

Chapter 3

WHEN IVF BECAME A NATIONALIST GLORY

In April 1985, the first test-tube baby in Taiwan, “Baby Boy Chang,” was born in the Taipei Veterans General Hospital. Mr. and Mrs. Chang, a lieutenant colonel and an accountant, had been married for six years and suffered from infertility. Mrs. Chang sought treatment and was recruited into the IVF experiments, starting in April 1984. Dr. Sheng-Ping Chang, who happened to share the same last name as the family and who was later crowned the “father of the test-tube baby,” recalled that when the IVF team decided to move from the lab to the clinic, they expected “repeated experiment, failure, frustration, and disappointment” (S.-P. Chang 1985). By August 1984, when Mrs. Chang became the first volunteer whose hormone test showed early signs of pregnancy, thirty-nine women had undergone the new IVF attempts at Taipei Veterans General Hospital. The IVF team announced the news of her pregnancy in late 1984, so the media followed Mrs. Chang’s due date closely.

The first successful IVF birth was a highly anticipated event. The newborn Baby Boy Chang and the making of a test-tube baby in Taiwan were in the headlines in all the newspapers, and follow-up stories appeared for an entire week. The event was widely celebrated under headlines such as “Made in Taiwan Champion” (*China Times* 11 April 1985: 3) and “Turn a New Page in Medical History” (*Central Daily* 17 April 1985: 1). IVF was applauded as a nationalist glory. One doctor I interviewed vividly described the pride of learning how to perform IVF at that time: “It was heatedly discussed. Achieving an ‘Asia’s First’ was really an honor. Doing ART became a hot prefer-

ence among us medical students" (Dr. F, 2010 interview). Baby Boy Chang was *not* in fact Asia's first test-tube baby, but Dr. F rightly recalled the zeal of competition at the time. As described further below, gaining international visibility through medical achievement has gradually come to constitute one of Taiwan's national sociotechnical imaginaries.

This chapter examines how IVF was perceived as a nationalist glory in its early development in Taiwan and how this also shaped the trajectories of framing IVF anticipation. Which dimension of anticipation stood out—success or failure, hope or risk, or some type of hybrid? Which actors gained the most credibility for directing the anticipation? Facing the major complication of IVF—multiple pregnancy—what governing strategies were at work, and what were their consequences?

"Achieving First"

Two layers of "achieving first" discourses stimulated the IVF experiments in Taiwan. One is "first in Asia." Many countries referred to the success of a first test-tube baby as achieving a nation's "position in the technology-driven modern world" (Ferber, Marks, and Mackie 2020: 91). For example, when Israel presented its first successful IVF birth in 1982, only weeks after the US, the media portrayed the medical progress as "lagging only slightly behind powerful countries like the USA" (Birenbaum-Carmeli 1997: 526). In the case of Taiwan, newspaper editorials advocated developing ART to "elevate Taiwan's status in the world" (S.-C. Li 1982a) and warned against Taiwan being seen to "lag behind" (S.-C. Li 1982b). After the first IVF baby was born in Singapore in 1983, an editorial in Taiwan's *Min-Sheng Daily* claimed that "we once thought that our technical competence was second only to Japan, so it was a surprise to learn that Singapore is ahead of us" (S.-C. Li 1982a).¹

Taiwan's zeal to become technologically competitive emerged in part from efforts to overcome international political isolation. Taiwan had suffered several major diplomatic setbacks since the 1970s. It had withdrawn from the United Nations in 1971 and faced a diplomatic break with the US in 1979. Achieving a "first in Asia" became a way to present Taiwan's national power, whether through competing with other Asian countries in terms of economic growth rate, winning gold medals in sports, or making a medical breakthrough. Achieving medical miracles gained new energy when

National Taiwan University (NTU) Hospital surgically separated conjoined twins in 1979, a twelve-hour procedure that was broadcast live on TV in Taiwan (D.-J. Tsai 2002: 247–55). Doctors checked the international medical records to confirm that this was a “first in Asia” and the second successful case globally. Chang-Gung Hospital performed a liver transplant in 1984, highlighting it as the first in Asia (*United Daily News* 4 April 1984: 3). These events helped Taiwan regain confidence and shed its “Orphan of Asia” identity. IVF joined the wish list of ways to demonstrate national power by achieving a medical miracle. After successful cases in Singapore and Japan, the timetable for Taiwan to achieve ART became more and more urgent.

Several hospitals in Taiwan made IVF a goal, and doctors began learning and training internationally. Ferber, Marks, and Mackie (2020: 84–85) found that Bourne Hall in the UK and Monash University in Australia became a “little scientific ‘empire,’” but for Taiwan the center of acquiring skill in IVF was the US. Ethnic ties with Taiwan-educated Taiwanese American scientists established an important learning route. Both the US policy since 1965, which attracted highly skilled immigrants, and the tendency of elite students in Taiwan to study in the US—to obtain a better graduate education and career and to escape political instability (from Communist China and also the local authoritarian Nationalist government)—facilitated the so-called brain drain in engineering and science (S. L. Chang 1992; Ng 1998; J.-Y. Hsu and Saxenian 2000).² The brain drain nevertheless became an important ethnic network that enabled the newly established IVF centers in Taiwan to acquire cutting-edge knowledge and skills. Taiwanese Americans (and a few Taiwanese Canadians) either offered direct assistance on the latest expertise or built bridges between leading pioneer IVF experts in the US and medical centers in Taiwan. One distinguished example is Helen Hung Ching Liu, who received her undergraduate degree in chemistry in Taiwan, her PhD in biochemistry in the US, and then worked with Howard and Georgeanna Jones in Norfolk, Virginia, in the early 1980s (e.g., Rosenwaks et al. 1981; Liu et al. 1988). She worked closely with the IVF teams in Taiwan, accompanying the Joneses on their 1984 visit to Taiwan, giving scientific advice, and writing a textbook chapter in Chinese together with Taiwanese doctors.

In addition, young doctors from Taiwan went to the US for hands-on training in the 1980s. There they attended the ASRM annual meetings more often than the ESHRE ones. Several doctors met Min Chueh Chang, the China-born American reproductive biologist

whose study of in vitro fertilization in rabbits and other mammals laid an important foundation for human IVF (Clarke 1988). These Taiwanese doctors called Min Chueh Chang the “true father of IVF,” clearly showing their preference for highlighting the contributions of someone of similar ethnic origins. Even though these learning routes extended to France, the UK, and Australia—and though leading experts such as Jacques Testart and Rene Frydman, who succeeded in making the first IVF birth in France, came to Taipei Veterans Hospital for seminars (S.-C. Chen 2020)—the US dominated the map of skill acquisition and also, as we will see, the road map for policy ideas.³

“First” discourse helped transform IVF from a possibly controversial technoscience into a glorious one. Like some other Third World countries, Taiwan had started its population control policy in the mid-1960s, so by the early 1980s promoting ART could still be viewed as contrary to the national interest. This was precisely the case in South Korea, where the focus on contraception in the 1970s led Patrick Steptoe and other leading scientists to come there to demonstrate their expertise (Wu, Ha, and Tsuge 2020). Although the aim was birth control, their knowledge of assisted conception inspired doctors in South Korea. Still, leading Korean scientists often claimed that their enthusiasm was due to personal interest in cutting-edge science in order to prevent being criticized as opposing state policy. In contrast, when the superintendent of the government-funded Taipei Veterans Hospital promoted IVF as the organization’s ambition, he skipped the issue of population policy and used the rhetoric of “pursuing something number one like National Taiwan University Hospital et al.” (Chang and Wu 1999). As a result, doctors on Taipei Veterans Hospital’s IVF team, who were paradoxically in the family planning rather than obstetrics-gynecology department, were able to gain generous infrastructural support to begin scientific research and clinical trials. “Something first” became a useful strategy for IVF doctors to use to mobilize expensive hospital resources, from recruiting experts who had trained abroad to funding capital-intensive lab operations (Doctor L, 2011 interview).

“Achieving first” also embodied local competition in terms of expertise. The rivalry among hospitals to achieve the nation’s first IVF success was an important part of IVF history in Australia, the US, and Japan. The same was true in Taiwan, but it also involved some local ethnic tension. NTU Hospital—established during the Japanese colonial period (1895–1945) and attracting the cluster of

elites of the so-called Taiwanese to work as doctors there—was viewed as the most prestigious medical center. By comparison, Taipei Veterans Hospital, built in 1959, after the Nationalist Party came to Taiwan, provided medical services to veterans—mostly so-called Mainlanders who had migrated to Taiwan with the military from Mainland China after the Chinese civil war.⁴ The “Taiwanese” and “Mainlanders” became a new ethnic divide, causing much conflict socially and politically, including in the world of biomedicine.

In terms of research funding for IVF, one senior doctor from NTU Hospital responded after my presentation to their seminar that his research proposal application to the National Science Council had been rejected for not following the national policy (on contraception) (Field note, June 2001). NTU Hospital had great difficulty acquiring sufficient funding to develop IVF, and leadership saw this as the reason it did not achieve the first IVF birth in Taiwan. With the goal of achieving “something first” like the old elite NTU Hospital, Taipei Veterans Hospital received such generous funding from the Veterans Affairs Council that it was able to build a new lab, send young doctors abroad to study, and invite leading scientists to visit for advice and hands-on training. In addition, entrepreneurs in Taiwan started to establish large private hospitals in the late 1970s. Chang-Gung Hospital, founded in 1976 by the leading millionaire of Formosa Plastic Corporation, signaled a new period of commercial competitiveness among hospitals. Competing for “something first” in Taiwan became an important incentive for upgrading IVF.

The two layers of “achieving first”—first in Asia and first in Taiwan—made IVF a medical innovation that was worth pursuing for nationalist glory and local pride. Comparing media reports on the first test-tube baby in Japan and Taiwan shows how the sociotechnical imaginaries of IVF differed greatly among the two East Asian countries. In Japan, as shown in chapter 2, the development of IVF was pervaded by social concerns. When the first test-tube baby was born there, Dr. Masakuni Suzuki showed the media a photo of the delivery, though not focusing on the baby herself (figure 3.1) and creating suspicion that the infant might be deformed. The baby died at one year old, seemingly confirming the rumor (*Yomiuri Shimbun* 12 November 1985: 23). In contrast, the birth of Baby Boy Chang was widely celebrated in Taiwan. All the doctors, nurses, and embryologists were named heroes and heroines by the media. The parents were highly publicized, and the media interviewed them with great joy. A three-layer birthday cake was cut at the press conference that was held when the infant and mother were discharged from the hospital, surrounded by the IVF team (figure



FIGURE 3.1. Dr. Masakuni Suzuki Showing the Photo of Japan's First IVF Baby at Tohoku University Hospital. Source: *Yomiuri Shimbun* 14 October 1983: 15. © Yomiuri News Photo Center (Yomiuri Shimbun), used with permission.

3.2). A survey done one month later showed that over 60.2 percent of the Taiwanese public supported IVF, and 16.2 percent supported it with some conditions (*Ming-Sheng Daily* 7 June 1985: 7). The report compared the result to a survey in Japan at the end of 1982, in which only 18 percent supported IVF. Whereas Japan's first IVF baby died at one year old, which intensified the country's doubts about the technique, Taiwan's media followed Baby Boy Chang for decades, reporting on his academic performance, marriage, and parenthood. Although Taiwan was only "Asia's fourth" in achieving a test-tube baby (after India, Singapore, and Japan), Taipei Veterans Hospital and the media successfully framed the anticipation of IVF as a nationalist glory, which greatly influenced the governance of IVF in seemingly contradictory ways.



FIGURE 3.2. The Celebratory Birthday Cake at the Discharge of “Baby Boy Chang,” Taiwan’s First IVF Baby, at Taipei Veterans Hospital, April 1985. *Left to right* Dr. Hsiang-Da Wu, Mr. Chang, Mrs. Chang, Baby Boy Chang, and Dr. Sheng-Ping Chang. Courtesy of Academia Historica, number 150-029900-0018-030.

Breakthrough or Tragedy? IVF Twins, Triplets, and Quadruplets

Taiwan’s first test-tube baby, Baby Boy Chang, was a singleton. Three eggs were extracted from Mrs. Chang, which developed into two embryos of good quality. Doctors implanted two embryos, leading to the birth of a single child. In the earliest experimental period, doctors in Taiwan, like their international counterparts, tended to implant all available fertilized embryos—generally one or two, since the fertilization rate and the implantation rate were still low and the embryo-freezing technique was not yet available. By the time Taiwan achieved its first IVF birth, clinical data from the international teams were beginning to show that the implantation rate or pregnancy rate increased with the number of embryos transferred (Edwards and Steptoe 1983; Speirs et al. 1983). For the pioneering IVF devotees in Taiwan, the risk of having twins, triplets, or quadruplets was far outweighed by the need to counter the relatively poor results of IVF.

Four months after Baby Boy Chang was born, the second IVF birth was approaching the due date. The mother was expecting twins. Taipei Veterans Hospital revealed the news to the media in April, prompting pages of glorious news (*China Times* 18 April 1985: 3). Unfortunately, early in August, a week before the due date, during their prenatal checkup, doctors detected that the twins would be stillborn. The three major media reported the news, not in the headlines this time but in the corner space of the third or fifth page. *China Times* published a critical comment calling for a medical ethics evaluation to address the possible health risks of IVF (Y.-H. Chang 1985). Taipei Veterans Hospital explained that twins had a higher health risk, and clarified that the stillbirth was not caused by IVF itself (*China Times* 17 August 1985: 3). By the mid-1980s, medical and epidemiological research had documented that the risk of stillbirth for twins was two to three times higher than for singletons (Bleker, Breur, and Huiderkoper 1979; Imaizumi, Asaka, and Inouye 1980). However, none of Taiwan's news reports mentioned that the procedure of multiple embryo transfer (MET) during IVF itself increases the incidence of twins. The next year, another tragedy occurred, with the death of a mother and IVF twins at Taichung Veterans Hospital. The family was angry at the loss of life, and the doctors were frustrated with the incident. Still, the news report emphasized the risk of twin pregnancy rather than of IVF itself (C.-C. Lin 1986).

The fatal events, all caused by multiple pregnancy, did not shadow IVF in Taiwan. The medical breakthrough and the joy about IVF progress still prevailed. The major narrative was focused on achieving more and more "firsts." Every hospital's first IVF birth was reported. Taiwan's first GIFT (gamete intrafallopian transfer) baby, first IVF triplets, first ZIFT (zygote intrafallopian transfer) triplets, and the "world's first IVF case combining the method of zona cutting and cryo-preservation" (S. Y. Chang et al. 1991) were all reported as milestone accomplishments. When parents were portrayed, it was their joy at overcoming infertility that was emphasized—joy that was doubled or tripled for a multiple birth. For example, when the first IVF triplets in Taiwan were born half a year after Baby Boy Chang, even though they were put into incubators for neonatal care, the title of the news report emphasized *yilao yungyi*, meaning "one labor for eternal ease" (*United Daily News* 17 November 1985: 5). When Chang-Gung Hospital delivered its first quadruplet IVF birth, three of the four babies were under fifteen hundred grams, the criterion for "very low birthweight." While showing the scenes

for the IVF quadruplets, doctors had retrieved ten eggs from the mother, placed five eggs with sperm into the fallopian tube—the so-called GIFT method—and had implanted another two embryos for IVF (*China Times* 10 February 1988: 12). Chang-Gung Hospital emphasized that using the two methods together could enhance the success rate. While some members of the international IVF community began to limit IVF to “three embryos” for transfer, Chang-Gung Hospital “retrieved ten eggs on average, and *implanted only five embryos* ... in order to prevent multiple pregnancy” (*Min Sheng Daily* 11 February 1988: 14, emphasis added). Yet five embryos certainly could not prevent multiple pregnancy, and such practice was not limited to Chang-Gung Hospital. According to the first national statistics report in Taiwan, between 1985 and 1993, 51 percent of IVF cycles were implanted with four or more embryos, which led to one in every four live births being multiples (Yuan 1995).

The risk of multiple pregnancy was presented by doctors as an unavoidable consequence when dealing with the fear of a low pregnancy rate. Dr. Yung-Kuei Soong, the leader of the IVF team at Chang-Gung Hospital, responded to the quadruplet controversy in a newspaper:

Multiples are the new problem that new reproductive technology brings. Due to the immaturity of current technology, the only way to increase the success rate is to implant more embryos. ... When we found the multiple fetuses on the sixth or seventh week through ultrasound, both the pregnant women and doctors would face a new problem: whether we should reduce some fetuses. (Soong 1988)

As discussed in chapter 1, locating the controversy within the framework of “benefit and risk” appeared early on (e.g., Speirs et al. 1983), although not without contention (e.g., Wagner and St. Clair 1989). In the early emergence of frequent multiple births in Taiwan, doctors maintained that MET was beneficial to patients, focusing on the suffering of repeated IVF failure rather than on the risk of multiple pregnancy.

In addition, Dr. Soong’s remark shows that Taiwan had moved from “successful event” to “success rate.” While some hospitals were still struggling to achieve a first successful case, some leading centers were beginning to pursue higher success rates. Dr. Soong’s comment also reveals that fetal reduction became an option after ultrasound detection of higher-order multiple pregnancies such as the three sets of quadruplets in Chang-Gung Hospital, though it was not practiced by Dr. Soong due to ethical concerns. Instead, he asked for social support, religious understanding, and legal approval

of fetal reduction so that women could both achieve pregnancy through MET and have fetal reduction ready in case of multiple pregnancy. In reality, however, Chang-Gung Hospital did not wait for the sociolegal system to be ready to practice fetal reduction in Taiwan. Only two months after the quadruplets event and Dr. Soong's commentary, fetal reduction became another news event, not as a controversy but as a medical accomplishment.

Fetal Reduction as a Technical Solution

Fetal reduction began to become infertility experts' technical solution to multiple pregnancy in Taiwan, and some presented it as another medical breakthrough. Chang-Gung Hospital announced achieving a reduction of four fetuses to three, and calling this four-to-three fetal reduction one of the few successful cases around the world (*Min-Sheng Daily* 25 April 1988: 14). Soon after, some cases that needed fetal reduction included octuplets (eight fetuses) in Taipei Veterans General Hospital (*Min-Sheng Daily* 21 December 1988: 23), nonuplets (nine fetuses) in Hsinchu (*China Times* 27 January 1995: 13), and septuplets (seven fetuses) in Miaoli (*China Times* 12 May 1998, North Taiwan Section: 12). These super-higher-order pregnancy cases were caused by implanting seven embryos or taking egg stimulation drugs, and all planned to reduce to twins with fetal reduction methods. In the early stage of introducing fetal reduction, some IVF experts told the press that the use of fetal reduction was to "keep the remaining babies safe," and they also mentioned the major side effect—namely, that the miscarriage rate of fetal reduction was about 10–15 percent (S.-H. Hung 1995). This statistic was based on the reports in other countries, not the local data in Taiwan. Fetal reduction became the part of the ART network of techniques to handle the risks of multiple pregnancy.

Unlike in Japan and other countries, in Taiwan the practice of fetal reduction was not closely associated with abortion, either technically or legally. As discussed in chapter 1, various methods of fetal reduction were developed in the 1980s in European and North American countries before doctors settled on the method of inserting a needle into the abdomen. Taiwan skipped the transcervical suction aspiration, which was most similar to abortion, occasionally attempted transvaginal reduction, and quickly adopted the trans-abdominal approach. The earliest published report came from the team at NTU Hospital and shows that nine cases of fetal reduction were performed in 1989–90, and only the first one used the trans-

vaginal route; the other eight cases adopted the injection of KCl into the fetus through the woman's abdomen (Ko et al. 1991).

This was partly because doctors who practiced amniocentesis were soon involved. Amniocentesis requires inserting a needle into a pregnant woman's uterus to remove amniotic fluid for genetic testing. These doctors had the tendency to practice fetal reduction abdominally. I interviewed Doctor Q, the pioneering expert in fetal reduction in Taiwan. He had originally joined the IVF team because of his specialty in chromosomes, and later became one of the leading practitioners to conduct fetal reduction. I asked him whether he still remembered his very first case of fetal reduction:

Of course I still remember the first case: I had a lot of sweat on my head [*laughs*]. It was actually not difficult. I had practiced amniocentesis since 1982, several years before the first case of fetal reduction [around the late 1980s]. The two procedures were similar. I inserted the needle through the abdominal wall, guided by ultrasound. Other IVF doctors used to retrieve eggs from the vagina, and hence tended to practice fetal reduction from the vagina. However, due to my experience with amniocentesis, I preferred doing it from the abdomen, which could reach a high level of sterility, much better than doing it from the vagina. My way is a much safer method. (Doctor Q, interview 3 August 2017, Taipei)

The early involvement of amniocentesis practitioners such as Dr. Q helped Taiwan move quickly to the transabdominal version of fetal reduction, which later proved to be safer than the transvaginal method in terms of rates of miscarriage and infection (e.g., Timor-Tritsch et al. 2004). Most reports show that IVF teams in other hospitals adopted the transabdominal approach of fetal reduction as well (Hwang et al. 2002; Cheang et al. 2007).

In addition, Taiwan passed the Genetic Health Act in 1984, which legalized intrusive prenatal testing for genetic diseases such as Down syndrome and abortion. The act laid the legal foundation for practicing amniocentesis (F.-J. Hsieh 2014). Doctors I interviewed told me that practicing fetal reduction may have involved some moral uneasiness but never met with any legal problem. In terms of methods, practitioners involved, and legal implications, fetal reduction in Taiwan was associated more with amniocentesis than with abortion.

Overall, without linking it to abortion, as in Germany and the US, or creating intraprofessional conflict, as in Japan, fetal reduction soon became routinized in Taiwan as a way to deal with multiple pregnancy. Some media reports used the term "feticide" to indi-

cate the controversy over the procedure (e.g., Y.-M. Chang 1994b; Hsueh 1994), but without any stakeholders to engage with the issue, the term and the accusation did not last long. A new division of labor in ART gradually emerged: infertility experts to achieve pregnancy, and amniocentesis experts (or general gynecologists) to reduce fetuses when necessary. Some IVF experts in Taiwan who had practiced fetal reduction tended to ask other doctors to do the job (Y.-M. Chang 1994b). A common response to my questions during interviews was that “my work is to create the life, so I do not like to reduce the fetuses.” This shows that doctors did face some moral dilemma about fetal reduction, yet they handled it not by reducing cases of multiple pregnancy from the outset but by having someone else later do the job of reduction.

By the late 1990s in Taiwan, the sociotechnical imaginary that pictures IVF as a nationalist glory led an anticipatory framing that focused more on success than on risk. This is not to say that the tragedy of maternal and infant death and the moral discomfort of fetal reduction caused no concern in Taiwan. However, what prevailed in media reports was various successful events: making the first IVF baby in the southern part of Taiwan, achieving the first IVF birth through a frozen embryo, and even the successes of delivering quadruplets and of accomplishing fetal reduction, which were controversial in some other countries. Perhaps most stunning was the case of a pregnancy with ten fetuses in 1997, which Dr. Maw-Sheng Lee claimed might be a national record (Y.-L. Li 1997); the ten fetuses were reduced to two, leading to a twin birth. Facing increasing numbers of multiple pregnancies, IVF specialists in Taiwan began to offer some techniques of risk management, preferring to try new technologies such as cryopreservation and embryo selection methods. These new technologies took time to mature. The need for legal regulation of the number of embryos transferred (NET) began to be voiced, even among the IVF experts themselves. What about government regulation?

Regulatory Agency: Leave Clinical Procedures Alone

Governmental regulation of IVF in Taiwan did start early, but it first focused on the perceived “social issues,” rather than clinical practices. The headline news of the first IVF birth also attracted some comments from legal experts (e.g., K.-T. Chen 1985; *United Daily News* 15 October 1985: 3). These legal concerns focused mostly

on third-party donation, surrogacy, and associated parent-child relationships, which had either already been practiced in donor insemination since the 1950s or were not the status quo in IVF. The Department of Health established an advisory committee on assisted reproduction to offer advice, composed of eleven members, six of whom were doctors. One senior government official told me that this kind of ad hoc committee followed the pattern used to deal with family planning and the legalization of abortion (Official Q, 2011 interview). Called "Ethical Guidelines for Practicing ARTs," the first official regulation was announced in 1986, one year after the birth of Baby Boy Chang. The guideline specified that ART be made available only to infertile married couples and be operated by qualified medical personnel, and it prohibited the commodification of donated sperm and eggs. This simple statement responded to major concerns in the earliest period.

Two IVF-related medical societies were established in Taiwan in 1990: the Society of Infertility Treatment of the Republic of China, renamed the Taiwanese Society for Reproductive Medicine (TSRM) in 2000, and the Fertility Society of the Republic of China (FSROC). Both societies' presidents routinely became members of consecutive governmental advisory committees. Thus, despite the major role of the government, policy related to the technical aspects of IVF has been dominated by medical professionals.

The official governmental intervention extended to detailed measures, but it still provided no word on number of embryos. In 1994, the new "Regulations Governing ARTs" established an accreditation system to certify IVF centers through governmental evaluation of lab standards, mainly based on the specifications of invited IVF experts. For the first accreditation, forty-eight centers received a formal license to practice IVF and third-party egg and sperm donation. For the lab evaluation, cryopreservation—the preservation of eggs, sperm, and embryos by freezing techniques—counted 3 points in a total possible score of 125, and number of embryos transferred (NET) was not even among the evaluation criteria in the early regulation.

This early absence of multiple embryo transfer regulation in Taiwan shows that the government left the territory of clinical procedure to medical professionals. Some newspaper reports in Taiwan exemplified the British regulation as an ideal from the advanced countries (Y.-M. Chang 1994a; Yuan 1995). When responding to the media's questions about potential regulations such as Britain's 1990 Human Fertilisation and Embryology Act (HFE Act), Taiwan

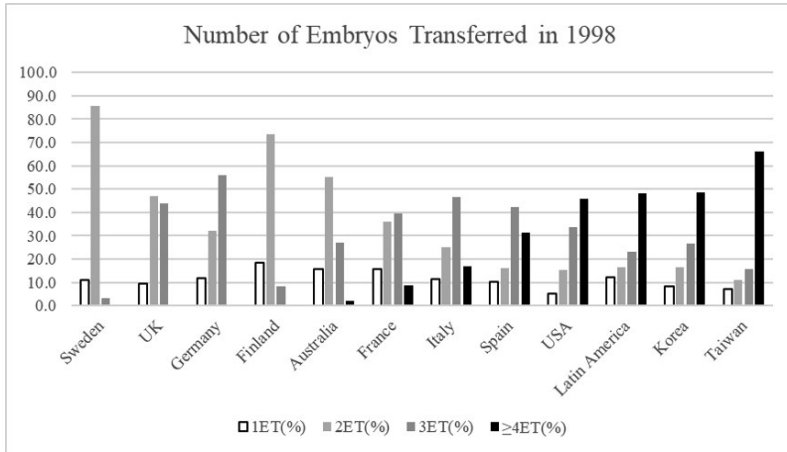
officials emphasized the “fast-changing” character of ART and regarded formal regulation as inflexible for this innovative technology (Y.-M. Chang 1994a). The HFE Act’s first edition of its Code of Practice limited NET to three or fewer embryos. One Taiwan official whom I interviewed promoted the self-regulation model:

The number of embryos transferred is related to doctors’ clinical judgment. Cases are diverse, and each judgment differs. Law, such as limiting with a specific number, is rigid; once it is stipulated, if we want to make changes, it has to undergo a lot of procedures. It is better to leave the judgment to doctors themselves. (Official M, 2011 interview)

What Official M argued shows that the Department of Health preferred leaving clinical judgments to the medical community. Compared to statutory regulation, such as what Germany and the UK did in 1990 to legally limit NET to three embryos at most, a voluntary guideline has the advantage of retaining medical professional autonomy while demonstrating professional responsibility.⁵

The medical community in Taiwan preferred no regulation on clinical procedures. It is worth noting that the very existence of statutory regulation on embryo transfer, at least in Britain, inspired a few Taiwanese IVF experts to support regulation. For example, Dr. Tzu-Yao Lee, a pioneering infertility specialist at NTU Hospital, criticized the high incidence of multiple births and asked for standardization (Lee 1995). However, when other leading IVF experts did voice concerns about multiple pregnancy, they favored the technical solutions of perfecting the skills of cryopreservation or improving the quality selection of embryos. They also stressed the limitations of regulation, stating that it could not prevent multiple pregnancy caused by ovulation-induction drugs (Y.-M. Chang 1994b). Their policy suggestions avoided the imposed standardization of clinical procedures found in the British model.

The decision-making structure in Taiwan in this period strengthened medical professionals’ autonomy in IVF. The advisory committee in Taiwan, as well as the officials in charge, were all under the Department of Health, in contrast to Britain, where the HFE Authority (HFEA) committee was an independent organization. The HFEA committee was required to include diverse expertise and laypeople (Johnson 1998), whereas in Taiwan medical professionals dominated the committee. Therefore, Taiwan lacked a regulatory regime through which the British model could be executed. Taiwan also lacked most of the policy elements that had forced the British government to regulate. No religious groups or antiabortion



GRAPH 3.1. The Distribution of Number of Embryos Transferred (NET) by Selected Countries in 1998. (1ET = one embryo transferred; 2ET = two embryos; etc.) Source: IWGRAR 2002. © Chia-Ling Wu

groups in Taiwan voiced their concern over the status of embryos (cf. Franklin 1997; Inhorn 2003). Legal experts and social scientists were involved with ART, but they tended to focus on the “social” aspects, leaving the “technical” ones to the medical experts. Overall, in the 1990s, no local stakeholders in Taiwan exerted pressure to regulate the number of embryos transferred.

What about pressure from the international IVF monitoring organizations? Health surveillance through data collecting and reporting has been the common strategy of global governance. The International Working Group for Registers on Assisted Reproduction (IWGRAR 2002) published the data of forty-four countries and found that Taiwan had implanted the highest number of embryos in the world. Taiwan’s national registry data started in 1998 so that the national data could be available for the world report. This 1998 global comparison showed that the average NET during IVF was 4.07 in Taiwan, followed by 3.46 in the US and 3.45 in South Korea, while the average NET was less than 2 in Finland and Sweden. Graph 3.1 reveals that 66 percent of IVF cycles in Taiwan involved four or more embryos, while the same column shows zero (no column at all for four or more embryos) for Sweden, the UK, and Germany, where two or three embryos was the maximum number by legal regulation. However, this world’s worst ranking was not reported in the Taiwanese media and therefore did not trigger public debate.

I asked several TSRM leaders whether this international comparison was known to the doctors in Taiwan. Dr. S told me how the medical community responded to the international data:

Right, we did mention the data at our board meeting. Taiwan's statistical result looked bad, and we felt that we needed to improve. However, this kind of pressure did not last long. Most doctors still *cared most about the success rates*. Those centers which did not have a strong lab often depended on implanting more embryos to increase the success rates. And it was also hard to make strict limitations because we [i.e., the TSRM] did not want to make hurdles for some members' running [their] business. It needs the reputation of high success rates to attract clients, so most of them pursue high success rates first, and deal with multiple pregnancy later, with fetal reduction. (Dr. S, 2010 interview, Taipei, emphasis added)

The international report did not create strong pressure. Individual clinics' success rates mattered most. The survival of clinics by keeping high success rates was the main concern. And the medical organization could not easily stand against other members' financial interests in the competitive environment of IVF.

Gathering Test-Tube Babies in the Shape of Taiwan

The health of test-tube babies is conveyed in two types of images: photos of gatherings of IVF children and follow-up statistics. Beginning in the late 1990s, some Taiwanese hospitals and infertility-related organizations would invite all the test-tube babies to get together. For example, the ROC Infertility Foundation, established by the IVF expert Dr. Maw-Sheng Lee, held an event on Children's Day in 1997 that was attended by seven hundred IVF kids, including one hundred twins, fifteen triplets, and three quadruplets, ranging from one to eleven years old. In addition to playing a crawling game and tug of war, two pediatricians offered heart exams by ultrasound on the spot. Dr. Lee claimed that a follow-up survey of twelve hundred IVF children showed that "one-third of test-tube babies were gifted students," possibly due to the selection of sperm during the IVF procedure, as well as to intensive care from their parents (Chao 1997). Combining the survey results and health checkups during the 1997 gathering, the ROC Infertility Foundation announced that "test-tube babies have no problem in IQ and health at all" (C.-H. Chen 1997).

Since then, gatherings of test-tube babies to present the image of happiness and achievement have become a routine event (Ke 2003). Taipei Veterans Hospital held a similar gathering to have “another father” of IVF, Dr. Chang, meet the hospital’s IVF children (Wei 2005b). Other clinics used the familial metaphor of “going back to your maternal home” to promote the achievement of the clinic (e.g., C.-L. Li 2006). No IVF entrepreneur could compete with Dr. Maw-Sheng Lee, however, who even applied to break the Guinness World Record of the gathering of 1,180 test-tube babies in Vienna, Austria, in 2007, after 1,232 test-tube babies donned pink hats and gathered in the shape of the island of Taiwan in 2011, the year Taiwan celebrated its centennial (*United Daily News* 17 October 2011). The nationalist glory continues.

In contrast to the joyful and record-breaking gathering, the epidemiology data looked worrisome. From 1987 through 1996, the Taiwan Society of Perinatology had collected data from six hospitals to build the first health patterns of premature babies, finding that the rate of premature birth was 36.9 percent for twins and 75 percent for triplets; the report predicted that premature births would increase with the increasing use of infertility treatments (Y.-F. Shih 1998). Some medical centers had the pediatricians trace the health outcomes of their IVF babies, which revealed that 20 percent had signs of delayed development (S.-H. Hung 2000). The highest-quality data came from Taiwan’s ART registry data, built since 1998, which included the health outcomes of the newborns and outshone the data of the voluntary registries in Japan and South Korea (Wu, Ha, and Tsuge 2020). The data revealed that since 1998, more than 40 percent of live births through IVF were of infants weighing less than twenty-five hundred grams, classified as “low birthweight” (ROC Department of Health 2003). This means that nearly half of IVF babies needed extra healthcare after birth. Those who were under fifteen hundred grams, categorized as “very low birthweight,” possibly needed long-term care due to disability—an image in stark contrast to the celebratory depictions of test-tube-baby gatherings. A shadow began to fall on the nationalist glory.

Conclusion

This chapter has demonstrated how a nation’s sociotechnical imaginaries shape the trajectories and dynamics of anticipatory governance. When IVF debuted as a nationalist glory in Taiwan, the

TABLE 3.1. Anticipatory Governance of In Vitro Fertilization (IVF) in Japan and in Taiwan. (JSOG = Japan Society of Obstetrics and Gynecology.)

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	Japan	Taiwan
National sociotechnical imaginaries of emerging IVF	Controversy	Glory
Dominant dimension of anticipation	Risk prevention	Pursuing a successful "first"
Framing of fetal reduction	Causing disputes	Medical innovation & routinized technical solution
Anticipatory practices for multiple pregnancy in the 1990s	JSOG's embryo transfer guideline	Professional autonomy

IVF medical community remained the dominant actor to frame the anticipation, primarily in terms of successful events and success rates, and only occasionally in terms of health risk. Even fetal reduction, a controversial procedure in most countries, could be framed as a medical breakthrough and quickly incorporated into the IVF network as the technical solution to the increasing incidence of multiple pregnancy. Facing increasing numbers of cases of quadruplets, maternal and infant death, and worrisome epidemiology of premature babies, the health risks of multiple pregnancy caused by both IVF and egg stimulation drugs attracted debates on regulation. However, the state preferred that IVF professionals self-regulate, leaving much space for practitioners to remain autonomous in their own clinical practices before the 2000s.

The contrast between Japan and Taiwan is revealing (table 3.1). When IVF emerged in East Asia in the early 1980s, it was linked to the management of controversy in Japan and the achievement of nationalist glory in Taiwan. This at least partially explains why Japan governed IVF through strong self-regulation to establish social trust, resulting in the JSOG model to impose a SET guideline to efficiently reduce health risk, which has been far from the case in Taiwan (see table 3.1). More such imaginaries are worth exploring to enrich our understanding of why anticipatory governance takes

so many different forms around the world. Even though the medical societies and the state did not actively intervene to change Taiwan's having the world's highest average NET, new voices started to rise in the 2000s: pediatricians, suffering mothers, the Premature Baby Foundation of Taiwan (PBFT), and some reflexive IVF experts all verbalized their concerns on behalf of Taiwan's wordless premature babies. New momentum to anticipate health risk finally started in Taiwan in the 2000s.

Notes

1. Taiwan's media seldom mentioned India's "Baby Durga," born in the same year as Louise Brown (Ferber, Marks, and Mackie 2020).
2. For example, Shirley L. Chang (1992) estimates that in the 1970s nearly half the graduates in engineering and science from National Taiwan University and Tsinghua University, the most prestigious universities in Taiwan, went abroad for graduate study and that 95 percent of them went to the US. Most of them stayed in the US after graduation; the returnee rate was only 5 percent in the 1960s and 15 percent in the 1970s.
3. The trajectory of experimenting with IVF in Taiwan differed greatly from that in China, which involved more of what Fu (2017) calls "*tu* science," a native, local, and Chinese way of doing science. For the making of the first IVF baby in China through *tu* science, see Jiang (2015) and Wahlberg (2016, 2019). I thank one reviewer for pointing out the different beginnings of experimenting with IVF in Taiwan and in China.
4. After defeat by the Communist Party during the 1946–49 civil war in China, the Nationalist Party, led by Chiang Kai-shek, retreated to Taiwan to continue the Republic of China (ROC), while the Communist Party established the People's Republic of China (PRC) on the Mainland. Around 1.2 million Mainlanders migrated to Taiwan and joined the 6 million Taiwanese. The authoritarian rule of the Nationalist Party led to the ethnic tension and inequality between Mainlanders and Taiwanese. For a literature review on this ethnic relationship, see F.-C. Wang 2018.
5. Britain's 1990 Human Fertilisation and Embryology Act (HFE Act) was sometimes mentioned by the media in Taiwan as a policy option, in part because it was the model most widely reported in the English medical journals and mass media (Journalist W, 2011 interview).