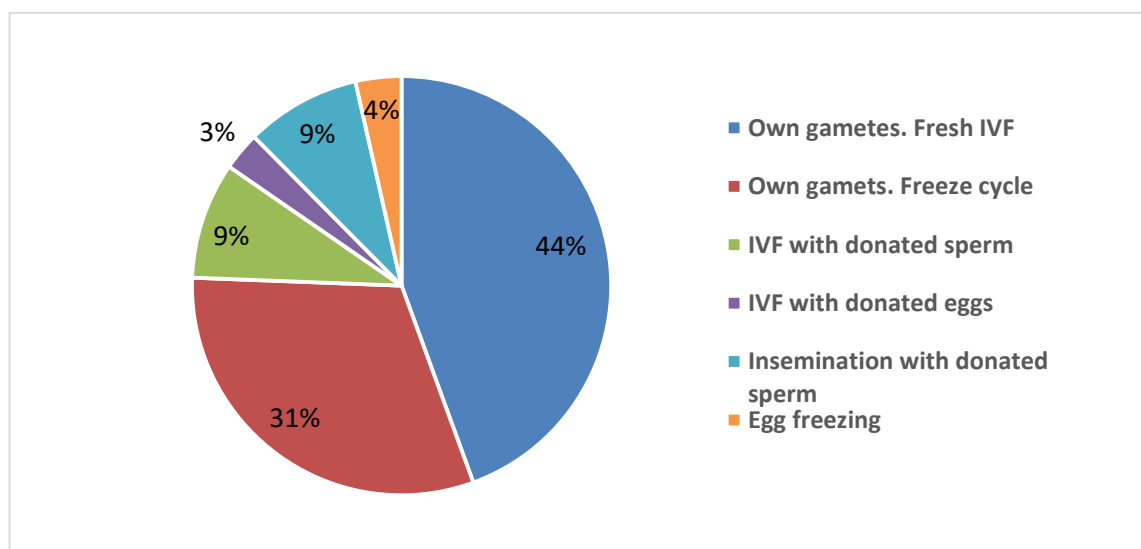
Some of the treatments given at private clinics are paid for by the state since the regional governments sometimes procure treatments from the private clinics. See figure 32.

Figure 4. Number of started treatments per clinic. Fresh IVF and freeze cycles. Own gametes.



Different treatments started in 2020

Figure 5. *Proportion of initiated treatments.*



In the figure above, the proportions of various treatments started are shown in a pie chart. For details, see tables 1 and 5. The number of treatments has to some extent decreased compared to previous year, but there is an increase in the number of IVF with donated sperm, and in oocyte freezing for autologous use.

Table 2. *Lost to follow up in 2020, i.e. treatments where we, despite investigations do not have any results. The reason may be because patients come from abroad or patients move abroad.*

	Missing treatment results	Pregnancies with missing outcome	Total
Fresh IVF	3	12	15
Freeze cycles	1	17	18

Figure 6a. *Proportion of women who started a fresh IVF-treatment in 2020, separated by age.*

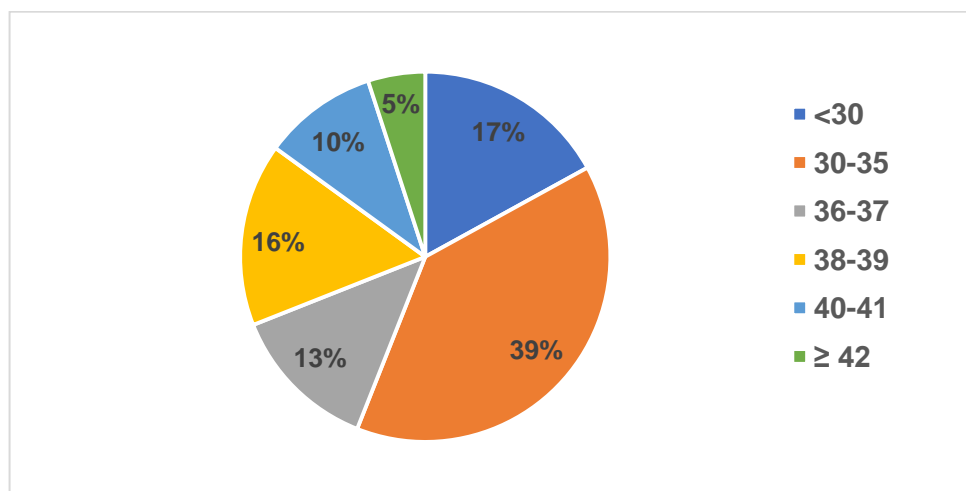
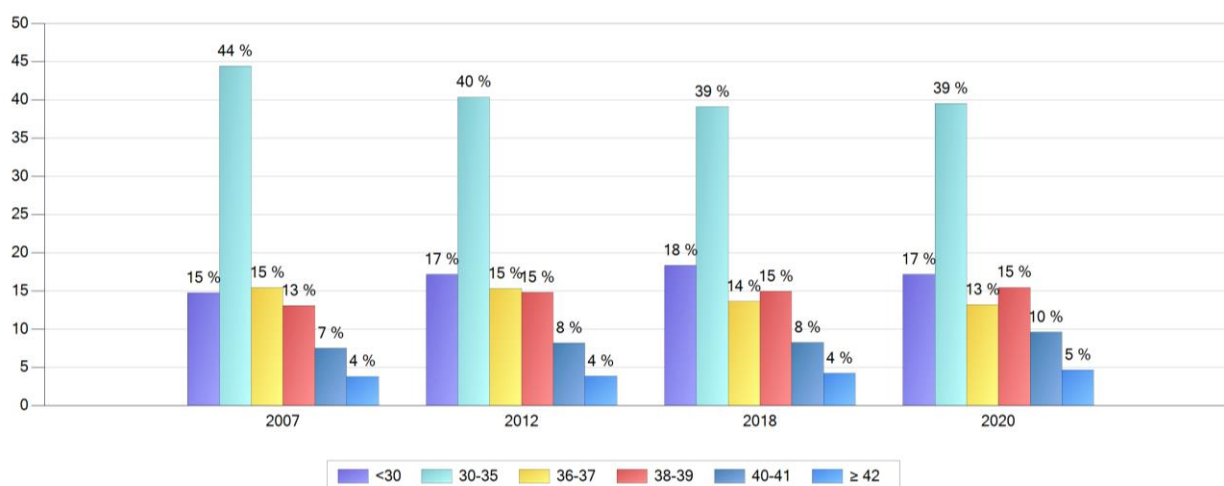
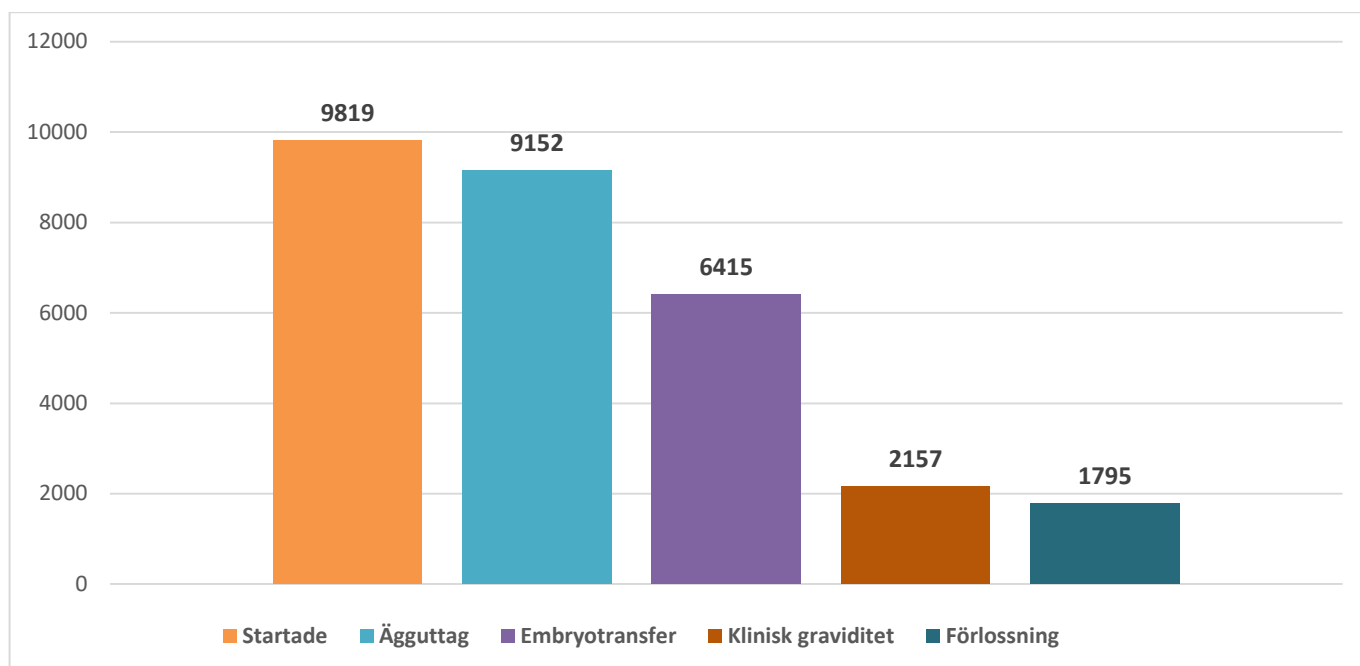


Figure 6b *Proportion of women who started a fresh IVF-treatment, separated by age the years 2007-2012 and 2020. Own gametes*



The age distribution of women starting IVF shows over time a small shift towards older age groups.

Figure 7. *Number of treatments reaching different steps in the treatment process. Fresh IVF/ICSI. Own gametes.*



Out of the 9819 started fresh IVF-treatments with own gametes, 1795 resulted in live births, i.e. about 20%. From the treatments reaching the embryo transfer stage, 28 % resulted in a live birth.

Many things can happen during the various treatment stages. Sometimes stimulation is disrupted before the 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 medical or personal reasons.

Out of all treatments that lead to an oocyte retrieval, in around 20% a fresh embryo transfer is not performed. The most common reason for this is that one chooses to cryopreserve all embryos of high quality. Freezing all embryos instead of doing a fresh embryo transfer is a common strategy when there is risk of OHSS. This does not reduce one's chance of becoming pregnant, even though it of course delays the embryo transfer. Other reasons why treatments don't lead to an embryo transfer might be that mature oocytes cannot be retrieved, that oocytes are not fertilized properly, or that no embryo develops that is suitable for transfer.

Generally, an IVF-treatment is an effective treatment method and most patients/couples manage to get pregnant and have a baby within the first three IVF-treatments.

PGT – Preimplantation Genetic Testing

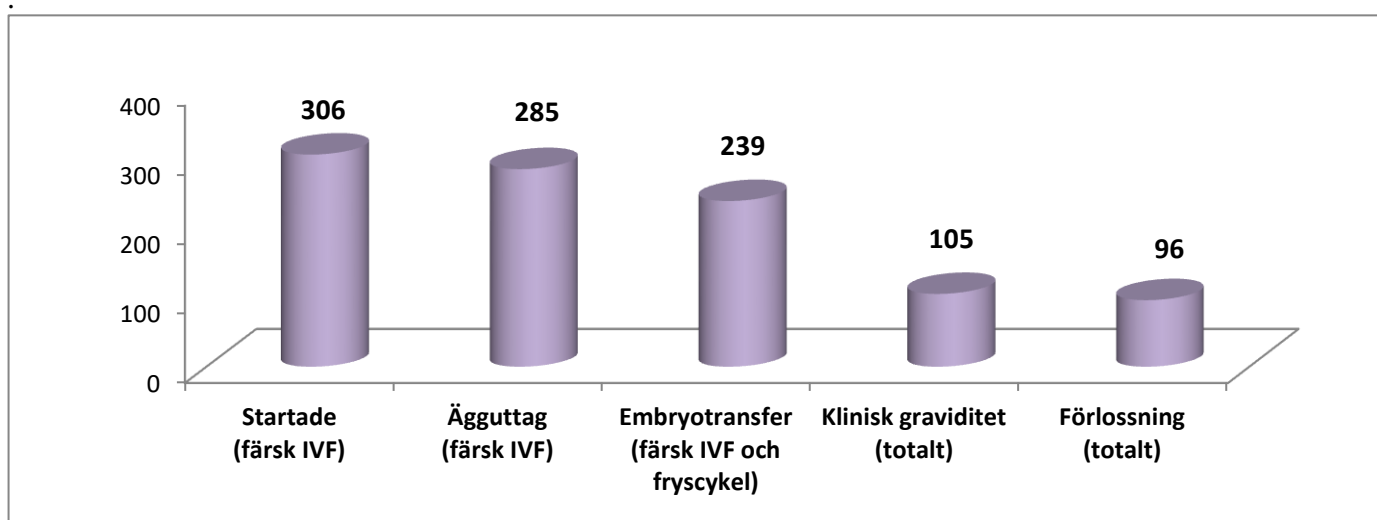
Preimplantation genetic testing was introduced in 1989 as an alternative to prenatal diagnostics for severe genetic diseases, and the first child from a process involving PGT was born in 1992. The technique, earlier named PGD (preimplantation genetic diagnosis) recently changed names to PGT (Preimplantation Genetic Testing), which involves several forms of genetic testing.

PGT-A (Preimplantation Genetic testing – Aneuploidy screening) is a variant of the PGT method, the purpose of which is to select an embryo without chromosome errors to increase the birth rate and decrease the time to pregnancy and live birth. In this case there is no known genetic hereditary disease for any of the parents.

In Sweden, PGT is offered to couples with known monogenic diseases and genetically inherited chromosome abnormalities, while PGT-A is only allowed in clinical trials. During PGT an embryo biopsy is performed, including one to ten cells being sampled from the growing embryo and then analyzed with PCR (Polymerase Chain Reaction), FISH (Fluorescence In Situ Hybridization) technique, array-based technique, or NGS (Next Generation Sequencing).

An embryo, which is considered healthy with regard to the disease in question, 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%. PGT is performed in two clinics in Sweden, in Gothenburg and Stockholm. The first child in Sweden born from a process involving PGT was born in Gothenburg in 1996, and today nearly 500 babies in Sweden have been born from a process involving PGT.

Figure 8. Number of treatments involving PGT that reached different steps in the treatment process in 2020 and results after fresh and frozen/thawed cycles (combined)..



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

Delivery rates after PGT have increased since last year, from 33% to 40% per embryo transfer, 2019 to 2020. Assessed per oocyte retrieval there is an increase from 24% to 34%.

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 needs to be 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 the abdomen after oocyte retrieval is 0.3%, which is low. Antibiotics are usually not administered, only if the treating doctor considers there being an increased risk of infection.

Minor bleedings after oocyte retrieval is common.

These are bleedings from the vagina or from the abdomen that will eventually be absorbed by the body. In 1–2 cases out of 1 000 oocyte retrievals a major bleeding occurs in the abdomen that requires observation at hospital and sometimes surgical/medical intervention.

A few cases of ovarian torsion, when an ovary has twisted over its own stem, occur every year.

Among the reported complications from fresh IVF-treatments initiated in 2020, there were 37 cases of OHSS where hospitalization was required, 10 cases of bleeding and 7 cases of infection.

Reporting about complications has improved considerably compared to last year and is now almost complete.

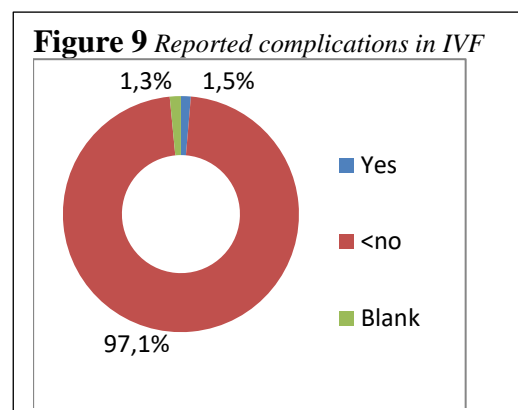


Table 3 Number of reported complications at fresh IVF-treatments with own or donated gametes

Complications - Yes	145
Complications - No	10 537
Not reported	165
Total number of OPU	10 847

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 that, as a rule, only one fertilized oocyte (embryo) can 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 (HDP) 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 the majority of the cycles.

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

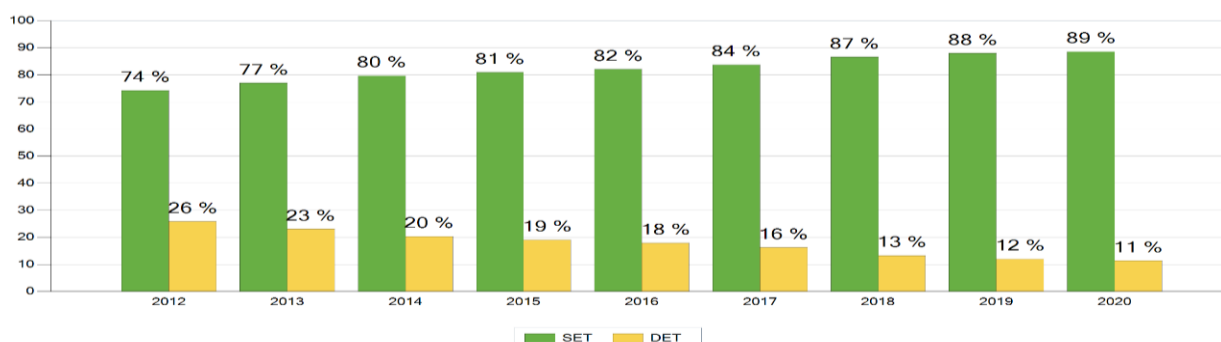


Figure 10b. Proportion of transfer of one (SET) or two (DET) embryos. Freeze cycles. Own gametes.

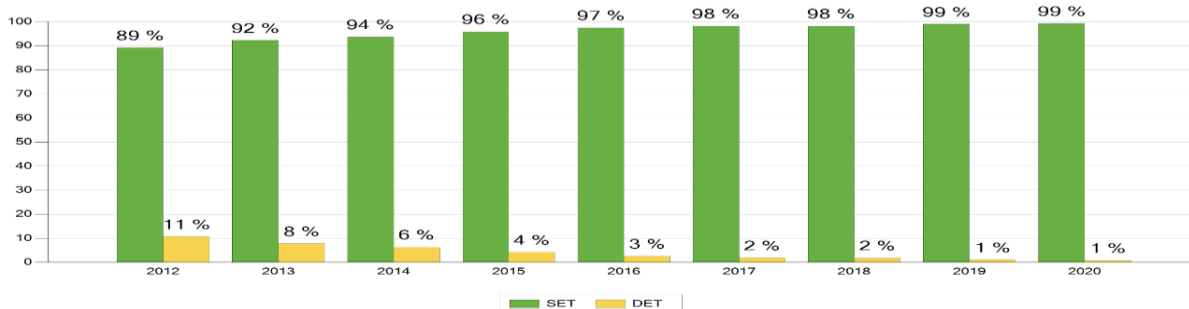
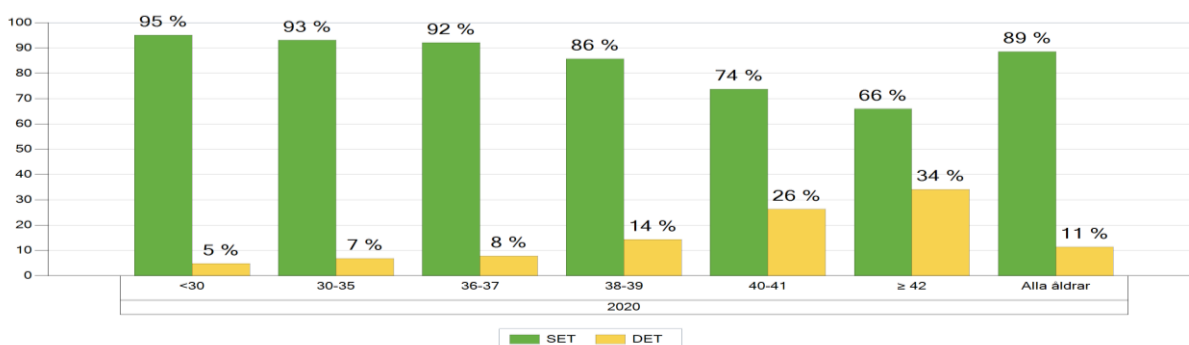


Figure 10c. Proportion of SET/DET per embryo transfer and age group. Fresh IVF. Own gametes.



Incidence of multiple births as a result of IVF-treatments in 2020

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 freeze cycles and is associated with modified embryo culture and cryopreservation methods.

The multiple birth rate in Sweden as a result of IVF is among the lowest in the world. Several other countries still have multiple birthrates at 25%–30%.

Figure 11a. Multiple birth rate per delivery. Fresh IVF/ICSI and frozen/thawed cycles.

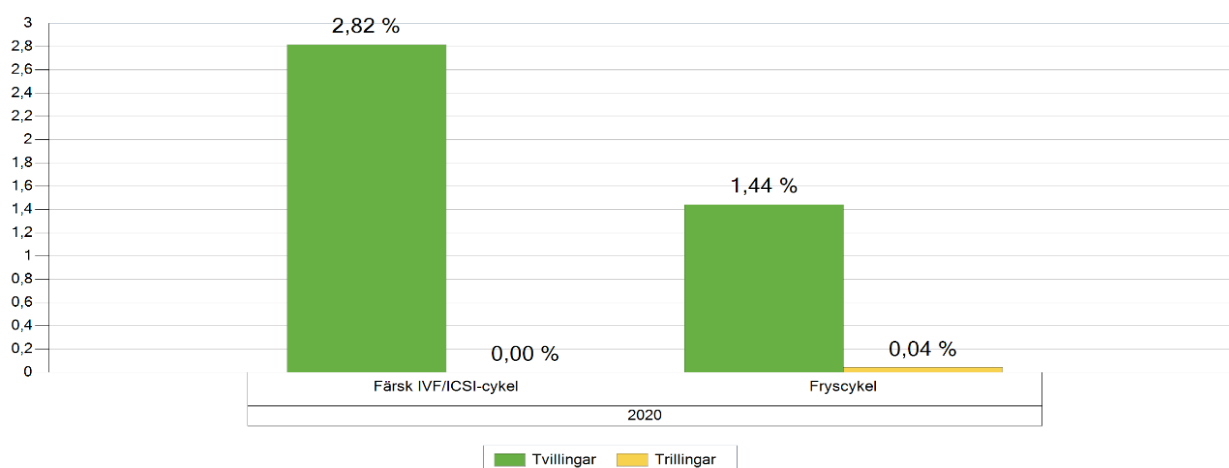


Figure 11b. Multiple birth rate per delivery at transfer of single embryo (SET). Fresh and frozen/thawed cycle.

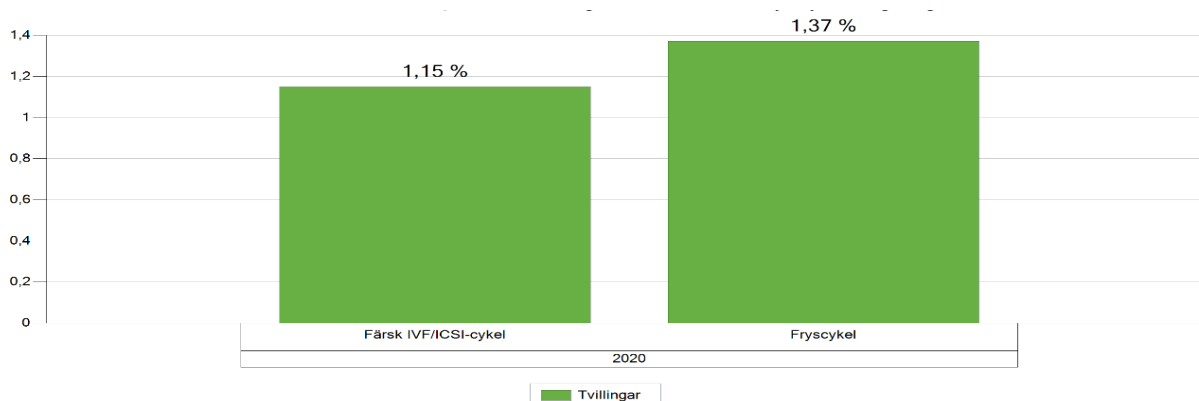


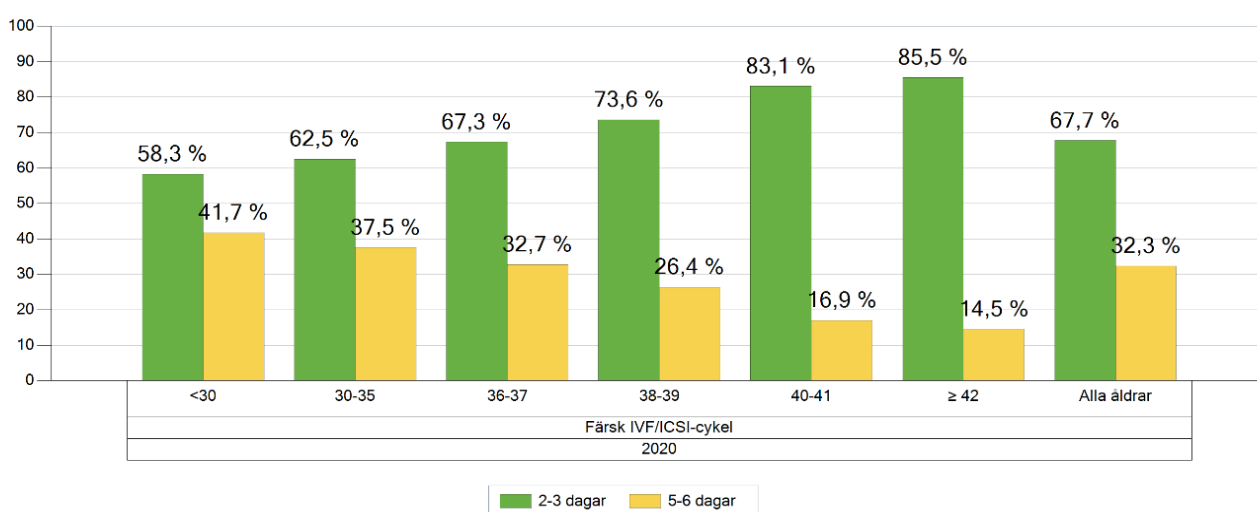
Table 4. Number of multiple births, in total and after transfer of one embryo (SET).

	Twin deliveries	Triplet deliveries		Twin deliveries	Triplet deliveries
<i>Fresh IVF - Total</i>	51	0	<i>If SET</i>	19	0
<i>Freeze cycles - Total</i>	36	1	<i>If SET</i>	34	0

For 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 is 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. 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 are believed to outweigh the disadvantages for the freeze cycles.

Figure 12 Proportion of embryo transfers day 2–3 and day 5–6 per age group. Fresh IVF. Own gametes.



The increased prevalence of blastocyst transfers in freeze cycles compared to fresh cycles are due to the freezing methods for blastocysts (vitrification) having yielded improved treatment results compared to the more traditional “slow freezing” of day 2–3 embryos. The difference for fresh cycles between these culture regimens, however, is not that apparent. See also figure 16.

Results

The results from fresh IVF-treatments have been stable over the years, while the results from freeze cycle IVF-treatments have improved in recent years. This is largely associated with extended culture duration aimed for the blastocyst stage and to improved freezing methods. Approximately 20% of all women become pregnant and have a child per started IVF-cycle. Younger women have a higher chance, while older women have a lower chance. 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 13 Delivery rate per started cycle for different age groups. Fresh IVF/ICSI. Own gametes.

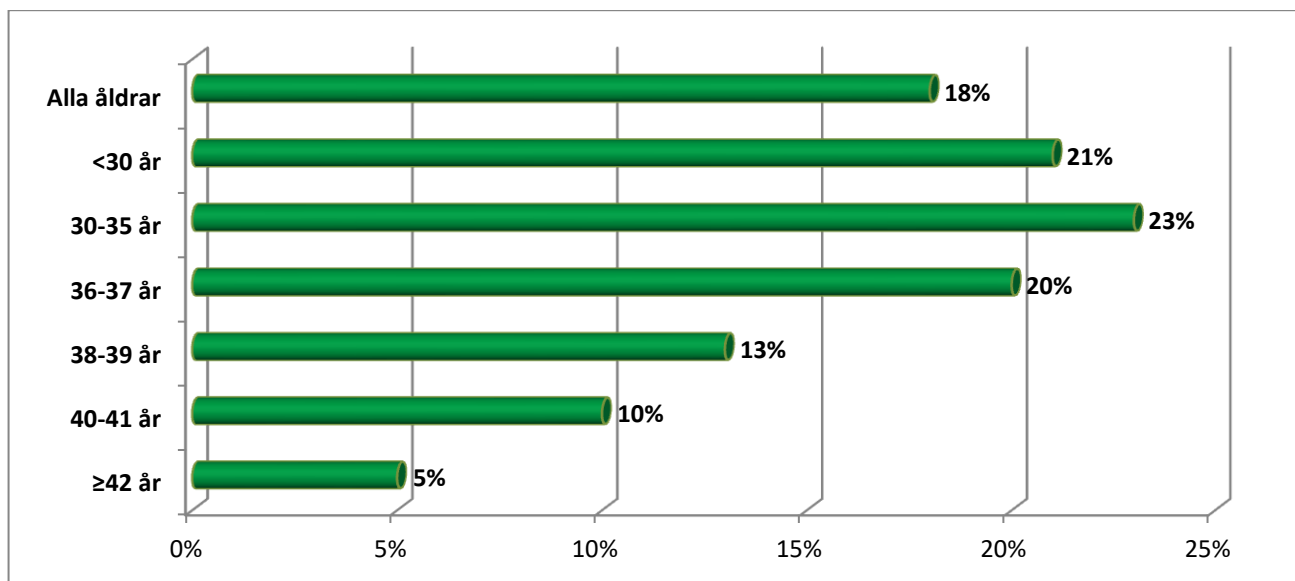
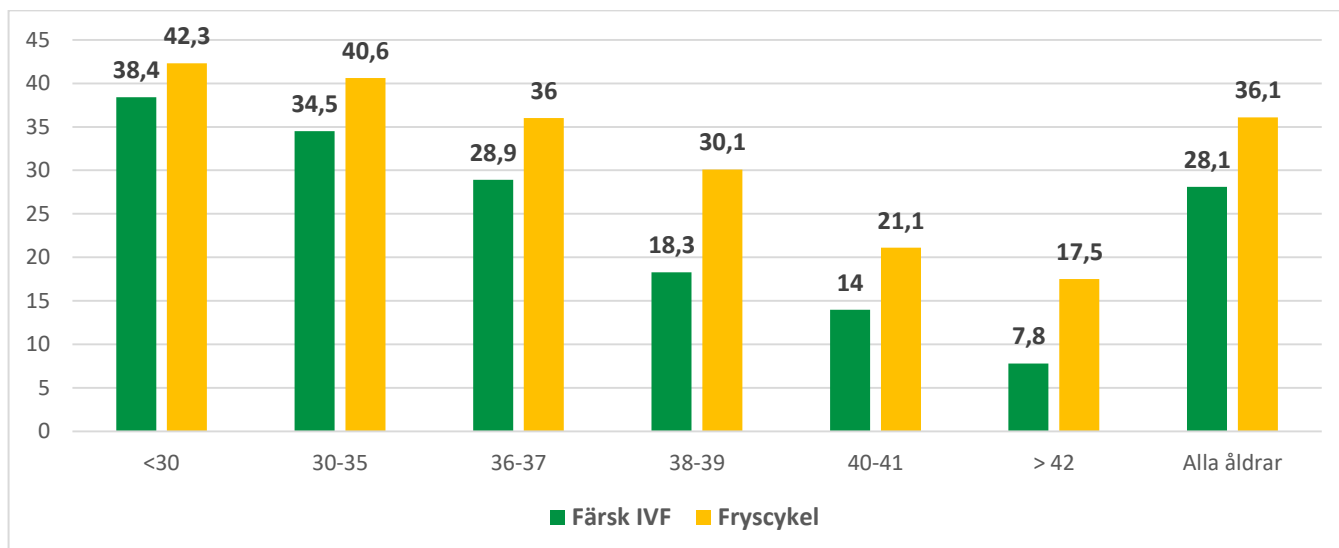
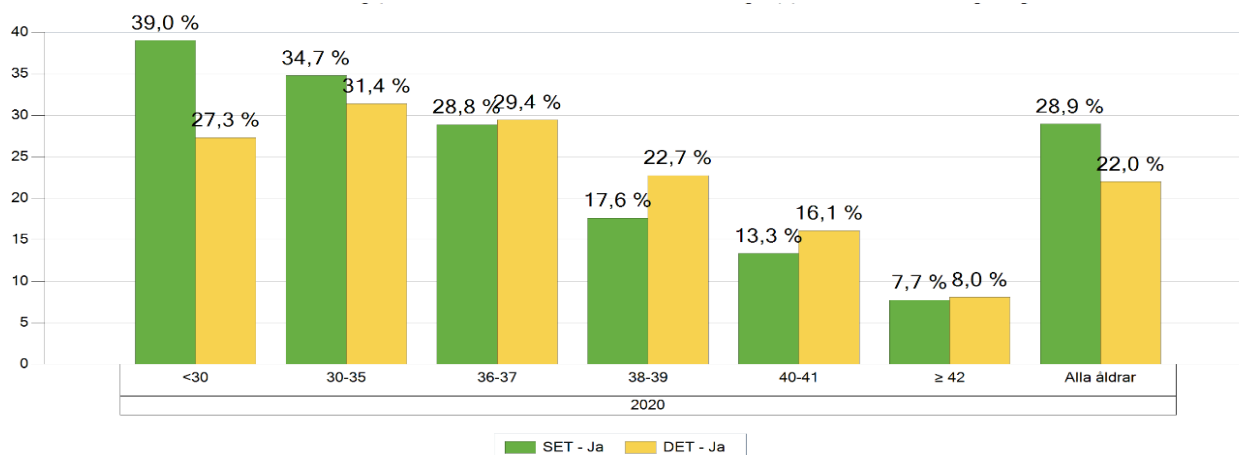


Figure 14 Delivery rate per embryo transfer for different age groups. Fresh IVF/ICSI and freeze cycles. Own gametes.



The reason for a higher birth rate after treatments with cryopreserved embryos compared to fresh treatments for women at a high age is largely because the embryos in the freeze cycles may have been frozen when the women were younger.

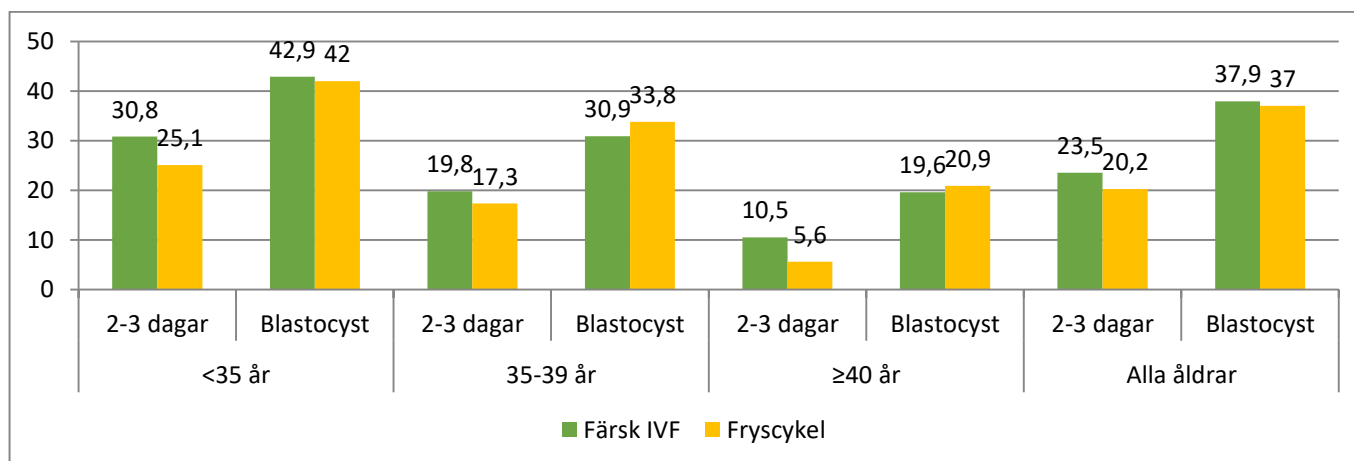
Figure 15. Proportion of deliveries per embryo transfer and SET/DET for different age groups. Fresh IVF/ICSI. Own gametes.



The delivery rate is not directly comparable for SET and DET for the different age groups because the reason why one or two embryos is transferred varies with the prognosis of the 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.

Due to the previously high multiple birthrate for women treated with IVF, the Swedish National Board of Health and Welfare introduced regulations already in 2003 that only one fertilized oocyte should be transferred. If the risk of a twin pregnancy is estimated to be low, however, two embryos are allowed to be transferred.

Figure 16. Delivery rate per culture time, day 2-3 and blastocysts, and per age group. Fresh IVF/ICSI versus frozen/thawed cycles. Own gametes.



The Figure shows that if one separate treatments in day 2-3 and blastocysts, no apparent differences exist in delivery rates between fresh and frozen/thawed cycles even though a small advantage is observed for fresh cycles (all ages).

Trends (autologous gametes)

Figure 17. Number of embryo transfers per year for various treatment methods.

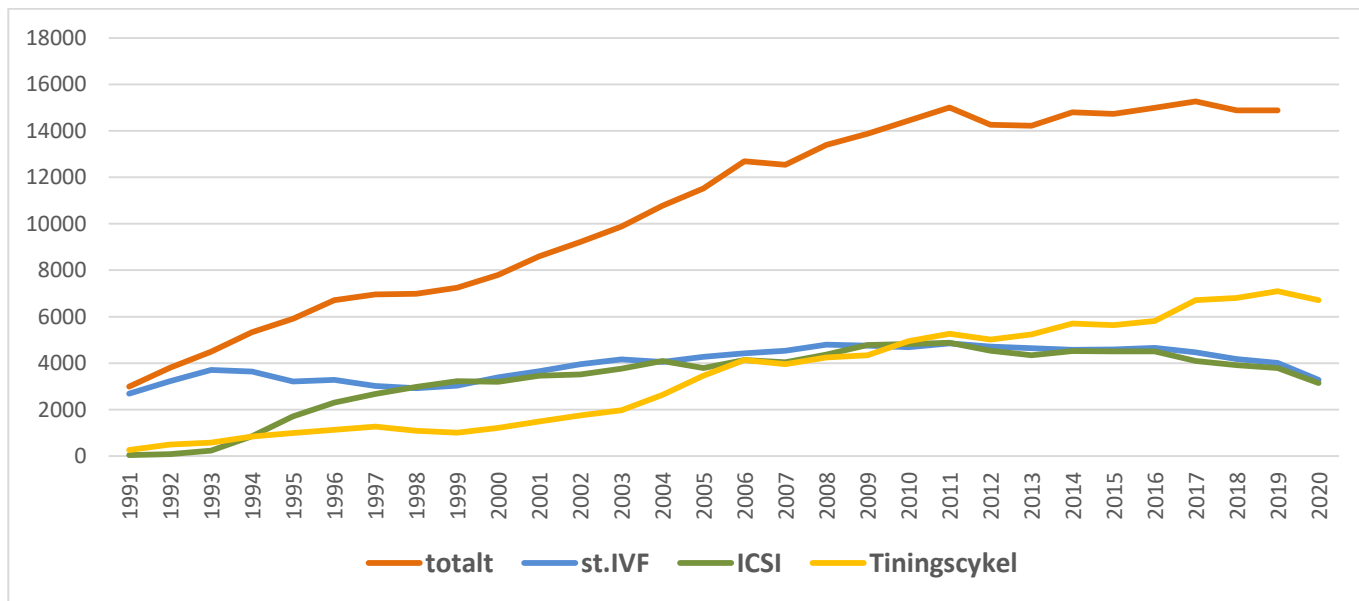


Figure 18. Proportion of deliveries per embryo transfer and year of treatment for various treatment methods.

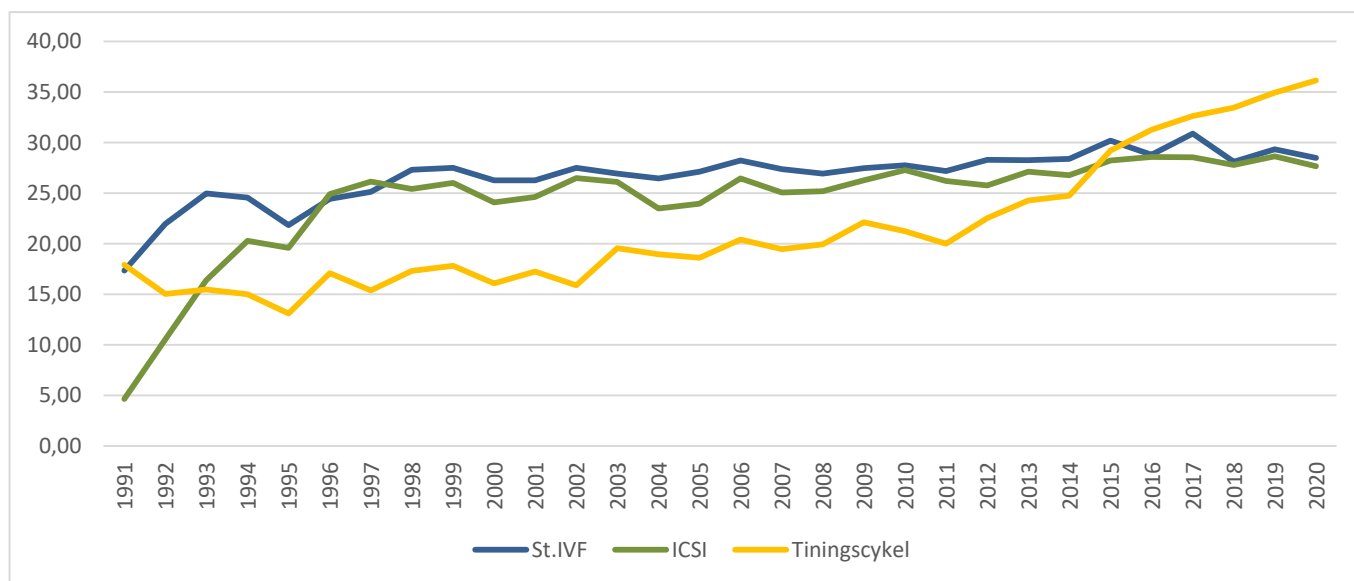
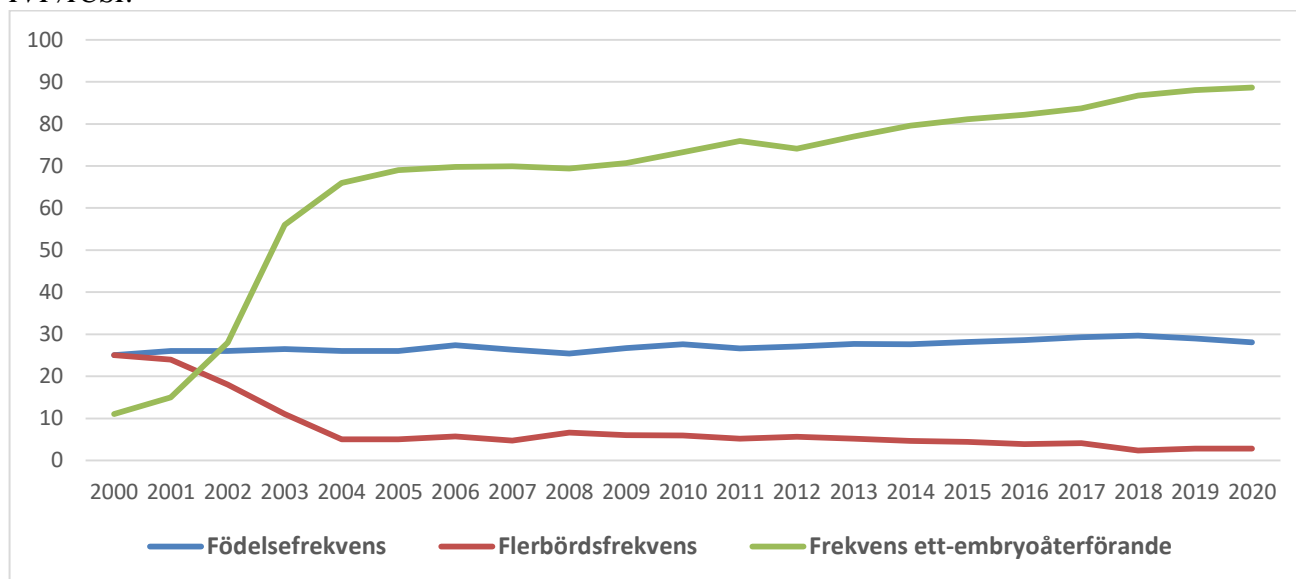
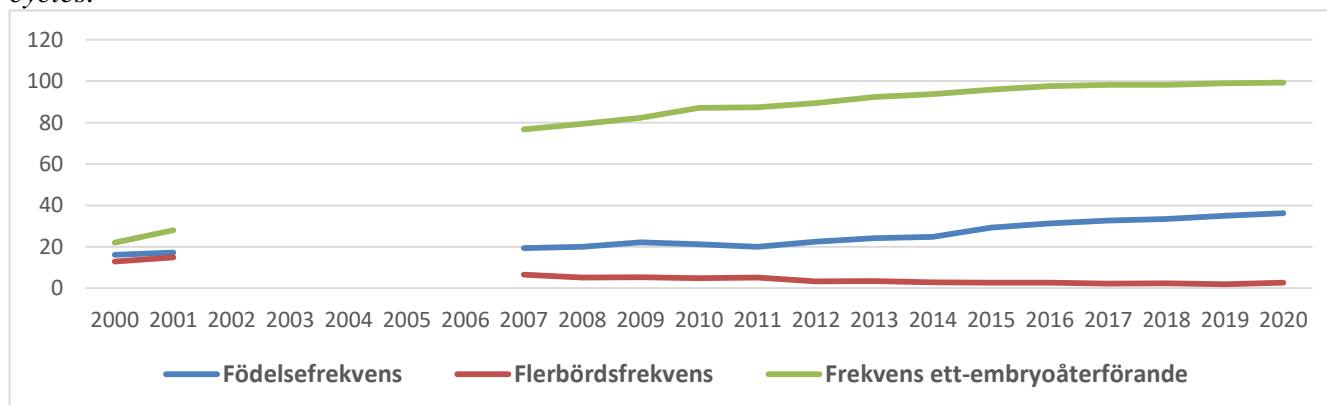


Figure 19a. Proportion of deliveries per embryo transfer, multiple births and SET per year. Fresh IVF/ICSI.

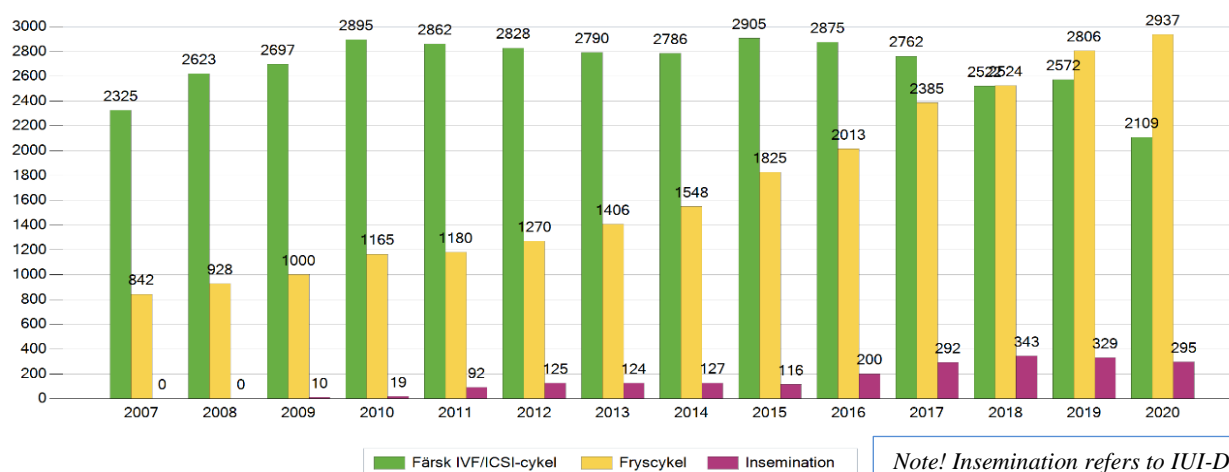


Figur 19b. Proportion of deliveries per embryo transfer, multiple births and SET per year. Frozen/thawed cycles.



Data for the years 2002-2006 is missing.

Figure 20. Number of live born children per year (fresh IVF and freeze cycles include donation and PGT).



Cumulative results

Cumulative live birth rate is defined as live birth rate per oocyte retrieval, including the fresh cycle and all subsequent frozen/thawed cycles from the same oocyte retrieval within one year after the oocyte retrieval (figure 21a) This way to present data may be regarded the most accurate way, since live birth rate is counted per oocyte retrieval. 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. Here we present the cumulative live birth rate for all oocyte retrievals performed in Sweden since the start of the registry 2007 and until 2019, June 30. We also present live birth per first transfer (either fresh or frozen) after one OPU, accounting for the “freeze-all” cycles in a better way (figure 21b).

Figure 21a. Cumulative live birth rate per oocyte retrieval and year of treatment, including all embryo transfers within one year after oocyte retrieval.

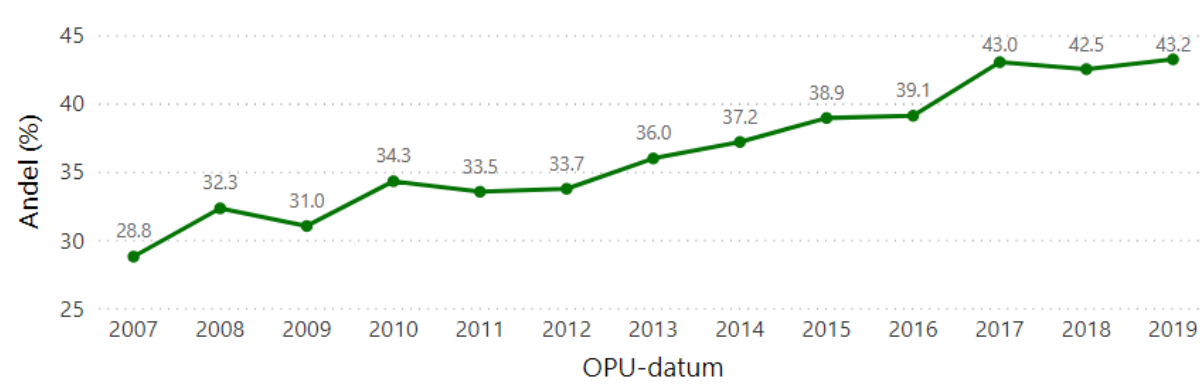
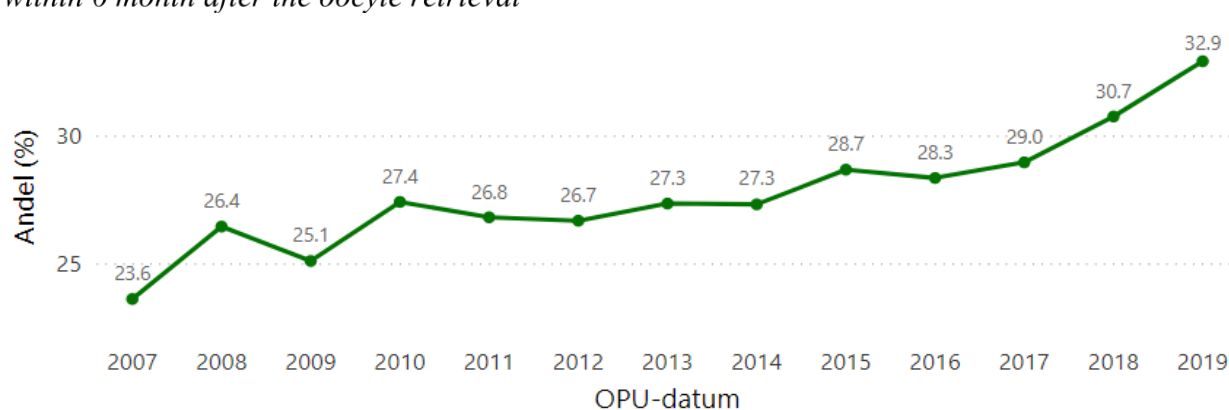


Figure 21b Proportion of live births per oocyte retrieval and the first embryo transfer (fresh or frozen) within 6 month after the oocyte retrieval



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 oocyte/sperm.

The chance of becoming pregnant and having a child as a result of IVF with one's own oocytes and donated sperm was 27% after a fresh transfer and 36% after a frozen-thawed transfer. Still, the chance of success depends on the woman's age, similar to all other IVF-treatments.

The chance of becoming pregnant and having a baby with an embryo that stems from a donated oocyte is not influenced by the age of the woman who receives the embryo. The donor's age, however, is important. Consequently, the donors are mostly younger women. For the freeze cycles, constituting almost 90% of transfers in this treatment group, the delivery rate increased from 26% to 38% per transfer from 2019 to 2020.

It is important to note that delivery rates can not be compared between fresh transfer and frozen-thawed transfers, since the patient groups are different with respect to age and other prognostic factors.

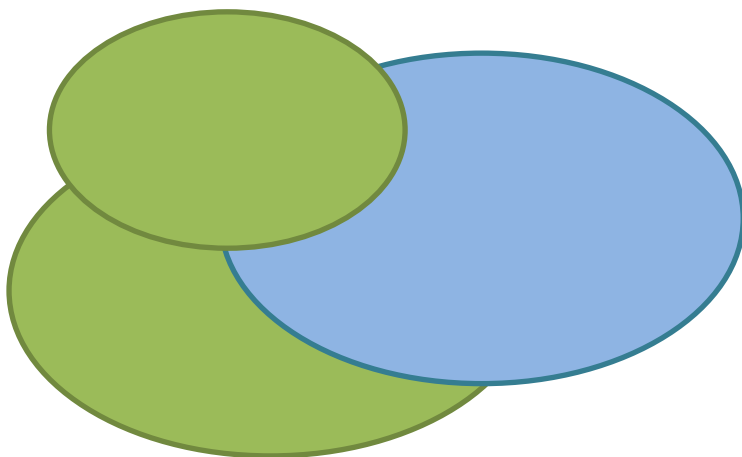


Table 5. *Number of treatments, pregnancies, babies and deliveries. IVF with donated gametes.*

	IVF with donated sperm		IVF with donated oocytes	
	Fresh IVF	Freeze cycles	Fresh IVF	Freeze cycles
Started cycles	1240	751	275	378
Embryo transfers	875	733	51	374
Positive pregnancy tests	321	364	21	201
Biochemical pregnancies	37	43	0	32
Clinical pregnancies	284	321	21	169
Spontaneous abortion < gestational week 13	54	67	4	39
Spontaneous abortion gestational week 13-22	3	7	2	3
Ectopic pregnancy	2	1	1	0
Stillborn gestational week 22-27	0	0	0	0
Stillborn gestational week 28+	1	3	0	3
Deliveries, singleton	236	261	14	141
Deliveries, twins	3	3	0	2
Deliveries, triplets	0	0	0	0
Total number of deliveries	239	264	14	143
Total number of live born children	241	264	14	141

Results

IVF with donated sperm

Figure 22. Delivery per embryo transfer for different age groups. Fresh IVF and freeze cycles. Donated sperm.

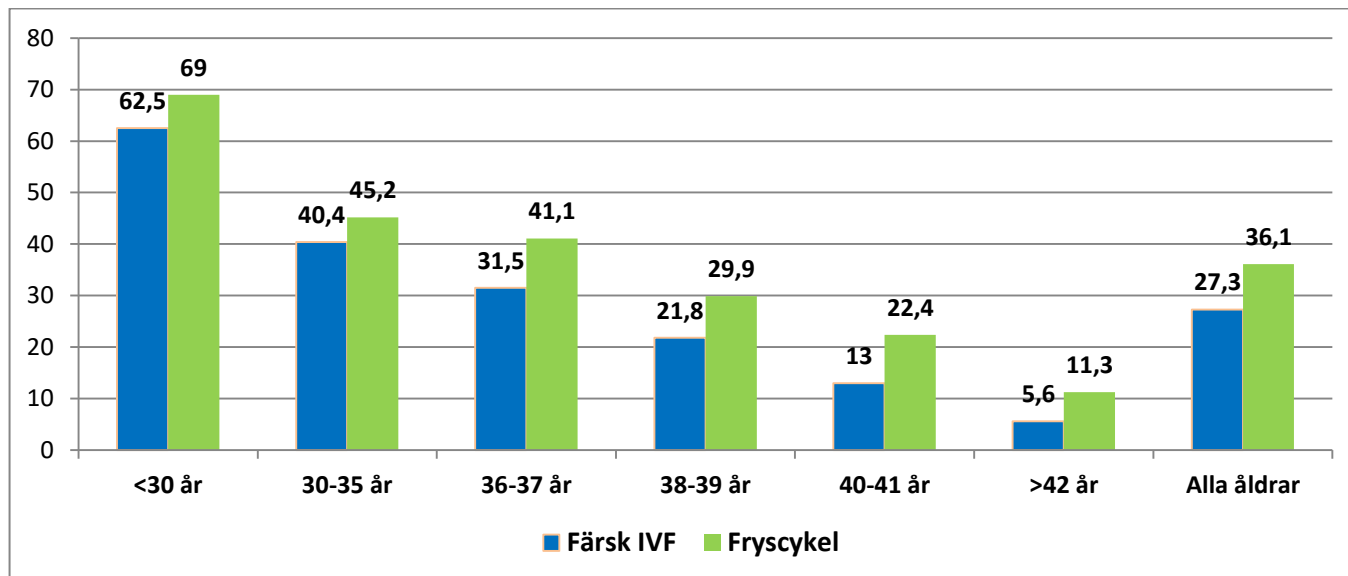


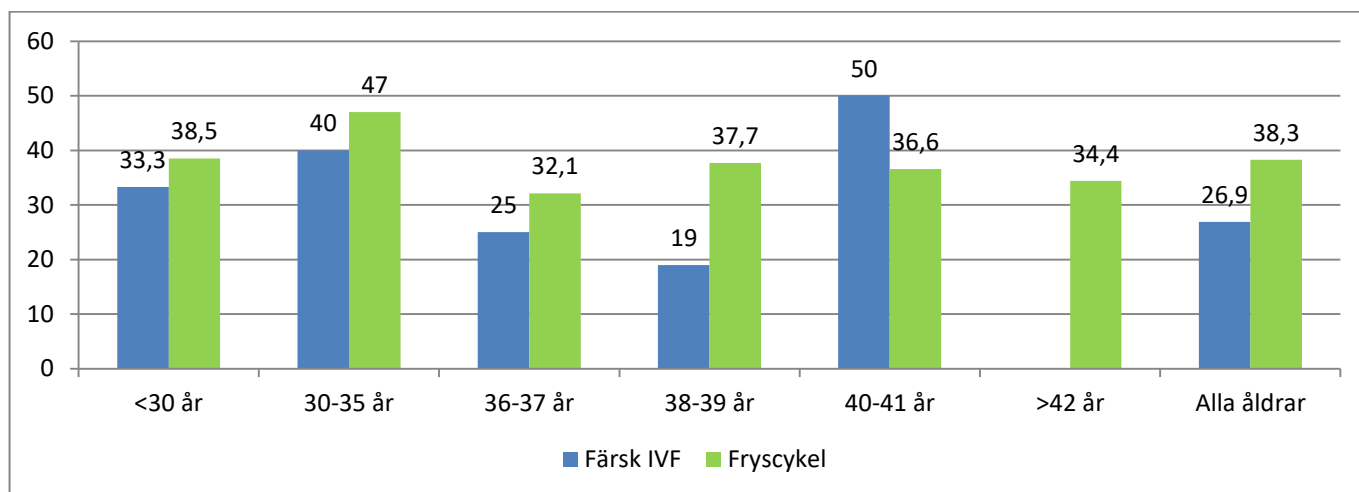
Table 6. Number of embryo transfers and deliveries for different age groups. Fresh IVF and freeze cycles. Donated sperm.

Age	Number of ET Fresh IVF	Number of deliveries Fresh IVF	Number of ET Freeze cycles	Number of deliveries Freeze cycles
<30	40	25	42	29
30-35	228	92	230	103
36-37	124	39	107	44
38-39	275	60	187	56
40-41	154	20	116	26
≥ 42	53	3	53	6

Results

IVF with donated oocytes

Figure 23. Proportion of deliveries per embryo transfer and year. Fresh IVF/ICSI and freeze cycles. Donated oocytes.

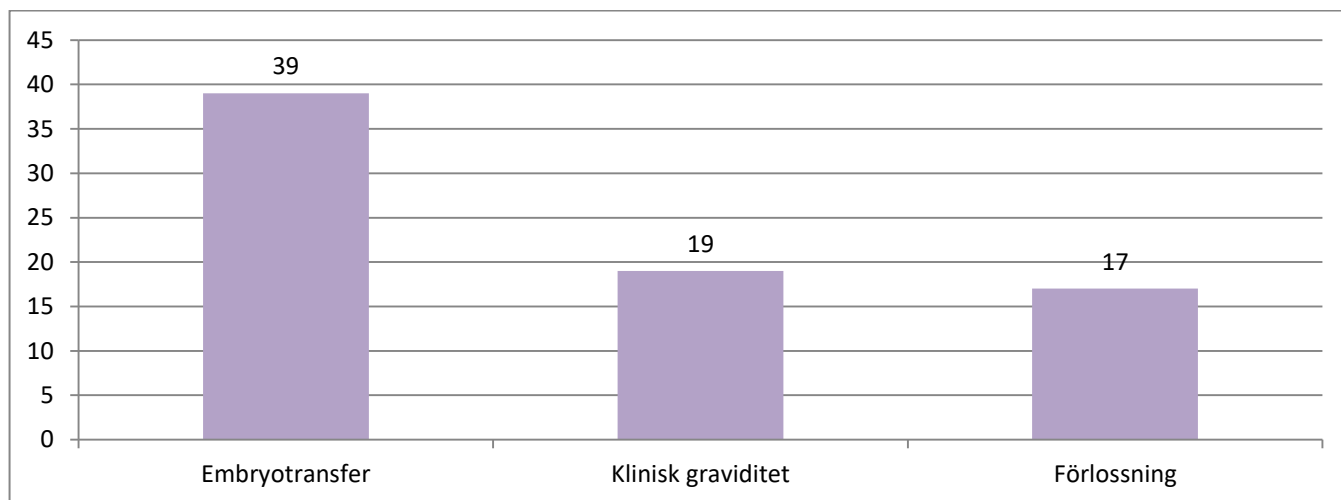


For donated oocytes, the age of the woman who is attempting to become pregnant is not as important for the result of the treatment as when using own gametes. The oocyte donor's age is more important. Please note that the number of oocyte donation treatments is low and that the presented rates therefore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

Table 7 Number of embryo transfers and deliveries for different age groups. Fresh IVF/ICSI and freeze cycles. Donated oocytes.

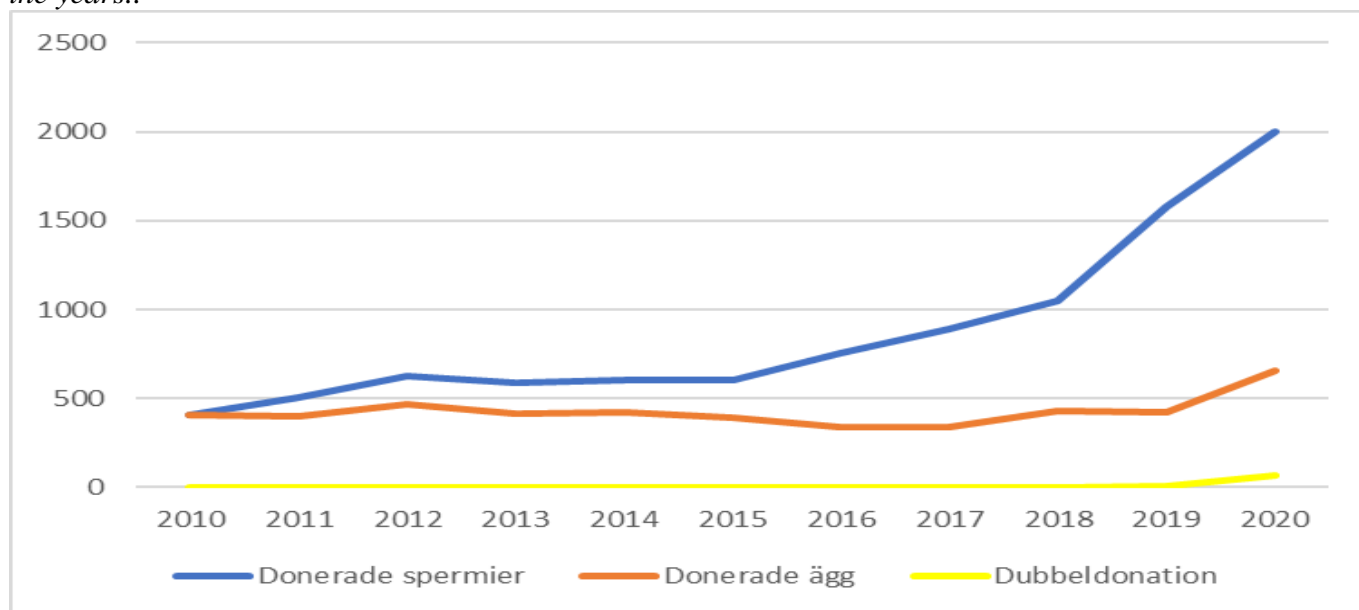
Age	Number of ET Fresh IVF	Number of deliveries Fresh IVF	Number of ET Freeze cycles	Number of deliveries Freeze cycles
<30	3	1	26	10
30-35	15	6	83	39
36-37	8	2	56	18
38-39	21	4	62	24
40-41	2	1	82	30
≥ 42	3	0	64	22

Figure 24 Results after double donation, ie. donation of both oocytes and sperm in the same cycle.



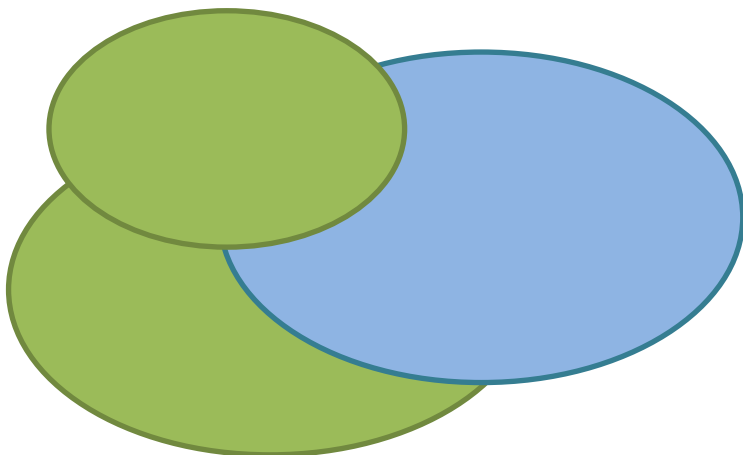
Double donation was legalised in 2019 and four such treatments were performed that year in Sweden. In the year 2020, 39 such embryo transfers were performed. Most of these treatments were performed at private clinics and payed by the patient.

Figure 25 Number of started IVF treatments ((Fresh IVF and Freeze cycles) with donated gametes over the years..



Insemination with donated sperm (IUI-D)

In April 2016, a change in the Swedish legislation made it possible for single women to undergo assisted reproduction. At the same time, private clinics could obtain permission from IVO (Inspektionen för Vård och Omsorg, the Health and Social Care Inspectorate), the government body in Sweden overseeing health care providers to perform insemination with donated sperm (IUI-D). Lesbian couples have had this opportunity since 2005, if performed at public clinics. Among heterosexual couples this treatment is available for couples where the man for some reason lacks sperm or if no fertilization is obtained.



IUI-donor (insemination with donated sperm)

Table 8 Number of treatments, pregnancies, babies and deliveries, IUI-D

Insemination with donated sperm	
Started cycles	1964
Insemination	1732
Positive pregnancy tests	347
Biochemical pregnancies	41
Clinical pregnancies	306
Miscarriage < gestational week 13	18
Miscarriage gestational week 13-22	1
Ectopic pregnancy	2
Stillborn (gestational week 22-27)	1
Stillborn (gestational week 28+)	0
Delivery singletons	263
Delivery twins	4
Delivery triplets	1
Total number of deliveries	268
Total number of live births	273

Figure 26. Number of IVF/ICSI and IUI-D treatments started in single women in 2020.

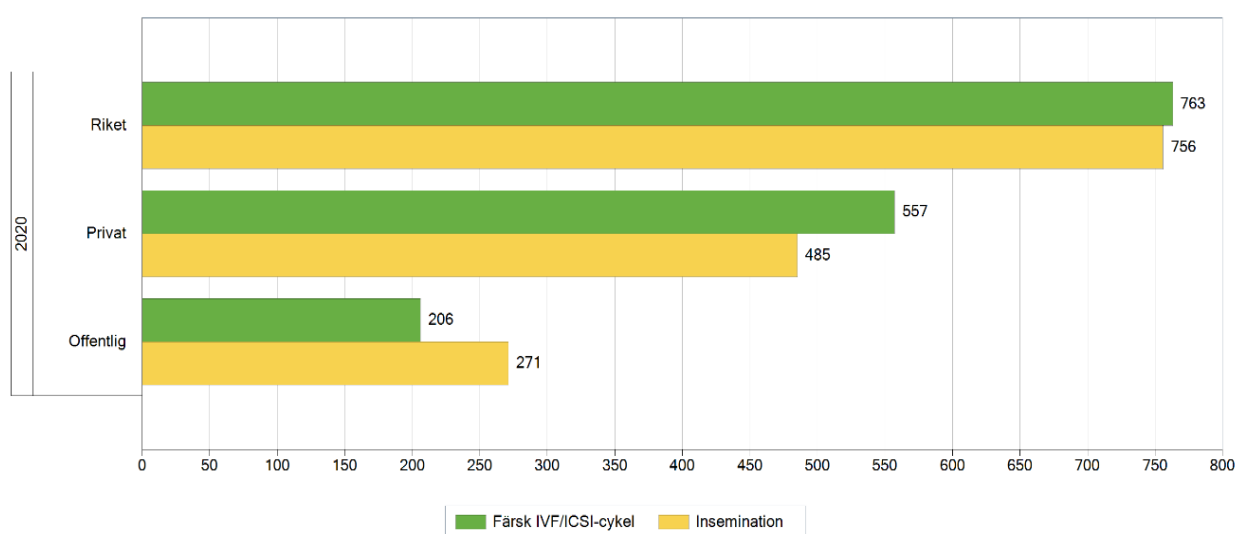


Figure 27 Number of IUI-D cycles (insemination with donated sperm) per year, public/private/total.

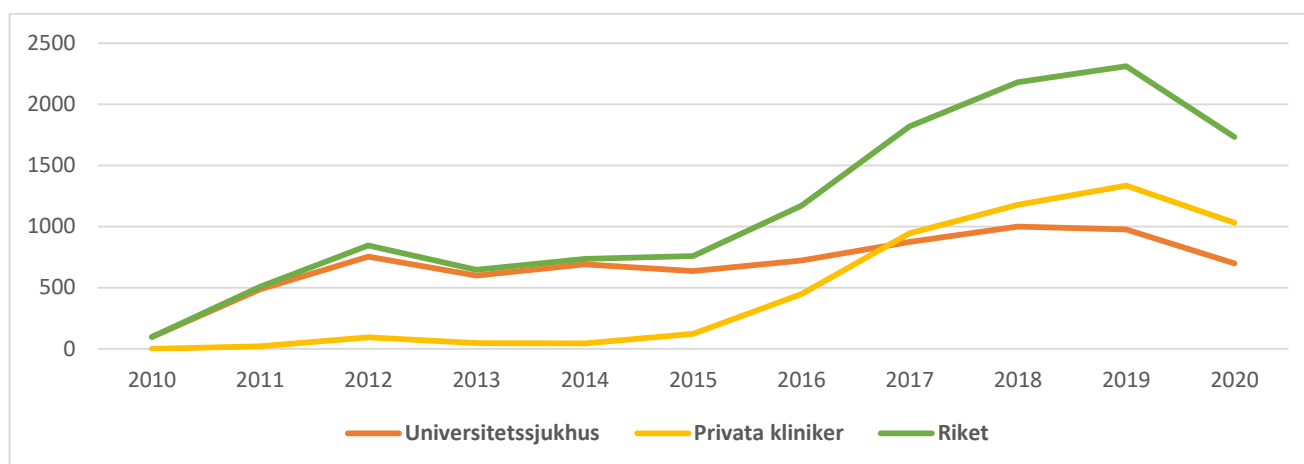


Figure 28 Delivery per insemination (IUI-D) for different age groups.

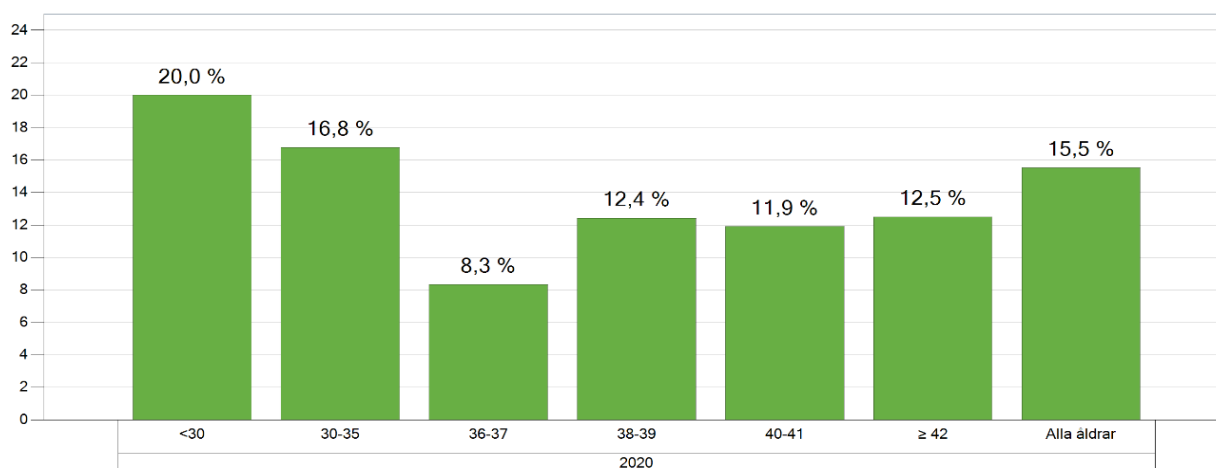


Table 9. Number of inseminations and deliveries for different age groups. IUI-D.

Age, years	< 30	30-35	36-37	38-39	40-41	≥ 42
Number of inseminations	337	916	264	145	42	24
Number of deliveries	67	153	22	18	5	3

Oocyte freezing

The technique of cryopreserving embryos (fertilized oocytes) is reliable and has been used for many years. However, it has been significantly more difficult for unfertilized oocytes. Today the technique of vitrification makes it possible to cryopreserve unfertilized oocytes more effectively than before. Oocyte cryopreservation can be done for medical reasons or non-medical reasons. One medical reason to cryopreserve unfertilized oocytes is the aim 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 to may be sex reassignment, surgery/gender confirmation surgery, severe endometriosis or risk of premature menopause. Non-medical reasons for women to cryopreserve unfertilized oocytes could be the desire to delay the starting of a family. It is also possible to cryopreserve donor oocytes in order to more easily coordinate an oocyte donation cycle with a recipient cycle.

In Q-IVF, oocyte freezing for oncological reasons, for other medical reasons and for non-medical reasons is separated into different categories. In 2018, 139 oocyte freezing treatments were performed on basis of oncological indication, an increase from the year before. In the same year (2018), 283 oocyte freezing treatments were performed for non-medical reasons. This latter group of treatments has also increased.

In the year 2020 159 oocyte freeze treatments were performed for oncological indication, a small decrease compared to previous year. In total, 615 oocyte cryopreservations were performed for non-medical indications, which is a substantial increase.

Even though the numbers have increased, still rather few of the cryopreserved oocytes have so far been thawed, fertilized and transferred, except for oocyte donation cycles. We can therefore not yet account for the results of those treatments.

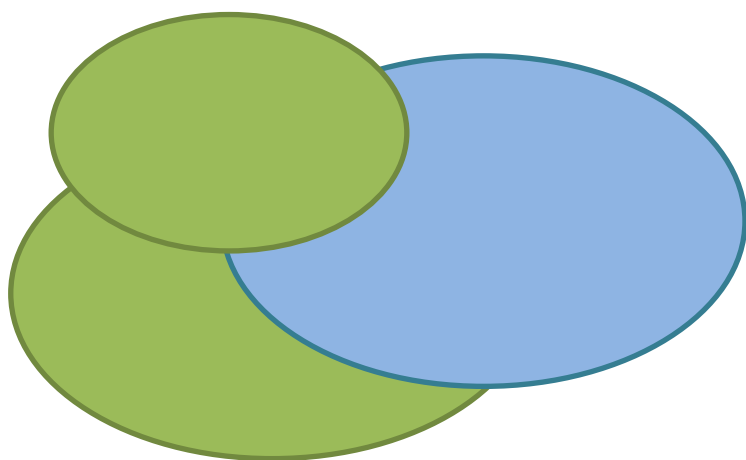


Figure 29. *Number of cycles with freezing of own oocytes. Public/private.*

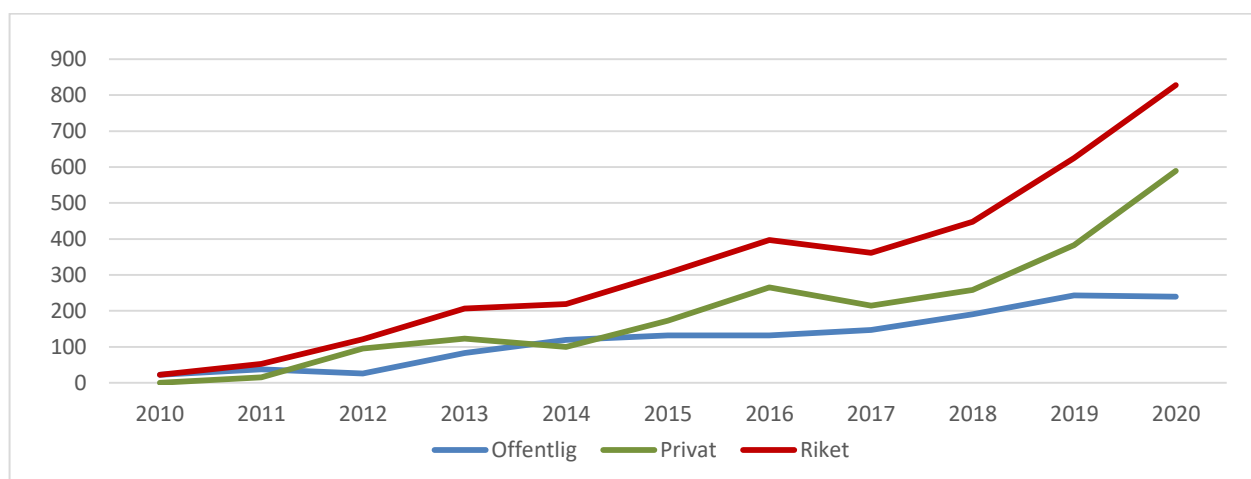


Figure 30. *Reasons for oocyte freezing*

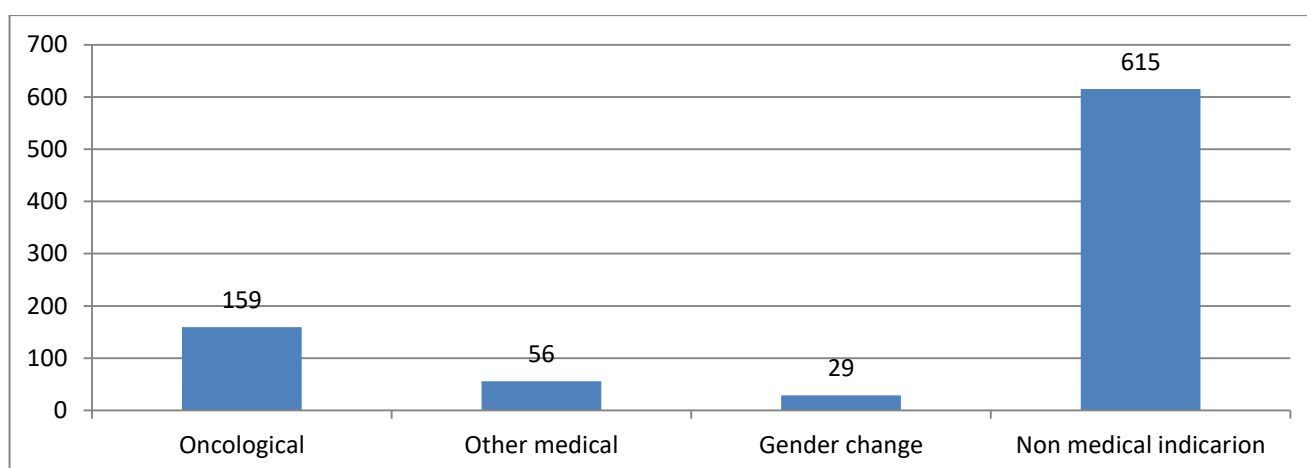


Table 10 *Number of own oocyte freezing due to change in gender.*

2017	2018	2019	2020
0	52	44	29

Figure 31. Number of embryo transfers, positive pregnancy test and live births using thawed oocytes after freezing of own oocytes.

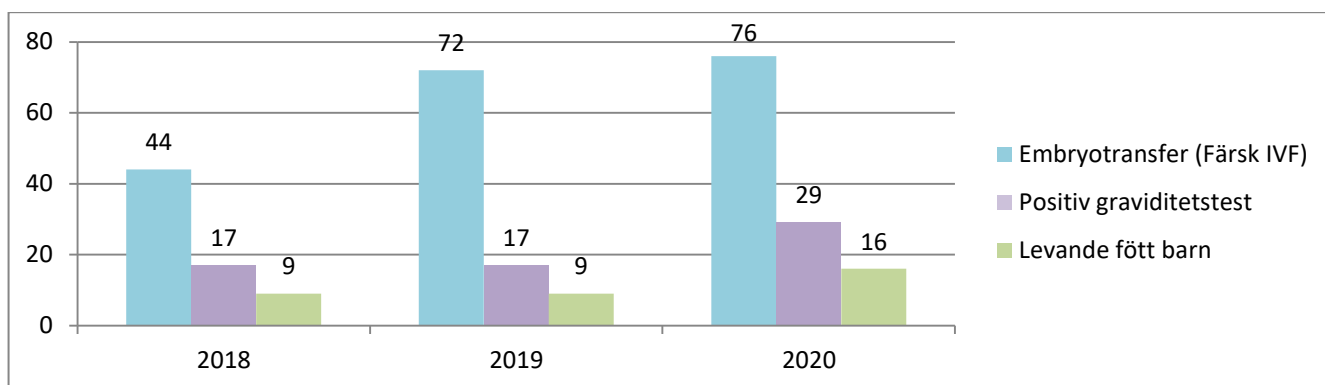


Figure 32 Number of public and private financed treatments (fresh IVF and freeze cycles)
The number here are preliminary

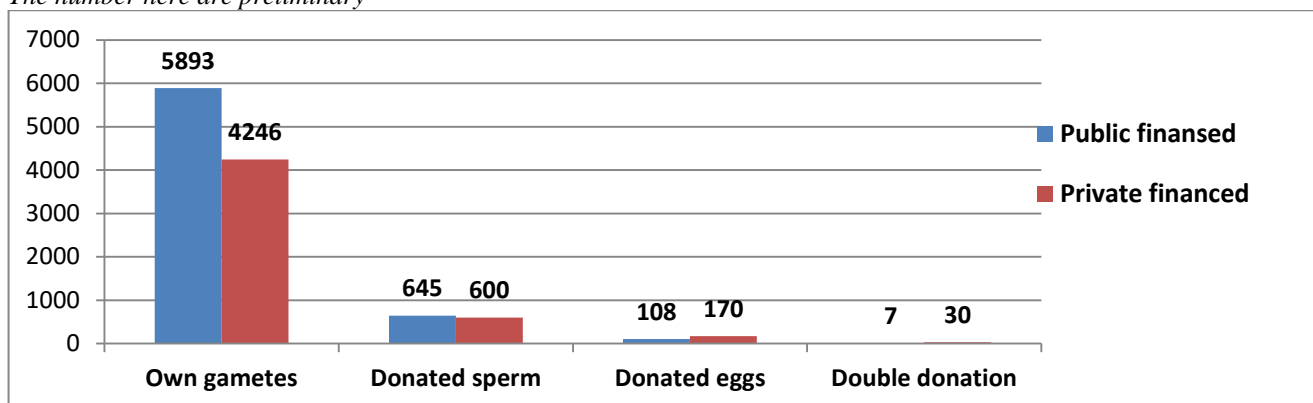
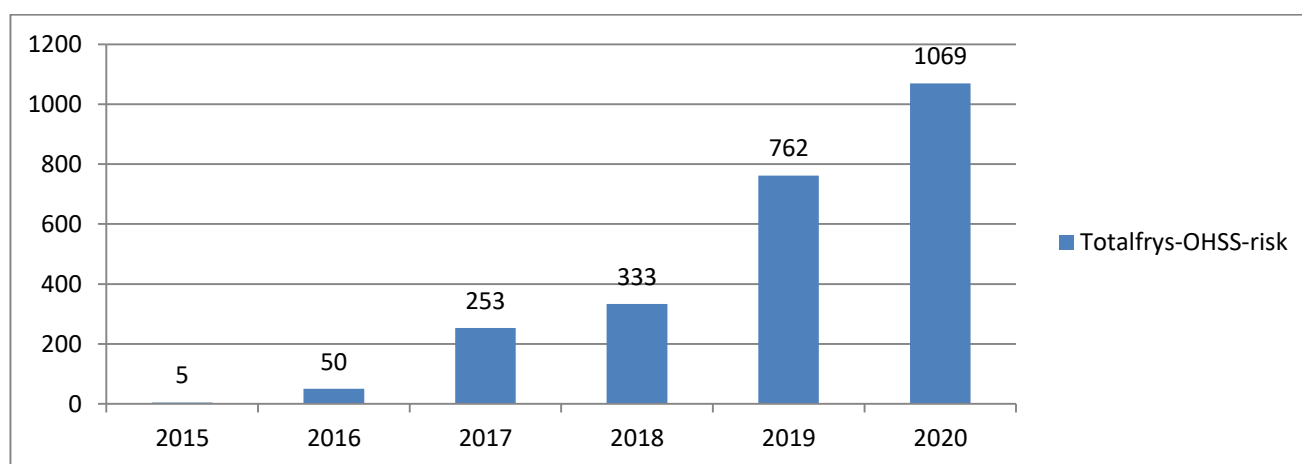


Figure 33 Number of cycles with freezing of all embryos due to impending OHSS



More 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 development of blastocyst culture and new cryopreservation methods-vitrification. The advantage with "freeze-all" is the almost 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.

Individual clinics

In this yearly report, we present numbers and results from individual clinics. The reader should take into account that the clinics perform treatments on 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 as a result of IVF, and who then undergo another IVF-treatment, have better chances of success than women who have not had an IVF-baby before. In addition, the number of patients treated in each clinic also 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 take into account how large the groups are. The larger the groups, the more reliable are the results, and the smaller the groups, the more unreliable the 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 exactly 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).

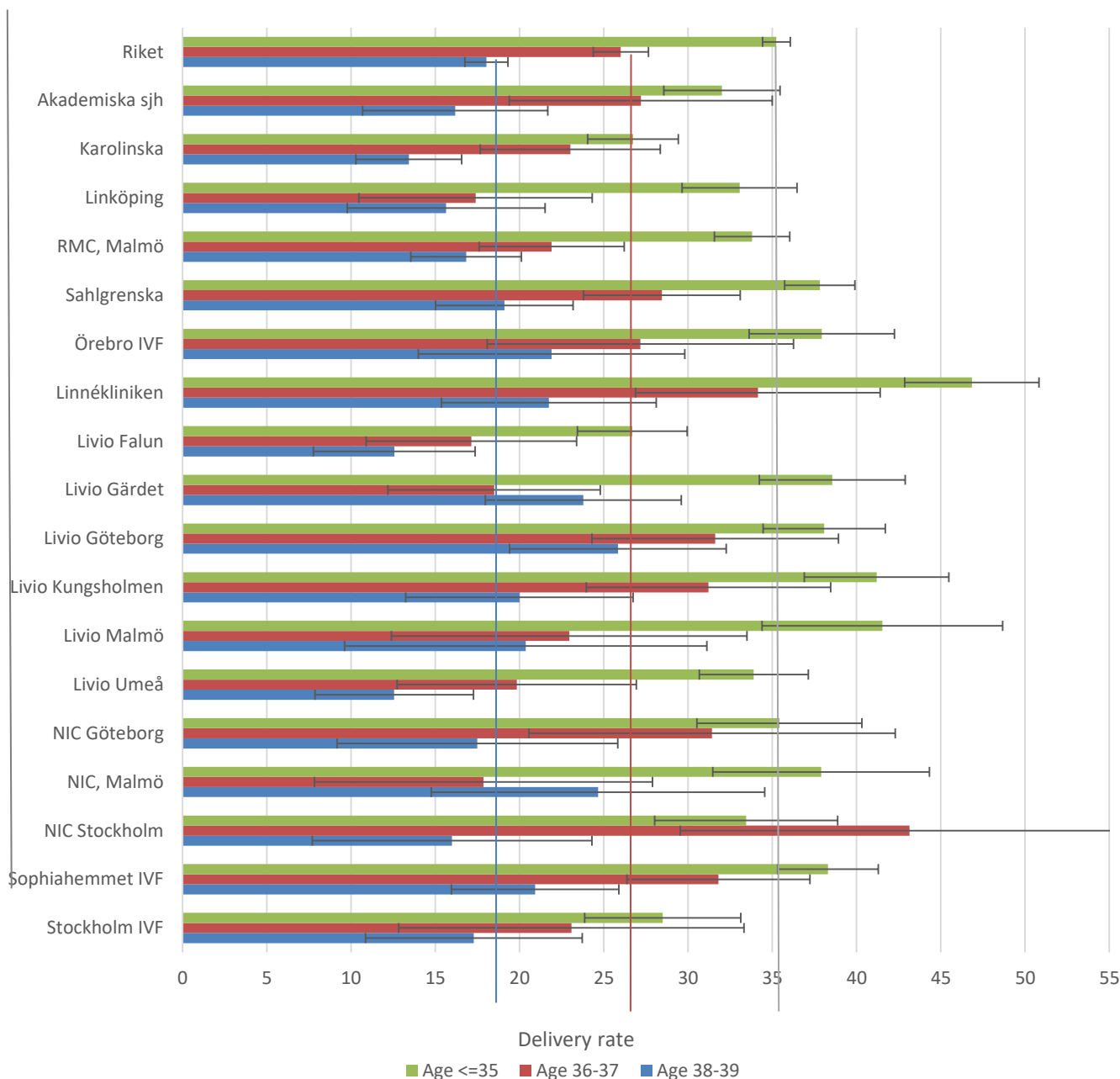
In order to achieve more reliable results, data from several years have been combined. Still, the 95% confidence intervals for the estimates of delivery rates are wide for most clinics. Regarding the number of days an embryo has been cultured, the graphs do not discriminate the results between day 2–3 embryos and day 5–6 embryos (blastocysts). Concerning fresh embryo transfers, day 2–3 embryos make up a considerable proportion (67%) of all embryo transfers (Figure 12), 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 vary due to the number of embryo transfers, and as reliability indication, the confidence intervals, are shown as a black line at 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 results for Sweden as a whole are very reliable, since numbers 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

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”). The compilation only applies for those women doing cycle number 1–3 and who have not had children earlier as a result of IVF.

Treatments with autologous gametes between June 1 2018 and June 30 2020

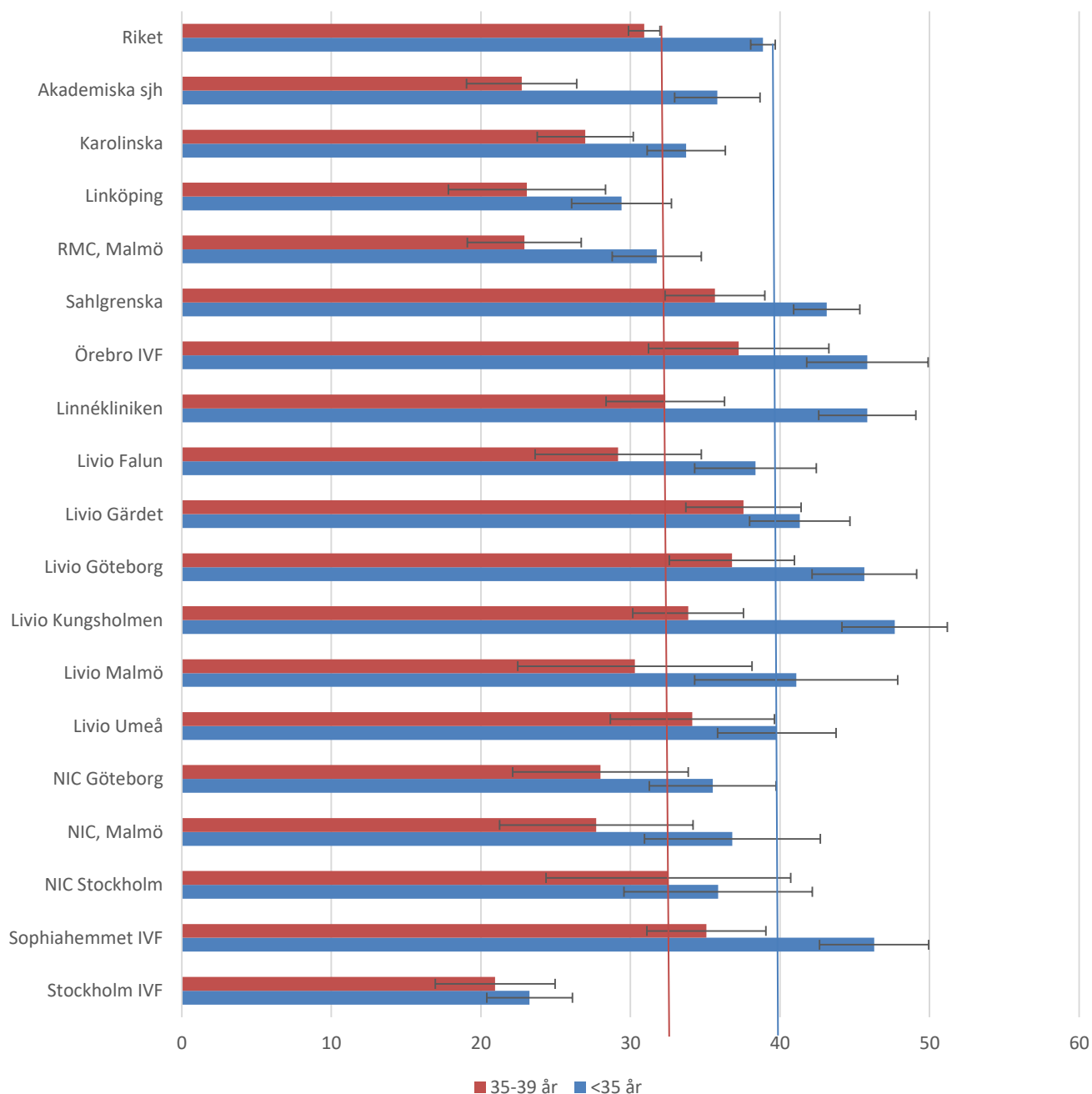


Confidence interval: The lines in the bars denote the confidence intervals. The confidence interval is an estimation of the reliability of the estimates of delivery rates. The longer the line, the more unreliable are the estimates of delivery rates. The factor affecting reliability is the number of treatments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

Comparisons

Figure 35. *Proportion of deliveries per embryo transfer of cryopreserved embryos. The woman's age at the time of the oocyte retrieval applies.*

Treatments with autologous gametes 2017–2020



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 (a low number of treatments gives low reliability ie. a wide confidence interval).

Figure 36. Rate of blastocyst transfers among frozen/thawed cycles per year.

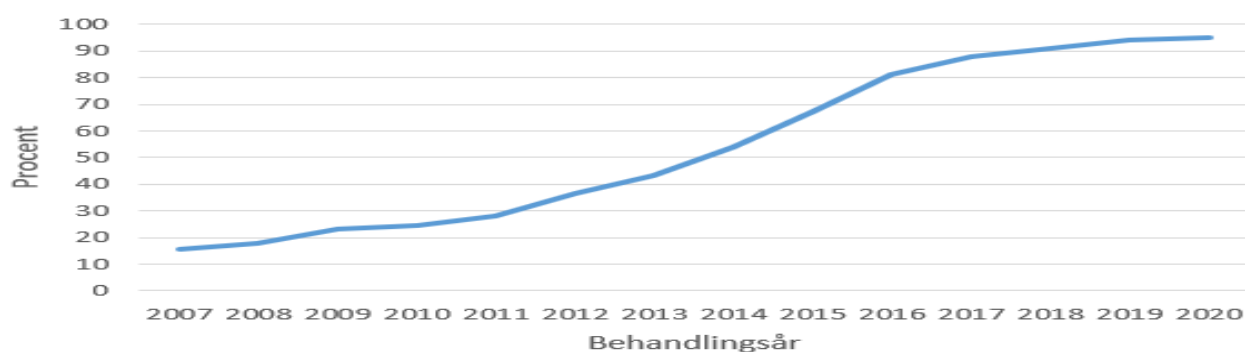


Table 11.

Number of embryo transfers included in the presentation of individual IVF clinics (Figure 34) **Fresh IVF**. The compilation only applies to those women undergoing cycle 1–3 and who have no children earlier as a result of IVF/ICSI. Own gametes.

Public clinics

Age	Akademiska Uppsala	Huddinge Karolinska	Sahlgrenska Göteborg	RMC Malmö	Linköping	Örebro
≤ 35 år	703	1036	2081	1716	729	485
36-37 år	125	239	362	356	115	92
38-39 år	173	454	356	499	147	105

Private clinics

Age	Linné kliniken	Livio Falun	Livio Gärdet	Livio Göteborg	Livio Kungs-holmen	Livio Malmö	Livio Umeå	Nordic Göteborg	Nordic Malmö	Nordic Sthlm	Sophia hemmet	Stockholm IVF
≤ 35 år	602	708	485	688	505	183	823	367	219	290	1018	365
36-37	164	140	146	155	157	61	121	70	56	51	283	65
38-39	161	183	206	178	135	54	191	80	73	75	258	133

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.

A large number of 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 as a result of IVF in Sweden are healthy. Additionally, research into how patients experience the IVF-treatment is performed, especially when the treatment does not succeed. 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 various 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 one-and-a-half-year interval. The answers in 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 the fall of 2020 (during three months), the survey IVF-KUPP was performed for the sixth time, using questionnaires. Each of the clinics is given the collective results of the questionnaires filled out by their own respective patients, in order to learn and make improvements.

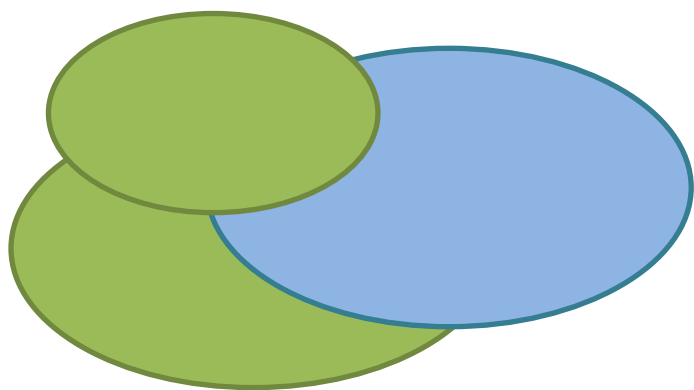
The Pandemic

In spite of extraordinary circumstances during the pandemic, our regular patient survey could still be carried out. The rate of people who answered this questionnaire was anyhow higher than it had been previously, with women undergoing treatment responding in 76 % and partners responding in 61 %.

The pandemic has strained the healthcare system overall and thus required changes being made to the system. The IVF-clinics have carried out fewer treatments than previous years and in some cases IVF-clinics have been forced to shut down. As a consequence, the availability of IVF treatments for patients has been lowered. Another consequence for patients is that the visits with caregivers have been kept to a minimum in order to limit the spread of Covid-19. In the majority of cases, partners have not been allowed to accompany patients on their scheduled visits to the clinics. This has negatively affected some partners, since they have not been able to receive information directly from medical personnel and since they have not been able to fully participate in the shared IVF experience.

New work-related methods and procedures have been developed during the pandemic, creating new opportunities as well as new obligations in the healthcare area. Digital consultations have increased a lot, which have been highly appreciated by the patients

For obvious reasons, patients whose circumstances have not favored an embryo transfer have been the least satisfied. Work has been done to improve information and support to this group of patients. We recognize that this group of patients is becoming more satisfied.

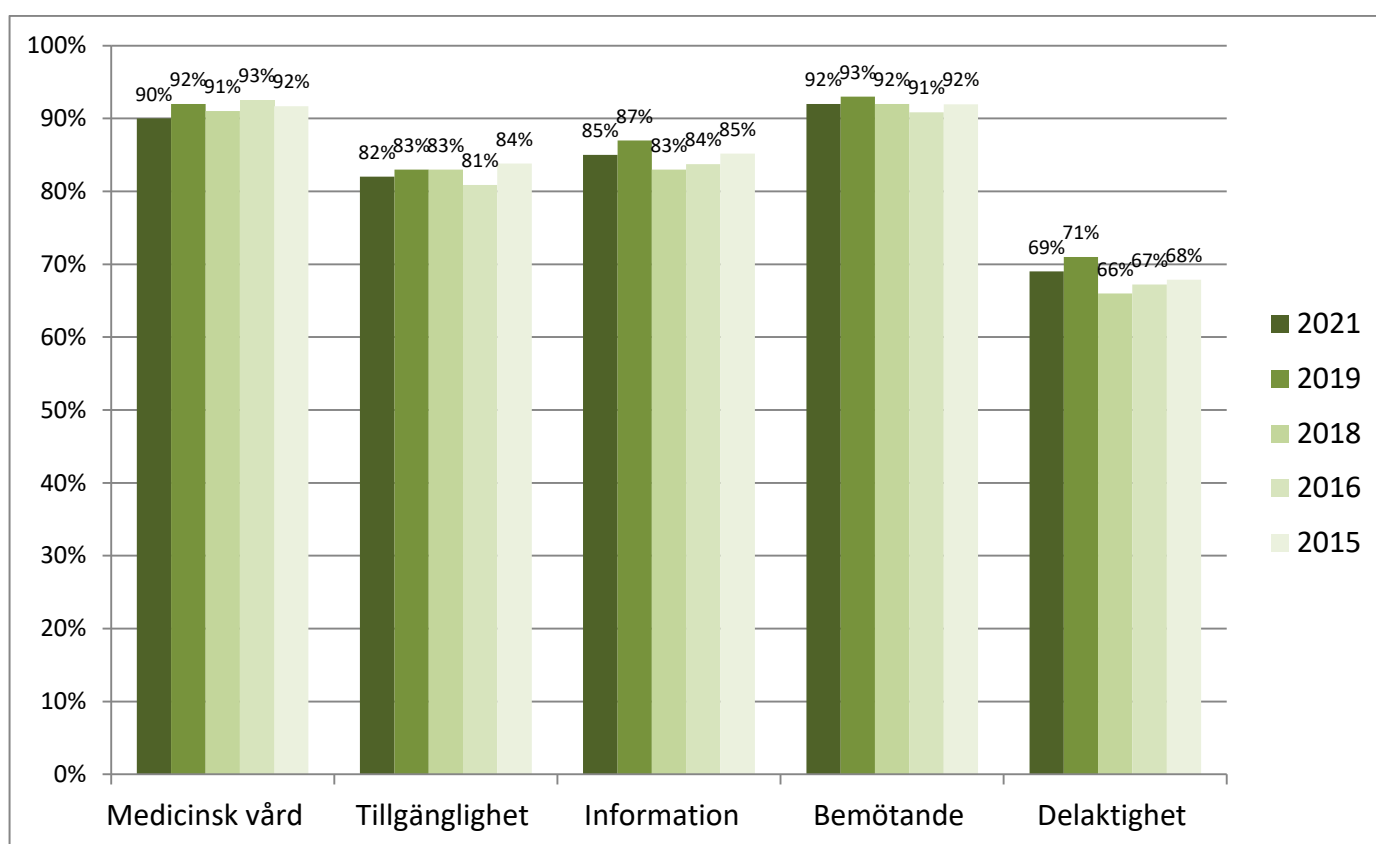


The presentation have been divided into five main categories;

- **Medical care:** We received the best possible health care as far as we can tell (1 question)
- **Availability:** It was easy to come in contact with the clinic, and it was easy to get an appointment (2 questions)
- **Information:** Treatment, medication, check-up-results, complications (5 questions)
- **Approach from staff:** Empathy, respect, engagement (6 questions)
- **Participation:** Participation in decision-making (2 questions)

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

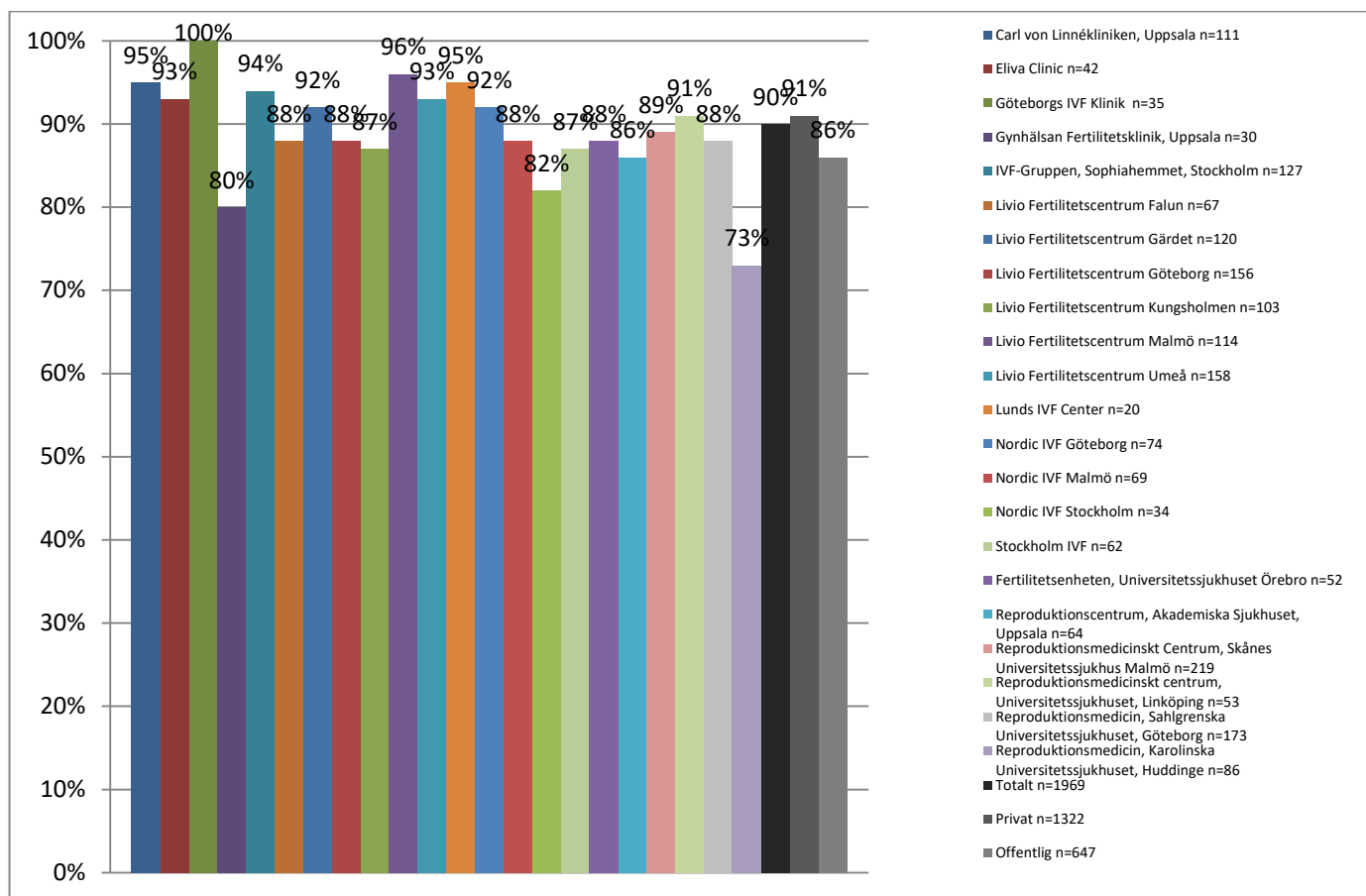
Figure 37. Average for all clinics in Sweden and comparisons to previous years.



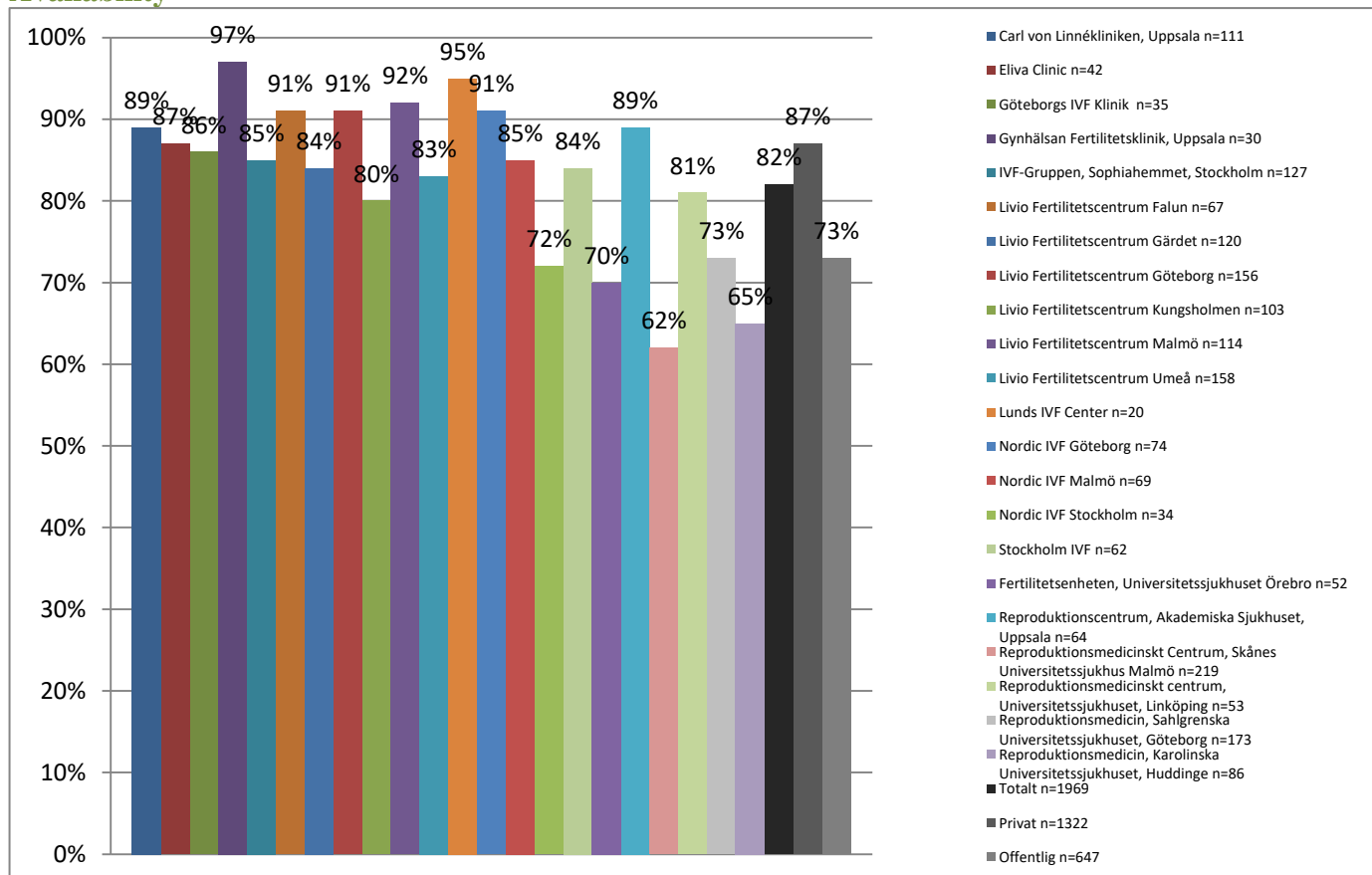
During previous surveys, similar questions have been asked to partners and to the women who are undergoing treatment. However, since partners have not been able to participate in the IVF process leading up to this year's survey in the same way as partners were part of the process in in previous years' surveys, partners this year have received a shorter, adjusted questionnaire.

In previous years' surveys, in the compilation of results for Sweden, both the women undergoing treatment and their partners have been included. This time, though, only the answers from the women undergoing treatment have been included. Therefore, all numbers, bars and graphs representing previous years' figures, shown for comparative purposes in this year's compilation, have been adjusted accordingly.

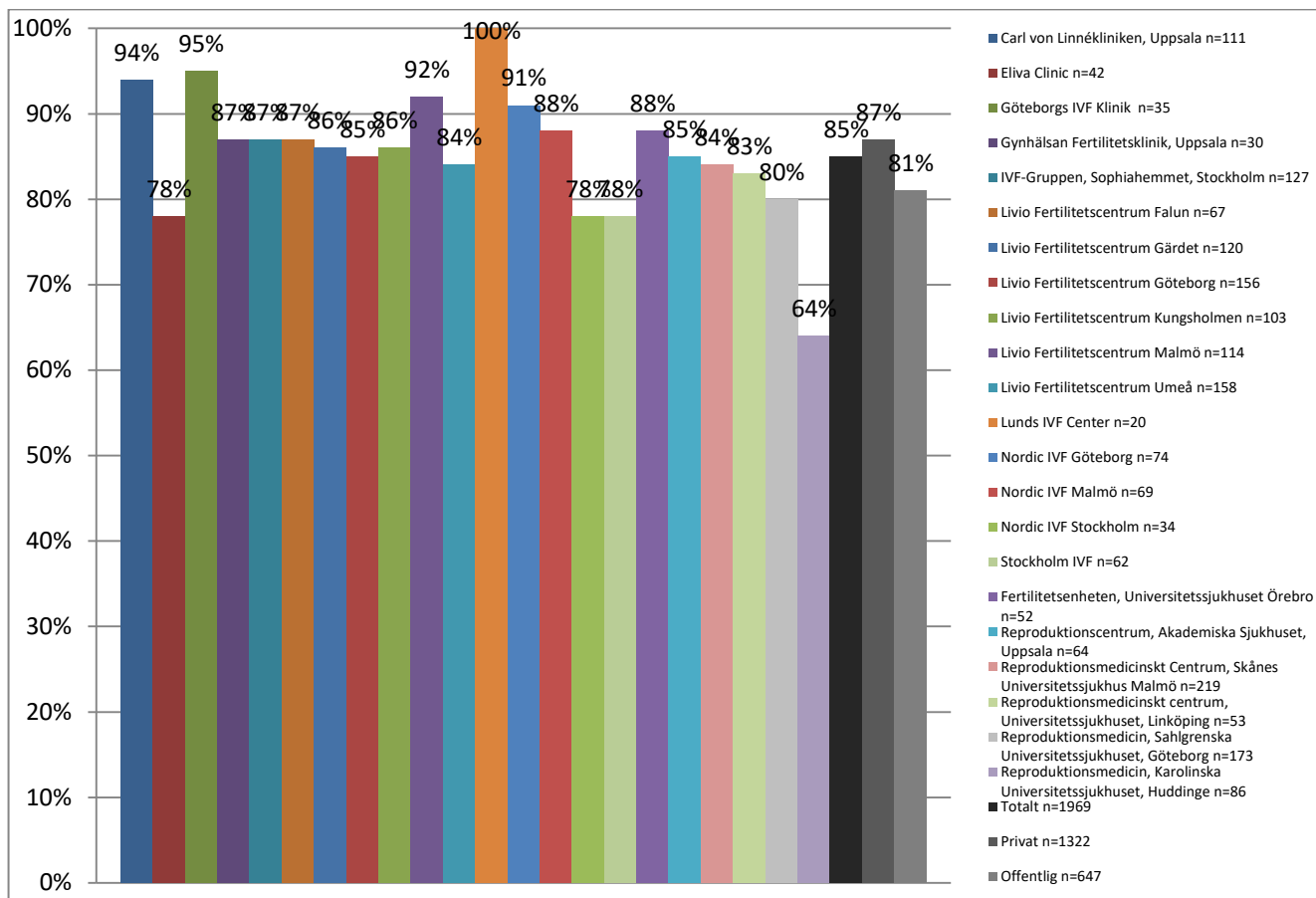
Medical care



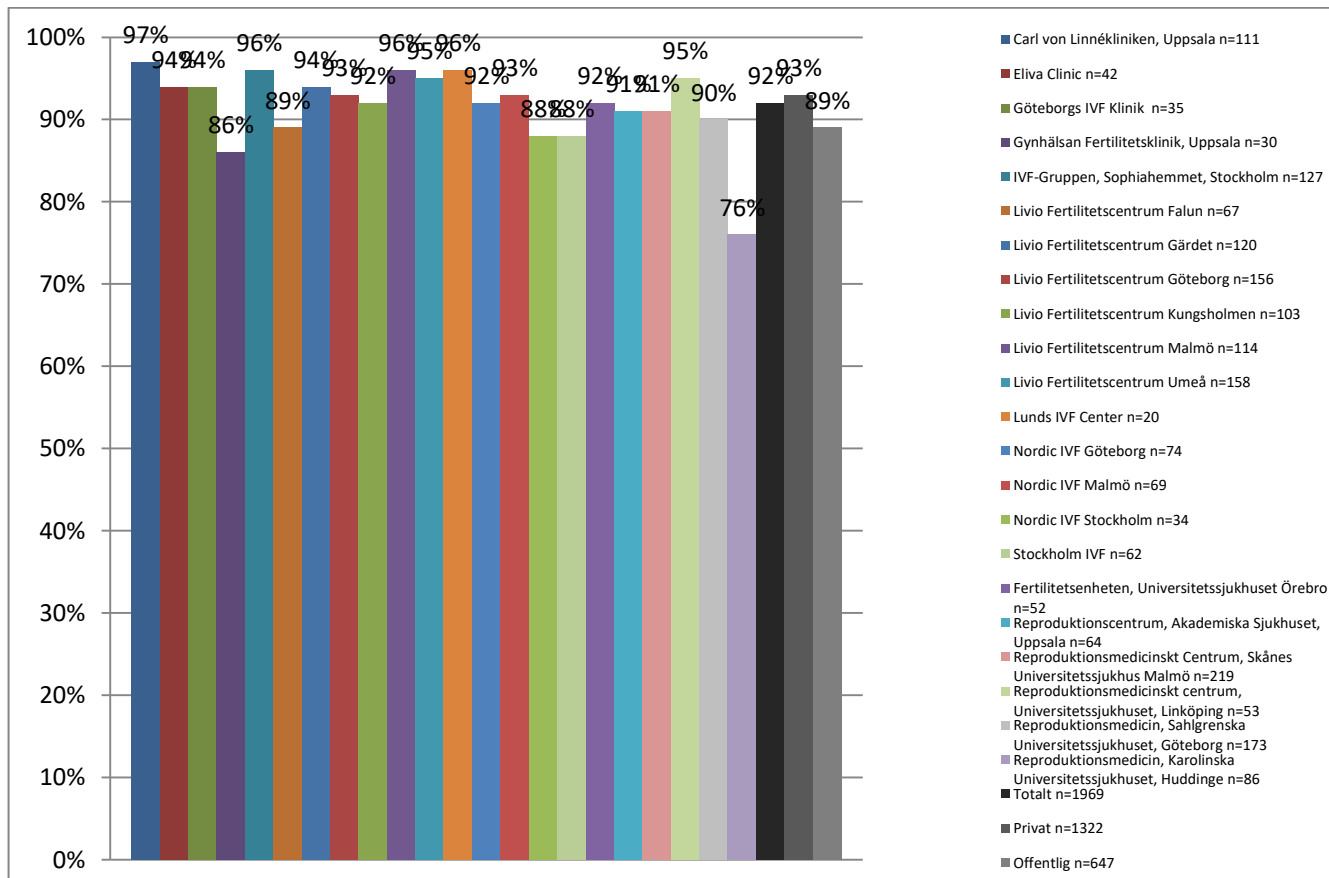
Availability



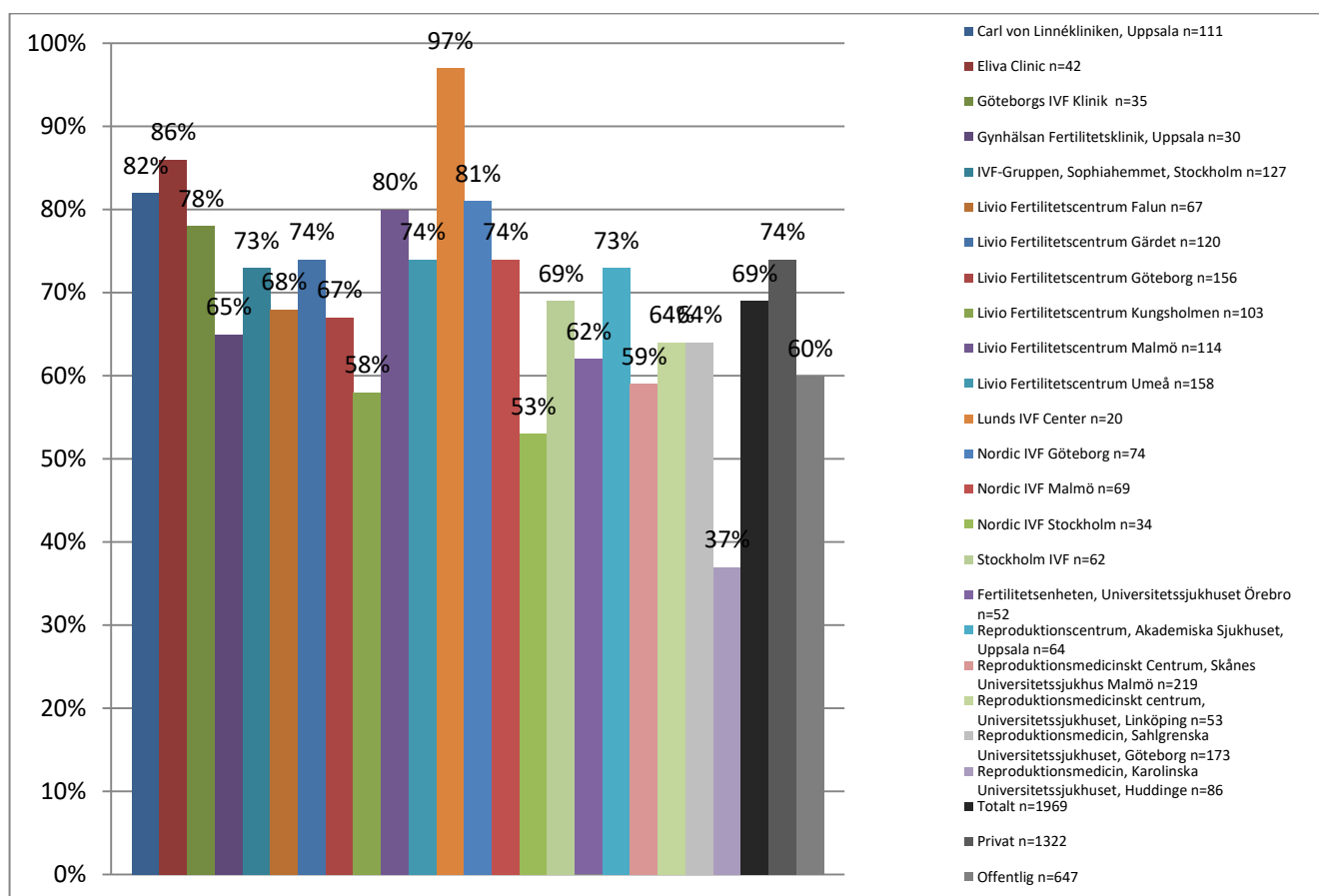
Information



Approach/empathy/respect



Participation



The profile of patients included in the nationwide study varies between clinics regarding age, indication etc. This difference in profiles could possibly explain the varying patient satisfaction. The COVID pandemic, obviously, has also affected caregiving in this period, and may be another reason why patient satisfaction varies between clinics.

Concluding remarks

Q-IVF is one of the world's most complete quality registries for IVF-treatments, with over 300 000 registered cycles from both public and private healthcare providers.

In 2020, 22 868 cycles were started, which is a decrease with 1000 cycles compared to previous year.

The chance of getting pregnant from a fresh IVF-treatment has remained at the same level during the last years. 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 a majority of the cycles.

In the last years, extended culture of all embryos, has increased, although day 2-3 stage embryos is still in majority for fresh cycles. Transfer of blastocysts now constitutes 99% of all transfers with cryopreserved embryos and 33% of fresh transfers.

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 in 2016, which allowed single women to use assisted reproduction, insemination with donated sperms has increased. In upcoming reports, we intend to present the proportion of these treatments performed in single women, and separate into treatments performed in heterosexual and homosexual couples.

Having children is a central part of most people's lives, and those who undergo an IVF-treatment usually have high expectations for the treatment. In the last few years, through the quality survey KUPP, we have been able to measure in a validated manner how well the providers of in vitro fertilization meet the patients' expectations. We are proud to say that the IVF providers meet the patients' expectations well, and strive to become even better. This report is one tool to help the IVF providers make the improvements they aim for.

