Human Fertilisation & Embryology Authority

Fertility treatment 2017: trends and figures

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www.hfea.gov.uk

We are the UK's independent regulator of fertility treatment and research using human embryos. A world-class expert organisation in the fertility sector, we were the first statutory body of our type in the world.

Contents

About this report

We are the independent regulator of fertility treatment in the UK. Part of our role is to collect data from every licensed fertility clinic about the cycles they perform each year. We hold this information in our database called the Register.

This report provides key information about the number and type of fertility treatments that have been carried out across the country and how many of these have led to a birth. The information in this report relates to data on treatment cycles carried out in 2017.

This is an annual publication. You can find the previous edition on our website.

Executive summary

The data in this report shows how far we have come in the UK since the first IVF baby was born over 40 years ago. IVF is now an established medical procedure with over 75,000 IVF treatment cycles carried out across the UK in 2017. At the same time, we are seeing a number of changes in the delivery and funding of treatment that we note in this report.

We hold the largest database of fertility treatments in the world and it's our ambition to use this data effectively to highlight changes in who is having treatment, what treatments are being used, and with what success. We regulate using this intelligence and make our data accessible for anyone interested in fertility treatment.

As the statutory regulator of IVF, we aim to ensure that every licensed clinic provides high quality care. We know from our recent national patient survey that how patients are treated as individuals counts more than anything else for how they view their experiences during and after fertility treatment. Over the last year, we have been working to improve the experience for patients, requiring all clinic staff to give closer attention to the support they provide. We also know that when it comes to patient care, leadership matters; which is why we have also been focusing on improving the quality of leadership in clinics.

We have been working with others to collaborate on a plan of action to improve the way in which treatment add-ons are offered in fertility clinics. It is the responsibility of all of us to ensure that innovation is encouraged with a clear evidence base, and patients are given transparent and relevant information about any treatments they are offered.

This report shows a number of important trends:

1. The multiple birth target rate of 10% has been reached. Through concerted action with clinics the multiple birth rate has fallen from 24% in 2008, when our multiple birth policy was launched, to an average of just 10%. This has been achieved against year-on-year increases in birth rates. Multiple births are the biggest single health risk to mothers and babies and reaching the target shows that fertility treatment births are becoming safer.
2. Treatment cycles using frozen embryos have continued to increase in use (+11% since 2016), while fresh embryo cycles have marginally decreased (-2% since 2016). Importantly, success rates from frozen cycles are now comparable with fresh cycles, with birth rates per embryo transferred (PET) of 23% and 21% respectively. This is a marked improvement in success for frozen cycles, which have traditionally had a lower success rate than fresh cycles (11% for frozen cycles compared to 15% for fresh cycles in 2007). This progress is due to improvements in embryo freezing techniques, and increased use of single embryo transfers. Patients can now be reassured that freezing their embryos gives them as much chance of success as having fresh cycles.
3. The reasons people use fertility treatments are changing – there have been significant increases in the number of patients in same-sex partnerships and single patients using fertility treatment as a way of creating genetically related families, although total numbers remain small. Most patients are heterosexual couples using their own eggs and sperm but we have observed an important trend in terms of the growth in different kinds of families. For all treatment cycles in 2017, heterosexual partnerships made up the majority at 90.7%, while female same-sex partnerships made up 5.9%. Single patients or those acting as surrogates made up 3% and 0.4%, respectively.

Fertility treatments are also being used as a means to prevent serious inherited genetic conditions. Though the total number of patients opting for embryo selection treatment such as pre-implantation genetic diagnosis (PGD) is small, there has been an increase in the number of serious inherited conditions that can be identified by these methods in recent years.

4. The NHS funding situation for fertility treatment is starting to show marked national differences across the UK. Public funding in Scotland and Northern Ireland have been increasing, in Wales funding is stable, but in England it is starting to decline. Currently, 62% of treatment cycles are NHS-funded in Scotland, 50% in Northern Ireland, while only 39% and 35% are NHS-funded in Wales and England. The widespread coverage of Clinical Commissioning Group (CCG) cuts to funding for fertility treatment in England during 2018 are likely to make their way into the figures for our future reports. While the current figures remain steady at about 60% of all treatments across the UK being privately funded, this is likely to become an England only figure in future years. Indeed, the gap in funding may widen between those who are able to afford private treatment and those who do not have the resources to try to self-fund their fertility treatment.

We are coming to the end of our three-year strategy proud that the multiple birth rate target of 10% has been reached by almost every clinic in the UK. Those that have not reached the target will be particularly highlighted over the next year at inspection. In considering our future strategy, we will continue to shine a light on the funding picture for treatment across the UK. We will also look at how fertility treatments are supporting new family relationships and helping those with serious inherited genetic disorders to have children.

The philosopher Baroness Mary Warnock died in March 2019 having contributed many years of her life to finding a workable solution to the challenges of science, medicine and society and the dilemmas of creating new families within this challenge. Her 1984 report identified the need for principles and limits to govern fertility treatment and human embryo research. It was through the ‘Warnock report’ and the consequent Human Fertilisation and Embryology Act that the HFEA was established to make sure patients could access safe, licensed fertility treatment in the UK. Her work to balance the many different interests in this area for the good of patients and families are a true testament to her ethical commitment. We’re proud to continue this legacy in our work on a daily basis and trust that reports such as this one will continue to contribute to wider knowledge and understanding in this area.

Key terms used in this report

Full term	Description[1]
Birth rate per embryo transferred (PET)	The number of births divided by the sum of embryos transferred for treatment cycles starting in that year.
Birth rate per treatment cycle (PTC)	The percentage of treatment cycles started in that year which resulted in a live birth.
Cycle	All treatments that are conducted at a fertility clinic.
Caesarean section/ C-section	A surgical intervention to deliver babies from a woman's abdomen.
Donor eggs and donor sperm (DEDS)	IVF treatment cycles using donor eggs and donor sperm.
Donor eggs and partner sperm (DEPS)	IVF treatment cycles using donor eggs and the patient's partner's sperm.
Donor insemination (DI)	Donor insemination is a treatment where donor sperm is placed directly into the womb. This is a type of IUI (see below).
Egg freezing	A treatment where a patient has their eggs collected and frozen for future use.
Egg sharing	When a patient who is already undergoing IVF treatment donates some of their eggs to the treatment clinic.
Freeze cycle	A cycle in which a patient has eggs collected with the intention of freezing them for use in future treatment.
Fresh treatment cycle	A treatment cycle in which a fresh embryo is transferred during IVF.
Frozen treatment cycle	A treatment cycle in which a frozen embryo is transferred during IVF.
Human Fertilisation and Embryology Authority (HFEA)	We are the HFEA and we regulate fertility treatment in the UK.
Intracytoplasmic sperm injection (ICSI)	A treatment where sperm is placed directly into the egg. Unless stated otherwise, IVF treatments in this report include ICSI.
Intrauterine insemination (IUI)	A treatment where partner or donor sperm is placed directly into the womb. We only collect comprehensive data on IUI using donor sperm.
In vitro fertilisation (IVF)	A treatment where a patient's eggs are fertilised with sperm in a laboratory. Unless stated otherwise, IVF treatments are reported with ICSI included.
Multiple birth rate	The percentage of all live births resulting from treatment cycles started in that year which resulted in the birth of more than one live baby.
Own eggs and donor sperm (OEDS)	IVF treatment cycles using a patient's own eggs and donor sperm.
Own eggs and partner sperm (OEPS)	IVF treatment cycles using a patient's own eggs and their partner's sperm.
Preimplantation genetic diagnosis (PGD)	A treatment which allows people with a serious inheritable genetic condition in their family to avoid passing it on by testing their embryos for the condition.
Surrogacy	The process of a patient carrying a baby on behalf of another person or family.
Thaw cycle	A treatment where patients use their frozen eggs in an IVF treatment cycle.
Treatment cycle	Only those cycles where the patient recorded on their registration form that they intended to become pregnant.

[1]See 'Background information' for further details on definitions and calculation methods.

Introduction

In 2017, 54,760 patients underwent 75,425 fertility treatment cycles. Donor insemination (DI) and in vitro fertilisation (IVF) made up the majority of treatments.

In 2017, IVF accounts for 93% of treatment cycles, but different kinds of fertility options are also being made available via fertility clinics. These treatment options include pre-implantation genetic diagnosis (PGD), egg freezing, egg sharing and surrogacy. In this report, we show the trends for different fertility treatments and options that occurred in 2017, focussing on:

- patient characteristics
- types of treatments
- birth rates, and
- where and how fertility treatment is funded in the UK.

Outline

We've divided the report into four main sections: patient characteristics, types of treatment, birth rates and funding by region. The first section provides the characteristics of patients seeking treatment: notably patient age (a critical aspect of fertility and fertility treatment success) and types of partners (heterosexual, same-sex, no partner or acting as a surrogate). This section provides a picture of the kinds of people seeking fertility treatment as well as the particular fertility concerns that affect specific age groups and types of families seeking treatment.

In the second section, we look at types of treatment, which describes the different kinds of fertility treatments available and their rates of use over time. This section is important for developing a sense of how fertility treatments are changing and the different options available both in the past and now.

In our third section, we provide details of the birth rates for the types of treatments available. Birth rates can be seen in terms of age, frozen and fresh cycles, egg and sperm source, and treatment type.

Finally, in our fourth section, we look at nations, regions and funding, providing data and graphs looking at the ways fertility treatments and funding are distributed across the nations and regions of the UK, as well as sectors (public and private). This section also examines the relationship between funding and locality; the decrease in NHS funding for fertility treatment in England and the rise in NHS funding in Northern Ireland, Scotland and Wales.

1. Patient characteristics

Key statistics

35.5

Average patient age has increased for both IVF and DI treatments from 33.5 and 32 in 1991 to 35.5 and 34.5 in 2017, respectively.

65%

Patients aged under 37 make up 65% of people having IVF treatment cycles and 73% of those undergoing DI treatment cycles.

90.7%

Most treatment cycles (68,380; 90.7%) were undertaken by patients with male partners. The remaining patients were listed with a female partner (4,463; 5.9%), no partner (2,279; 3%) or as a surrogate (302; 0.4%).

12%

Treatment cycles for patients in same-sex partnerships have increased by 12% from 2016 to 2017 and 4% and 22% for patients with no partner or surrogates, respectively.

Introduction

Patients seeking fertility treatment are typically people in heterosexual partnerships and this group represents almost 91% of people seeking fertility treatment in the UK. The remaining 9% of patients undergoing fertility treatment are those in same-sex relationships, in no recorded relationship and those using surrogacy.

The majority of people seeking treatment do so due to infertility. For this group, age is a critical aspect of both the cause of infertility (as the general population delay starting a family), kinds of treatments used and success rates (because a patient's fertility declines with age). As such, age is an important patient characteristic and most of the data we record is linked with age.

Likewise, fertility clinics also offer patients 'fertility preservation' treatment whereby eggs are collected/embryos created and stored for future use. Therefore, patient age is important in these instances too.

For the remaining patients, infertility is not necessarily the reason for seeking treatment and rather, it's the social contexts which do not allow for 'natural' conception. These circumstances include being in a same-sex relationship, not having a partner or acting as a surrogate. Therefore, patient characteristics include the recording of 'partner status', as this factor indicates why a person may be seeking treatment.

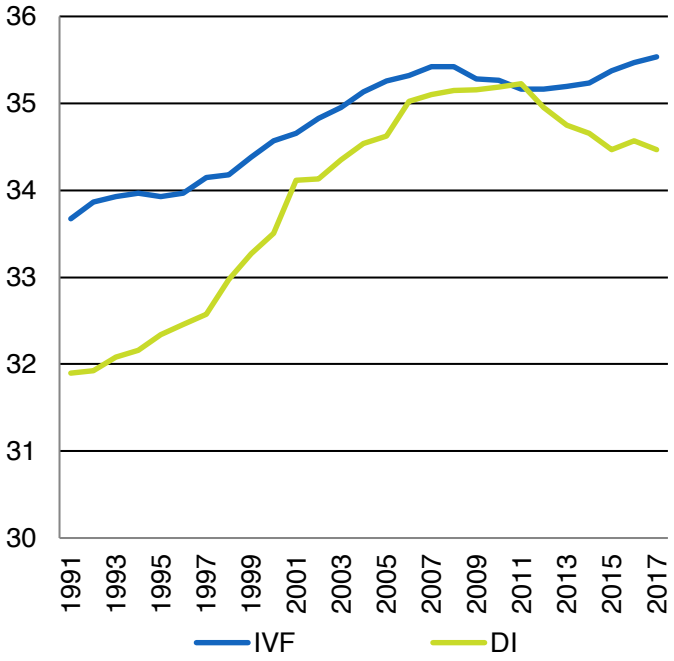
Additionally, about 1% of cycles are for patients undertaking PGD treatment to prevent any potential children from carrying life-threatening and/or debilitating diseases.

In this section, we present the data on the age of patients, their partner status and sources of eggs and sperm. These characteristics show changes over time and reflect the social trends of having children later in life and changing family formations.

Age

Age is a key indicator of fertility and this is reflected in the change in the ages of people seeking fertility treatment and could partly account for increased numbers of fertility treatments since we began recording data. In 1991, the average age for DI treatment was 32 and 33.5 for IVF cycles. In 2017, the average age for DI was 34.5 and 35.5 for IVF.

Figure 1: Average patient age by treatment type, 1991–2017



The general population are delaying parenting and therefore, as people's fertility declines with age, the need for fertility treatment potentially increases. The age of DI patients has continued to decline since 2011 (see figure 1) and this change could be attributed to:

- the decrease in NHS funding for DI treatments (see section 4)
- criteria for DI NHS funding (ie, many people no longer meet the criteria for NHS-funded DI), and
- an upward trend in the use of IVF by patients in same-sex partnerships and with no partner and clinicians recommending trying IVF before DI.

The majority of patients undergoing fertility treatment (some 55%) were aged between 35 and 44. Figure 2 sets out the percentage of patients by age divided into six bands. While it does show that patients under 35 represent the largest group undergoing fertility treatments, it should be noted that this is the largest age band compared to other age bands which only hold one to two years. The under 35 range also encompasses a higher proportion of patients seeking fertility for non-age related reasons, such as being in a same-sex relationship and those having genetic testing.

Figure 2: DI and IVF patient ages, 2017

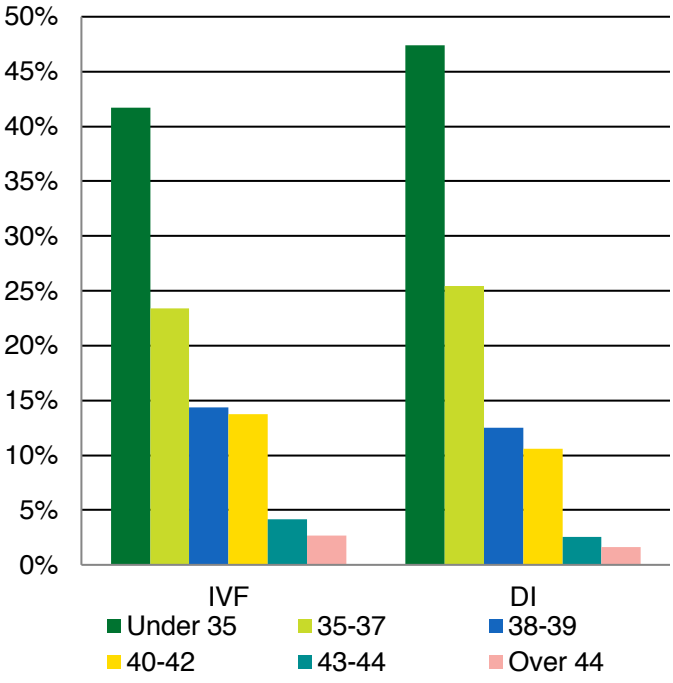
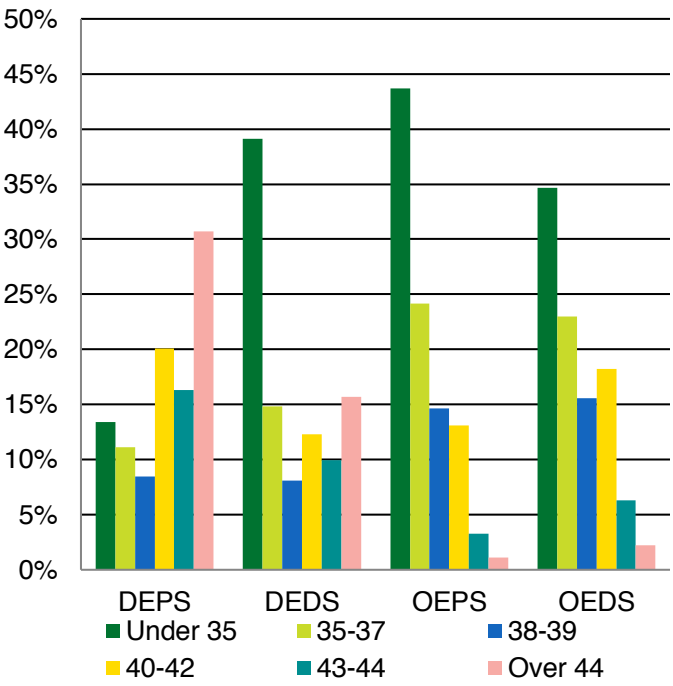


Figure 3 indicates that the highest number of patients using own eggs and partner sperm (OEPS) and own eggs and donor sperm (OEDS) are those aged under 35. Again, this reflects the impact of age on egg quality because most people who are able to use their own eggs are at the age where egg quality is still high (35 and under). This is not to say however, that older people cannot conceive using their own eggs and sperm, as shown in section three.

Interestingly, donor egg and donor sperm cycles are mostly undertaken by the under 35 age group too. This is in part due to the high percentage of patients with female same-sex partners using donor eggs and donor sperm who tend to be younger. As can be seen in the graph, using donor eggs with partner sperm is mostly used by those aged 44 and over, as the chances of successful pregnancy after 44 using one's own eggs are not high (see section three).

Figure 3: Patient age by source of egg and sperm, 2017

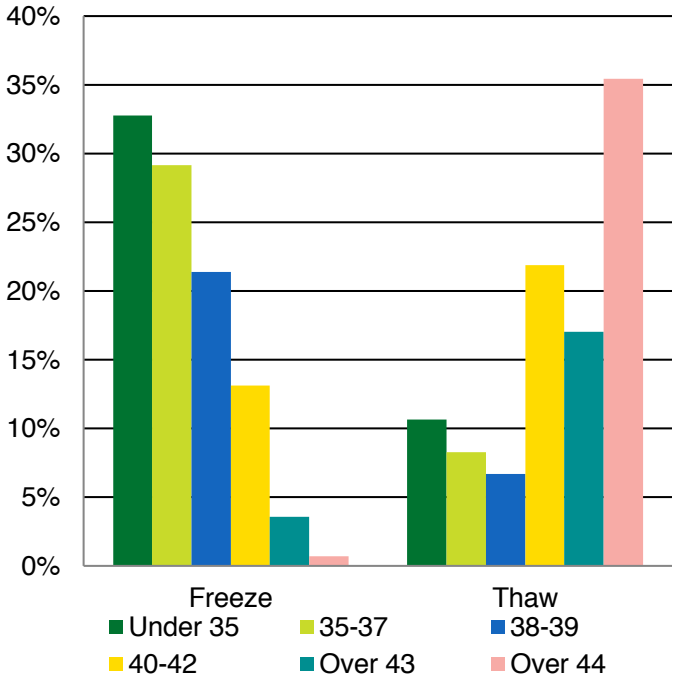


Most people who freeze their eggs (and sperm) do so for fertility preservation – either because they would like to delay having a child, they are having treatment for cancer, or they are transgender and may wish to use their eggs and sperm at a later stage.

As such, there were 479 egg freeze cycles for patients under 35, making up the highest proportion (33%) of people using this treatment. They were closely followed by the 35–37 age group at 426 cycles (29%).

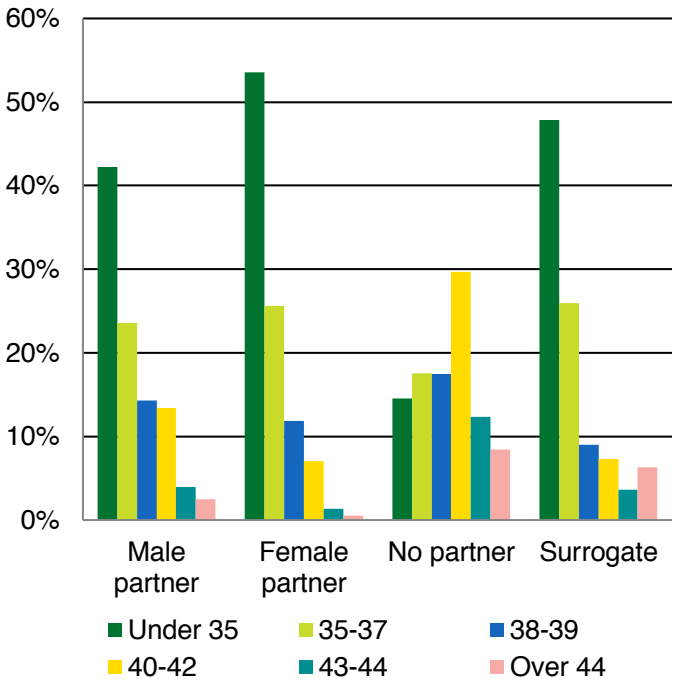
By way of contrast, in the thaw cycles, the highest proportion of people using frozen eggs are aged 44 and over (206 cycles, 35.5%), with a reverse incline for the other ages as well. The reasons for this include over 44-year olds needing to use their frozen eggs or frozen donor eggs more so than other age groups, as well as the fact that younger age groups may never need to use their frozen eggs because they become pregnant without fertility treatment.

Figure 4: Patient age at egg freeze or thaw cycle, 2017



Patient ages are broadly the same across partner types, with under 35s again being the largest group due to the width of the age band. Patients with a female partner are much more likely to be under 35, with 80% of patients below 37, while patients with a male partner or surrogates have very similar trends in ages. In contrast, patients with no partner are more likely to be above 40 (50%) than other partner types.

Figure 5: Patient age by partner status, 2017



Partner status

Partner status offers insight into both why fertility treatment is sought as well as how the kinds of people using fertility treatment may be changing over time. Figure 6 shows that the majority of people using IVF are people in heterosexual partnerships. On the other hand, as figure 7 shows, it's clear that more patients with a female partner used DI in 2017 and, when combined with patients who have no partner, they make up the majority of DI patients.

While only about 9% of treatment cycles were undertaken by patients in non-heterosexual partnerships – female same-sex (5.9%, 4,463), no partner (3%, 2,279) and surrogates (0.4%, 302) – there have been increases in treatment cycles of 12%, 4% and 22% for patients in female same-sex relationships, with no partner or surrogates, respectively. In contrast, treatments for patients with male partners make up about 91% of treatment cycles (68,380) but only increased by 2% in the last year. This indicates a shift in the kinds of families making use of fertility treatment

Figure 6: IVF treatments by partner status, 2007–2017

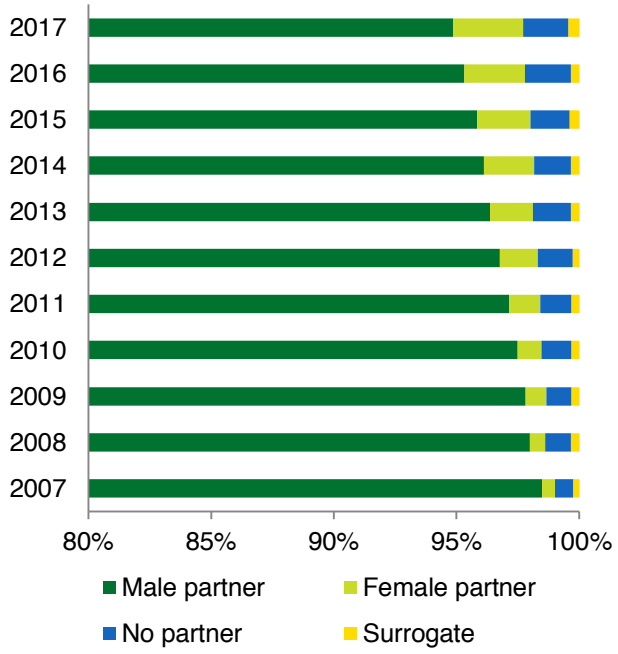
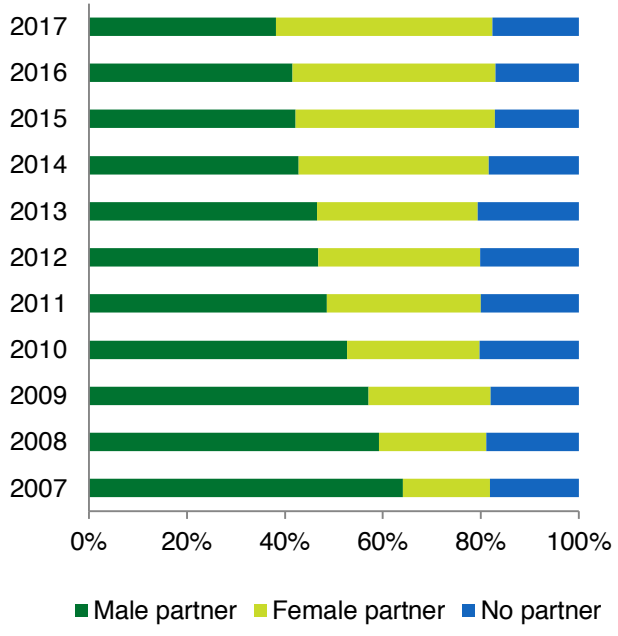
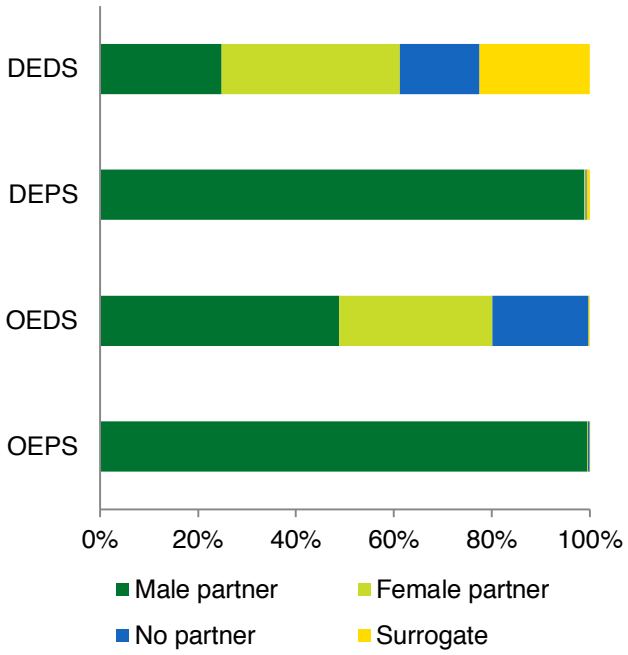


Figure 7: DI treatments by partner status, 2007–2017



The source of the egg and sperm used in treatment cycles is linked to the types of people seeking treatment, as seen in figure 8. Where donor sperm is used, the patient is more likely to be in a non-heterosexual partnership (55% compared to 45% in heterosexual partnerships).

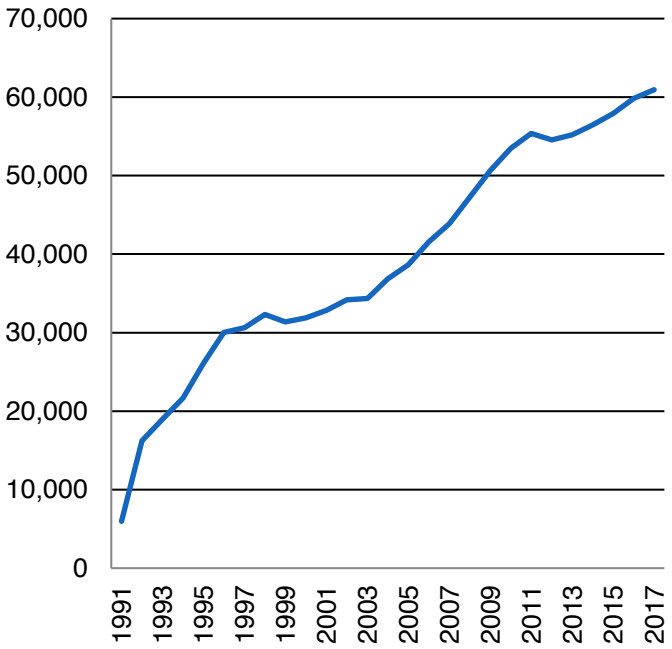
Figure 8: Partner status by source of egg and sperm, 2017



Sources of egg and sperm

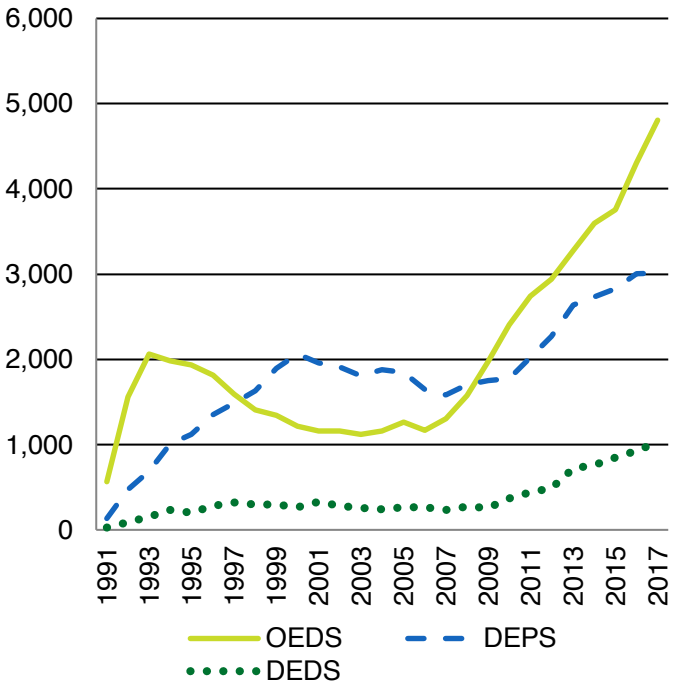
Figure 9 shows that the majority of people undergoing treatment use their own eggs and partner sperm. However, use of donor eggs and/or sperm has been increasing each year and made up 13% of treatment cycles (an increase of three percentage points since 2012).

Figure 9: OEPS treatment cycles, 1991–2017



In figure 10 we can see that treatment cycles with patients' own eggs and donor sperm are increasing at the fastest rate; increasing by almost 2,000 treatment cycles since 2012 (although proportionally still small at 5% of users). This increase is mainly due to an upsurge in use from patients in same-sex partnerships which has increased as a proportion of own egg and donor sperm treatment cycles from 10% in 2005 to 32% in 2017.

Figure 10: DEDS, DEPS and OEDS treatment cycles, 1991–2017



2. Types of fertility treatment

Key statistics

69,822

There were 69,822 IVF treatment cycles and 5,603 DI treatment cycles undergone in 2017, increases of 2.5% and 3% respectively since 2016.

2%

Fresh IVF treatment cycles have decreased by 2% in the last year, whereas frozen have increased by 11%.

3%

Use of ICSI has decreased by 3% in the last year.

10%

The fastest growing fertility treatment type is egg preservation (freeze cycles), which have increased 10% in the last year.

690

PGD has decreased from 712 in 2016 to 690 in 2017, the first decrease since 2004.

Introduction

The types of fertility treatment available have grown since we began recording them in 1991. Fertility treatment does not only attempt to resolve infertility; it now offers families who would not ordinarily be able to have children due to social reasons an opportunity to do so.

It is also used as a means to prevent serious inherited genetic illnesses and allows young women as well as cancer patients and transgender patients the possibility of preserving their fertility.

In this section, we focus on the kinds of treatments available and the shifts occurring.

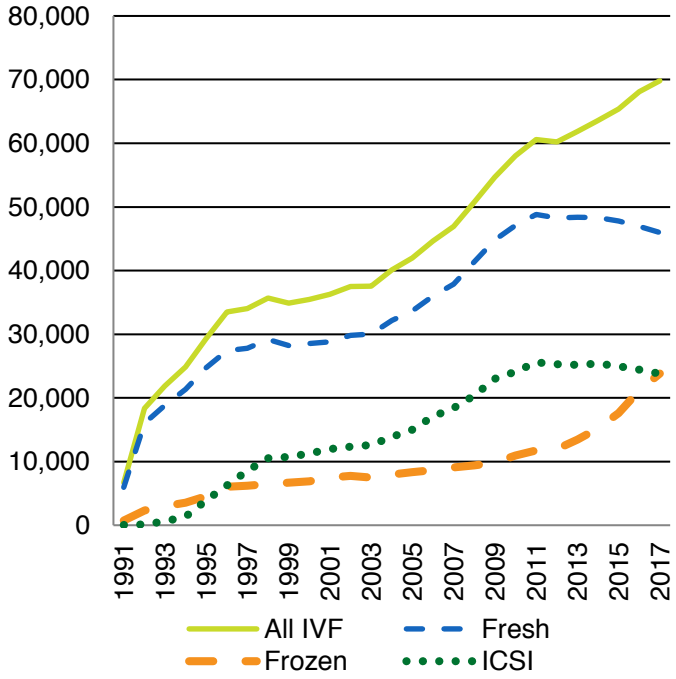
IVF

When we began recording fertility treatment in 1991, DI was used more frequently than IVF. This began to change however, and as figure 11 shows, IVF has increased every year and it's now the most common treatment. One reason for the increase in use could be the increase in the number of clinics licensed to perform IVF across the UK, making it easier for patients to access fertility treatment.

ICSI, a newer technology (where a sperm cell is placed directly in the egg) that was reserved for specific kinds of male factor infertility, has increased in use since 1994. It continued to increase until 2014, but it is now in decline, possibly due to clinical opinion that it's not needed in all contexts of IVF.

Fresh and frozen cycles, while steadily increasing in line with the general IVF trend, are showing a shift. IVF using frozen embryos is increasing in use, in part due to changes in clinical practices to reduce the likelihood of multiple births, while fresh embryo use is declining. Importantly, this shift has coincided with success rates for frozen cycles coming in line with fresh cycles in recent years (see section three).

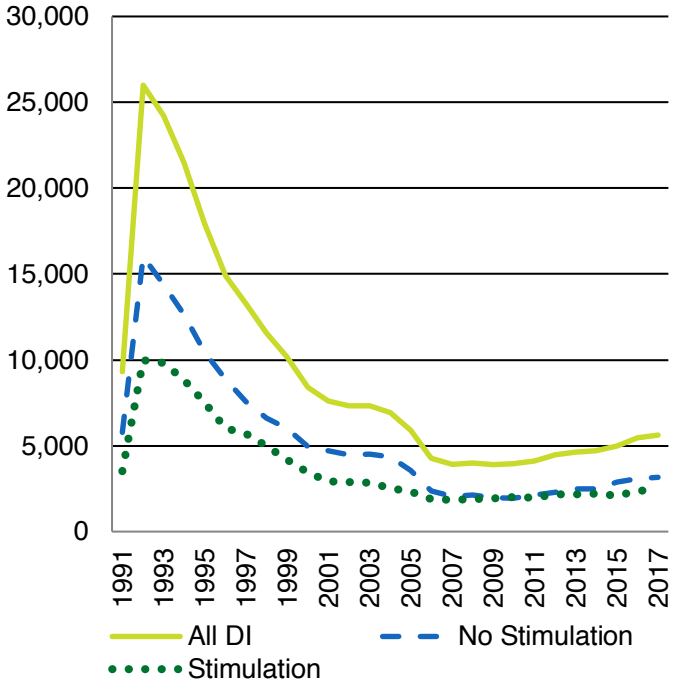
Figure 11: Total IVF, frozen, fresh and ICSI treatment cycles, 1991–2017



DI

It's clear that DI as a treatment option has continued to decrease since it was first recorded. A slight upswing from 2009 onwards may be attributed to both increases in patients in same-sex partnerships and with no partner using fertility treatment, as well as Scotland's increase in NHS-funded treatment cycles (see section four), which recommends using DI before moving to IVF.

Figure 12: Total DI, stimulated, and unstimulated treatment cycles, 1991–2017



Other fertility treatments

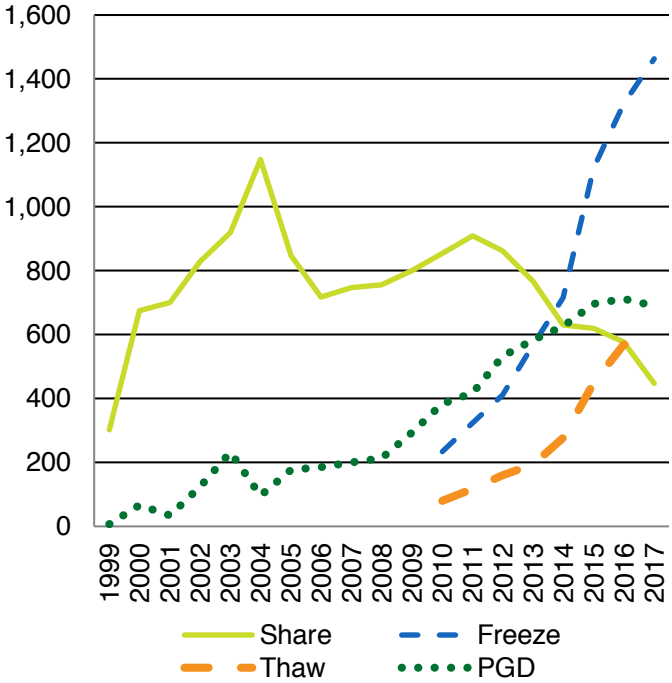
Figure 13 serves as a useful indicator of the newer technologies available in fertility treatment and how these have changed over time. While both egg freezing and egg thawing treatment cycles have been increasing in numbers since they started being recorded in 2010, egg freezing has experienced a much steeper incline in use. There were 1,462 egg freezing cycles in 2017 (410 in 2012), while there were 581 egg thaw cycles in 2017 (159 in 2012).

The number of people delaying childbearing is one reason for an increase in egg freezing. In addition, more education on fertility preservation could account for part of this upward trend, particularly for patients with cancer or transgender patients.

Interestingly, while PGD treatment cycles have been increasing in numbers since records began in 1999, 2017 is the first year in which there has been a decrease since 2004. Although this decrease is minor across the UK (712 to 690 treatment cycles), the decrease was mainly seen in England (661 to 619 treatment cycles).

Egg sharing has been declining in use since 2011 and has now reached its lowest usage rate since our records began in 1999 (909 treatment cycles in 2011 to 447 treatment cycles in 2017).

Figure 13: Egg freezing cycles, and egg thawing, egg sharing and PGD treatment cycles, 1999–2017



3. Birth rates

Key statistics

22%

The overall IVF birth rate PET was 22% in 2017 and the overall DI birth rate per treatment cycle was 14%, which is similar to 2016.

23%

Overall birth rates PET for frozen cycles exceeded those for fresh cycles for the third year in a row at 23% compared to 21% (+0.5 and -0.2 percentage points from 2016).

30%

For patients using their own eggs, IVF birth rates PET were highest for the under 35 group, with 30% for fresh and 27% for frozen treatment cycles, similar to 2016.

30%

Use of donor eggs and donor sperm recorded the highest birth rate PET for all gamete sources at 30% (+3 percentage points from 2016).

10%

Average multiple birth rates met our 10% target for both fresh and frozen treatment cycles for the first time.

Introduction

Birth rates remain a critical factor for patients and clinicians: having a healthy baby (either now or in the future) is the goal of all people seeking fertility treatment. In this section, we look at the birth rates for different kinds of treatments – fresh and frozen IVF treatment cycles and stimulated and unstimulated DI treatment cycles – as well as multiple birth rates.

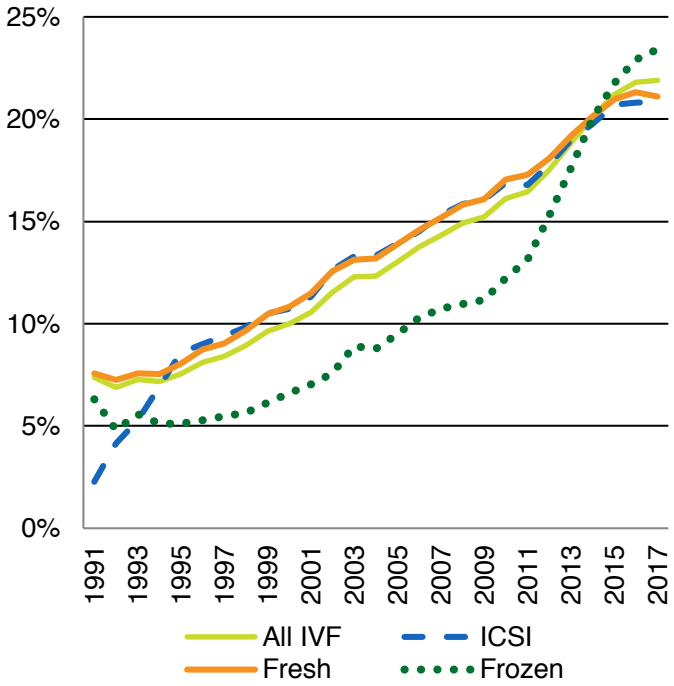
Birth rates for DI and IVF have continued to rise over the last 20 years, which may be attributed to better technologies, improved clinical practice, the uptake in donor egg and sperm use and higher numbers of treatments.

What is perhaps most significant is the steeper rise in IVF birth rates since 2009. This period coincides with the concerted efforts of the HFEA, together with clinics, to reduce the multiple birth rate. As such, it's important that birth rates have risen at a time when the multiple birth rate is being reduced, pointing to the success of single embryo transfers.

Birth rate trends

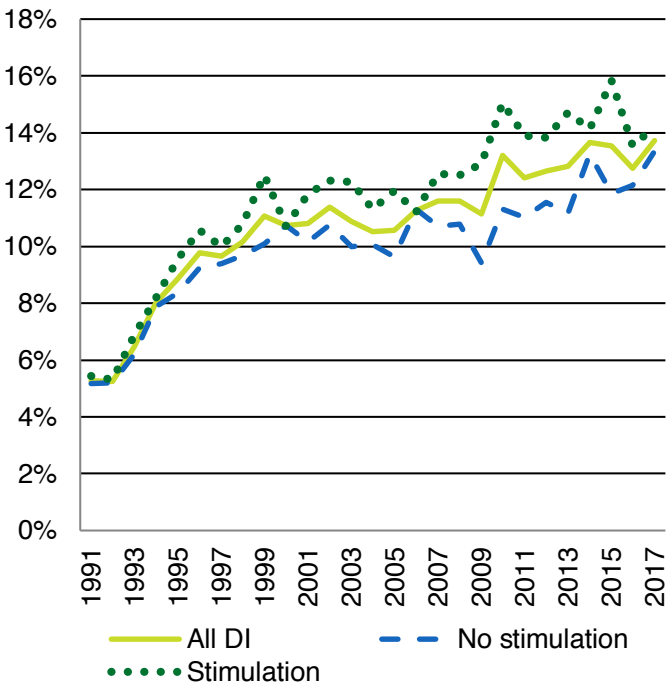
We can see from figure 14 that birth rates for IVF have increased since we began recording data in 1991 (from 7% in 1991 to 21% in 2017). Reasons for the increasing birth rates PET for IVF include: reduction in the number of embryos transferred per treatment cycle (see multiple births) and improvements in embryo storage. The slightly higher birth rates for frozen treatment cycles may also be explained by embryos being frozen at younger ages (when fertility is higher) and used at a later stage.

Figure 14: IVF birth rates PET using patient's eggs only, 1991–2017



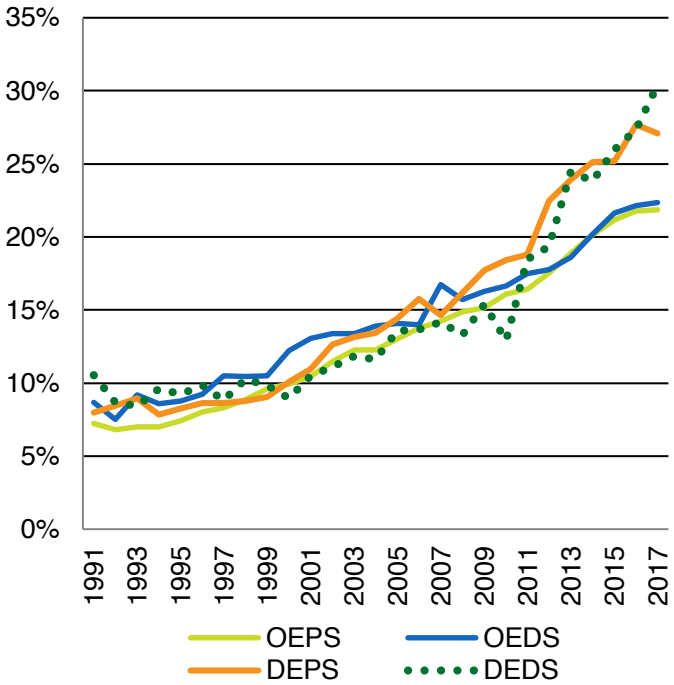
DI birth rates have been increasing since recording began, although the increases have been less significant than in IVF (from 5% in 1991 to 14% in 2017). It's important to note that DI birth rates are recorded as per treatment cycle (no embryos are transferred so per embryo transfer cannot be used for measuring DI success, unlike with IVF). Greater fluctuations in DI birth rates are also seen due to lower usage rate (about 5,600 treatment cycles for all DI in 2017).

Figure 15: DI birth rates PTC, 1991–2017



It's evident from the graph that using donor eggs and donor sperm, while initially not much higher than all other categories, resulted in a higher birth rate in 2017. This is because using donor eggs or sperm takes away many reasons for infertility: age factors, low sperm count, quality and motility, amongst other causes.

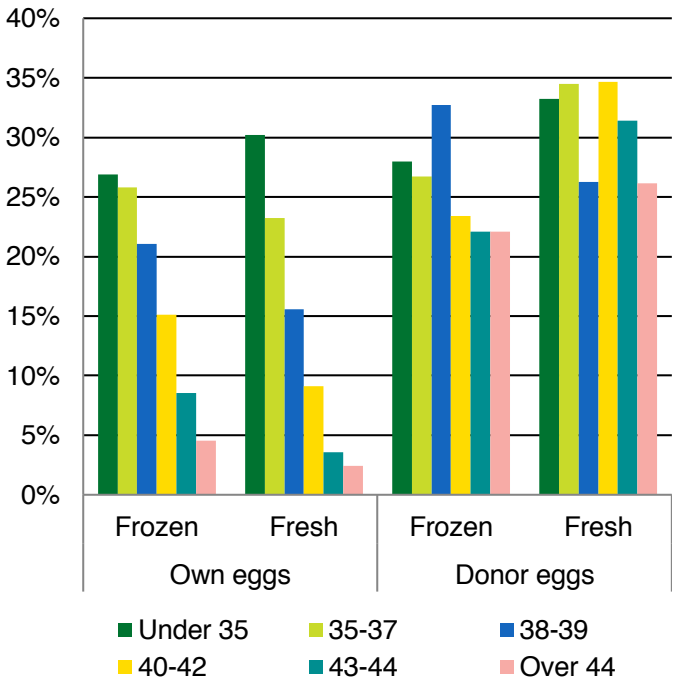
Figure 16: Birth rates PET based on source of egg and sperm, 1991–2017



Birth rates by age

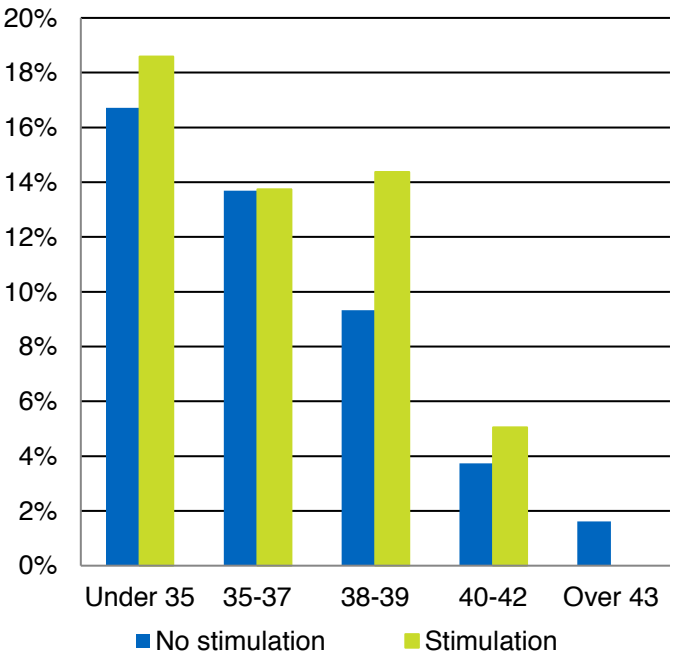
When comparing birth rates PET for IVF treatment cycles by age, it's evident that birth rates decrease with age where own eggs are used. However, when using donor eggs, birth rates PET remain above 20% even where patients are above 40 years of age, demonstrating that donor eggs can greatly increase birth rates as they are typically from younger women without infertility.

Figure 17: IVF birth rates PET by age, 2017



The figure below indicates that stimulated cycles tend to be more successful than unstimulated DI treatment cycles. We can see that age and success rates for DI are connected. DI requires minimal medical intervention so younger age groups have higher success rates. DI success rates are comparable with the population of fertile couples conceiving 'naturally' (11.6% for all age groups).[2]

Figure 18: DI birth rates PTC by age, 2017



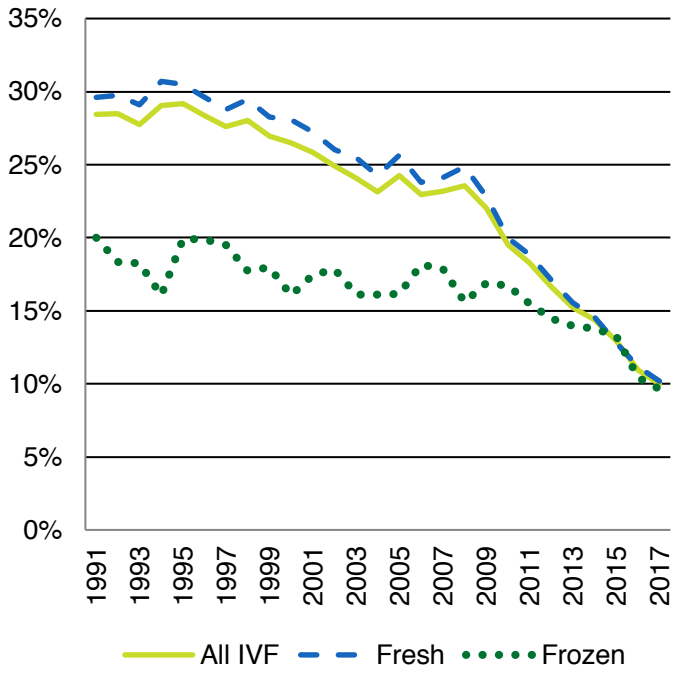
[2] Office for National Statistics, 'Conceptions in England and Wales: 2016'.

Multiple births

Multiple births are the single greatest risk associated with fertility treatment. Our campaign, 'One at at time', raised awareness among patients and professionals about the risks associated with multiple births (pregnancy complications and preterm birth are more likely in multiple birth pregnancies). We have worked with clinics, and professional and patient organisations, to promote elective single embryo transfer as the most appropriate treatment option for the majority of patients.

Seeing a dramatic fall from around 24% in 2008 to 10% in 2017 for all types of IVF is an exciting milestone in our history and regulatory work with fertility clinics; achieving our sector target of an average multiple birth rate of 10% for the first time. Importantly, this decrease in multiple birth rates has also coincided with rising birth rates, demonstrating a reduction in risk to the patient and child, while also increasing the likelihood of a healthy baby being born.

Figure 19: Multiple birth rate for all IVF treatment cycles, 1991–2017



4. Nations, English regions and funding

Key statistics

65,087

Most treatment cycles took place in England in 2017 at 65,087 treatment cycles.

91

91 clinics were actively providing fertility treatment in the UK in 2017; 78 in England, six in Scotland, four in Wales and three in Northern Ireland.

84

There has been an increase in active clinics performing IVF in the UK from 77 to 84 from 2012 to 2017, mostly increasing in London (+5) and North West England (+4).

The proportion of NHS-funded treatment cycles has been changing across UK nations over the last five years, with Scotland, Wales and Northern Ireland increasing funding and England decreasing funding.

53%

There have also been large decreases in NHS-funded DI treatment cycles in most UK nations and English regions, apart from Scotland which has seen an increase in NHS-funded cycles from 22% in 2012 to 53% in 2017.

Introduction

The UK's fertility clinics vary widely geographically with more clinics located in urban centres, especially in London. This factor determines how easy or challenging accessing treatment can be. Likewise, treatment is divided between private and NHS funding. The availability of funding varies widely across UK nations and English regions. In this section, we set out the distribution in fertility treatments in terms of locality and funding.

Nations and English regions

The kinds of fertility treatments and their availability vary across the nations and regions of the UK. The reasons for these variations include different amounts of NHS funding and the number of clinics in particular regions, which we elaborate on. As the most populous nation in the UK, it's no surprise that the vast majority of treatments took place in England at 65,087 treatment cycles, while there were 5,475, 2,905 and 1,885 treatment cycles in Scotland, Wales and Northern Ireland, respectively.

Figure 20: Proportion of UK treatment cycles by nation, 2017

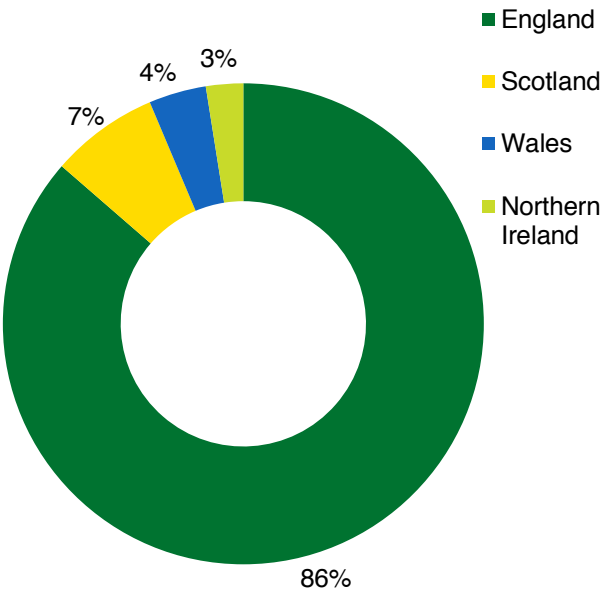


Figure 21: IVF treatment cycles by nation and English region, 2012 and 2017

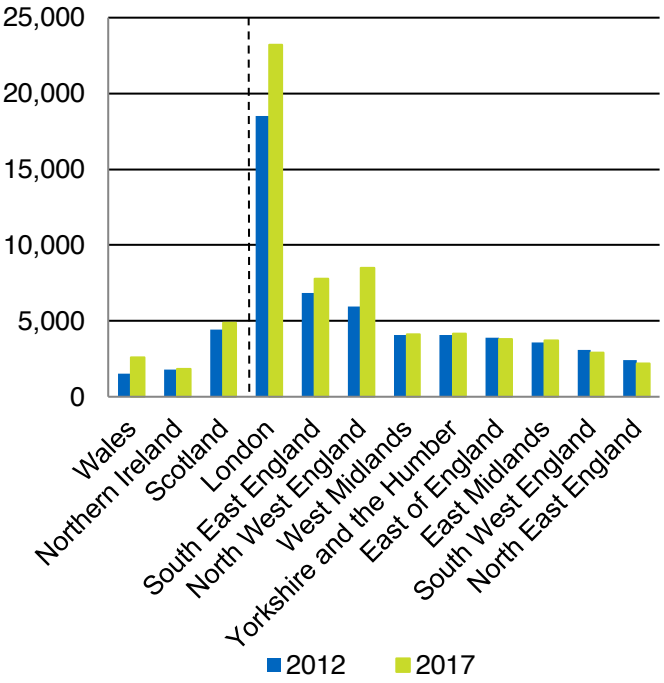
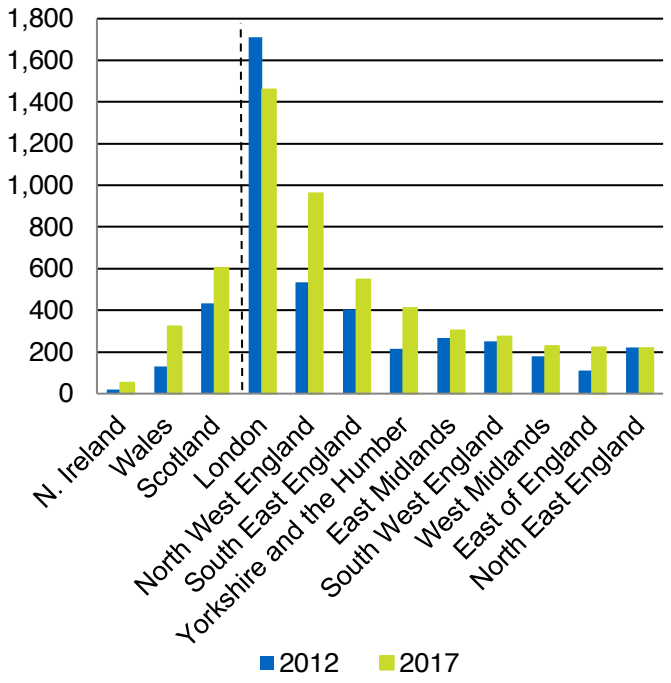


Figure 22: DI treatment cycles by nation and English region, 2012 and 2017



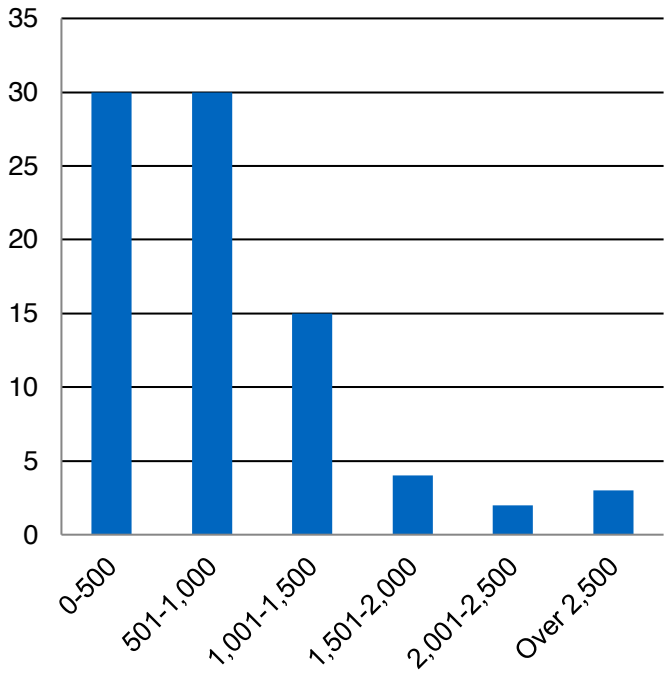
The figures from the last five years indicate that IVF has increased in almost all of the nations and regions (see figure 22), and DI has increased too, apart from in London. These numbers reflect the increase in the total number of active clinics in the UK from 80 in 2012 to 91 in 2017 and the continual rise in fertility treatments each year (see figure 23 for this trend).

Clinics and number of cycles carried out

Most clinics performed under 1,000 treatment cycles in 2017, but as can be seen in figure 23, three clinics treated more than 2,500 patients. The number of treatments were generally split evenly across clinics in the UK.

Clinics with high numbers of IVF treatment numbers (above 1,500) were mainly in highly-populated areas of the UK, such as London, the South East and North West of England. In 2017, England had 71 clinics carrying out IVF treatment, while Scotland had six, Wales had four and Northern Ireland had three. The number of treatments is therefore directly related to the number of clinics in each nation and these numbers, as noted earlier, are proportionate to population sizes in terms of regions and nations.

Figure 23: Number of clinics by IVF treatment activity, 2017



London remains the region with the highest proportion of clinics carrying out IVF and DI cycles (see figures 24 and 25), with the total number of clinics performing treatments rising from 20 in 2012 to 28 in 2017. This is mainly due to London being the place where most private clinics, which perform the majority of treatments, are situated. Notably, the number of clinics performing treatments has doubled in North West England from four in 2012 to eight in 2017. Other regions have maintained relatively stable numbers of licensed clinics performing treatment cycles over the last five years.

Figure 24: Clinics carrying out IVF treatments, 2012 and 2017

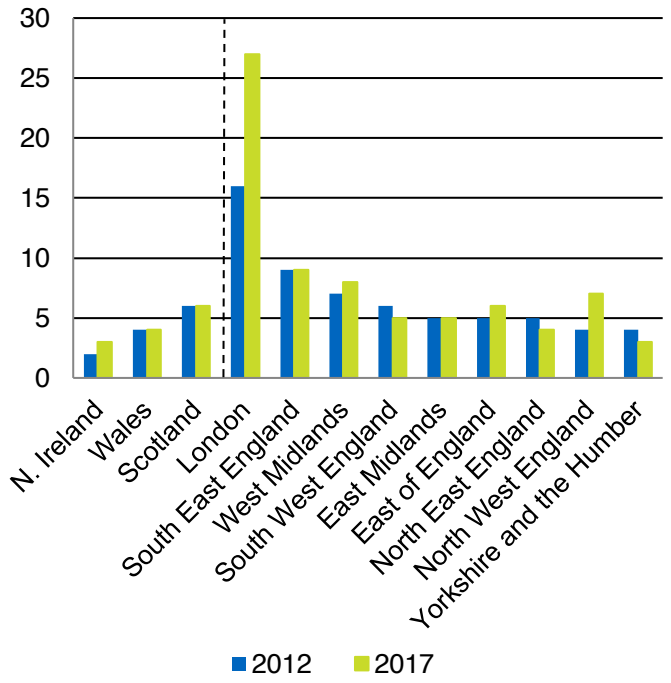
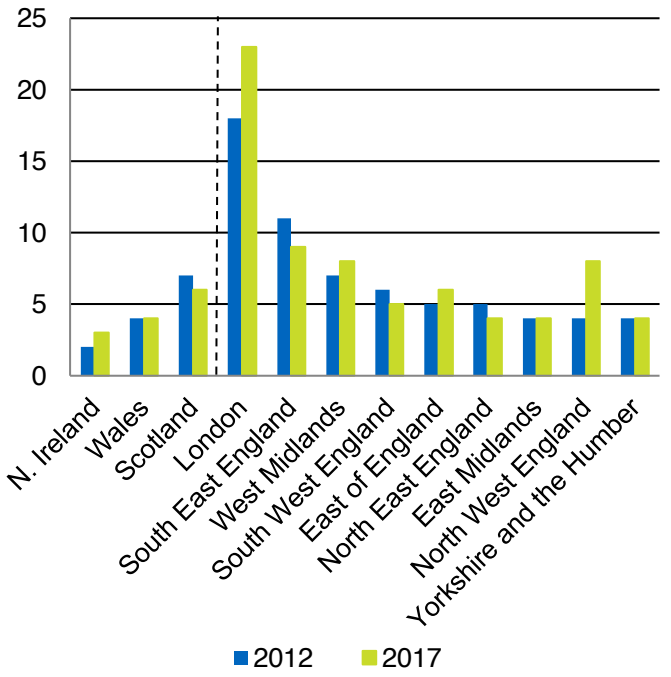


Figure 25: Clinics carrying out DI treatments, 2012 and 2017



Funding status

Although regulation of fertility services is UK-wide, policy on the commissioning of services is devolved at the national level. Changes in the proportion of NHS-funded IVF cycles in the past five years vary by nation and region, due in large part to different commissioning decisions. In England, the trend over the past few years has been for Clinical Commissioning Groups (CCGs) to reduce the number of treatment cycles they fund.

There has also been a steady decrease in the proportion of DI cycles funded by the NHS, from 17% in 2015 to 12% in 2017. Figure 26 also demonstrates that proportionally, IVF has been funded by the NHS more than DI. The reasons for this are: IVF and DI eligibility criteria are different and IVF can be easier to get funding for based on age (see NICE guidelines). Therefore, criteria for DI can mean people do not get treatment for DI under the NHS. This particularly impacts patients in female same-sex relationships or with no partner, who do not necessarily have an infertility diagnosis, and more significantly, are unable to try to conceive naturally with their partner.

Figure 26: Proportion of total treatment cycles funded by the NHS, 2009–2017

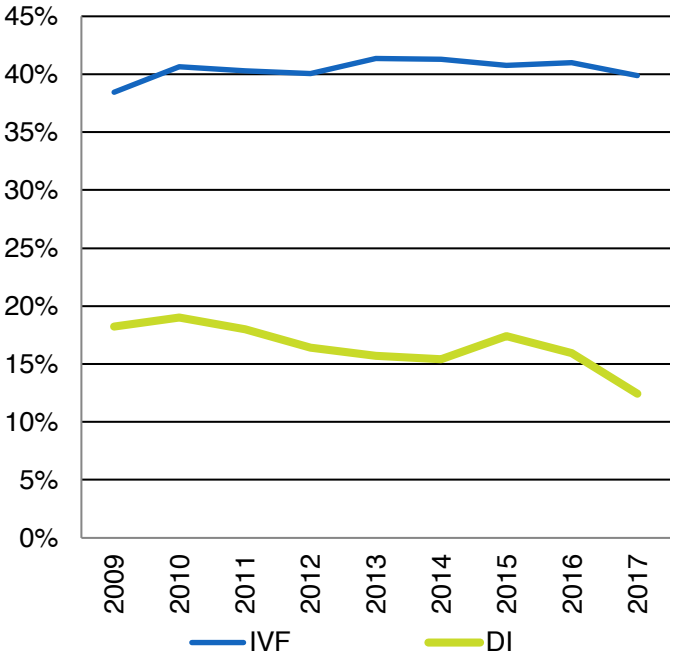
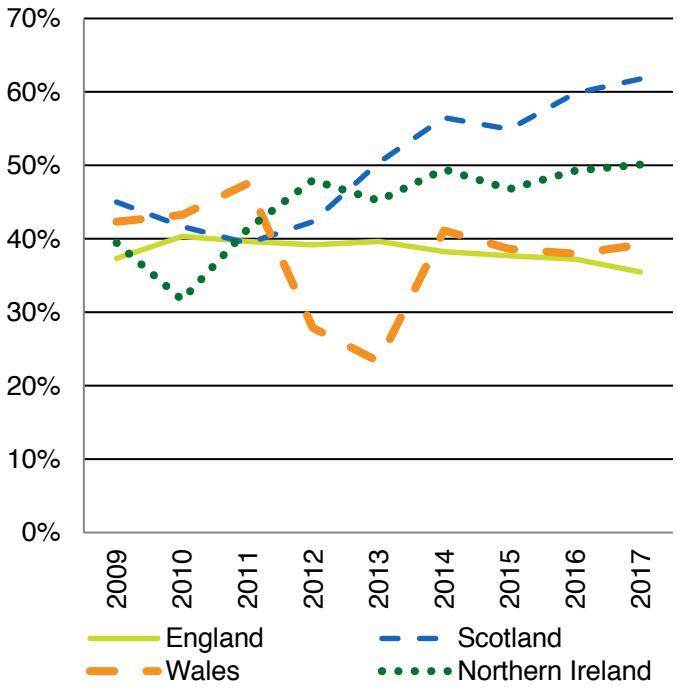
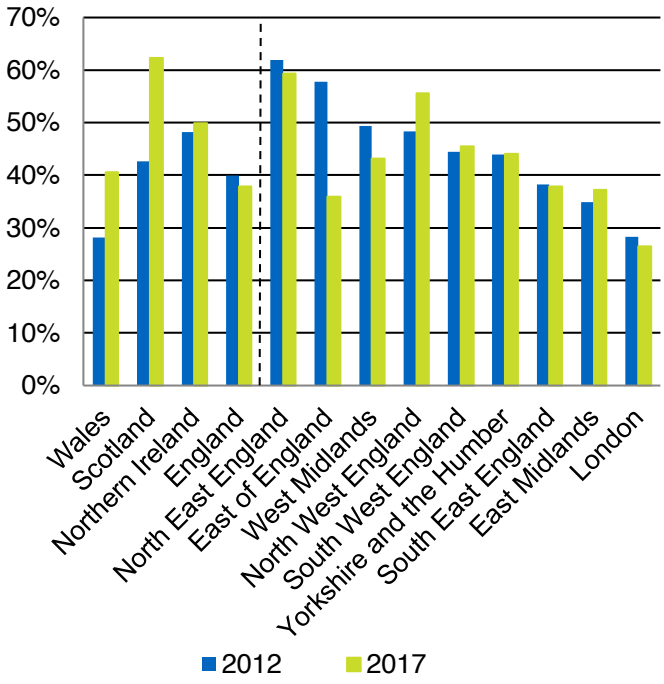


Figure 27: Proportion of NHS-funded treatment cycles by nation, 2009–2017



In 2017, Scotland had the highest proportion of NHS-funded treatment cycles at 62%, followed by Northern Ireland, Wales and England at 50%, 39% and 35%, respectively. Importantly, Northern Ireland, Wales and Scotland have seen an increase in NHS funding for fertility treatment since 2012 (Northern Ireland: 48% to 50%. Scotland 42% to 62%, Wales 28% to 39%). In contrast, there has been a slow decrease in NHS-funded fertility treatments in England (from 39% in 2012 to 35% in 2017).

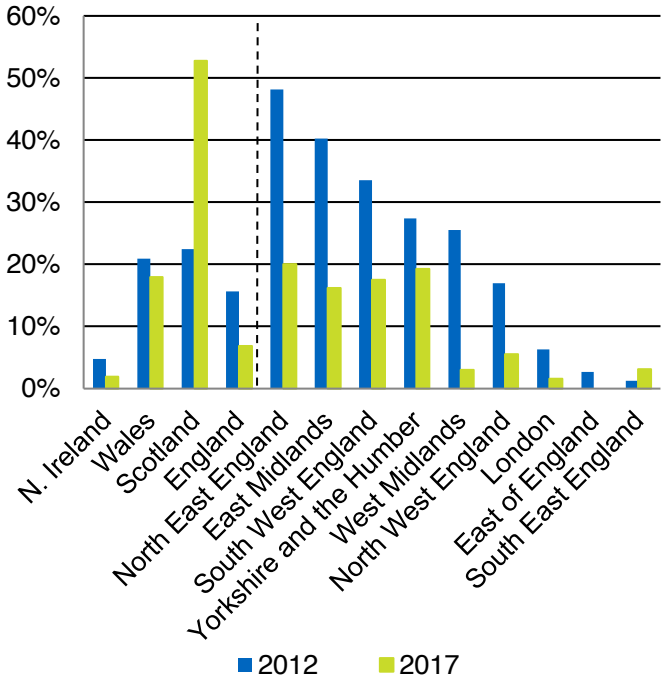
Figure 28: Proportion of NHS-funded IVF by nation and English region, 2012 and 2017



Looking at NHS funding changes for IVF treatment, we see minor changes in NHS-funded treatment numbers in most English regions and Northern Ireland. NHS-funded treatment cycles have decreased dramatically in East of England over the last five years from 58% in 2012 to 36% in 2017.

In contrast, NHS-funded IVF treatments have increased in both Scotland by 43% in 2012 to 62% in 2017 and in Wales from 28% in 2012 to 41% in 2017.

Figure 29: Proportion of NHS-funded DI by nation and English region, 2012 and 2017



While NHS-funded IVF treatment cycles have remained relatively stable across the UK, apart from a few exceptions, there have been dramatic changes in NHS-funded DI treatment cycles across the whole of the UK. There have been large reductions in NHS-funded DI cycles in North East England, East Midlands and West Midlands (-28, -24 and -22 percentage points, respectively). However, Scotland has experienced a steep increase in the proportion of DI cycles funded by the NHS (+30 percentage points). This is likely due to CCG funding changes in English regions, and Scotland's increase in NHS funding.

Appendix A: Methodology

Clinics in the UK are required by law to provide information to us about all licensed fertility treatments they carry out. We hold this information on our Register, which contains information about fertility patients, the treatment they received and its outcome. Results are published according to the year in which the cycle was started.

The information that we publish is a snapshot of data provided to us by licensed clinics at a particular time. The figures supplied in this report are from our data warehouse containing Register data as at 22/01/2019.

By this date, clinics are legally required to have submitted all records of 2017 births. At the time of running this report, however, there were circa 1,000 outcomes not yet reported. Therefore, 2017 data may yet be subject to change, but are expected to be correct to within one percentage point for large numbers of treatments (>c500).

As our database consists of a live register and we rely on accurate reporting from clinics, there are always missing outcomes and information may be subject to change.

As clinics may submit data at any time, the figures published here may differ slightly to those published before or in the future. Clinic-specific data is published on our website's clinic search tool, Choose a Fertility Clinic.

Understanding differences in birth outcomes

Our data is presented by the year the treatment cycle started, not the year in which a resulting pregnancy or birth was reported. Other data providers, such as the Office for National Statistics (ONS), publish birth rates according to the year the child was born.

There are different ways to account for the outcomes of treatment. Our live birth data counts all births where one or more babies were born showing some sign of life, including those who go on to die within the first month of life (neonatal deaths). Our multiple birth data counts only births where two or more babies were born alive, including those where one or more of the babies died within the first month of life.

Still births – where a baby is born after 24 weeks gestation showing no signs of life – are not included in either live birth or multiple birth counts in the period covered by this report due to the way clinic success rates are currently reported.

This means that a multiple pregnancy which results in the birth of one live baby and one stillborn baby is not counted within our data as a multiple birth. The ONS however, classes a multiple birth as a pregnancy resulting in the birth of more than one baby, whether alive or stillborn.

Age bandings and percentages

We have broken down most of the results presented here into standard age groups. The majority of cycles performed are in patients aged under 40 and as the age increases, the number of patients in each group decreases. In groups where the numbers are less than five, identification of patients becomes a risk and so we aggregate age groups to make their size larger.

If there's only a small number of patients in an age group, it can make results appear to be very changeable when expressed as a percentage. For instance, one year we may see that from 1,000 cycles performed in the youngest age group, there were 300 live births. This would give a live birth rate of 30%. We may see in the same time period that only 10 cycles were performed in the oldest age group, three of which resulted in live births. This also results in a live birth rate of 30%.

If the number of cycles stayed the same in the subsequent year, but one fewer patient in each age group had a live birth, the percentages would change to 29.9% for the younger patients (barely changing) and to 20% for the older age group (it appears the rate has dropped dramatically). As larger groups are less affected by small changes (possibly caused by chance occurrences), they tend to remain steadier.

Live birth rate and multiple birth rates

All the birth rates we quote in this report are for one full calendar year. They are calculated as follows:

1. Birth rates per embryo transferred: the number of births divided by the sum of embryos transferred for treatment cycles starting in that year.
2. Birth rate per treatment cycle: the number of births divided by the number of treatment cycles started.
3. Multiple birth rate: the percentage of all live births resulting from treatment cycles started in that year which resulted in the birth of more than one live baby.

We use per embryo transferred to measure IVF birth rates as we believe it is the appropriate measure of a clinic's practices and success. The data for IVF PTC birth rates is available in the underlying data tables for this report for those wishing to compare this measure to previous years. DI birth rates are reported as PTC as no embryos are transferred in this procedure.

Why do we use 'cycles' and 'treatment cycles'?

Patients undergo fertility treatment for a range of reasons:

- with the intention of becoming pregnant as soon as possible (most patients)
- fertility preservation (a small but growing number of patients)
- with the intention of donating eggs or embryos.

The term 'cycle' covers all the interventions that are conducted at a fertility clinic, regardless of whether the patient intended to become pregnant as soon as possible. This includes fertility preservation, donation, and treatment.

The term 'treatment cycle' includes only those cycles where the patient recorded on their registration form that they intended to become pregnant as part of their treatment (IVF, DI and egg sharing cycles are always treatment cycles).

A note on fresh and frozen cycles

When we refer to fresh and frozen cycles, we're speaking about whether a fresh or a frozen embryo was transferred in a treatment cycle, rather than whether a fresh or frozen egg was used. A freeze cycle is not the same process as a frozen treatment cycle. The former is a procedure in which eggs are extracted for the purposes of storing unfertilised eggs. The latter refers to a treatment whereby a frozen embryo is transferred to the uterus during IVF.

Appendix B: Background information

How we quality assure our data

Guidance note 005 in the HFEA Code of Practice sets out the legal basis and requirements which govern our interaction with licensed clinics and third-party providers. We work closely with clinics and third-party systems to ensure the importance and guidance around submission of Register data is understood through stakeholder groups, workshops and sharing good practice.

We use additional quality assurance processes, including:

- manually validating data submissions
- carrying out regular quality assurance checks on data through the inspection process
- publishing non compliances with data quality issues in inspection reports on our website
- where relevant, reviewing quality (validation) reports and targeting clinics for audit where irregular data has been submitted.

Change to data verification

Historically, we have undertaken a verification exercise in addition to the validation and quality assurance processes we undertake on an ongoing basis. This verification exercise requires clinics to review and sign off their submission confirming its accuracy.

In this 2017 fertility trends report, we have not verified data from July 2016 to December 2017. This is to ensure that we are able to provide relevant, timely and useful information to the public, professionals and patients. We have judged that the quality of our validation processes and legal basis upon which we collect data will result in accurate national level statistics from clinics.

How to access further data

The data in this publication have, in most cases, been presented as percentages to draw comparisons and maintain understanding for lay readers. If you would like to access the absolute figures, these are available to download as an Excel file from our website.

We are keen to engage with researchers and research organisations to gain the maximum benefit from the data we hold.

We publish an anonymised Register on our website which can be used to answer most types of research questions. If you are a researcher at a UK institution, you may be able to apply for access to identifiable data for a specific project. Please contact the Intelligence team if you would like further information.

Revisions policy

No revisions are planned to this publication unless errors are found, which will be corrected.

Contact us regarding this publication

Media: press.office@hfea.gov.uk

Statistical: intelligenceteam@hfea.gov.uk

Appendix C: Detailed glossary

In vitro fertilisation

In vitro fertilisation (IVF) is currently the most common fertility treatment used by patients. It's used by heterosexual couples who are unable to conceive without medical assistance or intrauterine insemination (IUI). It can be used by single patients or patients in same-sex relationships (in cases where they are unable to use IUI or wish to do reciprocal IVF (a form of egg sharing) and patients requiring pre-implantation genetic diagnosis.

IVF involves collecting a patient's eggs and fertilising them with sperm in a laboratory to create embryos. Often several embryos will be created through fertilising the eggs and those not transferred can be frozen for patients to use in later treatment.

Intrauterine insemination

Intrauterine insemination (IUI) is a type of fertility treatment in which high quality sperm are separated from sperm that are sluggish or non-moving. The sperm are placed directly into the uterus via a catheter.

IUI cycles can be stimulated (medicated) or unstimulated ('natural'). The former method uses medication to stimulate ovulation; her cycle is monitored and when ovulation approaches, the IUI procedure takes place. In unstimulated IUI, doctors monitor a patient's cycle via ultrasound scans and when ovulation approaches, IUI is performed.

Our data on IUI are not as comprehensive as DI and IVF treatment. This is because it's not a legal requirement for us to record IUI because it does not involve embryos or donated sperm or eggs.

Donor insemination

Donor insemination (DI) is IUI treatment using donor sperm.

It's used by patients for several reasons: these include single patients or same-sex couples who do not have fertility problems but need to use donated sperm in treatment, or couples with unexplained or male factor infertility.

Pre-implantation genetic diagnosis

Pre-implantation genetic diagnosis (PGD) is a treatment which involves testing the genes or chromosomes of embryos for a specific genetic condition. Embryos which have been tested and are free of the condition are placed in the uterus and allowed to develop as they would in conventional IVF.

It's not a widely used treatment as PGD is often only used when it is recognised that parents carry an inheritable condition.

As the embryos need to be tested in a lab, patients using PGD need to have IVF, even if they have no fertility problems. Therefore, PGD success rates are often higher when compared with IVF cycles that are used to treat infertility, particularly due to the majority of PGD patients being below 35 years old.

Egg freezing

An egg freezing cycle is a treatment where a patient has their eggs collected and frozen. There are a variety of reasons why someone may choose to freeze their eggs. Most people freezing their eggs are those who would like to 'preserve' their fertility, ie, freezing eggs when fertility is still high based on age, and using eggs later, when fertility may have declined but frozen eggs remain viable because they were collected when a patient was younger.

Egg freezing can also be used by patients with cancer and transgender patients for fertility preservation. We call this a 'cycle' rather than a 'treatment cycle' because the patient is not intending to immediately use the resulting eggs for an embryo transfer. A thaw cycle is when patients use previously frozen eggs in an IVF treatment cycle.

Egg sharing

Egg sharing is when a patient who is already undergoing IVF treatment donates some of their eggs to the clinic.

Reciprocal IVF, a form of egg sharing, is a procedure (mostly used by women in same-sex relationships), whereby one of the partners has their eggs collected and fertilised with donor sperm. The embryo is transferred into the egg donor's partner who gestates and gives birth to the baby.

Surrogacy

Surrogacy is the process of a patient carrying a baby on behalf of another person or couple. Surrogacy may be appropriate for women with a medical condition that makes it impossible or risky for them to be pregnant and/or give birth. It's also a popular option for male same-sex couples or single males who want to have a family.

In most cases, a surrogate is not genetically related to the baby they gestate and give birth to. A donor egg is fertilised by one of the partner's sperm (in the case of male same-sex surrogacies), or a heterosexual couple's egg and sperm are mixed, and the resulting embryo is transferred into the surrogate's uterus.

There are a few cases where the surrogate is both egg donor and surrogate. It's important to note that we do not regulate surrogacy but we do collect data from clinics when a patient is registered as a surrogate and undergoes IVF or DI treatment.

Multiple birth

A multiple birth (twins, triplets or more) is the single biggest risk to the health of patients undergoing IVF and their babies. This is because multiples are six times more likely to be born prematurely than single babies, which can lead to long-term health problems such as difficulty breathing, cerebral palsy and other physical and learning difficulties.

Patients carrying more than one baby are at an increased risk of miscarriage, high blood pressure (hypertension), pre-eclampsia (a problem with the placenta), gestational diabetes and caesarean section. The risk of death in pregnancy is also 2.5 times higher.

IVF success rates per treatment cycle (PTC) can be improved via the transfer of more than one embryo into the uterus, but this procedure runs the risk of a multiple birth. In 2008, around 25% of IVF births were multiples compared to the 2% that occur naturally. Over the last decade, we have worked with the sector to reduce the multiple birth rate with the goal of reaching 10%, a figure we have now reached.

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