

Fertile ground

How can Japan raise its fertility rate?

A report by The Economist Intelligence Unit



Sponsored by

Merck KGaA, Darmstadt, Germany

Contents

About this report	2
Introduction	3
Japan's falling fertility rate	4
The policy response	7
How have other countries responded to falling fertility?	11
Evidence review: Impact of family-friendly policies	14
Evidence review: Impact of ART	17
Discussion and recommendations	19
References	23
Appendix: Methods	27

About this report

“Fertile ground: How can Japan raise its fertility rate?” is an Economist Intelligence Unit report sponsored by Merck KGaA, Darmstadt, Germany. It examines the main drivers behind the drop in the fertility rate in Japan and reviews the evidence for a range of policy levers that could be used to increase the country’s birth rate back up to (or near) population replacement level. The report also examines the experiences of three other countries—France, South Korea and Singapore—in their own endeavours to maintain sustainable fertility rates.

The Economist Intelligence Unit carried out a literature review on fertility rate interventions both in Japan and across the globe, and interviews were conducted with local and international experts. Alongside family-friendly policies, the report looks at whether assisted reproduction technologies, such as fertility medication, in vitro fertilization and surrogacy, could play a role in increasing fertility levels. A more detailed description of our methodology is provided in the appendix.

We would like to thank the following individuals for sharing their insight and experience.

- Osamu Ishihara, Professor & Chair, Department of Obstetrics & Gynaecology, Saitama Medical University
- Ryuichi Kaneko, Deputy Director-General, National Institute of Population and Social Security Research
- Hisakazu Kato, Professor, School of Political Science and Economics, Meiji University
- Mikko Myrskylä, Executive Director of the Max Planck Institute for Demographic Research and Professor of Social Statistics, University of Helsinki
- Hiromitsu Shimada, Director General for Policy Coordination on Declining Birthrate and Aging, Society of the Cabinet Office
- Noriko Tsuya, Professor, Department of Economics, Keio University

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Introduction

Japan's birth rate has been falling for over 50 years. By 2015 the total fertility rate was just 1.46, far below the replacement rate of 2.1. Consequently, the population size is falling while old age dependency is rising. This demographic reversal has placed an enormous, and growing, burden on public services, because there are fewer workers to finance care, and smaller families to provide it.¹ There are a number of reasons for this fall in fertility, including the postponement of marriage and pregnancy, financial uncertainty, and the pursuit of higher education or career advancement. While Japan's case is not unique in the developed world, it's a well-known example of an ageing population.

To try and maintain a sustainable population level and work-force, the Japanese government has used a range of policy levers to support marriage and raising a family. Family-friendly policies, such as investing in child care or offering parental leave, have been used to improve parents' work/life balance and subsidise child-related costs. Alongside these policies, an emerging area for policy intervention is assisted reproductive technology (ART). These technologies, such as fertility medication, in vitro fertilization and surrogacy, can help address infertility problems.

This report examines the options available to Japanese policy-makers in their efforts to reverse declining national fertility levels. We consider the main drivers behind the fall in fertility, and look at what impact family-friendly policies and ART have already had in Japan. We describe three national case studies—South Korea, Singapore and France—to see how they are managing similar challenges. We also review the global evidence-base on the effectiveness and economic impact of family-friendly policies and ART. From this exploration of the literature we offer some thoughts on Japan's fertility challenge and propose ways in which the government could approach policy making in this area.

Some key definitions

Total fertility rate (TFR) represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year.

Replacement rate is the TFR at which women give birth to enough babies to sustain population levels.

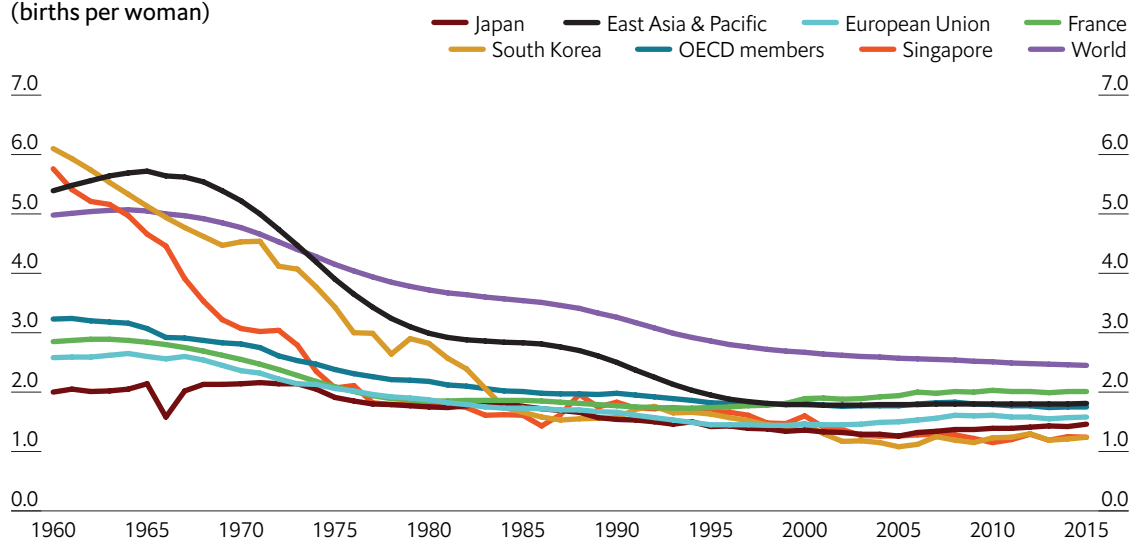
Old-age dependency ratio is the ratio of the population 65 years or over to the population aged 15-64, presented as the number of dependents per 100 persons of working age (15-64)

Japan's falling fertility rate

Falling off a fertility cliff

In the years since 1960, Japan experienced its highest total fertility rate of 2.16 in 1971 and its lowest of 1.26 in 2005, before climbing slightly to 1.46 in 2015* (Figure 1).² As a result of this, one-third of Japan's population is over age 60, and by 2060 it is predicted that two in five of the population will be over 65 and one in four of the population will be over 75.^{3,4} Japan's old age dependency ratio was 42.7% in 2015, compared to 15.5% for East Asia.⁵ Japan faces not only a rising elderly population, with its associated care needs, but also a diminishing workforce, which has fallen by two million since the 1990s.⁴

Figure 1: Total fertility rate since 1960 for Japan and case study countries
(births per woman)



Source: UN, World Population Prospects.

Total fertility rate however varies considerably within Japan—Okinawa Prefecture has the highest (1.94), while Tokyo has the lowest (1.13), and there is across the country a negative relationship between fertility and population density⁶; simply put, couples in the country are more likely to have children than those in the city. Consequently, the Cabinet Office notes that it is necessary to provide region-specific solutions, because factors in urban and rural areas vary substantially.

While these figures sound extreme, Mikko Myrskylä, Executive Director of the Max Planck Institute for Demographic Research, posits that Japan is not such an outlier; that many developed countries have had declines in fertility and in fact Japan “stabilized earlier”. Therefore other countries will be looking to Japan to see how it responds, and while Japan can learn from the experience of others, it can also serve as an example for countries to follow.

* The Cabinet Office (in their written response) suggests that the recent increase is due to “babyboomers” having children after postponement, but still, there was a record low number of births in 2016 at 976,978.

Here we look at some of the key drivers behind Japan's persistently low fertility levels.

Delayed marriages, delayed births

During Japan's first period of fertility decline in the late 1950's, most men and women still married, but had fewer children. The second period of fertility decline, however, beginning in the 1970s, has been accompanied by consistently decreasing rates of marriage^{1,7,8}. As of 2015, 14% of women and 23% of men at age 50 had never been married.¹ Professor Tsuya notes that a "direct demographic driver for the last 40 years has been the decline in marriage among young women and men," explaining that tradition dictates childbearing within marriage, both of which started to decline "at the same time in the mid-1970s." Moreover, those who marry, marry later and women are having children (or experiencing fertility problems) at a later age;^{9,10} one of the top two explanations for families not having their ideal number of children is "too old to have more children".¹¹ Childbearing outside of marriage is rare (2% of newborns) so most who do not marry will not have children.¹²

The decline in marriage has been noted by consecutive governments. For example, Hiromitsu Shimada, from the Cabinet Office, highlighted three drivers of the low fertility rate: the increasing unmarried rate, delayed marriage, and married couples choosing to have fewer children.

Insecure employment and straitened finances

Closely related and intertwined to the deferment of marriage are financial challenges. Raising a child in Japan is expensive, to the point where The Economist reports that "even for those who do start families, the rising cost of child-rearing often imposes a de facto one-child policy".⁹ Professor Myrskylä suggests that postponement of marriage is due to a lack of economic growth and labour market opportunities, as well as a cultural prerequisite of being securely employed prior to family-building. Professor Kato similarly identified three related economic reasons for low fertility: a) insufficient compatible support systems of child care and employment for married women, b) increasing direct and opportunity costs of children, and c) future expectations of income, economic growth, and quality of life.

The changing gender dynamics around work and pay in Japan can also impact the birth-rate in other ways. Professor Kaneko, Deputy Director-General of the National Institute of Population and Social Security Research, suggests that one of the reasons for the decline in the birth-rate is that work now allows women to be financially independent, and thus less likely to marry (or marry late).

Changing (and unchanging) gender roles

Commentators have suggested that women's advancement in the workplace, but a lack of corresponding progress in cultural norms, impacts marriage and child bearing. For example, an increasing number of women are pursuing higher education and the female labour force participation rate is 65%, but working or not, women of reproductive age are spending nine times as many hours on household responsibilities as men.^{13,14} Professor Tsuya points out that the rise in women's educational attainment, paid employment and economic empowerment, with attendant difficulty in balancing work and family, plus persistence of traditional gender roles and family (over individual) focus, leave women much less likely to get married or have babies: Marriage "is no longer a socio-economic imperative for women, but a choice". Professor Myrskylä echoes that "traditional roles of men and

women” and delayed transition to more modern roles hamper fertility. While survey data indicate people want to marry, “being single for a lifetime is no longer a rare course of life”.^{11, 15}

The (in)fertility trap

These demographic trends tend to reinforce themselves by changing expectations and producing, as our interviewees expressed it, “a self-feeding loop” and “low fertility trap,” in which “people’s attitudes and lifestyle expectations change”. As the working population falls, the “self-feeding” loop comes into effect. For example, Professor Kaneko suggested that continuing falls in the fertility rate can at least partly be attributed to a smaller number of potential parents and couples having one child instead of two.

It doesn’t help that fertility knowledge is also low in Japan.^{10, 16} More than 40% of Japanese women mistakenly believe that a woman in her 40’s has the same chance to conceive as one in her 30’s, and women’s “comprehensive fertility knowledge”—measured via the International Fertility Decision-making Study—is less than 40%, compared to 64% for peer countries.¹⁷

The Cabinet Office considers that “involuntary infertility has become a major issue in Japan as women’s empowerment caused late marriage and late birth”. One in six couples is infertile, while among child-seeking women, an estimated 1.3% experienced primary infertility in 2010, while 8.4% experienced secondary infertility (the inability to have another child after having given birth to at least one).^{10, 18}

The policy response

Aiming for 1.8

Beginning in the 1990's, Japan established and broadened family policies to address the fertility rate decline by providing parental leave, child care and child allowances^{3,14}. In 2010, it instituted a five-year plan of supporting four major policies: pregnancy, childbirth and childrearing; community capacity for child rearing; development of the young; and work-life balance.¹⁹ Beginning in 2013, there has also been increased fertility education¹⁶, and in 2014, the Ministry of Health, Labour and Welfare released a movie about pregnancy and infertility.

More recent initiatives introduced in 2016 and 2017 aimed to raise the fertility rate to 1.8. Policies were instigated to support marriage at a young age; make available free child care for all households; improve work-life balance with flexible work arrangements, shorter hours and "more female involvement"; and provide financial support for families with several children.⁴ Among less traditional policy actions, Professor Kaneko notes that the state is facilitating meetings of singles interested in marriage.

Parental leave: Japan's parental leave system includes 14 weeks of paid maternity leave and 44 weeks of paid parental and home care leave to mothers, with average payment rates of 67% and 56%, respectively.* As for fathers, there is no paid paternity leave and 52 weeks of paid parental/home care leave, at 58% average payment rate (Table 1); although uptake is low, and only 2-3% of men take their allotted leave.²⁰ However, parental leave is neither mandatory nor enforced.¹ As of 2010, parental leave was available in only 40% of companies with fewer than 30 employees, and about a third of women employees work in such small organisations.¹ Professor Kaneko reported that while the number of women taking maternity leave has grown, it has not resulted in having additional children.

* The "average payment rate" refers to the proportion of previous earnings replaced by the benefit over the length of the paid leave entitlement for a person earning 100% of average national (2015) earnings.

Table 1: Maternity, Paternity and Parental Leave Policy and Expenditure

	Paid maternity leave (weeks)	% average payment rate	Paid parental and home care leave available to mothers (weeks)	% average payment rate	Paid paternity leave (weeks)	% average payment rate	Paid parental and home care leave available to fathers (weeks)	% average payment rate	Public expenditure on maternity and parental leave per child (2013 US\$)
Japan	14	67	44	55.9	0	-	52	58.4	8,175.2
South Korea	12.9	79.5	52	28.5	0.6	100	52	32.0	1,722.9
France	16	94.2	26	14.5	2	92.8	26	14.5	9,061.5
Singapore	16 weeks, government-funded \$10,000 maximum/4 weeks				2 weeks government paid				N/A
OECD Average	18	N/A	37.2	N/A	1	N/A	7.1	N/A	12,316.0

Paid maternity, paternity and parental leave policy (2016) and expenditure (2013) for Japan and case study countries. N/A = data not available or unknown. Singaporean parents are also entitled to 6 days paid Extended Child Care Leave and 6 days unpaid infant care leave.

Source: OECD and Singapore Government

Child care: Japan has subsidized child care centres for infants through pre-schoolers, but urban waiting lists for infants are long (with plans for an additional 400,000 spaces by 2018), possibly because “financial support for expanding childcare has been half-hearted”.¹² The number of places and those enrolled have increased since 2000, though so have those on waiting lists.^{14, 21} The 0-2 year-old child care and nursery participation rate is 30.6%, below the OECD average of 34.4%, while Japan exceeds the OECD average for 3-5 year-old education enrollment rates, at 91.0% vs 83.8%.²² According to the Cabinet Office, while “it is quite difficult” to identify which policies contribute to fertility rates, “it is possible to say that some of the child care policies have succeeded in maintaining the birth-rate” for a couple of decades.

Subsidies: Japan’s child allowance is income-based, covers first and second children, and extends through junior high school. It is just \$100-150 per month, relatively low by OECD standards.^{1, 8, 12}

Insufficient funding remains an issue

In implementing the above policies, the government spends 1.49% of GDP on all family benefits: 0.80% cash, 0.46% services and 0.23% tax breaks (table 2).²² Professor Kato suggests that while policy interventions are sound, they are not sufficiently funded. Among 18 member countries, OECD ranked Japan’s family-friendly policies second to last with child care and parental leave “especially weak”.¹⁴ The Cabinet Office concedes some weaknesses, such as lack of financial support and training for youth, a small proportion of family spending to GDP, and “insufficient policies for stay-at-home wives”.

Table 2: Public spending on family benefits by type (% GDP)

	Total	Cash	Services	Tax Breaks
Japan	1.49	0.80	0.46	0.23
South Korea	1.32	0.18	0.95	0.20
France	3.65	1.56	1.35	0.74
OECD Average	2.43	1.25	0.94	0.23

Public spending on family benefits by type. Figures are from 2013 or latest year available.
Source: OECD

Why do fertility rates remain stubbornly low?

Adding to the impact of insufficient funding and “half-hearted” implementation, our interviewees offered a range of perspectives on why policies have not had the desired impact. Professor Kaneko observes that the large proportion of voting seniors leads to policymaking and public services that favour older Japanese, reinforcing the low birth rate trend. He goes on to say that there is a similar effect in the market-place, with progressively fewer goods and services being designed with young people in mind, as they make up an increasingly smaller proportion of the paying public. Professor Tsuya argues that the labour market needs to become more family friendly, but it is difficult for policy alone to achieve that. While Japan’s macroeconomic policy incorporates family policy (primarily through child care services), she states that “we need more family-oriented policy to address the socio-economic costs of bearing and raising children for couples.” The government must show the public that “it is serious in efforts to help them”.

Professor Myrskylä points out that Japan's "policies tend to provide minimal incentives" and are "insufficient" in comparison to the actual costs of raising a child. However he does note that integrated policies "might change the views and attitudes gradually and therefore you can expect to see changes several years after the policy is implemented." Professor Kato also specifically pointed to inadequate funding of child care.

One notable local example of comprehensive policy coordination is the town of Nagicho, which raised its fertility rate from 1.4 to 2.8 from 2005 to 2014 (though provisional numbers indicate it has decreased to 1.9, though still higher than the national rate). The increased proportion of the town's budget for fertility from 2% to 3% pays for a "celebratory" birth gift of ¥300,000, children's 30% co-insurance payment, volunteer-led nurseries, a secondary school allowance, subsidised housing, baby-sitting services and baby goods.^{23*} An example of a well-funded package of complementary policies.

The growing role of associated reproduction technologies

Family-friendly policies are not the only levers available to national governments to raise fertility rates. Governments can support access to associated reproduction technologies (ART), an umbrella term for a range of technologies that can assist people in achieving pregnancy. Such technologies are playing an increasing role in a number of countries, including Japan.

In 2015, there were 51,001 ART new-borns in Japan, representing just over 5% of births. While the number of treatments continued to grow in 2016, Professor Ishihara states that Japan should be able to reach the proportion Northern European countries have achieved, at about 8% of births (or one ART child for every 12 to 13 children). He explains that ART utilization in Japan has increased partly due to improved local government reimbursements, but also notes that only 40-45% of cycles are currently reimbursed, and that cost remains a barrier to ART, with most only able to afford one cycle. Of 424,151 treatment cycles in 2015, subsidies were provided in 160,368 cases.^{24, 25†}

While Japan has universal health insurance coverage, ART is not included; the only public ART support is a means-tested subsidy instituted in 2004. The subsidy is available to married couples with an annual income less than ¥7,300,000.²⁶ As of April 2016, the subsidy covered only those under 40 years of age, for up to 6 treatments (3 times for those age 40-42), but it was increased to ¥300,000 for one cycle and ¥150,000 for each additional cycle.²⁶ ART represented 0.15% of the 2010 Estimates of National Medical Care Expenditure.²⁷

A 2013 analysis of the direct costs (before subsidization) of ART in 32 countries found Japan was the eighth least expensive (at \$3,956 for one fresh IVF treatment cycle compared to a \$4,950 average cost),²⁸ and Japan's cost per live ART birth is a relatively low \$24,329,[‡] compared to \$41,132 in the USA. Total ART treatment costs as a percentage of total public and private healthcare expenditure is .09%.²⁹

Non-financial barriers to accessing ART

Cost is not the only barrier to access. ART is not available to single people or same-sex couples; Japan permits and regulates sperm donation, but does not allow egg and embryo donation or gestational carriers.^{*30} However sperm donation is "infrequently used" and compensation is illegal.^{25, 30} Professor Ishihara observes that for ART to affect fertility rates, the government would need to enhance its reimbursement policy beyond the income eligibility threshold and married heterosexual couples.

* A gestational carrier is a woman who carries a baby to term who is not genetically related to her. The eggs and sperm are derived from the "intended parents" through IVF, the egg is fertilized in the lab, and then the embryo is placed into the uterus of the gestational carrier. A surrogate on the other hand is someone who donates her egg and then subsequently carries the child; she is genetically linked to that baby.

† There are 607 registered ART facilities in Japan.

‡ Twins and triplets count as one; average direct cost of treatment per live birth.

FERTILE GROUND

HOW CAN JAPAN RAISE ITS FERTILITY RATE?

However, in 2017, the government cancelled a proposal to broaden reimbursement to unmarried couples.

There have also been historical and cultural reasons some couples don't utilize ART in Japan, although a 2015 news article notes that "what was once an issue that was rarely discussed because of the social stigma attached to it, fertility treatment has become such a common procedure that people are more willing to consider it without hesitation".¹⁰ While education around ART is increasing, Professor Ishihara suggests more could be done, such as through mass media campaigns.³¹ Japanese women using ART face a number of challenges maintaining their careers, including a lack of support.³² Research shows women treated for infertility suffer an emotional toll from stress, social isolation and depression.^{10, 33} A recently conducted Japanese survey of fertility treatment and work discovered that 23% of women left their jobs due to the difficulty of balancing treatment and work, and more than two-thirds (69%) of companies offered no support system for employees undergoing treatment.³⁴

How have other countries responded to falling fertility?

Case study 1: South Korea

Trends and drivers: Like Japan, fertility in South Korea has been below replacement level for 30 years.¹ In 2015, the fertility rate was 1.24, tied with Singapore.² Professor Myrskylä said that “in Korea, the [fertility rate] trend is still downward and total fertility rates are going to much lower levels than what we are seeing in Japan”. There are a number of factors associated with decreased fertility in South Korea that are similar to Japan. For example there is a trend of postponed or lack of marriage—with surveys indicating one-half of men are not married for financial reasons—and that “women face traditional gender roles and home/child responsibilities, unresponsive workplaces, lack of child care”.³⁵ Also as with Japan, extra-marital births are rare.³⁶ A driver that appears stronger in Korea than Japan is parents’ response to competition by directing all resources into one child, in order to pay expensive education fees.³⁵ The UN’s fertility rate projection for South Korea in 2025-2030 is 1.46, higher than its 2015 rate of 1.24.³⁷

Parental leave: South Korea’s parental leave system of employment-protected leaves of absence includes 12.9 weeks of paid maternity leave and 52 weeks of paid parental and home care leave to mothers, with average payment rates of 79.5% and 28.5%, respectively. As for fathers, there is six weeks paid paternity leave and 52 weeks of paid parental/home care leave, at 100% and 32% average payment rates. However, employers have lagged in implementing leave policies and, similar to Japan, employees have been reluctant to use it. The government has tried to introduce a family-friendly workplace by expanding on-site day care and through flexible hours, but with limited success.³⁵ Longer and higher paid leave for mothers, on the other hand, has increased take-up of maternity leave in the private sector fivefold between 2002 and 2015.²¹

Child care: South Korea subsidizes child care, which includes either fees for care centres or an allowance for home-based care and free after-school education.^{1,8,35} Policies expanding access to care have resulted in universal assistance for centre-based care, with increasing enrollment rates.²¹ Korea recently set a goal of having one-third of children in national, public or company day-care centres, along with improved quality of care.³⁸

Subsidies: Families with young children are eligible for tax relief and means-tested loans for housing.³⁵ South Korea spends 1.32% of GDP on all family benefits²²; from 2003-2009, there was a large increase in spending on children aged 0-5.³⁶

ART and ART policy: Unlike most countries, Korea considers ART an intervention to address decreasing fertility.²⁹ Beginning in 2006, Korea provided allowances to infertile people, and in 2010 a means-tested subsidy for certain treatments (with caps on amounts and cycles). During 2006-2015, 100,993 babies were born to parents who received state infertility treatment support, and the number of Korean couples who sought infertility treatment rose from 178,000 to 215,000.³³ Almost 3% of all 2011

births were supported with public funding.³⁹ The direct cost of a fresh IVF cycle is less than \$2,000, the lowest among a comparison of 32 countries.²⁹

Beginning in 2016, South Korea expanded benefits for infertility treatment by eliminating the income-threshold for subsidies and increasing the subsidy amounts, with goals of supporting 96,000 people (up from 50,000). In October 2017, health insurance coverage for infertility treatment costs and associated expenses was introduced with the goal of a universal support system.³⁸ To support these policies, South Korea's budget increased from 31.5 billion in 2007 to 92.5 billion in 2016.³³ South Korea requires diagnostic evaluation for single people and same-sex couples for treatment.³⁰ Sperm and egg donation are permitted and regulated, though they're "infrequently used," and reimbursement is allowed only for time and expenses.³⁰

Case study 2: Singapore

Trends and drivers: Fertility in Singapore has also been below replacement level for the past 30 years.¹ In 2015, Singapore's fertility rate was 1.24.² As with Japan and South Korea, Singaporean parents face high financial and opportunity costs from having children, especially with regard to a competitive, expensive education system, and women must manage a difficult work-life balance.⁴⁰ The UN's fertility rate projection for Singapore in 2025-2030 is 1.30, slightly higher than 2015's rate of 1.24.³⁷

Family policy: A United Nations report notes that "Singapore has the most long-standing and comprehensive policies to encourage marriage, boost fertility and provide support to families of any country in East Asia," having moved to address the fertility problem in 1987.⁴⁰ In addition to family supports, there are policies to encourage marriage, including through housing policy. Yet the report concludes that there is no clear evidence that Singapore's policies have had much impact on fertility rates. The authors suggest that for there to be an impact, financial incentives need to be higher, and wider social change is needed to "enable work and child-rearing to be more readily combined".⁴⁰

Parental leave: Working mothers are entitled to 16 weeks of maternity leave (which fathers can share), funded by the employer and government (though the third child and beyond is fully paid by the government).⁴¹ Fathers receive two weeks of paternity leave, funded by the government.⁴² Parents also have access to six days of paid extended child care leave and six days unpaid infant care.^{15, 43} Singapore offers grants to employers to incentivize family friendly policies.⁴⁴

Child care: Parents who have children enrolled in licensed child care centres are eligible for basic subsidies of a maximum of \$600 for infant and \$300 for child care.⁴⁵

Subsidies: Singapore offers baby bonuses of \$8,000 (for 1-2 children) and \$10,000 (for 3+ children) "to help families defray the costs of raising a child", and \$4,000 child health care grants, as well as health insurance coverage and tax relief.⁴⁶⁻⁴⁸

ART and ART policy: The government provides 75% co-funding (up to \$7,700 for fresh and \$2,200 for frozen) for standard ART treatment cycles, for a maximum of three fresh and three frozen ART cycles for those under 40 years of age.⁴⁹ As with South Korea, Singapore requires diagnostic evaluation for single women, single men, same sex female and male couples for treatment.³⁰ Sperm, egg and embryo donation are permitted, and there are regulations governing all three, while gestational carriers are not

allowed. Sperm and egg donation are “infrequently used” and reimbursement is only permitted for time and expenses.³⁰

Case study 3: France

Trends and drivers: France has the highest fertility in the European Union, at 2.01 in 2015.² The fertility rate has been relatively stable since the mid-1970’s, though has fallen slightly in the last couple of years.^{50, 51} There has consistently been a significant percentage of large families (three or more children) and non-marital births (57% of total births in 2012), in addition to a low percentage of women with no children.⁵¹ The UN’s fertility rate projection for France in 2025-2030 is 1.96, slightly lower than 2015’s rate of 2.01.^{2, 37}

Family policy: While France has had a long-standing policy of supporting child-bearing and parenthood, the focus has moved to promoting a work-life balance as “fertility decisions appear increasingly determined by a family’s ability to combine care and support for children with the workforce participation of both parents”.^{50, 51} Accordingly, total public spending on families is a comparatively high 3.7% of GDP, which funds policy initiatives that subsidize families to cover costs and facilitate employment to sustain income.^{22, 50, 52*} A 2015 UN Expert Group meeting on policy responses to low fertility in France found that “several evaluations suggest that policies that provide financial support to families or paid leave at the time of childbirth have a positive, but rather limited, impact on fertility”.⁵⁰

Parental leave: France’s parental leave system of employment-protected leaves of absence includes 16 weeks of paid maternity leave and 26 weeks of paid parental and home care leave to mothers, with average payment rates of 94.2% and 14.5%, respectively. As for fathers, there are two weeks paid paternity leave and 26 weeks of paid parental/home care leave, at 92.8% and 14.5% average payment rates.

Child Care: There are subsidized child care centres and preschool education, a long school-day and after-school care. France also provides a stay-at-home allowance: a “fairly low, fixed” amount, with a higher supplement for a third child.^{22, 51, 53}

Subsidies: France offers a lump sum “baby bonus,” income tax break, child tax credit and child care tax relief, including better benefits for families with three or more children and the same tax benefits for civil partnerships as married couples, as well as housing subsidies.⁵¹

ART and ART policy: The Statutory Health Insurance system provides complete reimbursement for ART treatment, though eligibility is limited to married or unmarried heterosexual couples who are infertile and services are limited by age (up to 43 years) and IVF attempts (no more than 4).^{54, 55} ART is “a medical treatment”; and single people and same-sex couples are not currently reimbursed for treatment, though reimbursement for artificial insemination with donor sperm for lesbians is being considered this year.^{54, 56} Coverage includes donor gametes and embryos, but rates of oocyte and embryo donation are relatively low as donors are only compensated for travel; surrogacy is prohibited.⁵⁷ The centralized healthcare system ensures uniform prices and access across the country.⁵⁶ Nearly 25,000 children (24,839) were born using ART in France in 2015.

* The private sector is less involved, and working parents generally receive limited support from their employer.

Evidence review: Impact of family-friendly policies

Assessing the effect of family policy on fertility is difficult for several reasons: a) policies being evaluated are often complemented by other policies, b) child bearing decisions occur over a long time horizon during which various policies can affect a person's plans, c) policies take time to have an effect at individual and societal levels, d) assessing an policy's impact against a control is difficult or impossible, and e) family policies have different goals which may indirectly affect others, such that measuring the respective contribution of each type of support is probably impossible.^{51, 58} In addition to this, Professor Kato cautions that while European examples of policy can be instructive, they are insufficient because of the social differences between Europe and Japan. Similarly, Professor Myrskylä states that because "attitudes don't change in line with the policies, it's therefore very difficult to find policies that could be taken from one country and transferred to another". Research results must therefore be carefully studied to understand scope, qualifications and limitations.

Evaluations mostly suggest that individual family policies generally have small effects on fertility rates. For instance, UN evaluations report that Japan's parental leave, monetary assistance and subsidized childcare appear to have had "very little impact" on marriage and fertility.^{1, 14} However, in amongst the evidence presented here, we can see some examples where packages of complementary interventions have made an impact.

Working hours and parental leave

Nagase's review of Japan's mandated shorter work hours for employees with children under age three found the result "significant and large—a 33% increase in first childbirths", but no significant effect on overall fertility.⁵⁹ While Nagase cites two studies using Japanese data that showed fertility increased among those working when parental leave was available, he qualifies the findings by observing that most research on paid leave excluded women working at firms that did not offer leave and women who left the workforce.⁵⁹ Boling similarly found that longer parental leave of three years in Japan does not seem to yield higher fertility rates "as women who take long leaves will have a difficult time resuming their careers".¹²

Thevenon's 2011 study with Gauthier found that "paradoxically, a comprehensive literature review suggests that the measures introduced with the explicit objective of supporting fertility, such as cash subsidies, have had a fairly limited impact, whereas measures designed to support the work-family balance or to raise living standards appear to have a more tangible impact on fertility, even though this was not their primary aim".⁵¹

A 2017 Center for Economic Performance (CEP) study noted that the effect of parental leave on fertility is "negligible", in keeping with 2014 research that without adequate paid leave, fertility decisions are not very responsive to parental leave.⁶⁰

CEP's review also noted, however, that a study of Austrian policy change from one to two years parental leave showed "substantial fertility effects of leave extension, accounting for 12 additional

children per 100 women,” and that a German policy of paid maternity leave based on income led to “sizeable fertility gains”.⁶⁰

Child Care

Fukai’s 2017 analysis of Japan’s 2000–2010 expansion of child care provision found it “led to a small but significant increase in the fertility rate of women aged 25–39 living in regions where the propensity for women to work is high” but little effect in other areas.⁶¹ The CEP analysis of six categories of family leave policy on outcomes in 30 OECD countries (including France, Japan and South Korea) found that only early childhood education and care spending had a “robust” positive correlation with fertility rate, with one extra percentage point of GDP spending associated with 0.2 extra children per woman⁶⁰

Thevenon 2016 found that among family-friendly policies, “provision of childcare services is a strongly positive factor in the decision to have children” (confirmed by European country comparisons, which also indicate that policies that support a healthy work/family balance improve fertility).⁵¹ For France, “of all the policies introduced over the years, provision of childcare services appears to be the most effective in encouraging families to have children and women to remain in the workforce”.⁵⁰

Cash Transfers

Regarding financial transfers’ contributions to fertility, Kalwij’s 2010 review of 16 Western European countries determined that increases in family allowance have “no significant impact on the timing of births or on completed fertility”.⁶² France’s home-care allowance, a cash subsidy complementing parental leave, introduced in 1985 for working parents with three or more children for a three-year maximum, on the other hand, “seems to have made a particularly strong contribution to maintaining fertility, even if it is hard to quantify its precise impact”. When the subsidy was expanded to second children it increased the probability of having a second child though decreased significantly the probability of a third⁵¹. The article concludes that the impact of child credits “seems to be significant, but the policies are costly”⁵¹.

Combined, family-friendly policies

Thevenon and colleagues found that public spending on family cash benefits, length of leave for mothers and age 0–2 child care enrollment rates “are among the most important (statistically significant) drivers of total fertility rates among EU and OECD countries.” The authors note that these findings are consistent with previous research, and that a combination of these benefits is most likely to facilitate parents’ choice to have children. While also positively associated with fertility rate, paternity leave length and age 3–5 pre-school enrollment rates, have a less significant impact.³⁶ Comparing family policy (leave, financial support, early childhood services) on fertility rates across countries, Thevenon concluded that “results suggest that all forms of support have a positive impact on fertility, all other things being equal, and that a combination of these types of support is likely to boost fertility”⁵¹.

In an analysis of 28 OECD countries (including Japan and France), Kato found a statistically significant close relationship between social expenditure on young families and fertility rate, with more funding leading to higher more births.⁶ Kalwij’s 2010 review of 16 Western European countries notes extending maternity and parental leave and child care “causes women to have children earlier

in life and to have more children” and that “the relatively large changes in expenditure on family policy programs over recent decades in western Europe have generated considerable fertility responses”.⁶²

The secret of France’s success?

In a 2016 review of studies on Europe, Thevenon found that there is “some evidence” France’s policies taken together, “matter” and its “broad, long-standing, and consistent family policies contribute to [fertility rate] stability, although the exact contribution is hard to quantify”⁵¹. While separate policies’ impacts may of themselves be small, France’s positive results “seem to lie in the diversified system of support that provides parents with supplementary resources in the form of money, time, and services” that aids different kinds of families with children of all ages.^{50, 51} Hoem offers a similar opinion: “The evidence from France and the Nordic countries suggest that it should be possible to maintain a reasonably high ultimate fertility rate by a coordinated use of public policies in a range of interlocking areas (economic policy, employment policy, housing policy, gender policy, core family policy, and more) that are implemented in a spirit that furthers childbearing in general, and do not just consist of making more money available to married families in selected situations”.⁵⁸

Evidence review: Impact of ART

Few countries explicitly cite demographic goals as a predicate for public funding of ART, even though used wisely it could support family-friendly policies. State support instead is usually based on equitable access and safe practice.²⁹ This may be because ART is less amenable to conventional health economic methods of analysis, such as cost-utility analysis and quality adjusted life years, as it is about creating life, not preserving and enhancing it.²⁹

Impact of ART Policies on total fertility rate

Teasing out the impact of ART from other policy measures is, as with family friendly policies, challenging. Some authors are positive about potential impact. For example a 2016 model examining trends five years after the passage of Taiwan's ART law found that the rate of ART newborns increased by 50%, suggesting that government incentives for those who marry late "may also increase use of ART and increase the fertility rate".⁶³ Another study concluded that full access to IVF after three years increases fertility rate by 0.08 children.⁶⁴ A 2007 RAND study found that if the United Kingdom had similar ART coverage and utilization as Denmark, the UK fertility rate would increase from 1.64 to 1.68 (or fall to 1.62 if ART was not available) and concluded that the increase was equivalent to other more orthodox policies, and possibly more cost-effective.⁶⁵

On the other hand, others are less confident on the potential degree of impact. For example, in noting that primary infertility was "relatively constant" in East Asia during 1990-2010 and secondary infertility increased in some countries, one researcher asserted in a 2014 analysis that "even if used widely, assisted reproductive technology would have only a minor effect on fertility rates".⁶⁶ Similarly, a 2010 review concluded that though ART's impact on fertility rate is hard to evaluate due to a variety of biological and behavioural factors, European government ART support "is beneficial for families, but the effect on fertility rate is extremely small".⁶⁷ Opinions are varied because, as with family-friendly policies, unbiased and unambiguous evidence, free of confounding factors, is so elusive.

Reimbursement as a potential policy lever to raise fertility

There is "a significant relationship" between reimbursement levels and proportion of ART births. This was the conclusion of a 2012 analysis of 23 European countries' fertility treatment funding and outcomes, with the lead researcher stating that while "the influence on birth rates is small, the relationship is positive".⁶⁸ Similarly, a 2014 analysis of European ART data found that reimbursement "could be part of a reproductive health policy promoting early child-bearing," suggesting that the widespread use of ART could become one of the factors keeping the fertility rate stable in the future.⁶⁹ Europe's "State of the ART 2007—ART and Society" meeting also asserted that "increased use of ART should be seen as part of a population policy mix in Europe" and a response to this study concluded that if ART costs were fully reimbursed, a small but significant impact on national birth rates would result.^{70, 71}

ART as an investment

ART treatment is often expensive from a patient's perspective but not from a public or third-party insurance perspective. In countries with supportive public funding, ART costs typically come in at around 0.25% of total healthcare expenditures,²⁸ and Ireland's Health Research Board stated that "the overall economic cost to society is relatively modest in the context of public spending from the overall health budget".²⁹ Because of lower success rates in older women, though, costs and public funding of ART live births increases with age.²⁷

ART costs, however, should be considered an investment that yields future economic benefits.⁷² A 2010 study using investment analysis concluded that "appropriate funding of ART services appears to represent sound fiscal policy",⁷³ while Chambers and colleagues found that "regardless of the approach taken to valuing ART treatment, the implied or explicit monetary value of providing ART treatment far exceeds the cost per child conceived, suggesting that ART treatment is indeed good value for money—particularly if ART children are born as singletons"²⁸.

Further studies of various countries' individual ART policy return on investment support this conclusion, including:

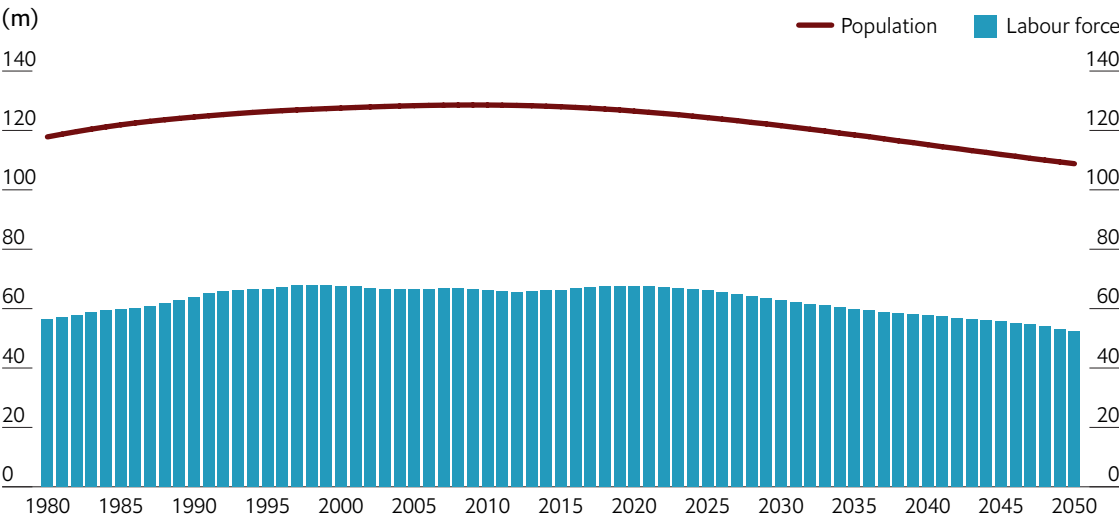
- Tax benefits from an ART-conceived child in Brazil, Denmark, Sweden, UK and United States were estimated to range from 1.24 to 13.91 monetary units for each unit invested in ART funding and the break-even age from 38 to 41 years.⁷⁴
- Discounted net tax revenue was calculated to be about \$208,400 for an IVF singleton born in 2005 in the UK, an eight-fold return on investment for the government.²⁸
- An IVF-conceived individual in Spain has been calculated to offer a net fiscal contribution of €66,709, resulting in tax benefits of €15.98 for every euro spent.⁷⁵

* Break-even age is the age at which the financial position between the individual and the state begins to be favourable to the state.

Discussion and recommendations

Japan's population is shrinking, and is predicted to continue to fall over the next few decades. The UN's World Population Prospects forecasts that Japan's population will tumble to just over 108 million by 2050, down from a 2006 peak of nearly 129 million. The labour force estimate from the Ministry of Health, Labour and Welfare shadows this trend, falling to a 2050 estimate of 52.5 million (figure 2). This reduction in the population is primarily a result of fertility rates being well below replacement rate. Falling fertility in Japan and the wider developed world is a complex problem, with numerous interconnected drivers. It is a problem that at least in the short term probably cannot be solved, but may be alleviated. Our report set out to understand the options open to Japan in the policy arena, and what it could learn from others.

Figure 2: Population and labour force projections for Japan from 1980 to 2050



Sources: UN, World Population Prospects; Ministry of Health, Labour and Welfare, Japan; EIU data tool.

The evidence suggests that a number of interventions can, in the right context and settings, have a positive impact on total fertility rates, but that effects are mostly small. However, they may also be cumulative, and high-income countries that have successfully maintained sustainable fertility rates (without recourse to immigration) have tended to bundle together several well-funded, long-term, interconnected programmes. Difficult though it may be to influence fertility rate, governments are not powerless, and in-fact have plenty of scope to make society a more welcoming place for young and old families alike. From the research described in this report we suggest there are five principles of successful implementations around which we believe policy packages can be built (table 3).

Table 3: The principles around which successful fertility-raising policies can be designed, and the actions that need to be taken to implement them.

	Principles	Actions needed
1	Make Japan a better place to have kids	Build a family friendly society; don't just aim to raise the fertility rate
2	Think "fertility in all policies"	Implement stable, long-term packages of complementary policies and programmes
3	Use technology	Improve access to assisted reproduction technology alongside family friendly policies
4	More funding, more babies	Fund the long-term implementation of policies in order to witness their impact
5	Fertility as investment	Be guided by a long-term, investment driven mind-set

1. Build a family friendly society; don't just aim to raise the fertility rate

Measures introduced with the explicit objective of supporting fertility, such as cash subsidies, often have had a limited impact. However, those measures designed to support work-life balance or raise living standards in general often appear to have a more tangible impact on fertility, even though this was not their primary aim. The government should not therefore emphasise too narrowly total fertility rate as an outcome, but instead focus on what they can do to improve family life and generally make Japan a more pleasant place to get married and have children.

2. Implement stable, long-term packages of complementary policies and programmes

Any one policy or programme will have at best a small impact on fertility rate. Instead the Government should continue instituting a comprehensive, consistent, stable, adequately funded policy package of family and ART supports (see recommendation 3, below). There should be a consensus across political parties, as families and prospective parents need to know the state will support them in the medium to long term. While not a comprehensive list, policy developments could include:

- Mandating a parental leave system of longer employment-protected leaves of absence funded by employers and government based on higher proportions of salary for mothers and fathers (including instituting paid paternity leave at a generous percentage of salary).
- Incentivizing implementation of model employer workplace policies supportive of childbearing and parenting through increased workplace flexibility, including shorter/flexible hours and easing transitions for mothers returning to work.

- Making larger investments in and expanding quality childcare and nursery for ages 0-2. Enhancing tax incentives for family-building and child care.
- Improving attitudes around gender equality in household and child care responsibilities.

3. Improve access to assisted reproduction technology alongside family friendly policies

In thinking about whether to fund or not to fund ART, Chambers and colleagues noted that while calculating the fiscal impact of ART conceived children is valid, they concluded that “demographic considerations and the value placed on increasing a nation’s population will determine the desirability of investing in ART treatment”.²⁸ Following this thinking, Japanese policy-makers must consider investing in ART. This should be done alongside family friendly policies, as children require support, schooling care and parental time whether conceived via ART or not. Policies that Japan could consider implementing include:

- Mandating health insurance coverage for ART.
- Increasing subsidies, and providing allowances, for ART, and expanding coverage and subsidies to individuals and same-sex couples and for third-party ART.
- Providing public education about work-family balance, fertility and infertility, ART options and insurance and public benefits.
- Creating a regulatory structure to ensure ART treatment quality and access.
- Promoting more policy and workplace support for ART, including paid leave, shorter hours and flexible scheduling.

4. Fund the long-term implementation of policies in order to witness their impact

The more spent on family benefits as a percentage of GDP, the greater the impact on total fertility rate. Japan has put in place what many describe as a sound package of measures that should, or rather could, have an impact. More often than not, however, the issue is that they’re not sufficiently funded. They need to be, and trying to save today over long term impact is short-term thinking (see recommendation 5, below). Something that the central government could consider is their role in promoting local municipality development of funding plans, for variation between urban and rural locations means local policies may be more suitable than national ones.

5. Be guided by a long-term, investment driven mind-set

Cost-benefit analyses of ART and family policy interventions suggest that, over a life-time, public spending on fertility and family support is an investment rather than a cost. Government, policymakers and other funders often discount potentially large future gains, in order to prioritise smaller current gains, or money saving measures. The situation with falling fertility will always be prone to discounting,

FERTILE GROUND

HOW CAN JAPAN RAISE ITS FERTILITY RATE?

but the threat of continued falls in the birth rate is existential to Japan. This is one situation where long-term thinking is essential.

Challenging though the policy response is, to fail to respond would be inexcusable. The government has instigated a number of plans over the years, but more needs to be done, and with a greater sense of urgency. The final word goes to one of our expert interviewees, Professor Noriko Tsuya. She noted that there is “no instant policy solution to stop fertility sliding,” but advises quick action, observing that “even if you don’t succeed in raising the fertility rate, you will have a better society”.

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Appendix: Methods

To investigate falling fertility in Japan, its key drivers and the range of possible policy responses (including family-friendly policies and support for ART), The Economist Intelligence Unit conducted a literature review and performed six interviews (one interviewee provided written answers to our interview questions) with local and international experts.

Literature review

For the literature review we searched published and grey literature to identify relevant academic studies and reports on fertility in Japan and the case study countries. We also performed a global literature search for evidence of impact on fertility rate and economic outcomes for family-friendly policies and ART. Database searches were performed in MEDLINE (PubMed) and Embase (Elsevier).

In addition to database searches we conducted grey literature searches, including searches of relevant organisations' websites. Supplemental search techniques such as reference harvesting and citation searching were used to identify further research reports from "pearl" articles. The search was pragmatic, iterative and targeted in scope, and was carried out by an experienced health information specialist. References were managed in Endnote.

Case studies

Case studies were performed for South Korea, Singapore and France, using data from the literature review and supplemental searching. We summarise how these three countries have responded to the challenges of falling fertility levels, including their policies on parental leave, child-care, subsidies and ART. Because each country is unique, successful interventions cannot simply be applied in Japan; similarly, failure of a policy in one country does not necessarily mean it will fail elsewhere. Nevertheless, the comparative case study approach offers insights into the landscape of possible approaches.

Primary research

We interviewed five experts in Japan and one international expert, Mikko Myrskylä from the University of Helsinki. Interviewees included expert voices from policy-makers, academia (in demography and economics) and experts in ART. Interviews were semi-structured in nature, with the questions varying slightly depending on the interviewee's field of expertise. Transcripts were made for all but one interview, where instead interview notes were kept. Direct and indirect quotes from the interviewees are used throughout the report.

We have summarised current policy arrangements, costs and other data points throughout the document using the most recent information available to us. We have made every effort to ensure that such figures are correct at the time of writing—March 2018. However, these figures will change over time. Also, costs and impact have been reported in the currency used in the original source report, including Yen, Pounds and Dollars. We have retained the original currency used to avoid inaccuracies caused by fluctuating exchange rates.

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