

**CHECK
OUT
THOSE
SWIMMERS!**





As concern about male infertility grows, more and more young men are using home-testing kits to analyse their sperm — then freezing it for later. *Ellie Austin* reports

For women in their thirties the issues surrounding fertility are all too apparent. In a friendship group, someone is usually pregnant while somebody else is desperate to be. Conversations about hormone levels and ovulation windows are frequent and candid. Even those women who are blissfully happy in their decision not to procreate often become fluent by association in the language of IVF, egg freezing and conception folklore (a friend currently performs headstands after sex to usher her partner's sperm in the right direction).

The same cannot, in general, be said of men of a similar age. In his late twenties Ciaran Hannington and his wife, Jenn, had spent a year trying to conceive when they decided to seek medical advice. As doctors poked and prodded Jenn, one eventually suggested they should measure Ciaran's sperm count. They discovered it was dismally low. "When the results came in, the doctor said, 'There's not much we can do for you here,'" recalls Ciaran, a teacher, at their home in Yorkshire. "I said, 'What do you mean?' I had no idea."

The World Health Organisation considers a normal sperm count to range from 15 to 250 million sperm per millilitre (men produce about two to five millilitres of semen per ejaculation). The doctor informed Ciaran, now 36, that his count was "about 1,500" and that only 1 per cent of that number were strong enough to have a shot at creating a baby. "I suddenly felt out of my body, but at the same time I'm thinking, 'They've got it wrong.' I was in denial for a long time." Initially, he tentatively tried to confide in a couple of friends. "It was either washed over with humour or the subject was quickly changed, so I kept to myself about it. I stopped socialising, I became very depressed. In the end I lost all belief in myself and didn't feel like a man... I just ended up shutting down."

Ciaran's experience is illustrative of the stigma that still exists around male infertility. This collective discomfort is one of the reasons behind a rise in so-called sperm start-ups — biotech companies focused on male reproductive health that have proliferated in the United States in recent years and are now springing up here.

This is big business: the global sperm-count test market is predicted to surpass £2.8 billion by 2031. The goal? To take male reproductive health mainstream by making sperm testing and freezing a routine and embarrassment-free process. Rather than visit a hospital room with its pile of dog-eared porn magazines, sperm samples can be produced at home and then posted to a laboratory. Currently, sperm testing is available on the NHS only for men who have been attempting to conceive for 12 months. One in seven heterosexual couples in the UK experiences fertility problems.

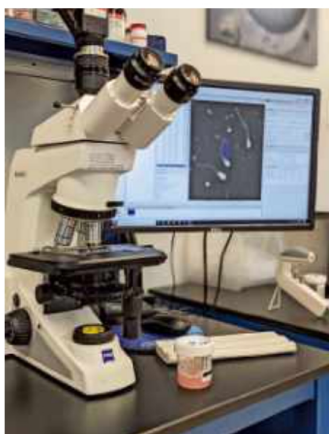


Ciaran Hannington felt shame after his low sperm count hindered starting a family with his wife, Jenn

£2.8bn

The global sperm-count test market is predicted to surpass this amount by 2031

A sperm sample collected from an at-home testing kit is analysed at the Legacy laboratory



For men struggling to conceive, at-home testing can help to gauge whether their sperm is a factor. As well as count, sperm concentration (how many swimmers are present in the semen), motility (the ability of said swimmers to travel swiftly and in a straight line) and morphology (the shape of individual sperm) are used to determine this. If results indicate poor sperm health, many start-ups offer virtual consultations with doctors to discuss lifestyle changes. Men can then test again in around three months — the time it takes for new sperm to be generated — to see if their results have improved.

Much like egg-freezing, sperm-freezing is increasingly popular among young men, usually in their twenties and thirties, who want to preserve their fertility for the future. While the majority of men produce sperm from the onset of puberty for the rest of their lives, sperm quality declines over time, a process that is thought to begin between the ages of 35 and 40. The average age to father a child in the UK is 34 but many couples are waiting until their late thirties or even early forties to try for children. A new men's health clinic, London Andrology, recently surveyed 1,003 UK adults and found that more than one in four (26 per cent) of those under 35 are considering freezing sperm or eggs while they are still young to help with conceiving later in life.

This is not a new idea: last month a 47-year-old British man fathered a child using sperm he had frozen more than 26 years ago, in what is thought to be the UK's longest gap between collection and birth. Peter Hickles provided the sample on June 5, 1996, after he had Hodgkin's lymphoma diagnosed at the age of 21. Data released this summer indicates that fresh and thawed sperm result in similar rates of pregnancy when used in artificial insemination.

Another reason why sperm is becoming big business can be traced back to 2017 when a study by the Hebrew University of Jerusalem went viral, announcing that sperm counts in the western world had more than halved between 1973 and 2011. Mooted explanations for this collapse included rising obesity rates and men's increasingly sedentary lifestyles. An emphasis was also placed on the possible impact of chemical additives found in everyday items such as cosmetics, non-stick frying pans and food packaging. A number of studies, including one by researchers at Imperial College London, provide evidence that exposure to these hormone-meddling substances risks compromising a man's ability to produce healthy sperm.

In her 2021 book, *Count Down*, Shanna Swan, a professor of environmental medicine and public health

at the Icahn School of Medicine at Mount Sinai in New York City and one of the authors of the aforementioned study, wrote that the “alarming rate” at which sperm counts are plummeting “could mean the human race will be unable to reproduce itself if the trend continues”. Some took issue with this forecast of an imminent Spermeddon. A group of Harvard researchers stated that the study was based on “questionable assumptions”, such as the belief that sperm count alone is an accurate predictor of overall male fertility.

Other experts say that advances in the way sperm is counted over the past 40 years could give a false impression that male fertility is in free fall. Dr Allan Pacey, professor of andrology (that’s men’s health with a focus on the reproductive system) at the University of Sheffield, has been analysing sperm for 30 years. “I’ve got better at it [counting] with time,” he tells me. “When laboratories get better, results [sperm counts] go down because errors always lead to overestimation.”

As the debate raged, a handful of health-conscious, tech-savvy millennials spotted a business opportunity in repackaging the conversation around male fertility for a generation raised on online shopping and instant gratification. Khaled Kteily, 33, a Lebanese-Canadian Harvard graduate and now the founder and CEO of Legacy, based in Boston, was one of them. In his twenties, an accident involving scalding coffee left Kteily with second-degree burns on his genitals and fears for his ability to start a family. Ultimately, his fertility wasn’t affected but “that was my lightbulb moment”, he tells me over iced tea in New York’s West Village. “It sent me down this whole path.”

Seven years on and “sperm is the zeitgeist right now” he says. He founded his company in 2018 and has raised \$45 million in venture capital. Legacy counts Justin Bieber, the Weeknd and Orlando Bloom as investors. “We’ve had about 20,000 clients come to us for a range of services, primarily freezing and testing. We’re at about a 50-50 split [for each service].”

Legacy’s products are currently available only in America and range from \$295 for a single semen analysis to \$3,995 for an “advanced” analysis of three samples, plus a lifetime’s cryogenic storage. Test kits arrive in stylish spinach-green boxes and include tools to keep sperm fresh as it is shipped back to the lab. Results are delivered to a client’s smartphone within a couple of days — no human interaction required.

Kteily’s most frequent customers are “men who want to have kids soon” but freezing is also popular among “men getting a vasectomy, men going through cancer treatment, men transitioning to become transgender women”. While most clients fall into the 28 to 35 age bracket, the company accepts sperm from men of all ages. To date, its oldest customer is a 74-year-old gent who “was getting married for the third or fourth time”.

There’s a general assumption that men don’t have a biological clock to contend with. Alec Baldwin recently fathered his eighth child at the age of 64. Mick Jagger welcomed a son at the age of 73. However, Professor Sheryl Homa, a clinical scientist based in London, views these celebrities as genetically blessed anomalies.

“I think he [Jagger] is quite unique. Don’t forget that he would have conceived with a much younger woman. A younger woman’s eggs are more likely to repair any damage in the DNA [of an older man’s sperm].”

Research by Stanford University shows that men over the age of 45 have a higher risk of fathering babies born prematurely and in need of neonatal intensive care. There are also studies that suggest children of



Above: Khaled Kteily, the founder of Legacy, whose sperm test kits, below, arrive in smart packaging, bottom



older fathers could be more likely to develop autism, Down’s syndrome and schizophrenia, but the evidence remains inconclusive. When treating older men, Homa explains, it is often difficult to determine whether deficient sperm results from age, poor lifestyle choices (unhealthy diet, high alcohol consumption, smoking, infrequent exercise), or a combination of both factors. “I recently saw a couple of much older men,” she says. “One had no DNA damage in his sperm but was very fit, with no underlying illnesses. The other did have DNA damage. He was overweight, he had several underlying conditions, including type 2 diabetes and hypertension. It’s difficult to pinpoint if it’s solely age [that causes sperm quality to decline] or whether the conditions and choices that led to these other conditions also contribute.”

Saad Alam, 40, a biotech company founder from New Jersey, noticed his body change when he hit his mid-thirties. His energy levels and libido plummeted. He struggled to concentrate and gained weight, despite working out six days a week. When a doctor diagnosed him with low testosterone and prescribed medication that he warned could suppress sperm production, Alam decided to freeze his sperm — four times. “Because I work in the tech health industry, I like to try every product I find. I ended up freezing [samples] at a couple of bricks-and-mortar clinics and a couple of online ones,” he says. How did the experiences compare? ►

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"You go into a bricks-and-mortar clinic and there's a little door with frosted glass. There's a massive [TV] screen full of porn. There's someone handing you a cup. On the one hand, it feels more comfortable knowing that what you're giving them is going directly into a freezer. On the other hand, it's a very jarring experience and makes you want to rush the process. I think they [scientists] say that if you take some time, you can produce a better sample." (There is no concrete evidence to support this, although short and long-term stress can impact sperm quality, according to research.)

Keitly describes himself as "a firm believer that all [young] men should be freezing their sperm. To me, if it's something you can do when you're at your peak fertility in your twenties — masturbate at home and you're set up for the rest of your life — it is an absolute no-brainer." He lives by his own philosophy. Now 33, he froze sperm at 26 that he plans to thaw when he's ready to become a father. There have already been "about ten" babies born from sperm frozen with Legacy, he says.

His approach is divisive. Dr Pacey, who is listed on Legacy's website as an adviser, believes it's "completely crackers" to suggest that freezing should become a widespread practice among healthy men. "It's a great business model to make men scared and encourage them to do that," he says. While he agrees that online sperm clinics can play an important role in "making testing more accessible", he cautions against becoming a fertility obsessive. "My worry with some of these companies is that they play on the 'worried well'."

Opinion is also split on the accuracy of at-home tests. "I think they're very reliable," Swan tells me from her San Francisco lab. Homa, meanwhile, has questions about the integrity of a sample that has spent 24 hours in transit to a lab, even when carefully preserved. "The best way to get a valid result is in a laboratory where the semen is produced and tested within 60 minutes... As a scientist, I need to see more data... to see that when you have a sample in a preservative for a period of time, it produces the same results as a fresh sample."

For Pacey, the emergence of private sperm companies (Legacy has myriad competitors in the US including Fellow and YO Sperm) underlines the failure of "healthcare and education" to address male fertility head on. In the UK, fertility research projects targeting men receive significantly less funding than equivalent projects for women. In his 2021 BBC documentary *Stand Up to Infertility*, the comedian Rhod Gilbert found that there are about 200 andrologists in the UK compared with approximately 8,000 obstetricians and gynaecologists. As well as doing a blatant disservice to men, this disparity places a burden on women as the primary focus of investigation when a couple is unable to conceive. All this despite the British Fertility Society's estimation that men and women experience fertility problems in similar numbers.

When a couple has been struggling to conceive, it's common for women to "go through a battery of testing, regardless of whether or not they have a problem", says Mohamed Taha, the CEO and founder of Mojo, an at-home testing brand with labs in Sweden and England that relies on couriers to transport samples. Another option available to British men is ExSeed, which offers an immediate analysis via a device that links to smartphones. Mail-in sperm test Jack Fertility plans to launch in the UK next year.

Has Taha noticed a difference in attitude

THE IDEA THAT ALL YOUNG MEN SHOULD FREEZE THEIR SPERM IS "COMPLETELY CRACKERS" SAYS ONE PROFESSOR. "IT PLAYS ON THE 'WORRIED WELL'"

35+

The age at which sperm quality is thought to decline

The comedian Rhod Gilbert has worked to raise awareness of male infertility



between British and Swedish men? "We see a completely different mindset!" he laughs. "In Sweden men are super-proactive, they understand it takes two to tango, they are well educated on the subject. They can take a sperm test and there is no shame." And the Brits? "They don't talk about it. We offer virtual consultations [to discuss test results] and most of them have their cameras off. We see a lot of women ordering tests for their men." The company "mostly" markets to women, he adds.

Dismantling the social constructs that link a man's fertility to his virility and ego is complex. In her clinic Homa sees men who take anabolic steroids in a quest for bulging muscles. What they don't realise is that these steroids disrupt the body's hormone production, often resulting in reduced sperm counts. "They're using their body image as a way to prove they're virile," she says. "Ironically, they're seriously impacting their chances of having a family."

Saunas, hot baths and laptops balanced on laps can also erode sperm health ("We know damage is caused by excessive heat to the testes," Homa says). And aside from the usual suspects of smoking, drugs, alcohol and poor diet, there's another culprit. "I do see an awful lot of couples where the main problem is not enough sex," Homa says. Because we're all overworked, glued to screens, anxious about Covid or the cost of living? "I think so," she says.

Almost a decade after that miserable day in the doctor's office, Ciaran now has a six-year-old son and a daughter, who's two, thanks to a specialised form of IVF used in severe cases of male-factor infertility (the NHS covered the cost of this for their son after initial IVF rounds were unsuccessful; Ciaran and Jenn paid privately for the same treatment that led to their daughter), as well as a lifestyle overhaul. "It became really evident that my lifestyle — even just having a couple of beers — drastically impacted my sperm health," he says. At work his head teacher was sympathetic to his struggles "and removed me from the classroom for eight weeks before treatment. My stress levels dropped significantly. I was lucky."

Indeed, sometimes luck seems to be the only factor separating those who become fathers and those who don't. I've spoken to several men who took the same steps and received the same treatment as Ciaran, but still don't have a child. According to Homa, "sometimes there are genetic factors that we may not be able to identify".

Ciaran says he still feels "partly broken". "I can't quite do what other men can. But I've come to realise that it makes me no less of a man and I'm going to keep saying that in case there's a guy out there who listens to me." Conversation alone isn't going to stop us from hurtling towards Spermeddon, but it isn't a bad place to start ■