

CONCLUSION

The stories of making multiple babies never stop amazing us. In January 2021 in Texas, in the US, a couple who had struggled with infertility earned 4.3 million hearts on TikTok when they documented how the mother, with an extra-large bump in her thirty-first week of pregnancy, went into the delivery room, where there were forty medical personnel in attendance, for the birth of “surprise pandemic quadruplets” (Dellatto 2021). In May 2021 in Taichung, Taiwan, the most popular IVF center in the country publicly announced the delivery of triplets, under the title “Congratulations,” to bring some happy news during Taiwan’s so-called level 3 voluntary lockdown (Lee Women’s Hospital 2021). In Australia, however, IVF medical societies were celebrating the “world-best twin rate” (Carroll 2021), meaning the world’s lowest twin and triplet rate for IVF births, 2.9 percent, along with a record-high success rate for achieving live birth through IVF. And in July 2021, when the UK’s Department of Health and Social Care (2021) updated its guidance for the surrogacy process, it assured the populace that “the aim of treatment should be to have a *single* healthy baby, as twins or more carry added risks for mothers and babies” (emphasis added). To avoid having twins, the British government suggested a careful discussion between the intended parents and the surrogates about whether or not double embryo transfer is needed.

These snapshots exhibit again, around the globe and up to the present day, that the making of twins, triplets, and quadruplets provokes strong affect—joy and tears, surprise and concern. Not

only aspiring parents and IVF practitioners but also social media followers, medical societies, civic groups, and the state engage in the making or unmaking of multiple babies. Never before in human history has the life and death of twins, triplets, and quadruplets been so salient in the various dimensions of people's social lives.

Thinking with Anticipation

This book invites us to contemplate these palpable stories and events. The foremost task is to understand how people become entangled with the dilemmas that advanced assisted reproductive technologies engender. A clinical practice such as multiple embryo transfer can yield extreme joy or a lifelong nightmare. At one time I focused on the angle of risk involved in ARTs, following those critics who stress how the so-called medical breakthroughs can create serious adverse outcomes. However, both the diversity of governing activities and the narratives of mixed emotions elicited by ARTs soon made it clear that the concept of risk is crucial but inadequate. After all, many of the actions meant to create a bright future from the stakeholders' perspective—whether in terms of a scientific innovation, a medical solution for infertility, a prosperous business, or a new family—are not intended to impose risk. In addition, while the mainstream technological assessment model has put risk in the center, the impact of innovations such as various ARTs is more than risk. Making multiple babies may become an essential part of a nation's pride, of a medical society's development of professionalism, or of a woman's identity, as I have shown. Risk is still largely ignored, and we need a more all-encompassing concept.

Anticipation captures the whole picture, without losing the significance of risk. Anticipation—which juxtaposes hope technology and risky medicine, affection, and knowledge making—helps us better comprehend how making multiple babies emerges and poses problems. In the anticipatory regimes of assisted reproduction, three layers of power dynamics are at work. The first layer consists of how stakeholders frame and act upon their selected dimension of anticipation. Scientists and fertility experts tend to envision and pursue successful events and high success rates. ARTs are the hope technology not only of aspiring parents but also of these professionals. However, the biomedical community of ARTs is not monolithic. Some experts in assisted reproduction join the alert public health sector, societies of pediatricians, and feminist health movements

to highlight the risks that ARTs may create. The selected dimension of anticipation for women is particularly revealing. Contrasting images of the future of making multiple babies include highlighting women's strong desire for biological motherhood versus presenting the social options of infertility; showcasing mothers' fulfillment of holding twins versus portraying the burden of care for handicapped triplets; and calculating the live birth rates versus emphasizing women's miscarriage, OHSS, and maternal death caused by carrying multiples. The ways stakeholders negotiate the framing of ARTs and the solutions to settle the contentions surrounding ARTs are the core governing activities.

The second layer consists of the power dynamics among science, state, and society vis-à-vis national sociotechnical imaginaries of assisted conception. The imagined desirable future of ARTs differs from country to country and can range from becoming a world leader in scientific innovation or catching up with forerunners to avoiding harm from the new invention. Every country has had its own first test-tube baby (or babies), usually laden with both positive and negative visions. The main imaginaries still differ, however, as I have argued when examining IVF within the broader historical and political context by contrasting IVF as a nationalist pride in Taiwan but as a troublesome invention in Japan. This accounts for the diverse methods of governing multiple birth ever since the dilemma of balancing ARTs' risk and benefit first arose in the 1980s.

The third layer involves global/local dynamics. IVF as a global technology (Inhorn 2020) has developed at least three mechanisms of global governance: reporting global data through the ICMART; comparing regulations through the IFFS; and evidence-based-medicine debating in academic journals, at conferences, and in systematic reviews such as the Cochrane reports. These global monitoring and recommendation measures sometimes offer strong guidance for state-bound regulations. For example, as shown in chapter 2, Professor Ishihara Osamu, active in both the ICMART and IVF societies in Japan, bridges the global and the local. However, Taiwan shows a different pattern, as analyzed in chapter 3. Although Taiwanese IVF experts actively participate in these international organizations and are aware that single embryo transfer is the trend in Europe and Japan, they tend to select the guidelines of the American Society for Reproductive Medicine and have developed the lenient "American model plus one" criterion in order to build a flexible standardization on the limit of number of embryos to transfer. Feminist legislator Shu-Ying Huang did present the global trend of SET during the stipu-

lation of Taiwan's 2007 Assisted Reproduction Act, but still needed to compromise with the pursuit of a high pregnancy success rate, which was perceived as fulfilling women's most important interests.

I have employed these three layers of analytical framework to explain why Taiwan has the world's highest twin rate after IVF. In Taiwan, the dominance of medical societies in regulating clinical procedures, the perception of IVF as a nationalist pride, and the selection of one global reference point (the US) rather than another (Japan) have created the anticipation of achieving a high success rate while downplaying the urgent need to tackle the health risk of multiple birth. Taiwan's self-congratulatory high pregnancy success rate is achieved at the expense of making too many multiple babies. The analytical framework is also useful for understanding why Japan anticipates risk more than success. This model needs to be further tested in other cases of making multiple babies, such as Australia with its "world-best twin rate" (Carroll 2021) and South Korea with its increasing births of multiples (Kim 2021), as well as in other cases of taking action now for a better future, such as measures to achieve climate security and good death.

Women anticipating having children and carrying multiples are an important part of the anticipatory regimes. This book has coined the term "anticipatory labor" to underscore women's increasingly hard work at different stages of dealing with multiple pregnancy. Women's labor during making multiple babies has been misrepresented and erased in several aspects. First of all, doctors and the media often cite women's requests to achieve success quickly as one of the main reasons that strong measures such as multiple embryo transfer (MET) are favored. This book offers the broader contexts needed to confront these views by delineating the reproductive trajectories of Taiwanese women. Taiwan's low and late marriage trend has led to delayed parenthood. Some gender minorities, such as lesbian couples, must still go abroad to have access to ARTs. Women hesitate to use IVF because they worry about the harm caused by the intrusive infertility treatments; IVF is almost always considered in Taiwan only after the failure of mild interventions such as traditional Chinese medicine. Due to these social and cultural factors, women start IVF late, so implanting more embryos to increase the success rate more quickly turns out to be an option to optimize women's reproductive goal. Women such as Wen-Min (see introduction) may state that they prefer twins to a singleton, but such a preference arises only after long failure and anxious delay in achieving the dream of having kids.

Once a woman becomes pregnant and is carrying multiples, *feto-centrism* becomes the underlying value of reproductive care. Fetal and infant mortality and morbidity are the risks of multiple pregnancy that are most often stressed in medical textbooks, public health agendas, and medical research. What is less visible is the fact that women carrying multiples face higher chances of dying or suffering physical and/or emotional burnout. Maternal mortality and morbidity are far less likely to become the organizing principle of pregnancy care in Taiwan than are fetal health and survival. In addition, while women's health risks and suffering are marginalized, they also carry almost the sole responsibility for protecting the unborn fetuses. Fetal reduction and preventive measures to prolong multiple pregnancy (which is often preterm) present women with challenging tasks and tremendous burdens. Carrying multiples means that women also face heavy moral struggles and must engage in intensive maternal body work.

Women's anticipatory labor is a continuous process within the changing sociotechnical network of reproductive care. During the stage of achieving conception, successfully becoming pregnant is often attributed primarily to doctors' expertise and high-quality lab facilities, whereas repeated failure to conceive is often attributed to a woman's physical incapacity or advanced maternal age. Moving on to the early confirmation of multiple pregnancy, especially of triplets and quadruplets, the network of fetal reduction emerges as a tough dilemma that most women never thought they would face when they began their reproductive journey. Given that doctors, laypeople, and even the gods offer conflicting evaluation principles and opinions on fetal reduction, women's main task at this stage is to navigate the diverse knowledge and values needed for informed decision-making. If carrying multiples continues, the next socio-technical network is to prevent preterm labor so as to protect fetal health. It is all up to the woman's maternal body to fulfill the advised tasks—including detecting the early signs of labor, getting sufficient bed rest, and taking some medical drugs—despite most of these measures not being supported by evidence-based medicine. This stage of anticipatory labor is often in vain. Half of the women carrying multiples still have preterm births.

Comparing and contrasting the three networks—achieving conception, fetal reduction, and prolonging pregnancy—reveals that the tasks and responsibility to handle the hurdles gradually rely on women alone. When facing worrisome outcomes, many women feel guilty and blame themselves, even though they have done

so much heavy anticipatory labor. Most likely, also, it is women who continue to do the main care work after multiples leave their wombs. Although I do not analyze this aspect in the book, how Ting-Ting cared for her sick twins (chapter 5), how Mei-Hsiang lamented that she had to quit her professional job to become the full-time caregiver of triplets (chapter 7), and how Gloria worried about her early menopause being caused by fertility drugs—all this reminds me that anticipatory labor continues long after multiple birth and needs further investigation. In addition, the extent to which Taiwanese women's anticipatory labor may differ from that of women in other countries will require more studies on women's trajectories of making multiple babies.

Responsible Governance and Solidarity

Collective action is required to relieve individual women of bearing heavy anticipatory labor. Based on the research findings, I propose "responsible anticipatory governance" as the policy recommendation for Taiwan, which would hopefully extend to developing a general framework. Responsible anticipatory governance, following the concept and action of responsible innovation (e.g., Stilgoe, Owen, and Macnaghten 2013), demands the reflexivity of stakeholders and institutions, inclusion of neglected voices—especially those of women carrying heavy anticipatory labor—and responsiveness to changing societal and technical challenges. Through *Making Multiple Babies*, I have shown how, in the world of reproductive medicine, some IVF experts, medical societies, and states reflect upon their own activities, critique themselves, and pay attention to their own biases and limitations. One impressive effort is to invent new concepts for measuring success, such as full-term live singleton births per treatment cycle. Such new indicators may make IVF look less effective than before, but they may also better meet aspiring parents' expectations. Such new calculations of success sometimes become the resources with which to build and evaluate the SET guideline. They can also provide guidance for IVF clinics when reporting their performance on websites for public communication (e.g., in Australia; see Reproductive Technology Accreditation Committee 2017). In the case of Taiwan, where a compulsory registry has been built since the late 1990s, some new concepts of success as well as health outcomes are collected and calculable. However, due in part to the lack of reflexivity among IVF experts and the weak capacity

of state bureaucrats to mobilize the data for monitoring, the high quality of data reporting in Taiwan has not yet led to evidence-based policymaking.

Such reflexivity could be enhanced through more public dialogue with diverse groups. I have shown some cases in which feminists, pediatricians, and public health scholars have cast doubt on the practices of the IVF community. Debates and contention need to focus on some mechanisms to make stakeholders work together to increase the momentum of reform. Some effective working examples and mechanisms to date include a special task force with diverse stakeholders (e.g., the UK's Report of the Expert Group on Multiple Birth after IVF; see Braude 2006); inclusive representatives on the official advisory committee to ARTs (e.g., Japan's national ART committee); and the establishment of deliberative forums that encourage the lay public to participate in important ART policymaking (e.g., the deliberative engagement of ART consumers in ART public funding in Australia; see Hodgetts et al. 2014). Women's health organization, feminists, and parents of twins and triplets are often important participants in these committees and meetings. Currently in Taiwan, the state advisory committee of ARTs is mainly composed of IVF experts and scholars; civic groups do not participate regularly. Doctors often act as the spokespersons for their clients, and as I have shown, may sometimes misinterpret women's values and interests.

The integration of efforts to reduce multiple pregnancy is essential to constructing an overarching, consistent, and productive governance approach. In chapter 2, I discussed the Belgian project and the JSOG project, the two exemplars to build the eSET network to effectively reduce multiple pregnancy significantly. The two projects differ in their major movers. The Belgian one was initiated by the state and executed by the medical societies to demand SET with a new public financing program. In contrast, the JSOG led Japan's reform by issuing a voluntary guideline—mainly through mobilization of social responsibility and evidence-based policymaking with new registry data—and by transforming the less generous subsidy from the state as a pronatalist measure. Both projects work well with the alignment of stakeholders' efforts, visually presented by the overlapping circles in figures 2.1 and 2.2. This contrasts with Taiwan's disconnected patchwork (figure 4.1), discussed in chapter 4.

A new opportunity knocks. The Taiwanese state would like to make more babies, which may lead to a decrease in making multiple babies. In April 2021, Taiwan's media widely reported the US

Central Intelligence Agency's latest estimation that Taiwan's total fertility rate would be the lowest in the world in 2021. Although it is not news that the birthrate has been declining for years in Taiwan, the CIA's prediction prompted heated debate in Taiwan's public forums ("Taiwan to Raise Subsidies to Boost Flagging Birthrate" 2021). In response to continuous strong criticism, the government announced some new measures, including a new subsidy program for infertility treatment. The new program no longer targets low-income families only, but grants couples under forty years old six cycles of IVF with subsidies, providing 100,000 NT dollars (roughly 3,500 USD) for the first cycle. For women aged between forty and forty-four, at most three cycles can be subsidized. The new program follows the Belgian project in linking public financing with single embryo transfer. It requires SET for women under thirty-five years old, and a maximum of two embryos for women between thirty-six and forty-four years old. This is by far the most generous subsidy ever offered in Taiwan; the government estimates that the program will benefit 30,000 couples, with a budget of 3 billion NT dollars (roughly 100 million USD).

Can this new subsidy program transform Taiwan from having the world's highest twin rate from IVF? Taiwan's disconnected patchworks of eSET seem to work well with its new subsidy program. The official statement of the new policy lists three goals: (1) to fulfill the reproductive aspirations of the infertile couples, (2) to relieve their financial burdens, and (3) to reduce the multiple birth rate and OHSS caused by ARTs. The TSRM calls this a win-win-win measure: more children may be born to meet Taiwan's societal needs; the health risk of multiple birth can be prevented, to relieve the care burden it places on Taiwan's medical institutions; and couples may have more resources with which to achieve their reproductive goals (Tsui 2021). Instead of calling it win-win-win, however, I would rather bring in the new policy's solidarity in terms of bioethics (Prainsack and Buyx 2012), so as to collectively handle the difficulties of overcoming each hurdle during IVF through redistribution of resources such as money. Still, the new policy is a top-down pronatalist program from the outset, more than being aimed at reducing the multiple pregnancy rate; women's health risk is seldom mentioned. The policymaking process was mainly negotiated between the Ministry of Health and Welfare and the IVF medical societies, without the inclusion of other stakeholders such as pediatricians, health economists, feminists, and lay users. It is predicted that the SET rate will sharply increase and the multiple

birth rate will effectively decrease. Yet the new policy is far from responsible anticipatory governance if we look into the pronatalist purpose and top-down policymaking process.

As STS (science, technology, and society) scholarship points out, STS scholars inevitably become part of a country's anticipatory governance (Barben et al. 2008). I did send my published paper on how to design public financing for better healthcare to governmental officials and the opinion leaders of the TSRM on the eve of their finalizing the details of Taiwan's new subsidy program in May 2021. When invited to give talks to IVF practitioners after the program was implemented in summer 2021, I also emphasized the need to reconceptualize the success rate, invite more stakeholders to participate in deliberations, and evaluate the new policy's outcomes not by how many more babies are born but by the extent to which the maternal and infant health risk of making multiple babies has been reduced. Still, I was quite surprised when I heard in July 2021 that the president of the TSRM, Dr. Min-Jer Chen, had announced, "We have lagged behind. Let's have this year as Taiwan's First Year to Promote SET." This happened much earlier than I expected. Who could have guessed that a CIA prediction of Taiwan having the world's lowest 2021 fertility rate would prompt Taiwan to launch a program to lower the world's highest twin rate? Perhaps responsible anticipatory governance is slated to gain momentum. I hope that this book's delineation of making multiple babies since the 1980s will help inspire the building of a solid eSET network in Taiwan. This may demand a new anticipatory regime of assisted reproduction, starting with putting women's anticipatory labor at the forefront.