It's been forty years since the world’s first “test tube” baby entered the world, her name is Louise Joy Brown, and she was born on July 25, 1978. Brown was conceived through in vitro fertilization (IVF), in which an egg is fertilized outside the uterus and put back in to gestate. Since her birth, at least five million babies have been born with the help of assisted reproductive technology around the world. Since 1978, the number of methods in the reproductive toolkit has multiplied, the technologies have become more effective, and the treatment has become more affordable. People now often use a combination of IVF, artificial insemination, egg and sperm donation, and other techniques. The field changes rapidly. In a few decades, we’ve gone from IVF making headlines as a controversial and experimental fertility treatment, to being a routine part of many people’s lives.

Dr. Ashim Kumar is a physician specializing in fertility based in California. He describes our culture going through “stage two” of the reproductive revolution. “The pill allowed women autonomy over their bodies and the same sexual freedom as men,” he explains during our recent phone interview. “And now fertility treatment is allowing women to stretch their fertility window to align with men and it’s allowing people to create babies whatever their relationship status or their sexual orientation.”
Ironically, many women spend much of our most fertile years trying not to get pregnant. When does fertility actually start to decline?

It turns out that there is a lot of research on this, and some of it is conflicting. A 2004 study from the French Institute of Health and Medical Research found that three quarters of thirty-year-old women will conceive "naturally" within a year of trying. That goes down to two thirds by thirty-five and to less than half at forty. Assisted reproduction can change this.

Paula Brody is pregnant with twins, and she's fifty years old. She made the decision to pursue IVF after her best friend passed away from lung cancer. "I went to the cemetery after she passed away to see her plaque," Paula remembers. "It said beloved mother, sister, niece, friend, aunt, and I knew that if I got to the end of my life and I had not experienced being a mother, I would feel disappointed." Her IVF experience was complex, and draining. "I did at least six embryo transfers, and transferred probably over twenty embryos total. None of the them stuck except for one boy whose heart stopped at about week nine. These were the last two frozen embryos I had left--and literally my last chance at getting pregnant. Dr. Kumar put both of them in and the both stuck!" It is, she says, "a total miracle, without question."

So how many people struggle with fertility, anyway?

According to the CDC, one out of eight heterosexual couples have difficulty with fertility. It's very common. The CDC states that in the US alone, 68,000 babies were born with the help of assisted reproductive technologies in 2015. This Included IVF, artificial insemination, egg and sperm donation, egg and embryo freezing, and surrogacy.

If it's so common, why is there so much stigma around fertility trouble in our culture?

"It's the grieving process," says Dr. Kumar. "The first thing that happens is guilt. What did I do to cause this? What did I do to deserve this? Does it mean I'm a bad spouse? Does it mean that God doesn't want me to have kids? Does it mean I don't deserve to have kids? Why didn't I have a kid earlier? You think people are going to judge you."

Laura Morales remembers experiencing some of those feelings after being diagnosed with stage-four endometriosis, an extremely painful and common condition where the uterine lining grows on the outside of the uterus. She was told there was a less than ten percent chance she could conceive a child naturally, and she and her husband assumed IVF would be too expensive. "This caused lots of heartache and fear on my part because I didn't know if my husband would eventually give up on me because I wasn't able to bear his children." She was also devastated by the thought that her lifelong dream of becoming a mother would never come true. Then, Laura found out through a family member that her insurance covers four cycles of IVF. With the help of IVF at Western Fertility Institute, Dr. Kumar's practice, she became pregnant and gave birth to twins. Laura reminds us that "Infertility struggles can affect anyone. For all the women dealing with endometriosis: you're not alone."

What are some of the specific things that cause infertility?

Dr. Kumar explains that, in women, it can be either an egg issue or a uterus issue. Endometriosis, for example, is a uterus issue. "A lot of what we're getting now is diminished ovarian reserves," says Dr. Kumar. "That's probably the most common diagnosis that I have."

But it can also be low sperm count or another factor from the male partner. That was Kelli Han's experience. When she and her husband had trouble conceiving, they "went in and they checked me first (because they always assume it's the woman's fault). The doctor said I looked perfect," recalls Kelli. "Then they turned their focus to my husband..."
when they started a cycle with Dr. Kumar. “We got six healthy embryos, transferred one, and it took! Finally, after two years, we had our first positive pregnancy test!”

What is the biggest challenge in the field of fertility?

“Consistently, one of the things that’s been very difficult to address is the ovarian reserve issues,” explains Dr. Kumar. “We can fix the uterus, we can even, at the extreme, use a surrogate, but at the end if we’re out of eggs we have to use an egg donor, and that’s an emotionally much more difficult shift.”

What sort of genetic testing is used during these processes?

PGS, which stands for Preimplantation Genetic Screening. It’s a test done after the eggs are fertilized to determine whether they’re genetically normal or not. “With the genetic testing,” says Dr. Kumar, “being able to biopsy the embryos, the success rate of IVF is getting better and better because the most common cause for a failed IVF cycle is the embryo not being viable.” PGS testing can also determine the sex of the embryo.

How does sperm and egg donation fit into all of this?

A woman might use donated eggs for IVF if her eggs are no longer viable or if she has diminished ovarian reserves. Often, says Dr. Kumar, the decision to use donor eggs is one of the most emotionally fraught decisions his patients make. “Everybody wants to... conceive with his or her own gametes, and the idea of having to use donor eggs can be really disconcerting.” But in the end, Dr. Kumar reminds his patients, the sperm and the egg are just raw materials, and families are bound together by love, not DNA.

Hypothetically, could you do an IVF cycle with both donor eggs and your own eggs?

Yes, Dr. Kumar says he occasionally does “combined cycles.” “The first time I did this,” he says, “was for a woman who was forty-five and she made three blastocysts [a technical term for a fertilized egg].

And sperm and egg donation would also be useful in surrogacy, right?

Yes, and in some cases essential. Many same-sex couples, like Joseph Iori and his husband JC, who are patients of Dr. Kumar, rely on working with a surrogate and egg or sperm donation to have a child. It can be an enormous undertaking, and can cost a substantial amount. JC and Joseph started a GoFundMe account, took out a personal loan—their “baby mortgage,” as they jokingly call it—and received support from their parents. JC and Joseph became close with their surrogate through the tumult of multiple lost pregnancies. “We had the kindness of a friend to take the journey with us. She heard our story and wanted to help us make our dream a reality,” Joseph recalls. “We had two failed attempts before having our son. We didn’t just mourn our losses—a piece of hope that this would happen broke off of our hearts. On our third attempt we were pregnant!! Boy was it a glorious day! Once our sobs subsided JC asked what do we do now? I said tearfully ‘We need to start saving for his college tuition!’” In the end, it was all worth it. “We feel complete,” Joseph tells me via email. “We are a family now, a normal family: two dads, a little nugget, a few dogs, a cat and a few fish. Just your typical American family.”

What are some other, lesser known, forms of assisted reproductive technology?

Embryo adoption is one. Dr. Kumar gives an example: “I had a couple come in today who had conceived with the first donor egg cycle they did. They had a little girl, and then they ran out of embryos. So we got the same donor back, made the embryo, and this time they were able to make a lot more embryos. We put in two embryos and this couple had twins, a boy and a girl, so they have three kids now and they’re done with their family. So they have leftover embryos and so their options are to destroy the embryos, donate them to another couple, use the embryos now, use the embryos later when it’s unlikely to work, or donate them to science. The couple talked about it and she was originally a little bit apprehensive, but he reminded her of how scared they were going through this process and that if they could offer hope and solace to a couple going through what they went through and donate their embryos to them, they’d be able to then make better use of them rather than just destroying them.”
When does it make sense for a young woman to freeze her eggs?

Egg freezing is becoming more and more common, and more and more effective. Dr. Kumar has a theory about why: “It’s really unfair, but biology doesn’t treat men and women equally. Men can easily have kids in their fifties, sixties, seventies, it doesn’t matter. And fertility for women is very finite. Being able to freeze your eggs, being able to say, ‘Well, I have a little bit more control over my fate or my destiny or the options I have in the future.’ Really the next shift in the psyche of a young person is to be able to have reproductive insurance, just like we get car insurance or homeowner’s insurance or health insurance.”

Isn’t it expensive to freeze your eggs?

“The costs are high,” admits Dr. Kumar. “But you don’t have to do it in your early twenties. You can wait. Dr. Kumar recommends checking your anti-mullerian hormone (AMH) levels, which indicate how many eggs you have left and the quality of those eggs. If they’re high, wait to freeze.” But ultimately, whether or not to freeze your eggs is an individual choice. Not everyone wants to become a parent, and not everyone who wants kids wants to wait until they’re older to have them.

I’ve heard a rumor that the success rates later on are higher if you freeze fertilized eggs than unfertilized eggs. Is that true?

“No, it used to be, but not so much anymore,” says Dr. Kumar. “If you’re a heterosexual woman, you find the man of your dreams, you wanna have kids with him, it’s not feasible. The problem is that women don’t freeze their eggs until it’s too late. It makes a lot of sense for you to know your AMH level, and if it’s favorable, it doesn’t make sense for you to freeze your eggs. I would continue to check until you’re in your early thirties.”

And what’s it like on the other side, once you’re ready to get pregnant using an egg that’s been frozen?

“The process is really easy,” assures Dr. Kumar. “You need somebody to provide a sperm, a significant other or a sperm bank. Then we thaw the eggs, we inject one sperm into each egg, culture the embryos for five to six days, biopsy the embryos to find out which are normal, and which are boys and girls. We highly recommend single embryo transfer so as to avoid the potential complications of a twin pregnancy. So you can normally decide on the gender you want if there are multiple embryos. Then you do the embryo transfer. It’s really easy. It feels like a pap smear.”

Where can I go to get statistics and more information about assisted reproductive techniques?

Dr. Kumar recommends the Centers for Disease Control and the American Society for Reproductive Medicine, both of which keep good statistics on the success rates of techniques and the success rates of individual offices. Dr. Kumar points out that “the half-life of medical knowledge is five years. So half of what I’ve learned five years ago is just not valid anymore.” Medical knowledge changes all the time, and it’s vital to stay current.

Why do some fertility clinics, like Dr. Kumar’s, have higher success rates than others?

“I think a lot of it is attention to detail,” says Dr. Kumar humbly. “It’s not being overwhelmed by volume. I had a couple come in today who started IVF in China. The hospital they had been to in Beijing does thousands and thousands of cycles a year.”

Dr. Kumar’s practice, by contrast, sees between ten and twenty patients a day, and only a fraction for IVF. Mostly, it’s just plain hard work and patience. “Somebody might come in with 200 pages of medical records. It’s taking the time to go through all of it, and sometimes you’ll uncover some key little piece of information that makes the biggest difference.”