



Best Age for Conception (women and men) and Freezing Eggs controversies

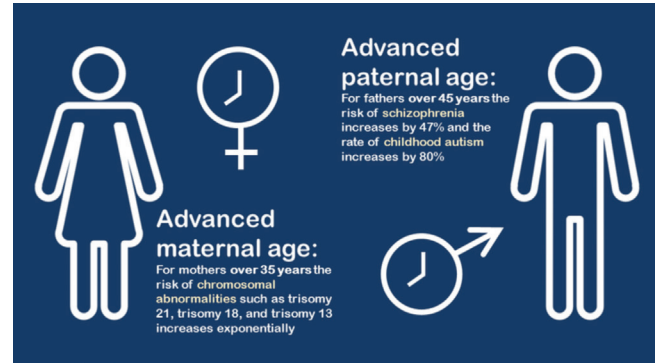
(Source: compilation of notes by Françoise Freedman from articles in The Conversation 2016-2020)

Over the past three decades, there has been a steady increase in the average age of parents. Advances in fertility science mean that people can, literally, put their eggs or sperm on ice and delay the start of parenthood. Many large companies, such as Apple, Facebook and Google, now offer egg freezing to employees¹ as part of their healthcare package. Putting off having a baby has never been easier or more socially acceptable. But is it a good thing?

There are three things to consider. Will your child be healthy? Will you get pregnant? How much will it cost?

Parents have a moral obligation² to give their child the best start in life. But children born to mothers³ over the age of 35 and fathers⁴ over the age of 45 are at greater risk of having genetic and neurodevelopmental disorders, such as schizophrenia and autism, which arguably affects the child's quality of life.

The ticking biological clock. Charlotte Walker, Author



Also, older parents are more likely to need assisted reproduction, such as IVF, which is associated with babies being born early or with low birth weight. Babies born via IVF are also at higher risk of cardiovascular and metabolic disease⁵ in later life.

If prospective parents freeze their eggs or sperm when they are younger, they can reduce some age-associated risks but not those due to IVF. The method of fertilisation in IVF with frozen eggs is intracytoplasmic sperm injection (ICSI), where sperm is injected into the egg. ICSI can also increase the risk of birth defects⁶ in children. Using ICSI is also more common in older men where sperm motility is poor⁷. Again, not the best start in life.

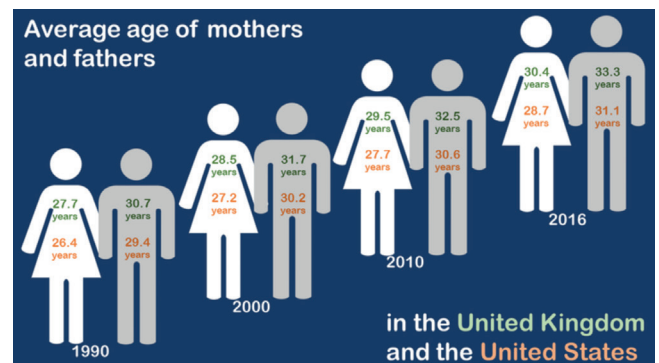
Read more: Tick-tock – for healthy mums and kids, dad’s age counts⁸



So you’ve decided to wait

If you want to wait to have children, you are not alone.

Increasing age. Charlotte Walker, Author



1 <https://www.businessinsider.com/egg-freezing-at-facebook-apple-google-hot-new-perk-2017-9?r=US&IR=T>
 2 Procreative beneficence: why we should select the best children <https://www.ncbi.nlm.nih.gov/pubmed/12058767>
 3 Impact of maternal age on obstetric outcome <https://www.ncbi.nlm.nih.gov/pubmed/15863534>
 4 Advanced paternal age effects in neurodevelopmental disorders <https://www.nature.com/articles/tp2016294>
 5 The longer-term health outcomes for children born as a result of IVF treatment <https://academic.oup.com/humupd/article/19/3/232/727781>
 6 Reproductive Technologies and the Risk of Birth Defects <https://www.nejm.org/doi/full/10.1056/nejmoa1008095>
 7 Consistent age-dependent declines in human semen quality <https://doi.org/10.1016/j.arr.2014.10.007>
 8 <http://theconversation.com/tick-tock-for-healthy-mums-and-kids-dads-age-counts-105962>



Most couples will fall pregnant after trying for a year. Although one in seven⁹ couples has trouble conceiving – and age is a big player in this. One in six women¹⁰ aged between 35 and 39 years of age will not conceive after one year. If their partner is over 40, this drops to more than one in four.

IVF is seen by many as a fail-safe way of conceiving, but its success is also governed by age. For a woman using her own eggs, the success of IVF over 40 is less than 10%¹¹.

The risks of delaying parenthood have been simulated with computer modelling¹². If a 30-year-old woman delays trying for a baby from age 30 until 35, her chances of falling pregnant are reduced by 9%, but IVF will only compensate for 4%.

And if you want to freeze eggs, great. Except women produce fewer eggs (“oocytes”) as they get older, so older women may need more rounds of stimulation to store the eight to ten eggs¹³ needed for a reasonable chance of a successful birth – and this can be extremely expensive.

Read more: Hard Evidence: does fertility really ‘drop off a cliff’ at 35?¹⁴



What will it cost you?

Although IVF is expensive, there are also other significant indirect costs of having a child.

The “motherhood wage penalty” is often cited in economic discussions about the effect of motherhood on women’s careers. It is the loss of earnings women are subjected to as they move into a non-paid job for a period of time. There is some evidence to suggest that women can earn more¹⁵ by delaying motherhood from their early twenties to early thirties.

But this wage penalty does not appear to be gender specific. A paternity quota of parental leave was introduced by the Norwegian government in 1993, and a study found a similar negative effect on the earnings of stay-at-home fathers.¹⁶

The bottom line is, if you take time out to have a family there will be a drop in earnings.

When to start?

The scientific data is clear. The “right” age to have a child according to your biological clock is under 35¹⁷ for women and under 40 for men.

More than 75%¹⁸ of young people underestimate the impact of age on male and female fertility – yet only 27%¹⁹ of doctors discuss this with patients aged 18-34 years who wish to delay childbearing for social reasons. There needs to be a greater awareness about the risks of delaying family planning, and family doctors should play a more proactive role in this.

So, ultimately, if you want to have a child, the right age may be sooner than you thought.

Everyone’s favourite property expert and house hunter extraordinaire, Kirstie Allsopp, raised some eyebrows when she recently suggested²⁰ that women’s fertility “falls off a cliff” when they hit 35. Her argument was that women should prioritise pregnancy and childbirth before careers. But does fertility really drop so quickly as women age – and specifically after 35?

9 <https://www.nhs.uk/conditions/infertility/>

10 Increased infertility with age in men and women <https://www.ncbi.nlm.nih.gov/pubmed/14704244>

11 <https://www.hfea.gov.uk/treatments/explore-all-treatments/in-vitro-fertilisation-ivf/>

12 Can assisted reproduction technology compensate for the natural decline in fertility with age? <https://academic.oup.com/humrep/article/19/7/1548/2356634>

13 Why all women should freeze their eggs <https://www.ncbi.nlm.nih.gov/pubmed/27031375>

14 <http://theconversation.com/hard-evidence-does-fertility-really-drop-off-a-cliff-at-35-29113>

15 The effects of motherhood timing on career path <https://doi.org/10.1007/s00148-009-0296-x>

16 The Impact of Paternity Leave on Fathers’ Future Earnings <https://link.springer.com/article/10.1007/s13524-013-0233-1>

17 Which career first? <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1215541/>

18 Fertility facts, figures and future plans: an online survey of university students <https://doi.org/10.1080/14647273.2018.1482569>

19 Counseling patients on reproductive aging and elective fertility preservation <https://doi.org/10.1007/s10815-018-1273-7>

20 <http://www.theguardian.com/tv-and-radio/2014/jun/02/kirstie-allsoy-young-women-ditch-university-baby-by-27>

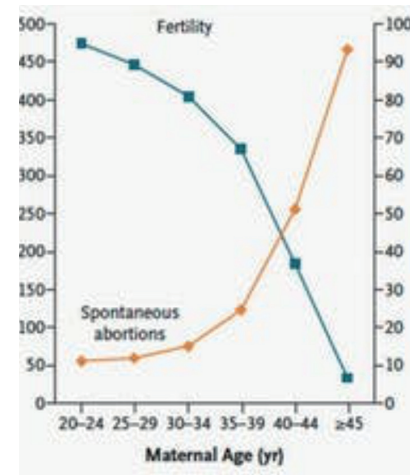


Female fertility does fall with advancing age and, at the same time, the likelihood of losing a pregnancy increases. There are biological reasons for this. Women are born with a finite number of eggs, or oocytes, within the ovary. As women age both the number and quality of the remaining eggs declines. However, there is no “cliff” – rather a gradual decline.

What is fertility?

Fertility is defined as the rate of childbearing in a population. It remains relatively stable up to the age of 30, with about 400 pregnancies for every 1,000 women (40%) not using contraception for one calendar year. It then begins to decrease²¹ until around the age of 45, when only 100 women will conceive for every 1,000 (10%) not using contraception. Miscarriage rates also steadily increase. About 10% of women will miscarry at the age of 20, compared to 90% or more at 45 years of age or older.

Fertility and miscarriage rates as a function of maternal age. Linda Heffner et al/ *Nejm*²²



Studies have shown²³ that 82% of couples will conceive within a year of trying and that this rises to 90% after two years where the woman is in the 35–39 age range.

These figures are not that dissimilar to those seen in women aged 19–26 – 92% of whom conceive within one year and 98% within two years. These figures show that most couples fall pregnant in the first year and of those who do not conceive, about half will do so in the second year. This is why couples should seek assessment and referral to a fertility clinic after trying for 12 months. At this stage tests can be undertaken to exclude obvious problems and if reassuring²⁴, the couple can continue trying for that second year.

Other risks

When we look at age it is not only fertility and pregnancy outcome that we must consider. The maternal risks associated with pregnancy also increase, especially in women aged 40 or more when there is an increased chance of death. One of the main risk factors is hypertensive²⁵ disease (heart problems that occur because of high blood pressure) which is twice as common among women aged 40 or older compared to younger women.

The risk of delivering a low birth weight or preterm infant is also increased in women in their 40s and about 1% of babies are stillborn. However, most pregnancies proceed uneventfully and women should be reassured that even after 40 the majority will not have complications and will deliver healthy babies.

It is probably more important to understand is that each and every woman’s fertility is different at the same age and, to some degree, impossible to predict.

Age and IVF

In developed countries about one in seven heterosexual couples are affected by infertility. Some will require assistance either because they have not conceived within two years or because there are identifiable problems such as blocked Fallopian tubes, endometriosis, polycystic ovaries, and/or low numbers of poorly motile sperm.

IVF was introduced to bypass tubal problems and ICSI, where a single sperm is injected into an egg, to address fertility problems in men²⁶. Both ultimately involve the transfer of an embryo, or fertilised egg, back into the woman.

We cannot predict which couples will need IVF but the chances of successful treatment do fall with advancing female age and more so from 35. Pregnancy rates are fairly stable²⁷ (30-35%) for each embryo transferred up to the age of 30, but then fall to 20% by 40 and are only 5% by 45. But women who elect to have an egg from a donor maintain

21 http://www.extendfertility.com/downloads/documents/NEJM_AdvancedMaternalAge_HowOldIsTooOld.pdf

22 *Advanced Maternal Age — How Old Is Too Old?* <http://www.nejm.org/doi/full/10.1056/NEJMp048087>

23 http://journals.lww.com/greenjournal/Fulltext/2004/01000/Increased_Infertility_With_Age_in_Men_and_Women.10.aspx?blacklove

24 *Fertility problems: assessment and treatment* <http://www.nice.org.uk/guidance/CG156>

25 *Hypertensive heart disease* <http://www.nlm.nih.gov/medlineplus/ency/article/000163.htm>

26 <http://www.resolve.org/diagnosis-management/infertility-diagnosis/male-factor.html>

27 *Fertility problems: assessment and treatment* <http://www.nice.org.uk/guidance/CG156>



the higher pregnancy rate seen in younger women (30-35%) and the much-reduced risk of miscarriage and foetal abnormalities. This is why to be an egg donor you must be younger than 36.

Taking referral, and the work up required before IVF, a woman using her own egg ideally needs to start trying in her early 30s to ensure she is treated before she turns 35. In the UK, NICE recommend three cycles²⁸ of IVF on the NHS, but only one between the ages of 40 and 42.

For IVF, then, a woman's age does start to become a consideration. Having a family is a very personal decision, and timing is just as important. Neither should be influenced by age but we cannot ignore biology or IVF statistics. But there are no guarantees – trying at an earlier age might increase your chances but it still won't work for everyone.

The best two tests to predict how a woman will respond to ovarian stimulation drugs appear to be one that measures a hormone known as AMH and an antral follicle count scan. Each follicle contains an egg and produces some AMH so a high measure of either indicates a better response to drugs and IVF success. People are increasingly using these tests to try to measure fertility and predict its end. But they weren't developed to assess a woman's fertility, and there are no robust studies to support such predictions.

Even the menopause isn't sudden

The ultimate fertility "cliff" that all women face is the menopause – or final period – which, for most women, lasts many years. Most women enter the menopause in their late 40s or early 50s. Fecundity in the time leading up to the menopause, known medically as the peri-menopause, is low but women require contraception as pregnancies still occur.

So when should women try for a family? Taking everything into consideration, the best compromise would be the decade between 25 and 35, as Linda Heffner has suggested²⁹. Clearly this is neither appropriate nor opportune for all women but gives some guidance for those who have choice. An increasing number of women are having IVF and freezing their own eggs as a back-up. Social egg freezing³⁰ is not only increasingly in popularity but has also become a much more successful process³¹, with 80% of eggs now surviving the process.

So what does this all mean? The take home message is that yes, fertility does fall with advancing age but there is no "cliff" – most couples will conceive within one to two years of trying, even at 40.

Egg freezing: the reality of putting your fertility on ice³²



Six things you should know if you are considering freezing your eggs³³



Fact Check: Is freezing human eggs really 'extremely unsuccessful'?³⁴



Was egg-freezing a perk too far from Facebook and Apple?³⁵



28 IVF Overview <http://www.nhs.uk/conditions/ivf/pages/introduction.aspx>
 29 Advanced Maternal Age — How Old Is Too Old? <http://www.nejm.org/doi/full/10.1056/NEJMp048087>
 30 Clinical application of oocyte vitrification <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0034444/>
 31 <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Gynecologic-Practice/Oocyte-Cryopreservation>
 32 <https://theconversation.com/egg-freezing-the-reality-of-putting-your-fertility-on-ice-101223>
 33 <https://theconversation.com/six-things-you-should-know-if-you-are-considering-freezing-your-eggs-94039>
 34 <https://theconversation.com/fact-check-is-freezing-human-eggs-really-extremely-unsuccessful-86729>
 35 <https://theconversation.com/was-egg-freezing-a-perk-too-far-from-facebook-and-apple-33212>