

# FSO News

14 Health

Neuchâtel, May 2021

## Reproductive health

# Assisted reproductive technology in 2019

In 2019, 5993 couples wishing to have children were treated using medically assisted reproduction with in vitro methods<sup>1</sup>. These treatments resulted in a total of 2204 live births in 2019 and 2020. The number of multiple births following medically assisted reproduction has declined considerably since 2017.

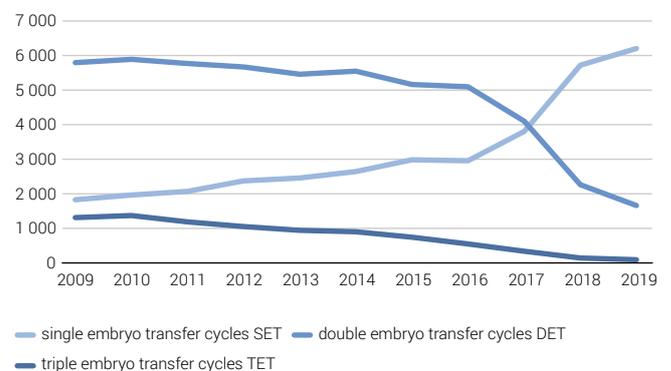
This report on assisted reproductive technology (ART) in 2019 comprises data from the 30 medical reproduction centres in Switzerland. The data concern in vitro fertilisation methods, in which fertilisation occurs outside of the human body. Due to the time it takes for a pregnancy to come to term, the 2080 births following treatments in 2019 occurred in 2019 and 2020. The number of births includes live births – both single and multiple births – but also stillbirths.

### Single Embryo transfers (SET)

Since September 2017, after the coming into force of the revision to the Reproductive Medicine Act (RMA), a noticeable increase has been observed in the number of single embryo transfers (G1). In 2016, in 66% of cases two or three embryos were transferred per transfer cycle to the uterus. In 2019, this percentage fell to 21%.

### Transfer cycles with single embryo transfers and multiple embryo transfers

G1



Source: FSO – Assisted Reproductive Technology Statistics

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The trend towards single embryo transfers (SET) can also be observed in other European countries as well as in Australia and Asia.

### Decrease in multiple births

Multiple births increase the risk of complications during pregnancy and birth. In particular, the risk of a premature birth is greater for multiple pregnancies. The increase in single births following medically assisted reproduction is therefore an important development for neonatal health (G2).

<sup>1</sup> Assisted reproductive technology (ART) using in vitro methods

**Deliveries of singletons, twins and triplets G2**



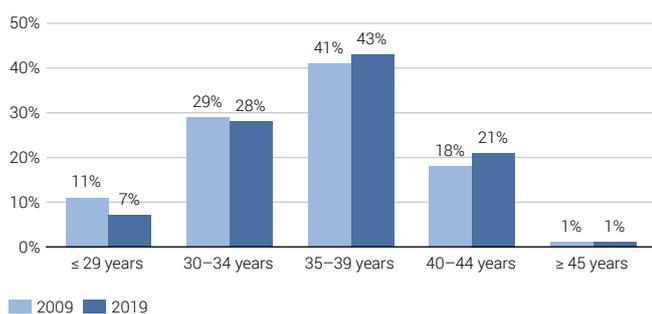
Source: FSO – Assisted Reproductive Technology Statistics © FSO 2021

As a result of increased single embryo transfers the proportion of multiple births has fallen considerably. Whereas treatments in 2016 led to multiple births in 16% of cases, this percentage fell to 6% in 2019.

**Age of women and men**

At the time of treatment in 2019 43% of the women were aged between 35 and 39 and 21% were aged between 40 and 44 (G3). The average age of women being treated was 36.6 years. In 2009, the average age of women treated was 36.0 years. The average age of the men was 39.6 years and has remained relatively stable in recent years.

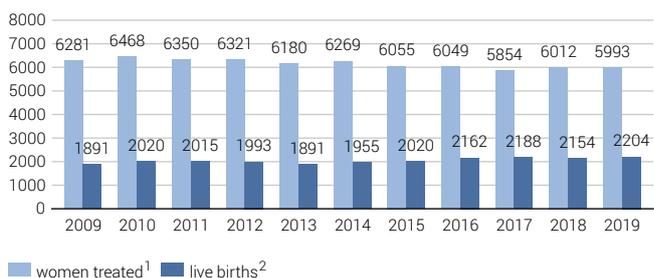
**Women receiving ART<sup>1</sup> treatment, by age: 2009 and 2019 G3**



1 Assisted Reproductive Technology using in vitro methods  
Source: FSO – Assisted Reproductive Technology Statistics © FSO 2021

The number of couples treated has fallen slightly in recent years. At the same time, the percentage of women who gave birth following treatment has continually increased (G4).

**Live births and number of women treated G4**



1 number of women treated per calendar year  
2 Live births occur both in the year of treatment and in the following year due to the duration of pregnancy.  
Source: FSO – Assisted Reproductive Technology Statistics © FSO 2021

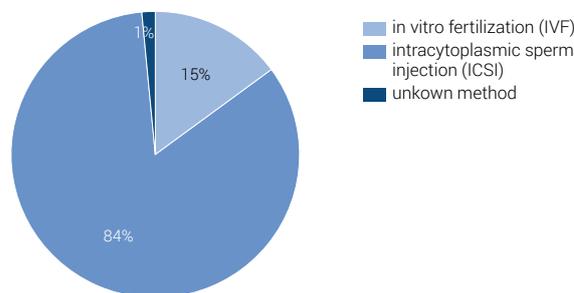
**Increase in live births**

Compared with 2009 the proportion of pregnancies in relation to the number of treated women rose in 2019 from 36% to 47%. The number of live births in proportion to the number of women treated in the calendar year increased from 30% in 2009 to 37% in 2019 (G4). The overall percentage of successful treatments has thus risen considerably.

**Type of treatment**

Intracytoplasmic sperm injection (ICSI) is a procedure in which a single spermatozoon is injected into the oocyte cytoplasm. ICSI was performed in 84% of in vitro cycles. In 2019, conventional in vitro fertilisation (IVF) was carried out in 15% of ART cycles. In 1% of the cycles, the type of treatment was not further specified (G5).

**Type of ART treatment, 2019 G5**



Source: FSO – Assisted Reproductive Technology Statistics © FSO 2021

## Success rate of frozen-thawed embryo transfer cycles

Once the oocytes have been retrieved and fertilised by means of IVF or ICSI, the developed embryo can be transferred to the uterus after 5 to 6 days. This is known as a fresh cycle. In a frozen-thawed embryo transfer cycle on the other hand, the viable embryos are first frozen before their subsequent transfer to the uterus (see glossary). If the embryo transfer is unsuccessful the first time, another transfer can be made; this usually takes place after a frozen-thawed embryo transfer cycle.

In 2019, 4124 embryos were transferred to the uterus after a fresh cycle, 5517 after a frozen-thawed embryo cycle. A slight difference can be seen when comparing live births after embryo transfer by frozen-thawed cycles and by fresh cycles. For embryos transferred after a fresh cycle, a live birth resulted in 21.2% of cases whereas per embryo transferred after a frozen-thawed cycle, a live birth resulted in 24.1% of cases.

## Use of supernumerary embryos

In both natural and medically assisted fertilisation, only about one in six fertilised oocytes will develop. Development of the embryo, therefore, may also come to a premature end in the case of medically assisted fertilisation. Since the revision to the RMA came into force on 1 September 2017, up to 12 embryos from fertilised oocytes can be further developed. As this increases the chances of producing a viable embryo, the probability of a pregnancy is also increased.

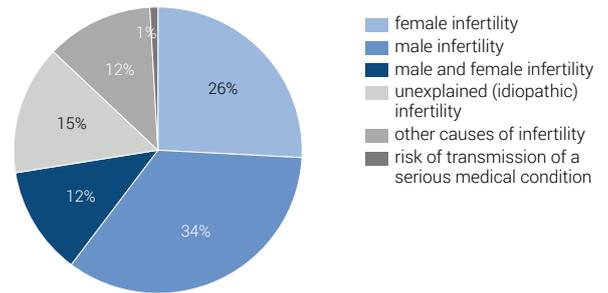
In 2019, 29.6 % of the embryos were transferred to a uterus. A further 33.9% were frozen for storage and a future transfer. 36.5% of embryos were destroyed in the laboratory. Embryos were destroyed in the majority of cases, (89.5%) because they had stopped developing. Much more rarely embryos were destroyed due to poor growth potential (2.7%), after the couple had discontinued treatment (2.1%) or due to a genetic abnormality (3.4%). No supernumerary embryos were made available in 2019 to obtain embryonic stem cells.

## Reasons for treatment

Of the 5993 couples who underwent medically assisted reproduction treatment in 2019, the reasons for the treatment were recorded for 2872 couples who were treated for the first time in 2019.

## Indication<sup>1</sup> for ART treatment, 2019

G6



<sup>1</sup> Indication for couples initiating their treatment in 2019.

Source: FSO – Assisted Reproductive Technology Statistics

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In 34% of cases treatment took place due to male sterility, in 26% of cases due to female sterility and in 12% of cases due to the sterility of both partners. In 15% of cases, a medical cause for sterility could not be found in either partner. In 1% of cases, medically assisted reproduction was carried out to reduce the risk of transmitting a serious genetic disorder.

Among 119 couples, donor sperm was used for medically assisted reproduction with in vitro methods, resulting in 168 embryo transfers and the birth of 50 children.

## Pre-implantation genetic testing

Pre-implantation genetic testing (PGT) has been allowed since the revision to the RMA in September 2017. In 2019 352 couples opted for pre-implantation genetic testing. This was 137 more couples than in the previous year. Of the 201 embryo transfer cycles after PGT in 2019, 32% resulted in a birth. In most of these cases, the transfer took place following a frozen-thawed cycle. After PGT, a total of 65 births were counted, representing 3% of the overall 2080 births (live singletons and multiple births, but also stillbirths), that took place following medically assisted reproduction in 2019. Of these, 48 births took place after PGT-A (aneuploidy screening) and 9 births following PGT-M (monogenic/single gene defects) or PGT-SR (chromosomal structural rearrangements). In 8 births, several types of PGT were conducted (see glossary).

## Other tables: See FSO website

[www.bfs.admin.ch](http://www.bfs.admin.ch) → Statistiken finden → 14 – Gesundheit → Gesundheitszustand → Reproduktive Gesundheit → Medizinisch unterstützte Fortpflanzung

## Data source

Since 2002, the Federal Statistical Office (FSO) has published reports on assisted reproductive technology in Switzerland (StatLPMA). The report includes data from all centres active in reproductive medicine that use extracorporeal fertilisation (IVF and ICSI). It records the number of treatments with medically assisted reproduction using in vitro methods as well as the resulting number of supernumerary embryos. Since 2017 it contains information on pre-implantation genetic testing. It also provides information on treatment results and pregnancy outcomes. Artificial fertilisation through insemination, which can take place both under medical supervision or in a private setting, is not included in these statistics. The statistics report on the data supplied by fertility centres to the FIVNAT-CH (Fécondation In Vitro National) registry of the Swiss Society of Reproductive Medicine (SSRM). The survey is conducted once a year.

## Glossary

### Medically assisted reproduction (MAR)

Reproduction brought about through various methods to treat different forms of fertility impairment and infertility. A diagnosis of infertility must be established by a medical professional. Methods include hormonally stimulated ovulation, artificial insemination and in vitro fertilisation methods (IVF and ICSI).

### In vitro fertilisation (IVF) also known as Assisted Reproductive Technology (ART)

With this method, fertilisation takes place outside of the woman's body. This term refers to both conventional IVF and ICSI. In both techniques, eggs (oocytes) are retrieved in a short procedure (aspiration) from the woman's ovaries usually following hormonal stimulation treatment. The moment of oocyte retrieval is known as a new fresh cycle.

### Fresh cycle in year of declaration

Fresh cycle in the year of oocyte aspiration.

### IVF

Also known as conventional IVF. In this method, a sufficiently large number of spermatozoa is incubated together with a mature oocyte in a nutrient solution to allow for fertilisation.

### Intracytoplasmic sperm injection (ICSI)

During intracytoplasmic sperm injection (ICSI) a single spermatozoon is injected by micro-injection under a microscope into a mature oocyte. This method is recommended when the quality of sperm is impaired.

### Egg (oocyte)

Female reproductive cell which matures in the ovaries.

### Fertilised eggs (zygotes)

A zygote is a fertilised egg (oocyte) after the fusion of the female and male genomes and before the first cell division.

### Embryo

Organism that develops after the first division from fertilised oocytes (zygotes). This organism is called an embryo until the organs have finished developing.

With in vitro methods, the development of zygotes and embryos is monitored in the laboratory for a certain time (5–6 days) after the fertilisation. This allows to evaluate the embryo's viability. After this time, the embryo is in the so-called blastocyst stage. During this stage, the embryo is transferred to the uterus or cryopreserved for storage.

### Cryopreservation

Since the revision to the Reproductive Medicine Act (RMA) came into force, cryopreservation of embryos is allowed. Cryopreservation is the process of freezing oocytes or embryos and storing them in a frozen state at very low temperatures.

In recent times single embryo transfers to the uterus have become more common to avoid multiple pregnancies. Additional developed embryos can be frozen for storage. Cryopreservation is allowed for up to 10 years in Switzerland.

### Cryocycle in year of declaration

Cryocycle in the year that corresponds to the date of thawing/warming.

### Transferred embryos

Embryos transferred to the uterus (from fresh cycles, cryopreserved zygotes or thawed embryos).

### Supernumerary embryos

Embryos obtained after the culture of fresh or frozen/thawed zygotes that are not transferred to the uterus.

### Pre-implantation genetic testing

The abbreviation PGT is often used when referring to pre-implantation genetic testing. PGT is performed to analyse the DNA of oocytes (polar bodies) or embryos (cleavage stage or blastocyst). It includes:

- PGT for aneuploidies (PGT-A), previously called PGS
- PGT for monogenic/single gene defects (PGT-M)
- PGT for chromosomal structural rearrangements (PGT-SR).

For the PGT of embryos at the blastocyst stage, a biopsy of the blastocyst is carried out. The blastocyst is subsequently cryopreserved until results are obtained and the best time for embryo transfer is determined.

### **Pre-implantation genetic diagnosis (PGD)**

Until recently, for pre-implantation genetic testing, the terms PGD (PGT-M and PGT-SR) and PGS (PGT-A screening) were used. These terms have been replaced by PGT in most sources.

### **FIVNAT**

The FIVNAT-CH (Fécondation In Vitro National) of the SSRM (Swiss Society for Reproductive Medicine) keeps a registry of IVF centres for reproductive medicine in Switzerland.

## **Literature and websites**

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