

Fertility Transition in Asia: Past Experiences and Future Directions

The complexity of the fertility transition does not allow for easy generalization. However, it is apparent that the prime determinant of fertility decline lies in social development, particularly the level of women's education and autonomy, as well as commitments by Governments to provide effective family planning programmes.

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During the second half of the twentieth century, many countries and areas in the region witnessed remarkable declines in fertility. For the region as a whole, the total fertility rate (TFR) dropped from 5.6 births per woman during the period 1950-1955 to 4.0 in 1975-1980. Fertility continued to fall to 3.3 during the period 1985-1990 and 2.6 in 1995-2000. The TFR of the region is currently estimated at

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2.4 births per woman (United Nations, 2003). However, this regional average masks a considerable difference in the TFR observed among subregions. The TFR has plummeted to below the replacement level in East and North-East Asia (1.8 births per woman) and North and Central Asia (1.5 births per woman). In sharp contrast, South and South-West Asia exhibit a TFR of 3.2 births per woman. The South-East Asian subregion has a TFR of 2.5 births per woman (ESCAP, 2003).

This paper begins with a discussion on levels and trends in fertility and presents age patterns of fertility by subregions; it then examines the factors leading to fertility decline. Country experiences are presented to highlight the relative impact of social and economic development vis-à-vis government interventions for family planning programmes aimed at reducing fertility. Drawing from experiences from countries with success stories in reducing fertility, this paper concludes with future prospects for fertility decline in countries that have high or moderately high fertility.

Levels and trends in fertility

East and North-East Asia and North and Central Asia

Table 1 shows the levels and trends in fertility in Asia. Fertility remained high during the periods 1950-1955 to 1970-1975 in several countries of these subregions, including China, Tajikistan, Turkmenistan and Uzbekistan. However, fertility transition was well under way in Japan and the Russian Federation, where the TFR was already less than 3 children per woman during the period 1950-1955 and it further declined to replacement level during the period 1970-1975. While Japan was the first country to complete the fertility transition from high to low level by the early 1960s (Jones and Leete, 2002), fertility transition had begun in the remaining countries in the beginning of the second half of the twentieth century, followed by a precipitous decline thereafter.

Overall fertility levels in East and North-East Asia and North and Central Asia in 1995-2000 represent low fertility (TFR of 2.1 or lower). In East and North-East Asia, all but one country, Mongolia, have below-replacement-level fertility. While many countries in North and Central Asia, namely Armenia, Georgia, Kazakhstan and the Russian Federation, have reached below-replacement-level fertility, some countries still have moderately high fertility, ranging from 2.3 in Azerbaijan to 3.7 in Tajikistan.

Table 2 shows the percentage decline in TFR between the periods 1970-1975 and 1995-2000. Many countries in the subregion experienced a rapid reduction in TFR. The most spectacular declines, with percentage declines of 50 per cent or more, occurred in such countries or areas as Armenia; China; Hong Kong, China; Macao, China; Mongolia; the Republic of Korea; Uzbekistan; and Turkmenistan.

Table 1. Trends in total fertility rates in Asia, 1950-1955, 1970-1975 and 1995-2000

Country, territory or area	1950-1955	1970-1975	1995-2000
East and North-East Asia			
China	6.2	4.9	1.8
Democratic People's Republic of Korea	3.3	3.9	2.1
Hong Kong, China	4.4	2.9	1.1
Japan	2.7	2.1	1.4
Macao, China	5.0	3.2	1.2
Mongolia	6.0	7.3	2.7
Republic of Korea	5.4	4.3	1.5
South-East Asia			
Brunei Darussalam	7.0	5.4	2.7
Cambodia	6.3	5.5	5.3
Indonesia	5.5	5.2	2.6
Lao People's Democratic Republic	6.2	6.2	5.3
Malaysia	6.8	5.2	3.3
Myanmar	6.0	5.8	3.3
Philippines	7.3	6.0	3.6
Singapore	6.4	2.6	1.6
Thailand	6.4	5.0	2.0
Viet Nam	5.7	6.7	2.5
South and South-West Asia			
Afghanistan	7.7	7.4	6.9
Bangladesh	6.7	6.2	4.0
Bhutan	5.9	5.9	5.5
India	6.0	5.4	3.5
Iran (Islamic Republic of)	7.0	6.4	2.5
Maldives	7.0	7.0	5.8
Nepal	5.8	5.8	4.7
Pakistan	6.3	6.3	5.5
Sri Lanka	5.9	4.1	2.1
Turkey	6.9	5.2	2.7
North and Central Asia			
Armenia	4.5	3.0	1.4
Azerbaijan	5.5	4.3	2.3
Georgia	3.0	2.6	1.6
Kazakhstan	4.4	3.5	2.1
Kyrgyzstan	4.5	4.7	2.9
Russian Federation	2.9	2.0	1.3
Tajikistan	6.0	6.8	3.7
Turkmenistan	6.0	6.2	3.0
Uzbekistan	6.0	6.3	2.9

Source: United Nations, *World Population Prospects: The 2002 Revision*.

Table 2. Percentage decline in total fertility rate: 1970-1975 to 1995-2000

Percentage decline		
Less than 25 per cent	25 to 49 per cent	50 per cent or more
East and North-East Asia		
	Democratic People's Republic of Korea (46.9)	Republic of Korea (64.6)
	Japan (32.8)	Macao, China (64.1)
		Mongolia (63.2)
		China (62.9)
		Hong Kong, China (61.9)
South-East Asia		
Lao People's Democratic Republic (13.8)	Myanmar (42.6)	Viet Nam (62.7)
Cambodia (5.1)	Singapore (40.3)	Thailand (60.8)
	Philippines (39.3)	Brunei Darussalam (50.0)
	Malaysia (36.8)	Indonesia (50.0)
South and South-West Asia		
Nepal (19.6)	Sri Lanka (48.5)	Iran (Islamic Republic of) (60.5)
Maldives (17.1)	Turkey (47.6)	
Pakistan (12.7)	India (36.4)	
Bhutan (6.8)	Bangladesh (35.8)	
Afghanistan (6.8)		
North and Central Asia		
	Azerbaijan (46.4)	Uzbekistan (54.2)
	Tajikistan (45.6)	Armenia (53.2)
	Kazakhstan (39.3)	Turkmenistan (51.0)
	Georgia (39.3)	
	Kyrgyzstan (38.8)	
	Russian Federation (38.4)	

Source: United Nations, *World Population Prospects: The 2002 Revision*.

South-East Asia

Fifty years ago, all the countries in this subregion had high fertility and all but Singapore continued to have high fertility during the period 1970-1975. However, fertility transition began to take place in most of the countries during the past 25 years and many of them experienced notable declines in fertility between the periods 1970-1975 and 1995-2000. A majority of the countries in that

subregion currently fall in the category of intermediate fertility (TFR of 2.11 to 4.99), with a couple of countries having high or low fertility. Countries with intermediate fertility include Brunei Darussalam, Indonesia, Malaysia, Myanmar, the Philippines and Viet Nam. While Cambodia and the Lao People's Democratic Republic exhibit high fertility (TFR of 5 and above), Singapore and Thailand are the only two countries in the subregion which have successfully reduced their fertility to below-replacement-level (see table 1).

Table 2 shows the variations in the percentage decline in total fertility rates between the periods 1970-1975 and 1995-2000. The most impressive declines occurred in Thailand and Viet Nam, both of which recorded more than a 60 per cent decline in fertility. In fact, Thailand is the only country which experienced a remarkable decline in fertility from a high level to below-replacement-level in a short time span. Other countries, such as Brunei Darussalam and Indonesia, also underwent fairly rapid fertility decline. In contrast, very little decline in fertility occurred in Cambodia and the Lao People's Democratic Republic during that period. However, the recent demographic and health survey of Cambodia suggests that there has been a resumption of fertility decline to 4.0 per woman (National Institute of Statistics, Directorate General for Health, and ORC Macro, 2001).

South and South-West Asia

All countries in South and South-West Asia had high fertility during the period 1950-1955. High fertility continued to prevail in all countries during the period 1970-1975, except in Sri Lanka, where TFR dropped to 4.1. Many countries in the subregion witnessed fertility transition during the past 25 years, with some countries, such as Bangladesh, India, the Islamic Republic of Iran and Turkey, exhibiting a fairly rapid decline in fertility. Nepal experienced a slow decline in fertility. Sri Lanka is the only country in the subregion with the current fertility reaching below-replacement-level, whereas other countries have current fertility levels that are at high or intermediate level. High fertility persisted in such countries as Afghanistan, Bhutan, Maldives and Pakistan, in which the TFR ranged from 5.5 to 6.9 during the period 1995-2000.

Age patterns of fertility

East and North-East Asia and North and Central Asia

Table 3 presents the age patterns of fertility for the most recent data available in each country or area, and the contribution of each age group of woman to TFR. Age patterns of fertility in those subregions are in sharp contrast with other subregions, particularly countries with high fertility rates. In those subregions, not only does childbearing start late in most countries, but also the fertility rate of women past age 35 begins to dip very rapidly. For example, in Japan and the Republic of Korea, women aged 25 to 34 contribute over 70 per cent to the country's TFR, while the percentage contribution of women above age 40 is almost negligible. That pattern of compressing fertility to a short reproductive span is a general trend that low-fertility countries have experienced.

Table 3. Age-specific fertility rates and contribution of each age group to fertility rate

Country, territory or area	Year	TFR	Age-specific fertility rates (per 1,000 women)								Contribution of each age group to fertility rate (percentage)							
			Age group								Age group							
			15-19	20-24	25-29	30-34	35-39	40-44	45-49	15-19	20-24	25-29	30-34	35-39	40-44	45-49		
East and North-East Asia																		
China	1994	1.9	5	161	144	47	10	4	1	1.3	43.1	38.5	12.6	2.7	1.1	0.3		
Hong Kong, China	2001	0.9	4	29	58	61	28	5	0	2.2	15.6	31.3	32.7	15.2	2.4	0.1		
Japan	2000	1.4	5	40	100	94	32	4	0	2.0	14.5	36.3	34.1	11.7	1.4	0.0		
Macao, China	1995	1.4	8	56	98	75	28	6	0	2.9	20.5	35.9	27.5	10.3	2.2	0.1		
Mongolia	1998	3.1	54	216	169	105	50	18	0	8.8	35.1	27.5	17.1	8.1	2.9	0.0		
Republic of Korea	2001	1.3	2	32	131	78	17	3	0	0.8	12.0	49.6	29.6	6.5	0.9	0.1		
South-East Asia																		
Brunei Darussalam	2000	2.4	33	91	132	113	76	27	17	6.7	18.4	26.9	22.9	15.5	5.5	3.5		
Cambodia	2000	4.0	51	191	203	165	118	55	15	6.4	23.9	25.4	20.7	14.8	6.9	1.9		
Indonesia	1995-97	2.8	62	143	149	108	66	24	6	11.1	25.5	26.6	19.3	11.8	4.3	1.1		
Lao People's Democratic Republic	2000	4.9	96	261	210	180	109	71	49	9.8	26.6	21.4	18.4	11.1	7.2	5.0		
Malaysia	1997	3.3	16	121	214	172	96	32	3	2.4	18.4	32.6	26.2	14.6	4.9	0.5		
Myanmar	1997	2.7	25	102	144	138	92	35	7	4.5	18.7	26.4	25.3	16.9	6.5	1.3		
Philippines	1998	3.7	46	177	210	156	111	40	7	6.1	23.6	28.0	20.8	14.8	5.3	0.9		
Singapore	1999	1.5	8	37	105	99	39	7	0	2.8	12.3	35.4	33.5	13.3	2.2	0.0		
Thailand	1995/96	2.0	54	126	107	68	36	11	3	13.2	30.9	26.2	16.8	8.8	2.8	0.7		
Viet Nam	1997	2.3	32	164	132	81	41	15	2	6.8	34.9	28.1	17.3	8.7	3.2	0.4		

Table 3 (continued)

Country, territory or area	Year	TFR	Age-specific fertility rates (per 1,000 women)										Contribution of each age group to fertility rate (percentage)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Source: Database maintained by ESCAP, Bangkok.

The age patterns of fertility appear to show a distinct feature in those subregions. It is apparent from figure I that in Hong Kong, China; Japan; Macao, China; and the Republic of Korea in East and North-East Asia, women aged 25-29 have the highest fertility level. In China and Mongolia, however, there has been a drift in the peak age of fertility from the age group of 25-29 in the 1970s to that of 20-24 in the 1990s. As figure II suggests, a distinctively shaped of age pattern of fertility can be observed in North and Central Asian countries, where fertility reaches its peak among women aged 20-24, and then begins to decline sharply with age. That age pattern is consistent with the high percentage of women aged 15-19 and 20-24 reported to have ever married (see table 4). Moreover, despite the overall reduction in the level of fertility, the age pattern of fertility has remained consistent in most of those countries. Exceptions are Azerbaijan and Turkmenistan, where there has been a shift in the age patterns of fertility, with peak fertility drifting from women aged 25-29 to 20-24.

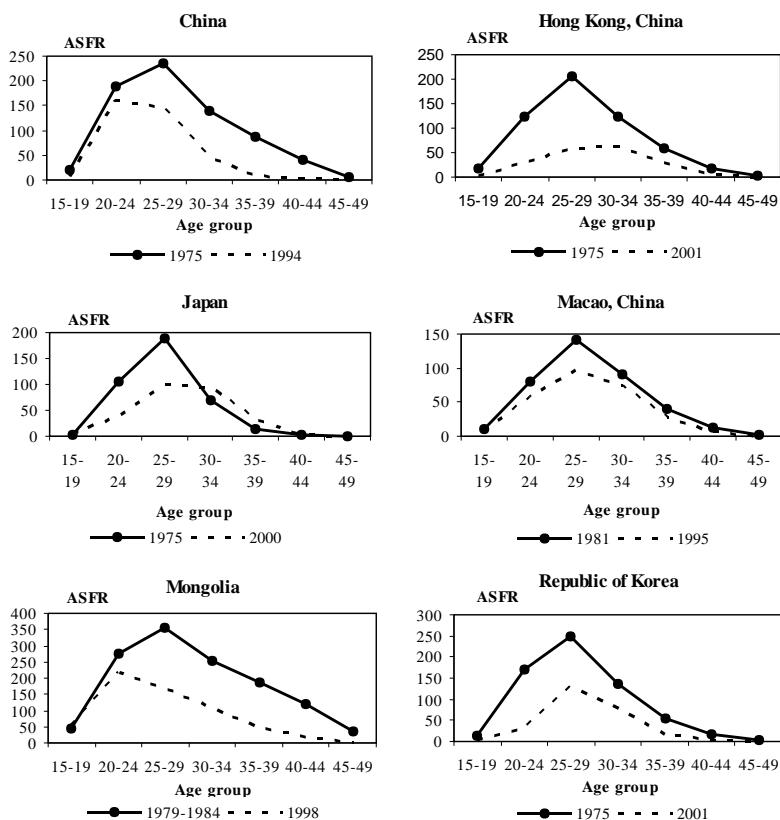
South-East Asia

The age patterns of fertility depicted by South-East Asian countries with intermediate fertility - Brunei Darussalam, Indonesia, Malaysia, Myanmar, the Philippines and Viet Nam - remained relatively similar at two points in time (see figure III). In Indonesia, Malaysia and Myanmar, fertility decline occurred in women of all age groups with a somewhat larger decline occurring among women in the older and younger age groups. A sharp reduction in adolescent fertility was observed in Indonesia and Malaysia. However, in the case of the Philippines and Viet Nam, fertility decline was more pronounced among women in the older age groups. The pattern observed in Singapore is somewhat different in that women in the prime reproductive age group, 20-29, exhibit a sharp reduction in fertility while the country maintains a low level of fertility among older women. That pattern is similar to the typical pattern observed in the East Asian countries, such as Japan and the Republic of Korea. By contrast, the patterns seen in Cambodia and the Lao People's Democratic Republic are quite similar to the ones observed in South and South-West Asia, such as that in Pakistan (discussed later).

South and South-West Asia

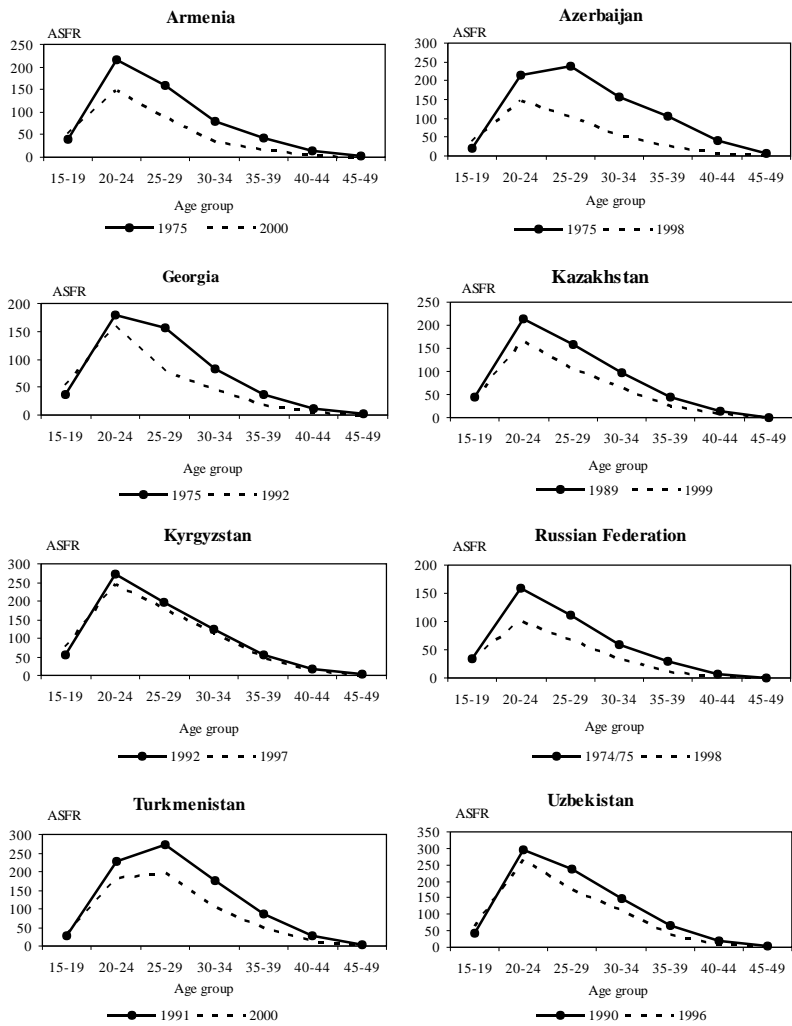
It can be seen from table 3 that age-specific fertility rates are typically high among women aged 15-19 in Bangladesh, Maldives and Nepal, countries that are characterized by a low age at marriage of females. In those countries, childbearing not only begins early but also spreads over a longer duration during the reproductive span, with the largest contribution to overall fertility by women in age groups 20-24 to 30-34. For example, in Bangladesh the share of adolescent fertility to overall fertility is over one fifth and the first three age groups of women, aged 15 to 29, contribute to 75 per cent of the total fertility rate. This is in sharp contrast to the pattern observed in East Asia, where childbearing is compressed into a narrow reproductive span.

**Figure I. Trends in the age-specific fertility rates:
East and North-East Asia**



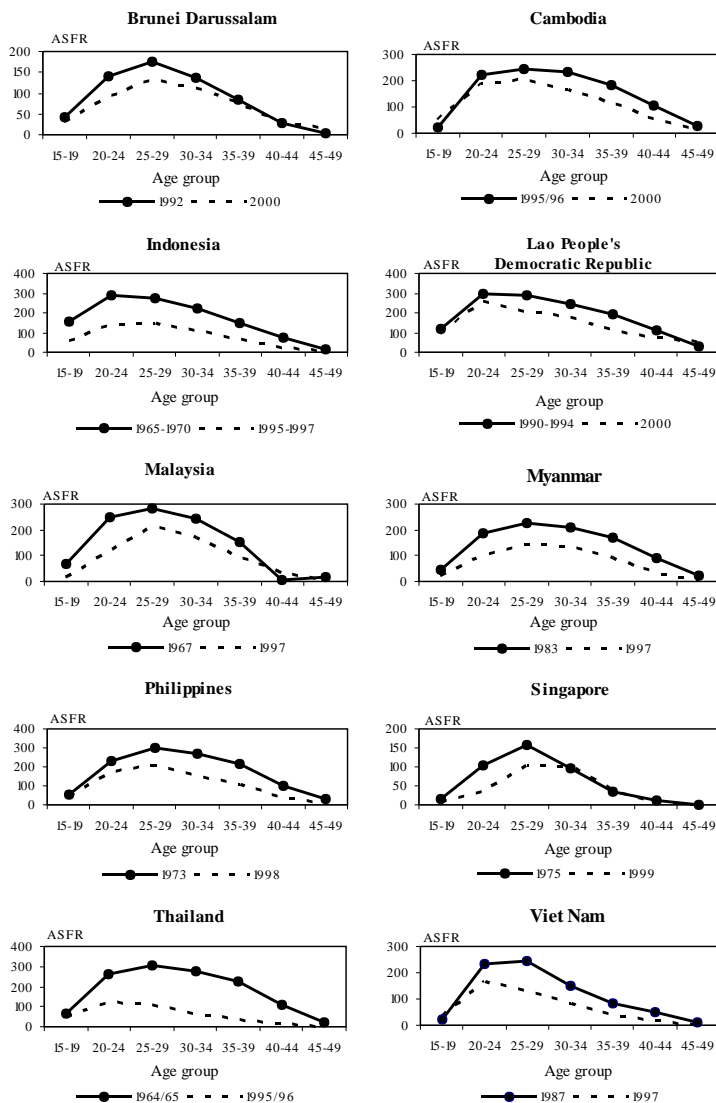
Source: Database maintained by ESCAP, Bangkok.

Figure II. Trends in the age-specific fertility rates: North and Central Asia



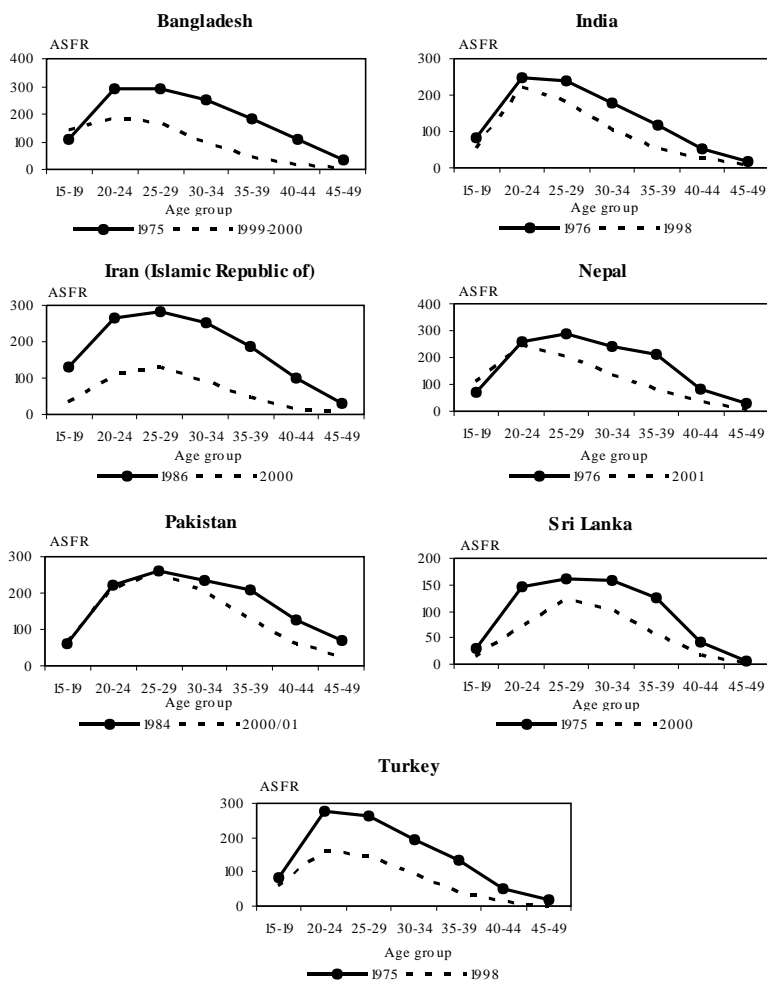
Source: Database maintained by ESCAP, Bangkok.

Figure III. Trends in the age-specific fertility rates: South-East Asia



Source: Database maintained by ESCAP, Bangkok.

**Figure IV. Trends in the age-specific fertility rates:
South and South-West Asia**



Source: Database maintained by ESCAP, Bangkok.

It is also important to mention that in Pakistan, one of the Asian countries with a high fertility rate, the shape of the fertility curve has remained relatively unchanged over time, and the change in the magnitude of the decline has also not been significant. Decline in fertility occurred, to a large extent, among women in older age groups in comparison with women in younger age groups. These are obviously the women who already have four or more children, who contribute very little to the overall fertility transition. A more or less similar pattern can be observed in Bangladesh, India and Nepal, where fertility decline occurred mostly among women in the older age groups. The lack of a precipitous decline in fertility among younger women in those countries is related primarily to the prevalence of early age at marriage of females, resulting in a higher proportion of women married in age groups 15-19 and 20-24. For example, in Bangladesh, India and Nepal more than four fifths of women in the age group 20-24 are already married (see table 4). Furthermore, a high female illiteracy rate, leading to a lower contraceptive prevalence rate, is another factor inhibiting fertility decline among adolescent women (ESCAP, 2001).

By contrast, in Turkey and the Islamic Republic of Iran, where the TFR has declined substantially, a sustained decline in fertility has occurred among women in all age groups, maintaining the same age pattern of fertility over time. In the case of the Islamic Republic of Iran in particular, a dramatic fall in fertility has occurred in a short period of time: the TFR plummeted from 6.2 in 1986 to 2.2 in 2002. During that period, fertility declined by over 50 per cent among women in all age groups and by more than 70 per cent among women aged 15-19 and women aged 35 years and older.

Explanations of fertility decline

East and North-East Asia and North and Central Asia

The traditional demand theories, such as the wealth flow theory of Caldwell, hypothesize that the demand for children declines with the changes in socio-economic conditions (Caldwell, 1976). More recent studies have concluded that the improvements in human development, measured by indicators such as literacy and life expectancy play a major role in reducing fertility, while economic development (a structural transformation of modes of production) is not a necessary condition for fertility decline (Bongaarts, 2002; Bongaarts and Watkins, 1996; Cleland and Wilson, 1987). A United Nations study also concludes that the driving force for fertility decline is socio-economic development, in particular decline in mortality and increased female education and labour force participation rates (United Nations, 2002a). Moreover, another study states that a prominent contributing factor in the changing demand for children is rapid social development, particularly the spread of primary education (Jones and Leete, 2002).

It can be seen from table 4 that countries in those subregions, particularly countries in East Asia, have a high level of human development. Along with advanced economic development, the high level of human development has created a favourable environment for a small family norm. In other words, as Coale (1973) has put it, fertility regulation has become a conscious choice of couples, based on the balance between the advantages and disadvantages of having a smaller number of children. Fertility regulation has been further recognized as advantageous to the couples; in addition, it became achievable by easily available and effective contraceptive methods. The socio-economic conditions of many countries in that region have provided the context for couples to desire a small family, while fertility control has become socially and culturally acceptable. Methods of controlling fertility were then introduced to meet the “unmet need” for family planning.

Table 5 shows a generally high percentage of contraceptive use in those subregions. Contraceptive use ranges from 56 per cent in Japan to 84 per cent in China and 86 per cent in Hong Kong, China (East and North-East Asia) and from 34 per cent in Tajikistan to 67 per cent in the Russian Federation (North and Central Asia). Somewhat lower contraceptive use reported in Japan is due to the legalization of induced abortion, which has been credited as one of the reasons for fertility decline (Atoh, 2001). Similarly, the much lower prevalence of modern methods of contraception reported in North and Central Asia, such as in Armenia, Azerbaijan, Georgia and Tajikistan, is attributed to the fact that in many of those countries induced abortion has been used as a method of family planning and that factor has played a major role in their fertility decline (UNFPA, 1999; Kandiah, 2003).

The case of China illustrates the crucial role that government policy can play in providing methods of family planning and thus reducing fertility even under low socio-economic conditions. As a result of the Government's comprehensive and strong family planning programme in the 1970s, China experienced an unprecedented drop in TFR from 5.8 in 1970 to 2.8 in 1979 (Zhai, 2002). The principles of late marriage, longer birth spacing and fertility limitation were strictly enforced throughout the country along with the vigorous implementation of the one-child policy (Jiang and Zhang, 2000). China experienced a sustained decline in fertility, reaching below the replacement level in the early 1990s and the TFR currently remains at 1.8. The successful family planning programme helped to free married women from high-order births and heavy family burdens, providing them more opportunities to participate in socio-economic activities. Thus, the commitment of the Government to reduce the population growth rate not only contributed to fertility decline but also improved socio-economic conditions and people's ideas about family and gender relations, making them more compatible with the low-fertility regime (Attane, 2002).

Table 4. Selected Human Development Index and percentage of ever-married women aged 15-19 and 20-24

Country, territory or area	Life expectancy at birth (years)		Infant mortality rate	Female adult literacy rate	Percentage married among woman aged		
	Males	Females	(per 1,000)	(per cent)	Year	15-19	20-24
East and North-East Asia							
China	69	73	39	77	1999	1.3	45.6
Democratic People's Rep. of Korea	70	76	20
Hong Kong, China	76	82	6	90	2001	0.7	10.8
Japan	77	84	4	..	2000	0.9	11.3
Macao, China	75	80	10	90	1991	2.3	22.0
Mongolia	65	68	65	99	2000	2.8	24.1
Republic of Korea	69	77	10	96	1995	0.8	16.7
North and Central Asia							
Armenia	68	74	25	99 a/	1989	16.3	64.2
Azerbaijan	66	75	34	96 b/	1999	12.5	47.4
Georgia	69	77	19	..	1989	16.8	56.1
Kazakhstan	64	73	33	99 a/	1999	7.1	47.4
Kyrgyzstan	64	73	38	95 b/	1999	7.3	50.4
Russian Federation	61	73	18	99	1989	10.5	62.2
Tajikistan	65	71	54	99	1989	11.4	73.8
Turkmenistan	63	70	52	97 b/	1989	6.2	51.5
Uzbekistan	65	71	42	100 b/	1996	12.7	73.4
South-East Asia							
Brunei Darussalam	74	79	9	88	1991	7.8	37.4
Cambodia	53	61	79	58 c/	2000	12.9	55.5
Indonesia	64	68	44	82	1997	17.1	61.4
Lao People's Democratic Republic	53	56	88	51	2000	26.8	73.0
Malaysia	71	75	11	84	1991	7.4	39.1
Myanmar	60	63	71	81	1997	6.6	34.8
Philippines	67	71	33	95	1998	4.8	34.5
Singapore	75	80	5	89	2000	1.0	15.7
Thailand	71	76	22	94	1990	13.9	48.7
Viet Nam	66	71	35	91	1997	7.7	52.0
South and South-West Asia							
Afghanistan	46	47	147	21
Bangladesh	59	60	73	30	1999/00	55.4	81.5
Bhutan	61	63	58	34	1990	25.5	64.8
India	63	64	68	42	1991	35.3	81.8
Iran (Islamic Republic of)	69	71	32	70	1996	17.5	59.5
Maldives	67	65	45	96	1995	20.1	70.1
Nepal	58	58	77	24	2001	40.2	82.9
Pakistan	64	66	70	28	2000/01	15.2	52.3
Sri Lanka	71	76	17	89	2000	8.6	37.1
Turkey	67	72	42	77	1990	15.1	61.2

Sources: ESCAP (2000); United Nations (2000b).

a. 1995, b. 1997 and c. 1996.

Table 5. Contraceptive prevalence rate among women of reproductive age and percentage of women with unmet need for family planning

Country, territory or area	Year	Contraceptive prevalence rate		Percentage of women with unmet need for family planning
		(per cent)		
		Any method	Modern method	
East and North-East Asia				
China	1997	83.8	83.3	..
Democratic People's Republic of Korea	1990-92	61.8	53	..
Hong Kong, China	1992	86.2	79.7	..
Japan	2000	55.9	55.1	..
Mongolia	1998	59.9	45.7	..
Republic of Korea	1997	80.5	66.9	..
North and Central Asia				
Armenia	2000	59	22.3	..
Azerbaijan	2000	55.1	15.8	..
Georgia	1999-00	40.5	19.8	23.8
Kazakhstan	1999	66.1	52.7	8.7
Kyrgyzstan	1997	59.5	48.9	11.6
Russian Federation	1994	66.8	48.6	..
Tajikistan	2000	33.9	27.3	..
Turkmenistan	2000	61.8	53.1	..
Uzbekistan	1996	55.6	51.3	13.7
South-East Asia				
Cambodia	2000	23.8	18.5	32.6
Indonesia	1997	57.4	54.7	9.2
Lao People's Democratic Republic	2000	32.2	28.9	39.5
Malaysia	1994	54.5	29.8	..
Myanmar	1997	32.7	28.4	..
Philippines	1998	46	28.2	19.8
Singapore	1997	62	53	..
Thailand	1996-97	72.2	69.8	..
Viet Nam	1997	75.3	55.8	6.9
South and South-West Asia				
Afghanistan	1973	1.6	1.6	..
Bangladesh	1999-00	53.8	43.4	15.3
Bhutan	2000	30.7	30.7	..
India	1998/99	48.2	42.8	15.8
Iran (Islamic Republic of)	2000	73.8	55.9	..
Nepal	2001	39.3	35.4	27.8
Pakistan	2000-01	27.6	20.2	33
Sri Lanka	2000	70.8	49.5	..
Turkey	1998	63.9	37.7	10.1

Sources: Population Reference Bureau (2002); United Nations (2001).

The Mongolian case elucidates a unique situation in which the weakening of pronatalist policies followed by economic crisis, rather than prosperity, has encouraged fertility decline. The TFR in Mongolia was consistently high at around 8 children per woman between 1960 and 1968. During that time, pronatalist policies were in practice: the distribution and use of modern contraceptives were prohibited, while women with many children were rewarded with various benefits. Since 1976, however, the pronatalist policies have gradually been relaxed, with a significant expansion of family planning services in 1988 and legalized abortion in 1989. Accordingly, the TFR declined to fewer than 5 children per woman by 1990. A further rapid decline was recorded with the collapse of the socialist system and accompanying economic crisis of the 1990s. Along with falling income levels and increased unemployment rates, the TFR dropped to less than 3 children per woman. More important, reduced social benefits for childbearing have adversely affected people's motivations for having many children as health care and schooling were no longer free, adding extra burdens for parents (Aassve and Altankhuyag, 2002). The Mongolian case thus suggests that changes in the level of social services along with economic hardship can depress people's desire to have many children.

South-East Asia

In addition to the previously mentioned demand factor, some studies have pointed out that the diffusion of new ideas and behaviours is another prime factor for fertility decline. According to the diffusion model, new ideas and information spread through social interactions, which is the process of changing (or not changing) people's attitudes towards a new idea. Social norms and traditions also act to encourage or discourage a new idea. Social interactions, which provide opportunities for diffusion, are communicated at the personal, national and international levels (Bongaarts and Watkins, 1996). Thus, the process of fertility decline is propelled by the transmission of information and ideas as regards the regulation of fertility and the use of modern contraceptives.

As is the case for China, the role of the Government is particularly important because it is a major institution that can effectively diffuse information at the national level. It has been argued by Bongaarts (1994:619) that national family planning programmes can have powerful impacts on fertility levels by "reducing noneconomic costs of contraceptive use, such as lack of knowledge, fear of side effects, and social and familial disapproval". Reviewing the development of family planning programmes during the latter part of the twentieth century, Caldwell and others (2002) emphasize that national family planning programmes have played a significant role in reducing fertility in the developing world by not only providing new contraceptive methods for free or at a reasonable price, but also and even more important, by popularizing the small family norm and legitimizing the use of contraceptives.

Thailand is an excellent example depicting the positive impacts of a national family planning programme. Thailand's TFR was close to 5 children

per woman until 1975, after which it drastically dropped to 3.8 in the 1980s and to 2.3 in the early 1990s. Fertility continued to decline through the 1990s, eventually dropping to below the replacement level (Chamrathirong, undated; Gubhaju and Moriki-Durand, 2003). The current TFR is estimated at 1.7 children per woman (ESCAP, 2003). As a result of the successful national family planning programme implemented in the early 1970s, the use of contraception increased from about 34 per cent in 1975 to 72 per cent in 1996 (Ruffolo and Chayovan, 2000). The national family planning programme in Thailand is well known for its innovative character, providing contraceptive services to the community level by employing nurses and auxiliary midwives as contraceptive providers (Rosenfield and others, 1982). In addition, some studies have argued that increasing economic pressures, the active participation of women in trading and farming and the relative autonomy of women have made Thai women desire a small family (Knodel and others, 1987; Mougne, 1988). Such factors as the rising age at marriage for both men and women, the increasing level of celibacy and the shortening of the childbearing span also contributed to the decline in fertility in Thailand. Thus, the case of Thailand strongly suggests that fertility transitions can progress rapidly when methods of modern contraception are effectively provided in favourable social conditions where people are ready and willing to limit their fertility.

The Vietnamese case further underlines the importance of the effect of family planning programmes under favourable socio-economic conditions. It presents an example of a sustained decline in TFR from 5.9 in the early 1970s to 4.0 in the late 1980s and 2.3 in 1999. This is consistent with the rise in contraceptive prevalence from 53 per cent in 1988 to 65 per cent in 1994 and 75 per cent in 1997. Although the increased contraceptive use is the main driving force in the reduction of fertility in Viet Nam, the transformation towards a market-oriented economy following the unification of the country has improved the socio-economic conditions of the people at large, thereby strongly affecting family structure, life style and reproductive behaviour (Hung, 2002).

The successful implementation of the Indonesian national family planning programme also contributed significantly to the reduction in fertility. Indonesia exhibited a remarkable decline in the TFR from close to 6 children per woman in the 1960s to less than 3 in the 1990s. This is associated with the percentage of married women currently using contraceptives, which increased from less than 20 per cent in the mid-1970s to over 50 per cent by the end of the 1990s. The success of family planning programmes in Indonesia is the result of the political change that occurred in the 1960s. The new regime changed the political climate from one that was traditionally Islamic to a less conservative one. The secularization of the Government helped the formulation of an effective family planning programme that was compatible with Islamic values. Increased involvement of women in school and the formal workforce further contributed to depress Indonesian fertility. A growing number of women are now choosing a life focused on higher education and a career rather than the traditional life based on

marriage and childbearing. The social reality of Indonesia is making it difficult for these young women to have both family and work (Hull, 2002 and 2003).

Some countries in South-East Asia, however, exhibit staggered fertility rates. The Philippines is an example where a religious institution appears to have hindered further progress in the country's fertility transition. Although the TFR in the Philippines started to decline in the mid-1960s, the pace of the decline has been quite modest during the past 25 years. The TFR has stalled at around 4 children per woman over the last 10 years (Cabigon, 2002). This is surprising in the light of favourable social indicators such as higher female literacy rate, relatively low infant mortality rate and higher life expectancies at birth (see table 4). One of the major reasons for the lower-than-expected performance is the resistance of the Roman Catholic Church to any effort to promote most forms of modern contraception and its ideological commitment to natural family planning methods such as the rhythm method. A weak political commitment to establishing a comprehensive family planning programme is further worsening the situation (Cabigon, 2002).

Malaysia is another case in which government policy influenced the course of fertility transition; yet the transition was not uniform across ethnic groups. In Malaysia, as a whole, the TFR dropped substantially from 5.4 in 1967 to 3.5 in 1987 and the decline slowed somewhat to 3.3 in 1997 (Peng, 2002). The establishment of the national family planning programme in the mid-1960s along with the impressive gains in socio-economic indicators led to a sustained decline in fertility among Malays and an accelerated decline among people of Chinese and Indian ethnicity. However, the slow pace of the overall fertility decline in Malaysia during the period between 1987 and 1997 is the result of a differential response by ethnic groups to the inequalities in the level of socio-economic development and government policy changes. Concerned over further reductions in fertility, the Government apparently de-emphasized the family planning programme and established a pronatalist policy in the early 1980s. The immediate effect of that policy was revealed in a slowing of the fall in the TFR of Malays, from 4.5 in the years 1977 and 1987 to 3.8 in 1997, as society responded quickly to the new government policy with its pronatalist messages. The fertility of people of Chinese and Indian descent, however, continued to fall, reaching 2.5 and 2.6, respectively, in 1997 (Jones and Leete, 2002; Peng, 2002).

South and South-West Asia

Among the countries in South and South-West Asia, the case of Sri Lanka stands as a unique example which demonstrates the crucial role of human development in the course of fertility decline. Despite the fact that Sri Lanka is still a low-income country, its TFR dropped from around 5 children per woman in the late 1960s to replacement level in the late 1990s. As table 4 suggests, the advanced level of human development, reflected in the high female literacy rate (89 per cent), low infant

mortality rate (17 per 1,000 live births) and fairly high life expectancies at birth (71 years for males and 76 years for females), has inevitably influenced the fertility level. Those social conditions that facilitated the acceptance of the small-family norm helped to complete the fertility transition earlier than economic indicators would suggest. The lessons from Sri Lanka clearly demonstrate that investments in social sector programmes with strong political commitment can be highly effective in reducing fertility in low-income countries (Sathar and Phillips, 2001).

The recent spectacular decline in fertility achieved by the Islamic Republic of Iran also suggests the importance of basic social and health infrastructures in improving human capital and thus facilitating the use of contraceptives. One of the characteristics of the fertility decline in the Islamic Republic of Iran is that it occurred in all segments of the population, including rural areas. Fertility rates fell from 4.5 to 1.8 in urban areas and from 8.1 to 2.4 in rural areas between 1976 and 2000. A fundamental improvement in female education as well as a change in marriage patterns made a significant contribution to the increase in contraceptive use from 37 per cent in 1976 to 74 per cent in 2000, leading to a rapid fertility decline (Roudi-Fahimi, 2002).

Those changes are attributed to the fact that government policies to increase public education and establish a health network system have resulted in

The rural health-care network in the Islamic Republic of Iran

There are now more than 16,000 health houses in the Islamic Republic of Iran, covering around 95 per cent of the rural population. In addition, mobile clinics bring health services to people living in remote areas. Each health house serves around 1,500 people, usually consisting of the people of one central village (where the health house is located) and those of satellite villages that are within an hour's walk from the central village. Each health house generally has two health providers (in principle, one man and one woman), known as *behvarzes*, who receive two years of training. The female *behvarz* is in charge of maternal and child health care and the male is responsible for issues related to environmental health, such as water safety and agricultural production.... The data also show the number of married women of reproductive age and their contraceptive prevalence rate by methods. *Behvarzes* are proactive: they are comfortable knocking on people's doors to talk about families' health-care needs, including family planning, and to give them appointments to visit the health house (Roudi-Fahimi, 2002: 4)

the promotion of successful family planning within the framework of the rural health-care network called “health houses” (see box below).

The implementation of the national family planning programme in 1989 was effectively enhanced through the health network. Religious leaders legitimized the family planning programme by giving full support, which enabled the Government to provide family planning services to the people without any religious barriers. Moreover, by the mid-1980s, the perceived costs of rearing children had increased owing to higher aspirations and investments by families in their children’s education (Abbasi-Shavazi, 2002).

By contrast, an example from Bangladesh presents a counter-case where insufficient human development is hindering maximum use of the family planning programme. Although the TFR in Bangladesh was impressively reduced from 6.3 in 1975 to 3.3 in the early 1990s, the decline has virtually stalled at around 3 during the last decade. The speed with which fertility declined from a high to an intermediate level was largely due to the successful family planning campaign, which was supported by a strong political commitment to reducing fertility. Culture-sensitive family planning programmes manifested in household visits by field workers, the involvement of religious leaders in the programmes’ promotion (McEachran and Diamond, 2001) and external funding to support the family planning programmes (Caldwell and others, 2002) have facilitated the progress of the campaign. As a result, the contraceptive prevalence rate increased from less than 10 per cent in the mid-1970s to about 40 per cent at the beginning of the 1990s and further to 54 per cent in 1999-2000 (Bairagi and Datta, 2001).

The stabilization of the TFR at slightly above 3 children per woman, however, indicates that a subsequent rise in contraceptive prevalence failed to show an impact on fertility decline. A study conducted in Matlab, Bangladesh, suggests that, conditioned by strong son preference in the area, fertility in Matlab has actually reached the level of couples’ desired number of children. The impact of the increase in contraceptive use has been offset largely by the decrease in the incidence of abortion, with the net balance resulting in the stalling of the total fertility rate at the desired number of children (Bairagi and Datta, 2001). Bongaarts and Watkins (1996) suggest that a low level of social development might be a factor in keeping the desired number of children at a relatively high level. According to them, the threshold level of social development (measured by the Human Development Index) required for the onset of fertility decline has dropped over time because of the diffusion of information transmitted from leading countries in the region which had initiated fertility decline; the onset of the fertility transition in Singapore occurred when its HDI was at 0.65, while the Bangladeshi fertility transition started when its HDI level was only at 0.32. Thus, since Bangladesh had begun its fertility transition earlier than anticipated in view of its level of social development, the social conditions were not sufficient to have a sustained fertility decline.

A further explanation concerning the apparent stalling of the fertility decline in Bangladesh is related to a decline in the quality of care. Islam and others (2003) found that the quality characteristics of fieldworkers, including regularity in work, innovative techniques in communication, technical competence, enthusiasm for work and conformity to social norms, have had significant positive impacts on the clients' current use of contraceptives. They conclude that the presence of or visits by a fieldworker are not enough to increase contraceptive prevalence/continuation rates and to decrease failure rates. What is needed is a good-quality fieldworker. The Bangladesh experience, therefore, suggests that a further decline in fertility would require renewed programmes with intensified training for fieldworkers emphasizing the quality of care and, more critically, fundamental improvements in social/human development.

Moreover, the case of India highlights the impact of human development on the uneven fertility transition among states divided between the northern and southern parts of the country. In India, as a whole, fertility declined from 6.0 children per woman in the early 1960s to 4.5 in the early 1980s. The process of decline continued at a gradual pace, reaching 3.2 in 1998. Such a steady decline in fertility at the national level is related to the implementation of the government family planning programme established in 1951 as well as perceptible changes in socio-economic development over the past 30 years in India (Ram and Ram, 2002). However, the aggregate fertility level of the country masks the substantial variations in fertility among states. For example, in the southern states of Kerala and Tamil Nadu, there has been a spectacular drop in TFR from around 5 in the early 1960s to below replacement level in 1998. By contrast, women in the northern states, such as Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, reported modest declines in TFR from over 6 children per woman to over 4 during the same period (Kumar, 2002). A distinct difference between north and south India is that the fertility transition began in the south at a higher level of social development, such as a higher female literacy rate (over 45 per cent), lower infant mortality (89 per 1,000 live births) and higher female age at marriage (20 years). By contrast, in most of the northern states the fertility transition began when female literacy was below 20 per cent, infant mortality was above 100 per 1,000 live births and female age at marriage was below 18 years (Ram and Ram, 2002).

Some studies have strongly argued the importance of women's autonomy in the manifestation of a clear fertility difference between northern and southern India, where underlying family structures as well as the status of women differ considerably. In the northern region of India, great emphasis is placed on males and the patrilineal family system. Dowry is usually required for women to marry, a strong son preference and neglect of girls are also persistent and the decision-making power of women is very low. In the south, however, marriage usually takes place within a circle of relatives, dowry is not as important and son preference not as strong. Thus, the earlier onset of social change in Kerala and Tamil Nadu in the south can be attributed to the fact that these states are examples

of more equitable societies with less strictly defined hierarchies and greater women's autonomy compared with the highly stratified class society found in some northern states (Sathar and Phillips, 2001; Dyson, 2002).

Finally, Pakistan represents a case where low status of women, coupled with weak political commitment has prevented the fertility transition from occurring. The TFR in Pakistan remained around 6 children per woman throughout the 1960s, 1970s and 1980s, while it declined marginally to a little over 5 children during the 1990s. This lack of decline is supported by the low prevalence of contraception, which nominally increased from 5.5 per cent in 1968 to 12 per cent in 1990-1991 and to 24 per cent in 1996-1997 (Hakim and Miller, 2001). Although recent estimates suggest that the TFR in 2000 dropped to about 4.8 with the contraceptive prevalence rate increasing to about 30 per cent, the unmet need for family planning still continues to be high at about 38 per cent (Sathar, 2001)

Comparisons with neighbouring countries in South Asia illuminate factors hindering a smoother fertility transition in Pakistan. For example, in contrast to the successful national family planning programme in Bangladesh, Pakistan's family planning programme suffered from a lack of political commitment, user-oriented contraceptive delivery systems, involvement of external agencies and international donors (Robinson, 2001). More critically, low education and the associated subordinate position of women have been suggested as major reasons inhibiting the onset of the fertility transition in Pakistan. A comparison of women's autonomy in Uttar Pradesh and Tamil Nadu in northern and southern India, respectively, and Punjab in Pakistan shows that a higher level of autonomy is associated with a lower desired number of children and a higher level of contraceptive use. Accordingly, women with more autonomy have fewer unmet needs for family planning (Sathar and others, 2001). Thus, the Pakistani case strongly suggests the adverse impacts of low status of women on the onset of the fertility transition.

Challenges and future directions

The preceding sections examined levels, trends and patterns of fertility and reviewed factors affecting fertility decline in the Asian region. The complexity of the fertility transition does not allow for easy generalization. However, it is apparent that the prime determinant of fertility decline lies in social development, particularly the level of women's education and autonomy, as well as commitments by Governments to providing effective family planning programmes. This section will present future prospects for fertility decline in intermediate- and high-fertility countries. It will also highlight challenges and emerging issues for countries having each level of fertility.

The future course of fertility in high- and intermediate-fertility countries will largely depend on several factors, including a high level of political

commitment, quality reproductive health information and services and investments in social sector development. Particularly in high-fertility countries, greater emphasis needs to be placed on strengthening family planning programmes in order to make services accessible and affordable to couples wanting to use contraceptives. The data reveal that there is a high unmet need for contraception, with at least a third of women of reproductive age reporting their desire to postpone or stop childbearing although not using contraceptives for various reasons (see table 5). At the same time, investments should be made to improve human development, which has been proven to reduce demand for children and increase demand for contraception. Improving women's autonomy and reducing gender inequality, especially in the case of Pakistan, have also been suggested to bring about positive changes towards increasing contraceptive use and reducing fertility (Sathar, 2001; Hakim and others, 2003).

Although there are groups in many societies that have fertility considerably higher than the national average, in general, the gap is the highest in the intermediate-fertility countries. For example, in the case of India, a considerable variation in fertility can be seen among the various states, with northern states generally showing a higher level of fertility than the southern states. Such variability in fertility therefore suggests that there are large pockets of the population who are less motivated to have a smaller family and/or have poorer access to quality family planning services and modern contraceptives. Thus, as a primary strategy to reduce the gap, special attention should be paid to the improvement of social and economic conditions along with an increase in the accessibility and affordability of quality reproductive health services for all. Moreover, a study by Foreit (2002) suggests that in order to better serve less advantaged women, it is important to determine categories of women who still need government-subsidized family planning services and women who can afford contraceptives from commercial sources. If more women with financial means use commercial outlets, the private sector will participate more in family planning and government support can more effectively reach women in real need.

Other important issues in intermediate-fertility countries relate to modification and adjustment of national family planning programmes in the course of fertility transition. First, the emphasis of programmes needs to be changed from a target-oriented approach to a holistic reproductive health approach, with the aim of providing quality primary health care, including family planning. The case of the Islamic Republic of Iran clearly suggests the effectiveness of establishing a quality health-care system rather than concentrating on narrowly focused family planning services. Secondly, it is apparent from the experience of Bangladesh that operating national family planning programmes heavily relying on external resources is not sustainable over a long period of time. In other words, it is necessary to transform programmes into more self-supportive systems (Caldwell and others, 2002). Thirdly, learning from the experience of low-fertility countries, the Governments of intermediate-fertility countries need to foresee the consequences of declining fertility rates. For example, the Government of

Malaysia has taken steps to decelerate its fertility decline well ahead of approaching low fertility. Needless to say, it is crucial for all countries with declining fertility to prepare measures for the consequent ageing of the population as soon as possible.

As to low-fertility countries, the challenge is to maintain a balance between population growth and economic development. Although low-fertility countries are the region's forerunners with some having reached replacement-level fertility earlier than their European counterparts, a continued depression in fertility in some of these countries has made them cautious about a further decline. In fact, national family planning programmes in the Republic of Korea and Singapore were phased out after fertility fell well below the replacement level (Caldwell and others, 2002). Experiences of European countries also confirm that the prospect of raising fertility to replacement level is most unlikely (United Nations, 2000a). Similarly, in the low-fertility countries of Asia, such as Japan, the Republic of Korea and Singapore, these measures have proved unsuccessful although concerted efforts were made to reverse the fertility decline.

Therefore, the pressing issue for low-fertility countries is the ageing of the population. As a consequence of a rapid fertility decline coupled with an increase in longevity, all low-fertility countries will be faced with a higher proportion of older population (aged 65 and over). The rapidity of the process leading to low fertility has not allowed enough time for these countries to adequately prepare for the problems associated with ageing of the population. For example, ageing countries like Japan, the Republic Korea and Singapore are facing the problem of increasing national expenditures for old-age social security and the mounting burdens of providing care for a growing number of frail elderly and shrinking labour force. The shrinking labour force and the increase in the ageing population have also contributed to lowering potential support ratios (United Nations, 2002b). Countries such as China and Thailand that have no established social security system, yet where fertility declined very rapidly, will face the problem of supporting an increased proportion of elderly with a smaller proportion of the younger generation (Gubhaju and Moriki-Durand, 2003). Thus, it is now especially important for low-fertility countries as well as near-low-fertility countries to take serious measures to prepare for an ageing society.

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