





Perhaps more than any other demographic indicator, fertility trends illustrate the similarity and the diversity of Asia's populations. Fertility has declined over the past 50 years in every major country of the region. Although the trend has been consistent, the rate of fertility decline has varied, so that fertility levels in Asia today are widely diverse.

Fertility is generally expressed as a total fertility rate (TFR), which indicates the average number of children that a woman would bear, at current age-specific fertility rates, throughout her reproductive years. Replacement-level fertility is defined as a TFR of 2.1 children per woman, which includes one-tenth of a child extra to make up for the mortality of children and of women who do not reach the end of their reproductive years.

In 2000–04, fertility in Asia's major countries ranges from a low of 1.3 children per woman in Japan to a high of 6.8 children per woman in Afghanistan according to the United Nations medium-variant projections (Appendix Table 2). Fertility levels are generally lowest in East Asia, are highest in South and Central Asia, and vary widely in Southeast Asia between the two extremes. Fertility is at replacement level or lower in all countries of East Asia except Mongolia. In China, the largest country of the subregion, the TFR is 1.8. In Southeast Asia, fertility ranges from 1.5 children per woman in Singapore to 4.8 in Laos (Lao People's Democratic Republic) and Cambodia. In South and Central Asia, fertility ranges from 2.0 in Kazakhstan to 6.8 in Afghanistan. The total fertility rate in India, the largest country of the subregion, is 3.0.

Other sources may estimate fertility levels rather differently. The Population Reference Bureau (2000), for example, estimates total fertility in 2000 at 3.3 for India, 6.1 for Afghanistan, 5.6 for Laos, and 1.7 for Kazakhstan. Comparisons among countries and trends over time are similar, however.

According to the United Nations medium-variant projections, all East Asian countries will reach replacement-level fertility or lower by 2010. In South and Southeast Asia, Indonesia and Vietnam are projected to reach replacement-level fertility by 2010; India, Malaysia, Myanmar, and the Philippines by 2020; Bangladesh by 2030; and Nepal and Pakistan by 2040. Afghanistan is the only country not projected to reach replacement-level fertility by 2050. Once these countries reach replacement level, the projections assume in most cases that fertility will stabilize at 2.1.

Although most countries in Asia are projected to reach replacement-level fertility over the next 20 years, their populations will continue to grow substantially for several decades. For example, China's fertility has been at replacement

Fertility has declined across Asia, but the rate of decline has varied, so that fertility levels today are widely diverse (Bangkok, Thailand) © Martin Parr/ Magnum

level or below since the early 1990s, but the Chinese population is projected to grow from 1.27 billion in 2000 to 1.46 billion in 2050—an increase of 15 percent over the 50-year period. India is projected to reach replacement-level fertility by 2020, but its population is projected to grow by 22 percent (from 1.29 to 1.57 billion) over the 30-year period between 2020 and 2050. As of 2050, national populations will still be growing in every country of Asia except China, Japan, South Korea, Singapore, and Sri Lanka.

Populations continue to grow after fertility reaches replacement level because of a temporary imbalance in age structure. When fertility declines from high to low levels, populations are characterized—about 15 to 20 years later—by an unusually large proportion of men and women in their reproductive years. The age structure of South Korea’s population in 1995 illustrates this pattern (Figure 1). Large numbers of reproductive-age adults lead to large numbers of births, even when fertility rates are low. For this reason, the population continues to grow, a phenomenon that demographers call “population momentum.” At the same time, the proportion of elderly in the population is not as large as it will ultimately become as a result of lower mortality and fertility. For this reason, the annual number of deaths is temporarily depressed, which also contributes to population momentum. Every country in Asia has recently experienced population momentum, is experiencing it now, or is projected to experience it in the next 20 to 30 years. Japan, for example, reached replacement-level fertility in 1957, but because of population momentum, the Japanese population is projected to keep growing until 2006.

And what happens to fertility once it reaches replacement level? For most countries in Asia where fertility is now below replacement, the United Nations projects that the rate of childbearing will increase. Between 2000 and 2050,

Figure 1. Age and sex structure of South Korea’s population in 1995, showing a temporary “population bulge” of young adults at the prime reproductive ages of 20 to 34

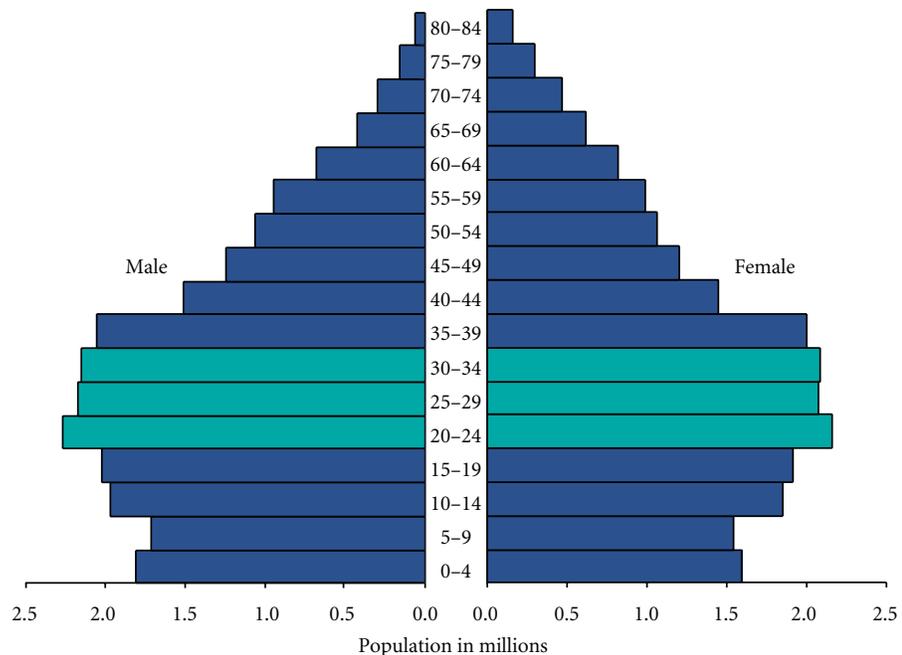


Table 1. Fertility assumptions for Asia's 10 most populous countries: Medium-variant United Nations projections, 2000–44

Country	Time period				
	2000–04	2010–14	2020–24	2030–34	2040–44
China	1.80	1.90	1.90	1.90	1.90
India	2.97	2.27	2.10	2.10	2.10
Indonesia	2.27	2.10	2.10	2.10	2.10
Pakistan	5.08	4.16	3.25	2.33	2.10
Bangladesh	3.56	2.90	2.32	2.10	2.10
Japan	1.33	1.43	1.53	1.63	1.73
Vietnam	2.25	2.10	2.10	2.10	2.10
Philippines	3.24	2.33	2.10	2.10	2.10
Iran	2.76	2.10	2.10	2.10	2.10
Thailand	2.00	1.85	1.88	1.90	1.90

Source: United Nations (2001).

Note: Countries are ordered from highest to lowest population size in 2000.

projections are that fertility will increase from 1.3 to 1.7 children per woman in Japan, from 1.8 to 1.9 in China (Table 1), and from 1.5 to 2.1 in South Korea (not shown). Only in Thailand, where fertility in 2000 was 2.0, does the United Nations project a further decrease—to 1.9 in 2050.

The United Nations projections may err on the high side for many countries. Japan, Singapore, South Korea, and China all reached 2.1 children per woman before 1995, and in each of these countries, fertility continued to decline to levels below 2.1 by 2000. So far, there is no indication that fertility will increase in these or other low-fertility countries in the future. The experience of Japan is illustrative. Japan reached a fertility level of 2.1 children per woman in 1957. Fertility remained close to replacement level until 1973 and then gradually declined further, dropping to 1.3 in 2000. In the 43 years since fertility reached replacement level, there has been no sign of a significant increase. There may be an upturn during the next 50 years, but it may not be as large as the United Nations has projected (see box on Japan).

Likewise, in countries where fertility is currently above the replacement level, there is no evidence to suggest that fertility will stop declining at 2.1 children per woman. In India, for example, some states have already achieved or are very close to achieving fertility rates of 2.1 despite low levels of economic and social development. As development proceeds in these states, it seems likely that fertility will decline even further (see box on India).

China is a special case. Fertility has been brought down to a considerable extent by the strict enforcement of government policies rather than by individual

preferences. Now that fertility is well below replacement level and the government is facing the prospect of extremely rapid population aging, the one-child family policy may be abandoned, and fertility may increase to some extent. In the case of China, therefore, the modest fertility increases that the United Nations has projected seem reasonable (see box on China).

Family planning

National levels of contraceptive use tend to parallel levels of fertility. Table 2 shows contraceptive use rates in nine of Asia's 10 most populous countries. Japan is not included because the available data on contraceptive use in Japan are not comparable with data from other countries. The overall rate of contraceptive use, as measured by the proportion of currently married women age 15 to 49 who are currently using any method, ranges from 84 percent in China to 18 percent in Pakistan. Specific contraceptive methods are grouped in the table under sterilization (male or female), any modern temporary method (mainly pill, condom, intrauterine device—IUD, or injectable), and any traditional method (mainly rhythm or withdrawal).

There is considerable variation among countries in their emphasis on specific contraceptive methods. The proportion of all contraceptive users who are sterilized ranges from 75 percent in India to only 6 percent in Indonesia (Figure 2).

Table 2. Current contraceptive use in nine of Asia's most populous countries: Percentage of currently married women age 15 to 49 using a method

Country and year	Any method	Sterilization	Any modern temporary method	Any traditional method
China 1997	84	41	42	1
India 1998/99	48	36	7	5
Indonesia 1997	57	3	51	3
Pakistan 1994/95	18	5	8	5
Bangladesh 1999/2000	54	7	36	10
Vietnam 1994	65	4	39	21
Philippines 1998	47	10	18	18
Iran 1992 ^a	65	9	37	20
Thailand 1993 ^a	74	23	50	2

Sources: United Nations (2001); Jiang (1999); IIPS and ORC Macro (2000); Central Bureau of Statistics [Indonesia] et al. (1998); National Statistics Office [Philippines] and Macro International Inc. (1999); NIPORT, Mitra and Associates, and ORC Macro (2001).

Notes: Japan is omitted because data are not comparable. Countries are ordered from highest to lowest population size in 2000. The total contraceptive use rate is defined as the percentage of currently married women age 15 to 49 who are currently using any method of contraception, whether modern or traditional. Sterilization includes both female and male sterilization (i.e., a woman is counted as sterilized if her husband is sterilized). Modern temporary methods include condom, oral contraceptive pill, IUD, and injectables. Traditional methods include withdrawal and the rhythm method.

^a Reproductive age is defined as 15 to 44.

IN JAPAN, LOW FERTILITY WILL SOON HALT POPULATION GROWTH

Japan has been in the vanguard of fertility decline in Asia. The Japanese experience is of particular interest because a number of other East Asian countries, such as South Korea, appear to be following in Japan's demographic footsteps. Unlike other Asian countries, however, Japan has reduced its fertility without a national family planning program. It is convenient to classify Japan's fertility decline since 1950 into three periods: (1) 1950–57, during which fertility declined by half to the replacement level of 2.1 children per woman; (2) 1957–73, during which fertility did not change much; and (3) 1973–present, a period of renewed fertility decline, during which fertility fell to 1.3 children per woman in 2000.

A fundamental force explaining fertility decline in Japan is the changing status of women. The proportion of Japanese women who go on to college or university after completing secondary school rose from 5 to 49 percent between 1955 and 2000 and is now about the same as for men. In addition, 99 percent of Japanese women now work before they get married. These single working women typically live at home with their parents, have plenty of spending money because they pay little or no rent, and feel little pressure to rush into marriage. Currently, the average age at marriage in Japan is about 28 for women and 31 for men. The rising average age at marriage accounts for about half of Japan's fertility decline since 1975.

When Japanese women finally do marry, they are increasingly likely to continue working—in most cases outside the home. Currently, about one-quarter of reproductive-age married women work full-time, and another quarter work part-time. Women's work duties tend to conflict with childrearing responsibilities, and such conflicts may reduce fertility. Another factor acting to reduce fertility is falling expectations of old-age support from children. The proportion of currently married women age 15 to 49 who have at least one child and who expect to be supported by their children in old age fell from 65 percent in 1951 to 11 percent in 2000.

As the increase in age at marriage levels off, some women may "catch up" on childbearing, resulting in a modest increase in fertility. On the other hand, Japanese women report that their ideal family size is about 2.5 children—

more than one child higher than their actual current fertility. If women's ideal family size were to drop to two children, as seems likely, then their actual fertility could fall even lower. The United Nations projects that Japan's fertility will increase from 1.3 in 2000–04 to 1.8 in 2050. As yet, however, there is little sign of a fertility upturn.

Japan's population is projected to start declining in 2006, when the effect of population momentum will have dissipated. The rate of population decline could be quite rapid if fertility remains as low as 1.3 children per woman. At this level of fertility, each woman replaces herself with about two-thirds of a girl child on average ($1.3/2 = 0.65$), implying that, once the age structure of the population stabilizes, the total population will decline by about one-third in a single generation, or about 30 years.

About half of Japanese women of childbearing age work outside the home (Tokyo, Japan)
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IN INDIA, FERTILITY DECLINES, BUT AT VARYING RATES

Fertility has declined to low levels in several of India's southern states (Tamil Nadu, India) © David H. Wells/Corbis

Fertility in India declined from 5.2 to 3.2 children per woman between 1971 and 1998 and is projected to reach replacement level sometime between 2015 and 2020. This overall trend masks considerable diversity among states. Fertility is falling in all the states of India but tends to be lowest in the south.

According to India's Sample Registration System, TFRs in 1998 ranged from 1.8 children per woman in the southern state of Kerala (population 32 million in 2001) to 4.6 in the northern state of Uttar Pradesh (population 166 million).

Fertility is already at or near replacement level in several southern states, despite a rather low level of economic and social development. In Tamil Nadu, for example, fertility was 2.0 children per woman in 1999, even though only 52 percent of ever-married women age 15 to 49 were literate and only 34 percent of houses had a toilet or latrine (IIPS and ORC Macro 2000).

If replacement-level fertility can be achieved at this level of development, what will be the future course of fertility as living standards rise, child survival improves, and women become more educated and more likely to work outside the home? India's economy has grown by about 6 percent a year over the past decade, suggesting that these changes are occurring. The experience of countries in East Asia and the West suggests that if India achieves replacement-level fertility during 2015–20, as projected, its fertility will probably keep falling to below-replacement levels as development continues. If so, the United Nations medium-variant population projections for India, which assume that fertility will level off at 2.1 children per woman after 2020, may prove to be somewhat on the high side.

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In the 1970s, the Chinese government identified population growth as a major obstacle to economic development and undertook its “later-longer-fewer” campaign (later marriage, longer birth intervals, fewer children). This was followed by the more coercive one-child family policy, which was promulgated in 1979. The one-child policy not only established various administrative rewards for couples who willingly had only

one child, but also implemented financial penalties and mandatory abortions for couples having unauthorized births.

Enforcement of the one-child policy has been more effective in urban areas than in the countryside, where fertility tends to be higher and there are fewer means of administrative control. Nevertheless—in terms of reducing fertility—the government’s policy

has been spectacularly successful. Fertility fell from 6.1 children per woman in 1965–69 to 1.9 in 1993 and further down to 1.8 in 1995–99. As a result, projected population growth in China between 2000 and 2050 (from 1.28 billion to 1.46 billion, a 15-percent increase) will result entirely from population momentum.

Although the one-child policy continues, enforcement is gradually weakening, and the policy is likely to be abandoned over the next decade. At the time it was established, the one-child policy was intended to last one generation, or approximately 30 years, which will be up in 2009. Today there is concern in government circles that the one-child policy, if continued for another generation, will cause a future crisis in care of the elderly as a consequence of extreme population aging.

The national government in China needs the cooperation of localities (which now elect their own local governments) to achieve its ambitious development goals, and this is contributing to a more client-oriented approach to family planning. In addition, with rapid economic growth and social development, couples are reducing their desired family size to levels that are close to the goals of the government program (Merli, Qian, and Smith 2002).

The United Nations projects that China’s fertility will increase from 1.8 to 1.9 between 2000–04 and 2040–44. This seems reasonable in view of the various economic, social, and political changes that are occurring.

Fertility has fallen so quickly in China that today’s young adults will have few grown children to look after them in their old age (Fujian, China)
© Dean Conger/Corbis

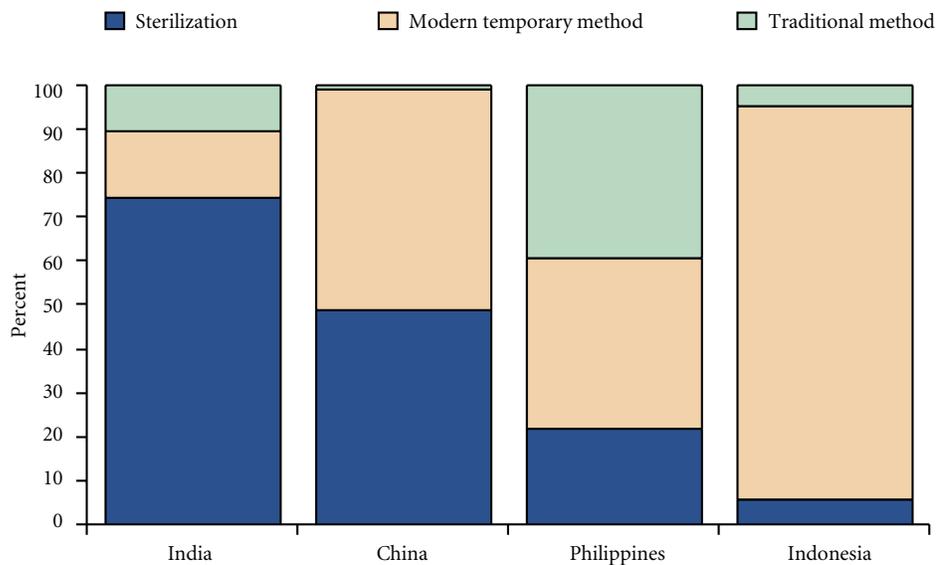
Conversely, the proportion of all users who use a modern temporary method ranges from 89 percent in Indonesia to 15 percent in India. The proportion of all contraceptive users who use a traditional method ranges from 39 percent in the Philippines to less than 1 percent in China.

India's family planning program places by far the greatest emphasis on sterilization—female sterilization accounts for 71 percent, and male sterilization accounts for 4 percent of all contraceptive use. The Indian government is currently expanding the availability of modern temporary methods, however. This shift toward temporary family planning methods will allow women to use contraception to postpone and space births and will help maintain the downward trend in fertility (see box).

The emphasis among modern temporary methods also varies widely by country (Figure 3). In China, for example, 87 percent of all currently married women who use any modern temporary method use an IUD. In Indonesia, there is a greater emphasis on injectable contraceptives (40 percent of all women who use a modern temporary method) and on implants (12 percent). In Japan, condoms account for about three-quarters of all contraceptive use. The proportion using condoms is far greater in Japan than in any other country, partly because the contraceptive pill was illegal in Japan until very recently.

Such variations in emphasis on specific contraceptive methods sometimes reflect national-level differences in the legal status of particular methods, as in Japan. More often, however, they reflect differences in what methods have been promoted most vigorously by national family planning programs, as in India.

Figure 2. Proportions of all married women of reproductive age currently using any contraception who are sterilized, use a modern temporary method (such as pill, condom, or IUD), or use a traditional method (such as rhythm or withdrawal): India (1998–99), China (1997), Philippines (1998), and Indonesia (1997)



Sources: Jiang (1999); IIPS and ORC Macro (2000); National Statistics Office [Philippines] and Macro International Inc. (1999); and Central Bureau of Statistics [Indonesia] et al. (1998).

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In India, it will be difficult to bring fertility down much further with the current heavy reliance on sterilization (Rajasthan, India)
© David Cumming; Eye Ubiquitous/Corbis

For decades, the Indian family welfare program has been dominated by an emphasis on female sterilization. The widespread use of sterilization has enabled India to achieve considerable fertility reduction—from 6.0 children per woman in 1950 to 3.2 in 1998. Analysis of data from the 1992–93 National Family Health Survey (NFHS), however, suggests that it may be difficult to achieve further reductions in fertility by such a heavy reliance on sterilization alone.

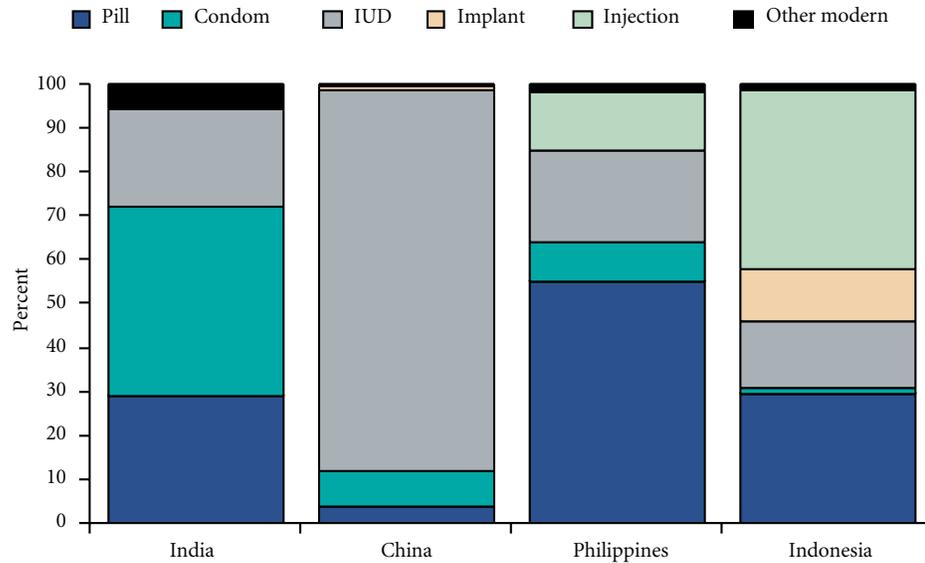
Because sterilization is irreversible, women are unlikely to be sterilized until they are certain that they do not want any more children. And in a country such as India where infant and child mortality are high, women who already have children may wish to keep the option open to have more until they feel confident that the children they already have will survive. Indeed, NFHS results show that Indian women do not

undergo sterilization until they already have relatively large families. Women who had been sterilized had 4.0 children on average, compared with 2.6 children for women using a modern temporary method and 3.1 children for all currently married women of reproductive age (Pathak, Feeney, and Luther 1998). In every age group, sterilized women had substantially more children than women who were using temporary methods.

NFHS results suggest that many women were using temporary contraceptive methods to stop childbearing: Nearly two-thirds (64 percent) of women who were using a temporary method said that they did not want any more children. In addition to these women, some of the women who use temporary methods to delay childbearing change their minds later and have no more children.

Clearly, efforts to reduce fertility below current levels will have to reach women before they have four children. NFHS results show a strong demand for temporary methods among women who are not using any contraception. This is further evidence that temporary methods can play an important role in achieving national population goals and helping women achieve their objectives for completed family size.

Figure 3. Proportions of all married women of reproductive age currently using a modern temporary contraceptive who use specific methods: India (1998–99), China (1997), Philippines (1998), and Indonesia (1997)



Sources: For India, IIPS and ORC Macro (2000); for China, Jiang (1999); for the Philippines, National Statistics Office [Philippines] and Macro International Inc. (1999); and for Indonesia, Central Bureau of Statistics [Indonesia] et al. (1998).

In some cases, the methods promoted by family planning programs today still reflect the preferences of foreign donor agencies during the early stages of program development.

Variations in emphasis on particular methods suggest that there is no unique combination of methods associated with fertility decline. Most countries have been moving toward offering a wide range of methods and letting couples decide which method to use. This “cafeteria approach” generally appears to be the most effective policy for lowering fertility.

In addition to offering a choice of contraceptive methods, family planning programs that have been particularly successful exhibit some common features. South Korea, Taiwan, Singapore, Thailand, and Indonesia offer a striking example. Starting in the 1960s, the governments of these countries became increasingly committed to population goals. Key political and religious groups were persuaded of the importance of slowing population growth, and governments adopted national development plans with specific growth-reduction targets. They initiated public campaigns to persuade couples of the benefits of small families and started education programs in communities and schools to inform their citizens about modern contraceptive methods. Family planning clinics and distribution systems, many of them heavily subsidized, were established to increase the availability of contraceptive supplies and services.

Beginning in the 1970s, some governments also implemented economic incentives and other policies to accelerate the transition to low fertility. In South Korea, for example, legislative action addressed gender bias in the hope that reducing couples’ preference for sons would lead to lower birth rates (Kwon 2001). None

of these countries initiated coercive programs, however, such as China's one-child policy or India's ill-fated sterilization campaign of the mid-1970s.

The family planning programs initiated in the 1960s and 1970s in South Korea, Taiwan, Singapore, Thailand, and Indonesia were possibly the best run of any in the world. In a short time, they greatly expanded the supply of modern contraceptive services at relatively modest cost. Programs in Taiwan, South Korea, and Thailand have served as models for many other countries. Tsui (2001) attributes their success to four factors:

1. Despite the governments' primary objective of curbing rapid population growth, programs and policies in these countries emphasized both family planning and health objectives.
2. Neither religious leaders nor other politically powerful groups mounted strong opposition to the programs. Even in Indonesia, the largest Islamic nation in the world, religious leaders did not actively oppose President Soeharto's decision to promote family planning.
3. The governments maintained a strong and sustained effort, which included significant financial support. This was possible because all five countries enjoyed a considerable degree of political stability, allowing their governments to pursue long-term goals. Even in Thailand, which experienced repeated changes in government, the monarchy provided continuity and a stabilizing influence, and political transitions were often relatively peaceful and unaccompanied by wrenching policy changes.
4. The governments willingly and successfully worked with nongovernmental entities. Nongovernmental family planning organizations such as the Population and Community Development Association of Thailand, the Indonesian Planned Parenthood Foundation, and the Planned Parenthood Federation of Korea played a particularly important role.

Although external funding for family planning programs was important at the beginning, reliance on external financial resources declined as economic conditions improved, and family planning programs were increasingly financed by governments and users. The best available information suggests that annual per capita funding for family planning in the mid-1970s ranged from US\$0.08 in Thailand to US\$0.32 in Singapore (Tsui 2001). By the early 1990s, annual per capita funding ranged from US\$0.32 in Thailand and Singapore to US\$0.75 in Taiwan. The bulk of this funding was provided by national governments.

In South Korea, Taiwan, Singapore, Thailand, and Indonesia, women reduced, or are reducing, their fertility to replacement level in a single generation. Singapore completed the transition to low fertility in only 22 years, South Korea in 24, Taiwan in 26, and Thailand in 28 years, and Indonesia is expected to complete the transition in 33 years. By contrast, the developed countries of Europe and North America completed a similar fertility transition much more slowly. Countries such as India and the Philippines are projected to take as long as 60 years.



In several Asian countries, fertility decline has boosted both family well-being and national economic growth (Chiangmai, Thailand) © Wisut Jaijagcome/East-West Center

The accelerated demographic transition in South Korea, Taiwan, Singapore, Indonesia, and Thailand was a product both of rapid socioeconomic change and of deliberate population policy. A national commitment to slower population growth, combined with support for voluntary family planning programs, contributed to a policy environment that proved to be remarkably successful. In all five countries, the resulting rapid fertility decline has had a significant impact on economic growth and standards of living.

Fertility is falling everywhere in Asia, but the pace of change has been much slower in many other countries of the region. The effect of delayed fertility decline on ultimate population size is magnified by population momentum, which produces continued population growth for many years after replacement-level fertility is achieved. This effect can be seen in the United Nations high- and low-variant population projections, which are based primarily on differing assumptions concerning the timing, speed, and extent of fertility decline (Table 3). For Asia as a whole, the difference between the high- and low-variant projections for 2050 is 1.8 billion people.

How quickly will Asia's high-fertility countries reach replacement-level fertility? The answer has enormous implications for the ultimate size of Asia's population and the potential strain on the region's resource base. Because Asia is already so densely populated, projected increases in population—whether low-, medium-, or high-variant—combined with economic development and rising living standards, will place enormous strains on infrastructure, natural resources, and the environment.

Table 3. Population projections for Asia, three subregions, and seven high-fertility countries in 2050: United Nations low- and high-variant projections and difference between these projections

Region, subregion, or country	Population in 2050 (1,000s)		
	Low-variant projection	High-variant projection	Difference
Asia	4,167,524	5,935,278	1,767,754
East Asia	1,422,695	1,914,625	491,930
Southeast Asia	647,200	975,091	327,891
South and Central Asia	2,097,629	3,045,562	947,933
Afghanistan	63,565	81,059	17,494
Bangladesh	202,949	341,045	138,096
Cambodia	24,521	35,941	11,420
India	1,297,992	1,887,966	589,974
Laos	9,988	13,614	3,626
Pakistan	296,658	395,295	98,637
Philippines	102,664	157,923	55,259

Source: United Nations (2001).