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Population Dynamics and Their Impact on Adolescents in the ESCAP Region

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Adolescents greatly outnumber the elderly, so care must be taken to ensure that policies towards them are not neglected

The ESCAP region is undergoing dramatic demographic, social and economic changes, which are both altering the share of adolescents in the population and changing their roles in society. The changes are, however, not uniform over the ESCAP region. On the contrary, the region contains countries running the full gamut: in demographic terms, from high fertility to extremely low fertility; in economic terms, from economically highly advanced to very poor; in human development terms, from highly advanced to some of the worlds least developed. These wide differences within the region pose difficulties for a broad overview of the topic of the effect of population dynamics on adolescents. This article will take a range of approaches, sometimes using broad subregions1 of ESCAP, at other times concentrating on some of the largest countries or on particular cases that are seen to illustrate a situation or trend that has wider applicability.

Table 1: Trends in adolescent population, by major subregions of Asia, * 1970-2020

	Number								
	1970	**1980**	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
East Asia - Total	986,971	1,179,012	1,351,710	1,424,155	1,493,284	1,550,773	1,605,221	1,659,593	1,707,477
10-14	102,834	147,104	113,658	114,246	130,141	116,954	116,996	109,747	111,580
15-19	105,456	123,969	141,699	113,263	113,900	129,798	116,675	115,740	109,536
20-24	81,873	101,460	146,008	140,892	112,676	113,371	129,268	116,226	116,342
Total 10-24	290,163	372,533	401,365	368,401	356,717	360,123	362,939	342,713	337,458
South-Central Asia - Total	787,673	990,060	1,243,314	1,381,160	1,525,812	1,672,087	1,816,977	1,954,244	2,076,460
10-14	93,514	117,731	138,554	157,304	168,480	179,069	186,637	190,456	191,347
15-19	77,891	103,842	128,245	137,133	156,167	167,531	178,298	185,954	189,868
20-24	63,893	89,879	114,815	126,746	135,900	155,029	166,588	177,452	185,209
Total 10-24	235,298	311,452	381,641	421,183	460,527	501,629	531,523	553,862	566,424
South-East Asia - Total	286,708	360,180	442,312	484,252	527,103	568,748	607,479	644,668	679,498
10-14	35,973	45,166	59,758	53,417	55,635	57,439	59,234	59,153	57,441
15-19	29,160	39,077	48,165	50,150	52,870	55,144	56,998	58,835	58,795
20-24	22,934	34,173	43,766	47,380	49,440	52,223	54,555	56,464	58,348
Total 10-24	88,067	118,416	142,689	150,947	157,945	164,806	170,787	174,452	174,584
Total Asia - Total#	2,061,352	2,529,252	3,037,336	3,289,567	3,546,199	3,791,608	4,029,677	4,258,505	4,463,435
10-14	232,321	310,001	302,970	324,967	354,236	353,462	362,867	359,356	369,368
15-19	212,507	266,888	318,109	399,546	322,937	352,473	351,971	361,529	358,199
20-24	168,700	225,512	304,589	315,018	298,016	320,623	350,411	350,142	359,899
Total 10-24	613,528	802,401	925,668	940,531	975,189	1,026,558	1,065,249	1,071,027	1,078,466

Source: United Nations, 1994. The Sex and Age Distribution of the World Population: The 1994 Revision, New York.
Notes: Projected numbers taken from the medium projection.
* Excludes West Asia and Oceania.
# Total Asia calculated as the sum of East, South-Central and South-East Asia.

The growth of the adolescent population

The United Nations considers adolescents to be young people aged 10-19 and youth to be those aged 15-24. This article will deal with the three age groups 10-14, 15-19 and 20-24, and for ease of presentation will refer to them all as adolescents. How many adolescents are there, how rapidly are their numbers growing, and how large is the share of adolescents in the population? These are fundamental questions, and some of the answers to them are contained in table 1. It should be noted that the projection of adolescent populations over the next 10 years is a fairly precise

exercise because these young people have already been born, and their numbers will be affected only by mortality and (to a limited extent) by migration. But the number of adolescents 20 or 30 years from now will depend as well on fertility trends, which cannot be predicted with any degree of precision. In the present article, reliance is placed on the United Nations medium projection.

Asias adolescent population as a whole is continuing to grow -- by 0.6 per cent per annum between 1990 and 2000. But this is much slower than its growth over the past few decades. Growth is slowing because of the earlier declines in fertility that have been very pronounced in East Asia, in parts of South-East Asia, and more recently in parts of South-Central Asia (see Leete and Alam, 1993). Total fertility rates declined from a range of 5.3-7.0 in the 1970s to a range of 1.2-3.4 in 1995, except for two outliers, Bangladesh and the Philippines, where the TFRs were 4.1 and 4.3, respectively, in that year (see Caldwell, 1997, table 4.3). Such declines begin to affect the adolescent population within 10 years, and have a really major effect on its growth within 20 years. The delayed onset of fertility decline in South-Central Asia is the main reason why its adolescent population is continuing to grow quite rapidly. The pace of fertility decline has varied sharply within major regions as well. It is largely for this reason that there are extreme inter-country variations in the growth of the adolescent population.

The share of adolescents in the total population of Asia has already fallen somewhat -- from a peak of 31.7 per cent in 1980 to 28.6 per cent in 1995. This decline is expected to continue. By 2020 their share is expected to have declined to 24.2 per cent. Again, there are wide differences by subregion; for example, in 1995, adolescents were 25.9 per cent of East Asias population, but 31.2 per cent of South-East Asias population. It is worth stressing here that the share of adolescents in the population of the ESCAP region is much larger than the share of the elderly. The elderly (aged 65 years and older) make up only 5.4 per cent of the population and, although their share is increasing rapidly, they will still make up only 8.4 per cent in 2020, still well below the 24 per cent expected to be made up by adolescents.

Table 2: Growth and decline of adolescent populations, ESCAP subregions, 1970-2020

	Proportions (percentage)								
	1970	**1980**	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
East Asia - Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
10-14	10.4	12.5	8.4	8.0	8.7	7.5	7.3	6.6	6.5
15-19	10.7	10.5	10.5	8.0	7.6	8.4	7.3	7.0	6.4
20-24	8.3	8.6	10.8	9.9	7.5	7.3	8.1	7.0	6.8
Total 10-24	29.4	31.6	29.7	25.9	23.9	23.2	22.6	20.7	19.8
South-Central Asia - Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
10-14	11.9	11.9	11.1	11.4	11.0	10.7	10.3	9.7	9.2
15-19	9.9	10.5	10.3	9.9	10.2	10.0	9.8	9.5	9.1
20-24	8.1	9.1	9.2	9.2	8.9	9.3	9.2	9.1	8.9
Total 10-24	29.9	31.5	30.7	30.5	30.2	30.0	29.3	28.3	27.3
South-East Asia - Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
10-14	12.5	12.5	11.5	11.0	10.6	10.1	9.8	9.2	8.5
15-19	10.2	10.8	10.9	10.4	10.0	9.7	9.4	9.1	8.7
20-24	8.0	9.5	9.9	9.8	9.4	9.2	9.0	8.8	8.6
Total 10-24	30.7	32.9	32.3	31.2	30.0	29.0	28.1	27.1	25.7
Total Asia - Total[#]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
10-14	11.3	12.3	10.0	9.9	10.0	9.3	9.0	8.4	8.1
15-19	10.3	10.6	10.5	9.1	9.1	9.3	8.7	8.5	8.0
20-24	8.2	8.9	10.0	9.6	8.4	8.5	8.7	8.2	8.1
Total 10-24	29.0	31.7	30.5	28.6	27.5	27.1	26.4	25.2	24.2

Source: United Nations, 1994, The Sex and Age Distribution of the World Population: The 1994 Revision, New York.
Note: Projected numbers taken from the medium projection.

The differences in growth rates of the adolescent population between different parts of the Asian region are immense. Table 2 shows indices of growth in the main subregions of Asia, and table 3 shows similar indices in China, India, Indonesia and Pakistan. Eastern Asia is already experiencing a decline in the absolute number of adolescents. Growth is relatively slow in South-East Asia, but remains more rapid in South-Central Asia.

Table 3: Gowth and decline of adolescent populations, China, India, Pakistan and Indonesia, 1970-2020

1995 = 100	1970	1980	1990	1995	2000	2010	2020
East Asia							
10-14	90.0	128.8	99.5	100	113.9	102.4	97.7
15-19	93.1	109.5	125.1	100	100.6	103.0	96.7
20-24	58.1	72.0	103.6	100	80.0	91.7	82.6
Total 10-24	78.8	101.1	108.9	100	96.8	98.5	91.6
South-Central Asia							
10-14	59.4	74.8	88.1	100	107.1	118.6	121.6
15-19	56.8	75.7	93.5	100	113.9	130.0	138.5
20-24	50.4	70.9	90.6	100	107.2	131.4	146.1
Total 10-24	55.9	73.9	90.6	100	109.3	126.2	134.5
South-East Asia							
10-14	67.3	84.6	95.0	100	104.2	110.9	107.5
15-19	58.1	77.9	96.0	100	105.4	113.7	117.2
20-24	48.4	72.1	92.4	100	104.3	115.1	123.1
Total 10-24	58.3	78.4	94.5	100	104.6	113.1	115.7
1995 = 100	**1970**	**1980**	**1990**	**1995**	**2000**	**2010**	**2020**
China							
10-14	87.7	129.9	98.2	100	117.0	103.3	98.8
15-19	93.0	110.4	126.4	100	101.9	105.7	98.3
20-24	54.4	70.5	105.0	100	79.2	94.5	83.6\
Total 10-24	76.5	101.2	109.4	100	97.9	100.7	92.8
India							
10-14	62.6	77.9	89.0	100	105.3	112.9	111.5
15-19	60.1	78.4	95.8	100	112.5	124.6	127.8
20-24	53.1	72.4	91.3	100	104.5	124.5	134.0
Total 10-24	58.9	76.4	91.9	100	107.4	120.3	123.7
Pakistan							
10-14	48.3	64.6	81.4	100	119.5	143.9	165.7
15-19	51.6	69.2	89.6	100	124.4	166.5	193.0
20-24	41.4	66.2	94.1	100	113.0	169.7	205.0
Total 10-24	47.4	66.5	87.5	100	119.2	158.4	185.4
Indonesia							
10-14	68.1	85.7	99.0	100	100.2	102.4	93.9
15-19	56.3	74.7	96.9	100	101.2	101.1	102.3
20-24	47.2	69.8	89.1	100	103.5	105.5	108.3
Total 10-24	57.5	76.9	95.1	100	101.6	103.0	101.3
Proportion of total population (per cent)							
China							
10-14	10.6	13.0	8.5	8.2	9.1	7.5	6.7
15-19	11.0	10.8	10.7	8.0	7.8	7.5	6.5
20-24	8.1	8.7	11.2	10.1	7.6	8.4	6.9
Total 10-24	29.6	32.6	30.4	26.3	24.5	23.3	20.0
India							
10-14	11.6	11.6	10.8	11.0	10.6	9.8	8.6
15-19	9.8	10.3	10.2	9.7	10.0	9.5	8.8
20-24	8.2	9.1	9.3	9.2	8.8	9.0	8.7
Total 10-24	.7	31.0	30.3	29.9	29.4	28.3	26.1
Pakistan							
10-14	12.7	13.1	11.6	12.3	12.8	11.9	11.0
15-19	10.8	11.2	10.1	9.8	10.6	10.9	10.2
20-24	7.6	9.4	9.3	8.6	8.4	9.7	9.4
Total 10-24	31.2	33.7	31.0	30.7	31.8	32.5	30.6

Indonesia							
10-14	12.2	12.2	11.6	10.9	10.1	9.2	7.6
15-19	9.8	10.4	11.1	10.6	10.0	8.9	8.1
20-24	7.9	9.3	9.8	10.2	9.8	8.8	8.2
Total 10-24	29.9	31.9	32.6	31.7	29.9	26.9	24.0

Source: United Nations, 1994. The Sex and Age Distribution of the World Population: The 1994 Revision, New York.
Note: Projected numbers taken from the medium projection.

But within these broad subregions, there is also considerable variation. Between 1995 and 2020, the number of adolescents in Asia as a whole is projected to grow by 20 per cent, but over the same period, as table 3 shows, the growth is projected to be 85 per cent in Pakistan but only 24 per cent in neighbouring India. These rates of increase do not cover the full range of difference to be found within countries of the region; over the same 1995-2020 period, the number of adolescents is projected to increase by 18 per cent in the Philippines and by 1 per cent in Indonesia, but to decline by 7 per cent in China and 10 per cent in Thailand. The difference between Pakistan and countries such as China, Indonesia and Thailand is truly dramatic, and reflects Pakistans failure to lower fertility rates over recent decades, contrasted with the sharp fertility decline in China, Indonesia and Thailand.

Age at marriage

Traditionally, age at marriage for females has been very young in most of the countries of the ESCAP region, though considerably higher in some. This is reflected in the data on percentages ever married at ages 15-19 in years prior to 1970 in the countries of South Asia. Percentages ever married at these ages, i.e. of above 70 per cent in Bangladesh, India, Nepal and Pakistan, imply average age at marriage of no more than 16. By contrast, very few females were married at these ages in Japan or Hong Kong, and only around 14 per cent in the Republic of Korea, Philippines and Thailand. Sri Lanka, the only South Asian country where most females married at ages in their twenties, joined South-East Asian countries such as Indonesia, Malaysia and Myanmar as countries with intermediate ages at marriage for females.

Male ages at marriage were much older; in South Asian countries, it was typical for the age difference between spouses to be about seven years, and in South-East Asian countries, four or five years (Casterline, Williams and McDonald, 1986, table 1). Thus, despite the very young female ages at marriage in South Asian countries, most males aged 15-19 were not yet married. Bangladesh showed the most dramatic gender difference in percentages married: 8 per cent of males compared with 76 per cent of females. Bangladesh, India and Pakistan, however, showed a pattern of "child marriage" not only for females but also for quite a high proportion of males, with a quarter or more of males aged 15-19 already married. By contrast, in no countries of East and South-East Asia did the percentage of males married at these ages reach 8 per cent.

What changes had taken place by the 1980s? Almost universally, female ages at marriage had risen, and by a much greater margin than male ages at marriage, leading to a narrowing in the age difference between the spouses. In the Republic of Korea and Singapore, female marriage before age 20 had almost vanished, and in Indonesia and Malaysia, percentages married in the teenage years had declined very sharply. But in the Philippines and Thailand, where age at marriage had long been higher, there was actually a slight rise in the percentages ever married as teenagers. In the South Asian countries, child marriage remained very common, although in India and Pakistan at least, it was considerably less prevalent than it had been in the 1950s and 1960s.

Table 4: Marriage and early fertility in selected countries of the ESCAP region

	Percentage of women 20-24 marrying before 20 years of age	**Percentage of women 20-24 giving birth before 20 years of age**
Indonesia	51	36
Thailand	37	24
Sri Lanka	28	17
Pakistan	49	30

Source: Westoff and others, 1994.

Data from the Demographic and Health Surveys (DHSs) of the late 1980s showed that half of Indonesian women were still marrying before 20 years of age, compared with little more than one-third in Thailand and one-fourth in Sri Lanka (table 4). In fact, Indonesia compared with Pakistan in this respect, even though the relative position of

women and womens educational levels in Pakistan are much inferior to those of Indonesia.

The only substantial changes in the proportion of males married at ages 15-19 were for those countries where the proportion had previously been high: India, Nepal and Pakistan. But in each of these countries, the proportion of females married declined by even more. There has been a tendency over time for a convergence in male and female ages at marriage in Asian countries (Xenos and Gultiano, 1992:14-20), resulting from a faster rise in female ages at marriage than in male ages at marriage. This is very apparent among Malay-Muslim populations of South-East Asia, where average age differences narrowed from about five years in 1960 to 3-4 years in 1990 (Jones, 1994, table 3.16). Age differences were, and remain, wider for women who married very young, who were uneducated, and whose marriages were arranged (Jones, 1994:102-109).

For some countries, data are available for a year in the 1990s. These most recent data reveal a narrowing of the previously very wide differences between the East and South-East Asian countries, with their low proportions married among teenage girls, and South Asian countries. For example, the proportion of females married in the teenage years has fallen sharply in India and Pakistan to levels comparable with those in Indonesia and Thailand. In Bangladesh, teenage marriage remains very prevalent, but even there it is gradually declining: the married proportion of 15-19-year-old Bangladeshi girls had fallen from 75 per cent in 1974 to 69 per cent in 1981 and to 51 per cent in 1991.

The implications of the differentials and changes in proportions married for the life of young women are important. In many ESCAP countries, marriage used to take place at such young ages that the transition was straight from childhood to marriage. But now adolescence has become an extended period of time before marriage, raising issues about sexuality and relationships with the opposite sex that simply did not arise in times of early, parent-arranged marriage (Xenos, 1990; Utomo, forthcoming). Wide age differences between the spouses reinforced cultural norms about the subservient place of women, and narrowing of those differences is linked with trends towards self-choice of spouse and a more companionate form of marriage, a trend that has proceeded much further in South-East Asia than in South Asia. As will be discussed later, rising age at marriage for females has been linked with extended periods of schooling for girls and with very substantial increases in labour force participation, particularly in work that is not based in the home.

Table 5: Educational statistics, ESCAP subregions and countries

ESCAP subregions and countries	School enrolment as a percentage of age group										Percentage of cohort reaching grade 4			
	Primary				Secondary				Tertiary					
	Females		Males		Females		Males				Females		Males	
	1980	1993	1980	1993	1980	1993	1980	1993	1980	1993	1980	1990	1980	1990
East Asia														
China	103	116	121	120	**37**	51	54	60	1	4				
Republic of Korea	111	102	109	100	**74**	92	82	93	15	48	96	100	96	100
South-Central Asia														
Bangladesh	46	105	76	128	**9**	12	26	26	3	4 *	30	46	29	44
India	67	91	98	113	**20**	37	39	60	5		52		57	
Kazakhstan		86		86		91		89	34	42				
Kyrgyz Republic									28	**21**				
Nepal	49	**87**	117	129	**9**	23	33	**46**	3	**6**				
Pakistan	27	49	51	80	**8**	13	20	29	4 #	3 *	41	45	53	55
Sri Lanka	100	105	105	106	**57**	78	52	71	3	6		96		95
Uzbekistan		79		80		92		96	30	33				
South-East Asia														
Cambodia		**46**		**48**										
Indonesia	100	**112**	115	**116**	**23**	**39**	35	**48**	4 #	**10**				
Lao People's Democratic Republic	104	**92**	123	**123**	16	**19**	25	**31**	0	**2**	31		31	
Malaysia	92	93	93	93	**46**	61	50	56	4	7 *		99		98
Philippines	112	111	113	113	**69**	75	61	71	24	26		82		78
Singapore	106	107	109	110	**59**	71	56	70	8		**100**	100	**99**	100
Thailand	97	**97**	100	**98**	**28**	**37**	30	**38**	13	**19**				
Viet Nam	106	99	111	105	**40**	40	44	43	2	2	67		71	
East Asia and Pacific	102w	116w	118w	120w	**36w**	51w	51w	60w	3w	5w				
South Asia	61w	87w	91w	110w	**18w**	35w	36w		5w					
Europe and Central Asia		97w		97w		90w		81w	31w	32w				

Source: World Bank, World Development Report, 1994 and 1997; Asian Development Bank, Key Indicators of Developing Asian and Pacific Countries, 1995.
Notes: Figures in bold are for years other than those specified.
* 1991; # 1970; w = weighted average.

Educational developments

Table 5 shows basic data about educational developments in the Asian region, derived from the World Banks World Development Report for 1997. As with so many other matters related to youth and adolescents dealt with in this article, it is hard to draw generalisations because the differences between countries are so wide. However, in the following discussion, an attempt will be made to generalize as much as possible.

Primary schooling

In most Asian countries, almost all children attend primary school, but not all complete it. The gross enrolment rates in table 5 are a very rough guide because they relate primary school enrolments to the numbers in the official primary school age groups, making no allowance for late enrolment and repetition of grades. That is why many of them exceed 100 per cent. Figures exceeding 100 per cent do not necessarily imply that all children complete primary school. For example, in Indonesia, where the rates for both boys and girls were well over 100 per cent in 1993, approximately 20 per cent of children do not complete primary school (World Bank, 1997: 68). Even more strikingly, in Bangladesh, which also has a gross enrolment rate above 100 per cent, less than 50 per cent of children reach grade 4, and in the Lao People's Democratic Republic, only 31 per cent do so (see table 5).

In most Asian countries, differences between boys and girls in school attendance at this level are not very great. There is a fairly wide gap, however, in some countries, in Afghanistan, Nepal and Pakistan, for example.

Primary school enrolment rates appear to have improved universally since 1980 in those countries where rates were low in 1980. Improvements have been particularly impressive in Bangladesh and Nepal, particularly for girls, whose rates had been very low in 1980.

Another point needs to be made about primary school in the region, and this concerns the quality of primary education, and its relation to equity of access. Although near-universal primary education, as attained in many countries, has positive implications for access to opportunity on the part of the rural and the underprivileged sections of the population, many problems remain. The quality of education varies greatly between regions and between kinds of primary schools within most countries, with the lowest quality normally in the more isolated and poorest regions of the country. Problems of inadequate training of teachers, absenteeism of teachers, poor quality buildings and lack of facilities and teaching aids bedevil such regions. A child sent barefoot to a school where attendance is spasmodic, the teacher is poorly trained and lacking motivation, and teaching aids are non-existent apart from a cracked blackboard and a few pieces of chalk can hardly be considered to be equipped to compete with his or her city cousins in the competition to advance to higher levels of education.

Secondary schooling

At the secondary level, enrolment rate differences between countries, between the sexes, between regions within countries, and between socio-economic groups, become more pronounced, although the two last-mentioned differentials are rarely apparent in readily available international comparative statistics, simply because such data are rarely presented (and in fact, are frequently unavailable, even at the national level).

At this level of education, conflict emerges between education and traditional roles for adolescents and youth: namely, to become an immediate economic asset for the family by assisting in the family farm or business, or as exchange labour; and, particularly in the case of girls, to get married. In societies such as Nepal, or among Malays and Indonesians in the 1950s and 1960s, most girls were already married at ages younger than the completing age for high school. Thus, extended education required major modifications in community attitudes towards appropriate marriage ages. These modifications have been taking place almost universally in the region, as already discussed in the section on marriage.

In 1980, secondary education was already widespread in countries such as the Philippines, Republic of Korea, Singapore and Sri Lanka. It was very restricted in Bangladesh, the Lao People's Democratic Republic and Pakistan, particularly among young women. By 1993, rates had increased in all countries for which data are available. In most countries, the rise appeared to be sharper for females than for males (UNDP, 1995, table 2.3), thus closing to some extent the gender gap in enrolment. The gender gap in enrolments remains wide in the South Asian countries as a whole, but it is no longer of major consequence in most of East and South-East Asia. The really serious gap in these countries (which is also present, along with the gender gap, in South Asia) is the socio-economic status gap. This refers to the comparatively very poor chances for young people from disadvantaged socio-economic backgrounds to enter and complete secondary school (Knodel and Jones, 1996).

Tertiary education

At the tertiary level, differences between countries are very pronounced, but difficulties in interpreting the data are also great. For example, in Indonesia and Thailand, the development of open universities led to a rapid increase in tertiary enrolments, but a much less impressive increase in tertiary graduates, because of the very low ratio of graduates to enrolments in any given year. Countries such as Malaysia and Singapore still rely on overseas institutions to provide a substantial proportion of the tertiary education received by their young people, so local tertiary enrolment rates are thus misleading with regard to the proportion of young people who do receive tertiary education.2 Despite these problems of interpretation, most countries of the region do appear to have raised the proportion of adolescents attending tertiary institutions over the past decade or two. For example, in Indonesia, tertiary enrolments increased from slightly under 1 million in 1984 to 2.2 million in 1994 (Oey-Gardiner, 1997, table 8.1), a rate of increase greatly in excess of the growth rate of the potential student population.

Future trends

In table 3, which compares the projected growth of the adolescent population in China, India, Indonesia and Pakistan. Not only are there wide differences in the projected growth of the adolescent population (ranging from 85 per cent in Pakistan to minus 7 per cent in China over the period 1995 to 2020), but also in its proportion of the total population. Thus in 1990, adolescents were 31 per cent of Pakistans population and 33 per cent of Indonesias. But by 2020, they will remain at 31 per cent of Pakistans population but will have fallen to 24 per cent of Indonesias population. Pakistans adolescents will be requiring massive investment in educational facilities if educational enrolment rates are to be held constant, let alone increased. Indonesia, by contrast, faces the task of raising enrolment rates, but this will be facilitated by the near-cessation in growth in numbers of potential students. Moreover, the dependency rate in Indonesia will be much lower than in Pakistan, implying that Indonesia should find it much easier to generate the necessary resources to fund an expansion of the education system.

The generalisation that the demographic structure tends to be least favourable to educational development in precisely those countries with the least developed educational systems (Jones, 1990:11) continues to hold. It is in countries with high fertility, experiencing rapid population growth and high child dependency ratios, that school enrolment ratios tend to be the lowest. Such countries face an uphill battle in raising their school enrolment ratios to levels reached in other countries. The task is not impossible, but it will require a high priority to be given to educational expenditures among the many competing claims on government budgets.

Labour force participation

Labour force participation at these ages is affected by many different factors: most importantly, by the extension of schooling, changes in the economy and changes in cultural norms about appropriate activities for women. The extension of schooling tends to delay the entry of young people into the labour force, although some continue to combine part-time work with studies. Changes in the economy sometimes provide many new employment opportunities that are considered to be best filled by young people, often of a particular sex: for example, work for young women in electronics factories in Malaysia or in garment production in Bangladesh. In general, the rapid expansion of manufacturing has been credited with much of the advancement of womens employment in East Asia (Joekes, 1987), whereas in South and West Asia, where urban employment growth has been sluggish, women have actually been displaced from the labour force, possibly by better educated male workers (Schultz, 1990:480).

Table 6: Labour force participation rates, Asian subregions * , countries and areas, 1980, 1990 and 1995

	Labour force participation rate								
	1980			**1990**			**1995**		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
East Asia									
China		***1982***							
15-19	76.2	72.5	80.1	64.8	61.5	68.3			
20-24	94	96.8	91.1	91.2	92.6	89.6			
Hong Kong		***1981***			***1991***				
15-19	43.9	45.2	42.6	32.1	35.2	28.6	20.7	22.5	18.8
20-24	85.6	90.9	79.7	83.8	84.8	82.9	78.1	79.2	77.2
Japan									
15-19	19.6	20.3	18.8	18.7	19.9	17.4	17	17.9	16
20-24	73	74.7	71.1	75.5	75.4	75.5	74.1	74	74.1
Republic of Korea									
15-19	29.8	25.9	34	12.5	8.4	16.7	11.9	9.3	14.6

20-24	51.9	50.8	53	46.4	40.2	51.4	62.8	58	66.1
South-Central Asia									
Bangladesh		***1981***			***1990-91 LFSS***				
15-19	35.3	65.6	4.1	66.8	72.8	59.5			
20-24	41	80.9	4.5	72	85.5	59.8			
India									
15-19	47.9	61.7	32.4						
20-24	62.2	88.4	35.3						
Maldives		***1977***							
15-19	65.2	78	52.2	30.1	46.8	13.6			
20-24	78.1	93.4	62.1	51.7	82.6	23.6			
Nepal		***1981***							
15-19	60.7	69.2	51.3						
20-24	66.1	86.3	47.6						
Pakistan		***1981***			***1990-91OE***			***1993-94***	
15-19	35	62	3.4	35.7	55.2	13.1	33.4	52.3	12.1
20-24	41.9	76.5	3.6	49.4	87.7	14	47.8	84.9	14
Sri Lanka		***1981***			***LFSS***				
15-19	29.9	40.4	19	31.5	36.2	26.9	23.5	28.5	18.2
20-24	57.8	78.7	36.8	74.2	84.9	63.8	64.5	78.2	51.8
South-East Asia									
Brunei Darussalam		***1981***			***1991***				
15-19	28.2	38.2	17	18.9	23.8	13.7			
20-24	68.5	86.4	47.1	71.5	84.2	58.2			
Indonesia									
15-19	39.3	47.7	31.3	40.9	47.6	33.6	43.2	49.2	37.1
20-24	55	79.4	34.2	60.7	80	43.5	66.4	86.4	48.7
Malaysia					***LFSS***				
15-19	40.8	47.8	33.9	34	40.2	27.6			
20-24	70.1	89	52.6	70.7	83.2	57.7			
Myanmar		***1983***							
15-19	42	48.3	35.8						
20-24	57.2	75	40.1						
Philippines		***1975***							
15-19	31.9	40.4	23.5	36.8	42.3	31.3	37.7	46.5	28.1
20-24	48.7	70.5	27.6	56.5	70.7	42.5	68.3	81.1	53.8
Singapore									
15-19	49.1	47.5	50.7	28.1	28.4	27.8	19.9	20.5	19.1
20-24	86.1	93.4	78.4	82	84.3	79.6	76.7	76.2	77.2
Thailand		***CS***			***LFSS***			***1994 LFSS***	
15-19	61.8	63.5	60.1	68.5	67.7	69.4	49.4	50.8	48
20-24	73.4	79.3	67.6	86.7	91.6	81.7	78.4	86.6	70.1
Viet Nam					***1989***				
15-19				70.4	67.4	73.3			
20-24				91.3	94.4	88.8			

Source: ILO, 1980, Yearbook of Labour Statistics: Retrospective Edition on Population 1945-1989; ILO Yearbook of Labour Statistics 1991-96; Biro Pusat Statistik, 1990 Indonesian Population Census and 1995 Intercensal Population Survey; and United Nations, Demographic Yearbook, 1994.
Notes: * Excludes West Asia and Oceania.

The data used in table 6 suffer from the definitional and measurement problems that bedevil the measurement of womens labour force participation in particular. The sharp rise in the participation rate of young women in Bangladesh between 1981 and 1990-1991 must surely be the result of changes in measurement procedures. The higher proportion in the data for the period 1990-1991 is more likely to reflect reality. Many studies have shown that

womens economic activities in societies such as Bangladesh are hidden or disregarded because the society perceives their work as more wifely or daughterly duties than as economic contributions (Anker, 1983; Barkat-e-Khuda, 1985; Wallace and others, 1987). In agricultural areas of many countries, most women work despite what the official statistics might say (ILO/ARTEP, 1981).

However, in urban areas the official statistics are more (though not completely) reliable in recording employment. There was a steady increase in labour force participation rates for young females in urban areas throughout East and South-East Asian countries over the 1970s (Jones, 1984), and this has continued in most cases (Singarimbun, 1997, Ch. 2). However, this trend has been confounded at the young ages by the extension of schooling. This almost certainly accounts for the sharp decline in both male and female participation rates at ages 15-19 in the Republic of Korea between 1980 and 1990 and the more modest decline in Malaysia over the same period. Some stranger trends are apparent in some countries. The very sharp rise in female participation rates in Bangladesh has already been commented on; the Maldives registered a sharp fall. This probably also reflects definitional and procedural changes between the two sources of data rather than real changes.

There is no doubt that, in the cities of East and South-East Asia, labour force participation rates for young women once they have left school are currently very high. In South Asian cities, too, they are tending to rise, although this rise faces resistance from conservative forces, such as is the case in Afghanistan, where both educational and employment opportunities for young women are restricted.

Table 7: Unemployment rates at ages 15-24, various Asian countries and areas

	1980s		**1990s**	
	Male	**Female**	**Male**	**Female**
East Asia				
Hong Kong	*1986*		*1995*	
15-19	9.4	8.8	12.6	12.7
20-24	4.3	4.2	6.4	4.4
Japan	*1985*		*1995*	
15-19	7.9	5.3	8.9	7.5
20-24	3.5	4.4	5.5	5.8
Republic of Korea	*1985*		*1995*	
15-19	12.5	10.1	9.2	7.5
20-24	13.8	6.3	7.7	4.9
South-Central Asia				
India	*1981*			
15-19	13.9	5.6		
20-24	26.1	12.1		
Pakistan	*1988*		*1994*	
15-19	6.3	1.2	8.4	11.9
20-24	5.4	1.4	6.3	9.1
Sri Lanka	*1990*		*1995*	
15-19	23.4	38.8	41.0	58.3
20-24	22.5	50.5	21.1	35.3
South-East Asia				
Indonesia	*1988*		*1992*	
15-19	5.4	7.0	6.3	7.4
20-24	12.3	10.3	10.2	10.4
Philippines	*1985*		*1995*	
15-19	8.1	12.2	12.8	16.3
20-24	11.2	19.9	15.8	21.3
Singapore	*1985*		*1995*	
15-19	4.9	11.0	3.7	9.0
20-24	7.2	5.9	4.9	4.8
Thailand	*1985*		*1991*	
15-19	6.0	5.5	4.1	4.7
20-24	6.6	7.6	3.8	4.7

Source: International Labour Office, Yearbook of Labour Statistics, various years, Geneva; United Nations, Demographic Yearbook, various years, New York; and National Statistical Office, Thailand, Report of the Labour Force Survey Whole Kingdom, Round 3, August 1985 and 1991.

Unemployment

Most countries of the ESCAP region are still relatively low-income countries, and unemployment is notoriously difficult to measure in such countries. Time trends are also difficult to measure, because there are often changes in definitions or procedures between different sources of data. It is probably for reasons such as this that both the levels and trends of unemployment at ages 15-19 and 20-24 vary greatly between different societies as seen in table 7. Moreover, there is no consistency, either between countries and areas or in the same country/area over time, in male/female differentials in unemployment rates or in whether the rate are higher at ages 15-19 or at 20-24. What is clear is that in many ESCAP countries, a substantial proportion of young people are unemployed, defined as not working but looking for work during the reference period, and that unemployment is particularly a problem for the young, rather than a general problem.

Table 8: Unemployment rates, by age and sex, Indonesia and Thailand

Age group	Males	Females	Both sexes
Indonesia 1995			
10-14	12.6	20.9	16.1
15-19	18.4	26.7	21.9
20-24	15.5	23.3	18.5
25-29	6.4	12.5	8.6
All ages 30+	1.2	2.4	1.7
All ages	**5.6**	**10.1**	**7.2**
Thailand, 1991			
13-14	7.2	0.5	2.9
15-19	5.4	6.1	5.8
20-24	5.6	6.5	6.0
25-29	2.9	3.3	3.1
All ages 30+	0.6	1.0	0.8
All ages	**2.0**	**2.8**	**2.3**

Sources: Indonesia: Central Bureau of Statistics, Population of Indonesia, Results of the 1995 Intercensal Survey, Series S2, table 35.
Thailand: Report of the Labour Force Survey, Whole Kingdom, Round 2, May 1991, National Statistical Office, Bangkok, table 1.

There is a strong age pattern to unemployment rates in the region, as in most countries. The unemployment rates are generally much higher at ages 15-24 than they are at older ages. Examples of this are shown for Indonesia and Thailand in table 8. It is the age patterns rather than the actual levels that should be stressed in this example, because there is some evidence that the unemployment rates in Indonesia are exaggerated in comparison with other sources of Indonesian data (World Bank, 1997a:8-9). Both sets of data show the pattern of higher youth unemployment, and if the data were disaggregated by educational level, the rates would be highest for those with a high school and college education. A corollary of the higher unemployment rates among young people is that young people constitute a very high proportion of the total unemployed. In the Indonesian data on which table 8 is based, those aged 15-24 make up 64 per cent of the total unemployed; in the Malaysian Labour Force Survey for 1989-1990, they made up 72 per cent of the total unemployed.

A large literature has emerged on the meaning of high unemployment rates for the young, well-educated population. A cross-sectional approach generally leads to the conclusion that a crisis situation is emerging, and that the economy is unable to absorb the young people leaving school and college. But a longitudinal view, comparing similar sets of data over time, generally leads to a more sanguine interpretation, namely, that high unemployment among these young, educated groups is a structural fact of life, reflecting a period of job search and delays in finding satisfactory employment, a period that in most cases has ended by the mid-twenties of a persons life. This more sanguine view is based on the fact that unemployment rates do not normally rise sharply over time at ages beyond 25.

For many countries, the appropriate interpretation may contain elements of both the interpretations just noted. There is sometimes an element of crisis involved, because with the rapid expansion of education systems, the number of jobs of the kind that educated young people aspire to is not growing as rapidly as the number of job aspirants. Rising unemployment rates are one result; another is a modification of expectations in light of the new reality (Jones, 1993).

Therefore, the decline in unemployment rates at ages beyond 25 may reflect both the tendency for young people to have found long-term employment by that age, and the tendency for much of this employment to be in jobs with a status and conditions worse than those the young people had aspired to.

Table 9: Fertility indices, various years, for ESCAP subregions, countries and areas

ESCAP subregions	Year	Total fertility rate	Age-specific fertility rate (per 1,000)	
			15-19	20-24
East Asia	1990-95	1.91	14	160
South-Central Asia	1990-95	4.12	73	223
South-East Asia	1990-95	3.29	47	162
ESCAP countries and areas		**General fertility rate[#]**		
East Asia				
China	1966	-	56.0	299.0
	1976	-	16.0	179.0
	1986	-	9.0	183.0
	1991	-	20	187.0
Hong Kong	1970	84.4	17.7	134.7
	1980	66.1	12.1	86.1
	1985	53.2	8.5	57.4
	1990	42.6	5.8	35.5
Japan	1970	64.9	4.4	95.3
	1980	51.5	3.6	76.5
	1985	46.4	4.1	61.3
	1990	38.9	3.6	44.3
Macau	1970	45.5	3.4	67.8
	1981	65.0	10.2	79.8
	1988	59.2	4.8	47.0
	1991	59.4	9.9	60.0
Mongolia	[*]		38.0	
Republic of Korea	1975	94.7	13.2	170.5
	1980	84.7	10.3	129.1
	1985	58.8	9.8	117.0
	1989	52.8	4.1	86.3
South-Central Asia				
Afghanistan	1979	232.5	159.9	332.8
Bangladesh	1981	161.5	130.4	247.7
	1986	154.2	84.1	262.0
	1988	147.6	81.4	247.4
Bhutan	[*]		86.0	
India	1993		66	224
Islamic Republic of Iran	[*]		80.0	
Kazakhstan	1989	92.3	47.5	210.4
Kyrgyzstan	1989	131.7	45.2	269.2
Maldives	[*]		71.0	
Nepal	[*]		89.0	
Pakistan	1968	174.8	61.1	219.7
	1975		131	275
	1979		99	283
	1984		64	223
	1991	177	84	230
Sri Lanka	1968	143.5	49.6	216.2

	1980	119.3	38.3	177.8
	1985	96.3	35.2	151.8
	1987	85.6	32.1	130.9
	1993		35	
Tajikistan	1989	175.2	38.9	302.6
Turkmenistan	1989	149.0	22.3	227.3
Uzbekistan	1989	144.8	42.1	285.7
South-East Asia				
Brunei Darussalam	1971	178.6	73.4	263.1
	1978	140.1	59.4	206.4
	1983	115.7	41.7	148.6
	1989	104.8	35.5	118.6
Cambodia	*		23.0	
Indonesia	*		45.0	
Lao People's Democratic Republic	*		51.0	
Malaysia:				
Peninsular	1970	140.1	53.6	232.6
	1980	121.5	35.0	176.0
	1986	117.9	23.8	147.4
	1990	104.9	18.5	123.9
Sarawak	1970	150.3	74.5	227.5
	1980	124.7	67.6	202.6
	1985	114.9	57.0	168.7
Myanmar	*		36.0	
Philippines	1970	114.8	36.3	165.5
	1980	126.3	45.8	188.8
	1986	107.7	43.9	164.0
	1989	103.9	38.6	159.4
Singapore	1970	93.1	26.2	139.5
	1980	59.3	12.3	80.0
	1985	56.4	9.7	66.9
	1990	64.5	8.8	61.9
	1992	60.3	8.2	55.3
Thailand	1970	147.0	52.3	227.1
	1980	95.5	52.1	173.6
	1985	73.2	42.6	129.3
	1990	63.3	43.1	111.6
Viet Nam	*		35.0	
Pacific				
Australia	*		22.0	
Fiji	*		48.0	
French Polynesia	*		69.0	
Guam	*		81.0	
New Caledonia	*		53.0	
New Zealand	*		32.0	
Papua New Guinea	*		23.0	
Samoa	*		32.0	
Solomon Islands	*		95.0	
Vanuatu	*		74.0	

Sources: United Nations, 1994. World Population Prospects: The 1994 Revision; United Nations, Demographic

Yearbook 1975, 1981, 1986 and 1992; 1997 ESCAP Population Data Sheet; India, National Family Health Survey 1993; China data kindly provided by Mr. Zhongwei Zhao.
Notes: # General fertility rate (to women 15-49);
* Data included from 1997 ESCAP Population Data Sheet for countries whose data are not included in the Demographic Yearbooks.

Fertility among adolescents

Overall fertility varies considerably between the regions and countries of Asia (see table 9). The lower total fertility rate in Eastern Asia (1.91 or below replacement level fertility) is mirrored by a much lower age-specific fertility rate at ages 15-19 than in either South-Central Asia or South-East Asia. In fact, at 14 per thousand at ages 15-19 in Eastern Asia, fertility at these ages can be said to have almost vanished. However, there is far less difference in fertility rates between these regions at ages 20-24. This is because these are major ages for childbearing, and even in East Asia, there is a tendency for childbearing to be concentrated in these ages and the late twenties.

Table 9 also presents age-specific fertility rates at ages 15-19 and 20-24 for individual countries, in many cases for a series of years, although in some countries, notably in Central Asian countries of the former Union of Soviet Socialist Republics, only one years figures are available.

In Asian countries, fertility outside of marriage is extremely rare. It is therefore not surprising that fertility rates are correlated fairly closely with marriage. In countries with early marriage, fertility at the young ages tends to be high. This is evident in table 9, which shows a higher proportion of young women giving birth before 20 years in Indonesia and Pakistan -- where age at marriage is fairly low -- than in Sri Lanka or Thailand, where age at marriage is higher. The reason is that in almost all Asian countries, strong pressure tends to be exerted on newly married couples by their parents and other family members to begin childbearing quickly. Even in societies where fertility is low, such as the Republic of Korea and Taiwan Province of China, there is still pressure on couples to quickly produce the one or two children they will have. However, in China, there is the additional element of state permission to negotiate. This might have been expected to lower the age-specific fertility rate for Eastern Asia, which is dominated by China, at ages 20-24, but this is not the case. Although figures for China at ages 20-24 are not available in the United Nations Demographic Yearbook, other sources indicate that there is a sharp rise in fertility from an extremely low level at ages 15-19 to a peak at ages 20-24 (about 180 per thousand), after which fertility declines sharply again (Zhao, 1994:41).

In Hong Kong, Japan and the Republic of Korea, fertility at ages 15-19 and 20-24 has declined sharply since 1970, except at ages 15-19 in Japan, where fertility was already very low in 1970. The contrast with South Asian countries is dramatic: Afghanistan is estimated to have a fertility rate of 153 per thousand at ages 15-19, Bangladesh a rate of 119 and India 110, compared with 5 in China and 4 in Japan and the Republic of Korea; at ages 20-24, the age-specific birth rate in Bangladesh was 247 per thousand, compared with 35 in Hong Kong, and 44 in Japan. The only South Asian country with relatively low fertility at these ages is Sri Lanka. At these ages, fertility in major South-East Asian and North and Central Asian countries tends to be intermediate between the low East Asian and high South Asian rates. In Singapore and Thailand, there have been clear declines in fertility over these ages, though interestingly the decline at ages below 20 in Thailand has been only modest, probably because age at marriage has not risen markedly. In the Philippines, there has been only a slight decline.

In South Pacific island countries, the total fertility rates are above 3.0 in most countries and territories, and over 5.0 in three of them: Papua New Guinea, Solomon Islands and Vanuatu. The percentage of all births occurring to teenagers is unknown in Papua New Guinea and Solomon Islands; it is 7 per cent in Vanuatu and much higher (approximately 20 per cent) in the Cook Islands and the Marshall Islands. The age-specific fertility rates at ages 15-19 range quite widely from around 20 per thousand in the Cook Islands and Tuvalu to about 80 in the Marshall Islands and Guam and 95 in Solomon Islands (Lee, 1995, table 1; ESCAP, 1997).

Effects of demographic and educational changes, poverty, globalization and urbanization on adolescents: implications for policy

Adolescents in the Asian region, like the rest of the population, are living in a rapidly changing environment. As the region enters the twenty-first century, most of its adolescent population will still be alive at mid-century. In the interim, this cohort will play a crucial role in national development in an increasingly interconnected and high-technology world. From this perspective, it is tragic to note that many of these adolescents will still lack access to secondary schooling -- and in some cases, even to primary schooling -- and will suffer from avoidable health problems. Some will continue to suffer from exploitation in the form of child labour and abuse within the family. Profound changes in technology, in economic structures and in living conditions are altering the nature of adolescents lives and influencing family relationships and expectations placed on them. In general, conditions of life are improving for Asias adolescent population and their opportunities are widening. Nevertheless, the variety of circumstances across the Asian region is so broad as to defy easy generalisation.

Demographic trends in the ESCAP region will have important ramifications for the growth and welfare of the adolescent population. With the exception of certain high-fertility South Asian countries such as Nepal and Pakistan, the growth of the adolescent population has slowed considerably and will continue to decelerate in coming years. This will facilitate the rise in primary and secondary school enrolment ratios, with all the implications this has for adolescents: increased life skills, greater independence, and the opening of a greater range of possible work opportunities. Of course, the extent to which the opportunities will increase to match the rising educational levels of young people will depend on rates of economic growth, which are very hard to predict. Economic growth rates have been remarkably high in recent years in many East and South-East Asian countries, and quite high in a number of South Asian countries. But recent revisions to projected economic growth rates have been sharply downward in a number of South-East Asian countries.

Demographic trends, however, underpin positive longer-term assessments of the economic prospects of these countries, as a result of the declining dependency ratios they will experience over a sustained period (Higgins and Williamson, 1997). Many other factors will of course influence the rates of economic growth achieved, but the declining dependency ratios will have unambiguously positive implications for economic growth and levels of per capita income.

Urbanization in the region is increasing apace. Projections suggest that even large and relatively poor countries such as the Philippines and Indonesia are likely to reach urbanization levels of 50 per cent of their population by about the year 2002 (Philippines) or 2017 (Indonesia), although India is expected to remain predominantly rural until about 2030. A number of implications for adolescents emerge. First, for the next two decades, most adolescents in the region will continue to live in rural areas, and their needs should not be overlooked because of the greater visibility of issues facing adolescents in metropolitan areas. Second, adolescents will be prominent in rural-to-urban migration flows, and an increasing proportion of adolescents will be living their lives in urban environments, increasingly in big city and metropolitan environments.

In conditions of poverty and traditional attitudes about the role of children and of women, child labour remains a problem and women continue to fulfil their traditional roles of producing children and serving their husbands family. Such conditions can be observed very widely throughout the region. In countries such as Indonesia and Thailand, the incidence of poverty has been dramatically reduced, and most children are now able to continue their schooling into lower secondary school without the pressure of working at the same time. Reduction of poverty and the achievement of almost universal secondary education has been particularly dramatic in some countries such as the Republic of Korea.

But even in the poorest countries, expanded schooling and the effect of improved transport and communications is changing attitudes and leading to tensions as tradition comes into conflict with the changing aspirations of the young. Age at marriage has risen, and puberty is now reached well before young people marry. Issues of sexuality and how to deal with it, along with the problems of finding satisfactory employment for both the young city-born and young people migrating to the cities from the countryside, are only two of the key problems with which young people have to deal. Adolescence is the most volatile period in a persons life, and issues young people have to resolve are faced at the household, local community and wider political level. At the household level, there is frequently a growing gap between the traditional attitudes of parents regarding control over teenagers and appropriate behaviour of teenagers, and the attitudes of teenagers themselves, conditioned by their peers at school and the influence of the Westernized media. In fact, for many parents the control of the behaviour of adolescent girls is a new issue, since they themselves and their own parents were already married when they reached these ages.

At the societal level, rebelliousness of teenagers in school is frequently decried, as is the reluctance of some of them to participate in youth organizations under the auspices of religious, school or government authorities. The idealism and perhaps foolhardiness of youth frequently encounter the reality of deficiencies in the political system and the nature of governance, and in some cases oppressive and/or corrupt regimes. Aspirations for effective political expression lead some adolescents to the forefront of demonstrations and expressions of dissatisfaction with the regimes in power, and this leads to tight control over political movements in universities in many countries of the region, thus inhibiting expression of views of a kind not officially sanctioned.

Communications is one area in which the changes have been so profound and universal that it is possible to generalize to some extent. It is clear that, even in the most isolated villages in countries such as Indonesia, Philippines and Thailand, the influence of radio and television has penetrated deeply. This was not the case 30 years ago. Villagers these days are bombarded by images of the urban middle class, not to mention of the great world beyond national boundaries. Therefore, it is very difficult any longer to find villages where young people are entirely ignorant of the world outside and of the gulf that separates their conditions from those in more favoured settings typically shown on television. These images help to fuel migration of young people from rural areas to the cities.

It was noted previously that the share of adolescents in the ESCAP region is much larger than the share of the elderly which, although increasing rapidly, will remain much smaller than the share of adolescents three decades from now. Issues of an ageing population are, appropriately, receiving increased attention throughout the region. But

care must be taken to ensure that the pressing issues facing adolescents and facing governments in their policies towards adolescents are not neglected.

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Endnotes

1. In summary tables, the ESCAP region is approximated by Asia (excluding Western Asia): in other words, as the sum of East, South-East and South-Central Asia. This excludes Oceania, but as Oceania constitutes less than 1 per cent of the population of the ESCAP region, this is not a major problem. The difficulty with Oceania is that it comprises Australia and New Zealand and the Pacific island countries, which have quite different demographic regimes, with the result that the aggregate Oceania figures have little meaning, and certainly do not reflect conditions in most member states of that subregion, the small island states of the South Pacific.

2. According to data in UNDP's Human Development Report for 1995 (table 10), in Singapore and Malaysia, the ratio of tertiary students abroad to those at home was 25 per cent and 38 per cent, respectively, compared with 1 per cent in Bangladesh and 2 per cent in Indonesia.

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Recent Changes in Marriage Patterns in Rural Bangladesh

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Apart from effective legislation and its enforcement, suitable welfare schemes can facilitate increasing the age at marriage

The patterns, duration and the dissolution of marriage do not remain constant for specific societies over time. Through socio-economic development these factors change, although the changes do not occur with equal intensity in all societies at equal levels of socio-economic development. When the cultural and traditional norms and values of a society are strong, the changes are gradual (Gupta, 1979).

Marital status is one of the most important factors relating to population composition. Quantitative information about nuptial events, such as proportion never married, married, widowed, divorced or separated, as well as the timing of marriage, describes the history of marriage prevailing in a society. Marriage patterns and levels also hold non-demographic implications for the socio-economic development of a country. For example, a trend towards rising age at marriage would mean that young adults might as a result have greater opportunites for education, greater mobility and better job opportunities. Later child-bearing following later marriage would also contribute to the health of mothers and children (Westoff, 1977). Especially in societies where contraception is not practised well and where births do not occur outside marriage, age at marriage has an important effect on the rate of population growth (Coale and Tye, 1961). Sadiq (1965) observed that, with the same duration of marriage, early age at first marriage for women tends to have the strongest impact on increasing fertility.

Data and methodology

Sources and quality of data

Most of the studies undertaken in Bangladesh in the field of nuptiality and fertility have been based primarily on censuses or surveys. Data for this study have been taken from the Demographic Surveillance System (DSS) in Matlab, Bangladesh, carried out by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) from 1974 to 1993. The DSS is one of the components of ICDDR,B's health-oriented research programme.

The data used in this study are registration of marriages and estimated mid-year population by marital status for a period of 18 years from 1975 to 1992, and censuses conducted in 149 villages during the years 1974, 1982 and 1993. Socio-economic information collected in the 1974 and 1982 censuses was used.

Method and data collection

The DSS, as it currently operates, is an independent four-tier system. At the village level, 110 female community health workers (CHWs), each having a minimum of eight years of schooling, are responsible for collecting data on vital events. In the comparison area, 30 CHWs visit each household under their care once a week and 80 CHWs visit each household once every two weeks in the maternal and child health and family planning (MCH-FP) area to enquire about births, deaths, migrations, marriages and divorces, and record the details in their notebooks. Each CHW is responsible for serving a population of about 1,000 persons (or 200 households) and almost all of them reside in the area where they work. The work is checked by 12 male health assistants (HAs) who visit each household monthly along with the CHW to check the completeness of the registration and record vital events in standard registration forms. Each field unit comprises a population of about 16,000 (about 3,000 households) and it is covered by one HA, whose work is supervised by a senior health assistant (SHA). This person visits each household at least four times a year to identify any errors or missing events, and to ensure the target population's cooperation. Supervisors and managers meet senior health assistants once a month in the field headquarters at Matlab to exchange directives, ensure continuous training and perform administrative tasks.

Before 1989, all registration forms were taken to the Dhaka office for both manual checking and for computer entry to check for errors and inconsistencies. Since 1989, this information has been entered directly into a personal computer in the Matlab DSS office, which has a system for automatic detection of errors and inconsistencies.

Results

Marriage rate

The age at first marriage pattern has been examined by considering (a) the crude marriage rates by age, (b) the proportions never married by age, and (c) the average age at marriage for those getting married in different years. All three indicators have been examined for the 18-year period from 1975 to 1992.

Table 1: First marriage rate, males and females, 1975-1984 and 1989-1992

	Marriage rate			
	Never	Rate	Never	Rate
Year	married males (N)	per 1,000 population	married females (N)	per 1,000 population
1975	17,406	61.9	18,074	73.0
1976	25,617	77.2	21,019	107.7
1977	23,625	88.7	22,778	104.1
1978	20,966	108.4	20,498	124.1
1979	22,493	108.3	21,814	125.4
1980	23,909	87.9	23,031	102.3
1981	25,390	95.6	24,231	111.3
1982	23,005	85.2	21,874	101.3
1983	23,255	85.7	21,637	104.0
1984	21,943	100.1	20,039	120.2
1989	26,566	92.7	24,430	107.3
1990	26,350	94.2	25,042	104.7
1991	25,644	90.7	25,192	97.3
1992	26,838	90.6	26,288	98.9
Total	**333,007**	**90.8**	**315,947**	**105.9**

Table 1, which provides the crude first marriage rates per thousand never married males and females, shows that there is no clear trend in the marriage rates for the two sexes over the period. The rates fluctuated between 62 and 108 for males and 73 and 125 for females. The marriage rates were particularly low for 1975, a year of famine.

Table 2: Age-specific first marriage rate (ASFMR), males and females, 1975-1984 and 1989-1992

	Males						
Years	15-19	20-24	25-29	30-34	35-39	40+	Total
1975-1979							
ASFMR	15.1	138.7	457.4	352.7	240.0	37.4	89.6
N	(70,469)	(27,941)	(9,006)	(1,993)	(350)	(348)	(110,107)
1980-1984							
ASFMR	10.4	124.5	430.5	389.2	219.6	38.5	90.9
N	(68,494)	(35,224)	(10,676)	(2,238)	(428)	(442)	(117,502)
1989-1992							
ASFMR	5.9	99.3	341.5	546.0	278.3	96.6	92.1
N	(58,064)	(30,343)	(13,006)	(3,174)	(521)	(290)	(105,398)
	Females						
Years	15-19	20-24	25-29	30-34	35-39	40+	Total
1975-1979							
ASFMR	21.4	269.1	155.1	62.7	22.7	-	107.8
N	(64,731)	(33,382)	(5,436)	(383)	(44)	(207)	(104,183)
1980-1984							
ASFMR	11.3	244.8	250.4	123.7	76.3	12.8	107.6

N	(64,542)	(36,487)	(8,566)	(865)	(118)	(234)	(110,812)
1989-1992							
ASFMR	5.3	177.4	336.5	239.9	111.5	31.3	101.9
N	(53,734)	(35,207)	(9,875)	(1,680)	(296)	(160)	(100,952)

Although no clear trend in marriage rates could be observed, the age-specific marriage rates over the three periods, 1975-1979, 1980-1984 and 1989-1992 (table 2), give a clear indication of a rise in the age pattern of marriage. The marriage rates for the first three age groups, which account for persons aged 15-29, declined substantially. For example, the marriage rate for those 20-24 years old declined by 28 per cent from the period 1975-1979 to 1989-1992. The marriage rate, on the other hand, increased by 55 per cent for those 30-34 years of age.

The rise in the age at marriage for females is more prominent than for males (table 2). The marriage rates show a decline for the younger age groups of 10-14 and 15-19; for the latter group the decline was 43 per cent over the period from 1975-1979 to 1989-1992. In the age group 20-24, however, the marriage rate increased two-fold, from 155.1 during the period 1975-1979 to 336.5 for that of 1989-1992. The marriage rate for females in the age group 30-34 also increased considerably.

Table 3: Percentage never married by age and singulate mean age at first marriage, by sex, 1975-1992

Year	Percentage never married				Singulate mean age at first marriage		
	Male age		Female age				
	20-24	35-39	15-19	30-34	Male	Female	Years difference
1975	66.8	0.5	37.6	0.1	24.4	16.6	7.8
1979	74.2	1.4	59.7	0.3	25.2	18.3	6.9
1984	61.4	1.4	45.3	0.6	23.9	17.5	6.4
1989	79.9	1.6	75.6	0.8	26.1	19.4	6.7
1992	81.9	1.9	90.3	0.9	26.6	20.8	5.8

Trends in proportion married and mean age at first marriage

The proportions never married are estimated from the census and mid-year population by age and marital status in table 3. Using Hajnal's (1953) method, the singulate mean age at marriage (SMAM) is also estimated and shown in the table. It is evident from the table that in 1975, 66.8 per cent of the males in the 20-24 age group and 37.6 per cent of the females in the 15-19 age group were never married. The percentage never married for both males and females in the said age groups increased to 81.9 per cent and 90.3 per cent, respectively, in 1992. The SMAM for males increased by 2.2 years during the period of nearly two decades. For females, the increase was by 4.2 years during the same period. It is also evident from table 3 that marriage is virtually universal in the study area. The proportion of never married males 35-39 years of age was only 0.5 per cent in 1975 and increased to 1.9 per cent in 1992. Among females aged 30-34, the proportion never married has been less than 1 per cent. The mean age difference between males and females is quite high, about 7-8 years, and it decreased only slightly, by about one year, during the 18-year period.

Table 4: Mean and median age at first marriage of brides and grooms, 1975-1992

Year	Grooms				Brides			
	N	Mean	S.D.	Median	N	Mean	S.D	Median
1975	1,081	24.5	3.95	25.0	1,322	16.0	1.96	16.0
1979	2,443	24.1	3.79	24.0	2,738	16.9	2.13	17.0
1984	2,201	25.8	3.66	25.8	2,412	18.6	2.62	18.4
1989	2,463	26.2	4.52	26.2	2,623	18.9	2.65	18.7
1992	2,431	26.6	4.21	26.5	2,599	19.3	3.03	18.9

The age at marriage patterns have been examined using the marital status registration data collected in the DSS area from 1975 to 1992. The mean ages at marriage for both sexes are presented in table 4, which

reinforces the earlier finding that there has been a systematic shift in the marriage pattern towards older ages.

It is important to note that the singulate mean age at marriage estimated from census and mid-year population, explained in table 3, is generally higher than the mean age at marriage calculated directly from marital status registration data (table 4).

It should be mentioned that the mean age at marriage based on the registration data takes into account only the age distribution of those who get married in a specific year. SMAM depends on past age-specific first marriage rates. In this connection, it would also be pertinent to note that, according to Van de Walle (1968) and Sadiq (1965), the Hajnal method of estimation tends to present an over-estimation of the mean age at marriage. The main problem arises with the selection of the earliest age at which marriage takes place and of the maximum age at marriage.

"In using quinquennial age groups, one must assume that the average age of marriage of persons in any five-year age group is at the mid point of each group. If a large proportion of persons in the younger quinquennial age groups marry either in the early or later part of the quinquennial age groups Hajnal's method may respectively over estimate or under estimate the mean age at marriage" (Alam, 1968).

Table 5: Mean and median age at first marriage of brides and grooms, by education, 1975-1992

Education of brides and grooms	Grooms				Brides			
	N	Mean	S.D.***	Median	N	Mean	S.D.***	Median
1975-1980								
No education *	3,205	23.2	3.7	23.0	3,412	16.5	2.2	16.0
*maktab***	2,072	23.6	3.9	24.0	3,586	16.5	2.0	16.0
Primary (1-5)	2,062	23.9	3.6	24.0	2,709	16.5	2.1	16.0
Secondary (6-10)	1,959	24.4	3.4	25.0	1,289	16.8	1.9	16.0
Higher secondary (11+)	1,877	26.5	3.4	26.0	179	19.4	2.5	19.0
1981-1986								
No education	1,682	24.1	3.9	24.0	1,837	18.1	2.8	18.0
*maktab***	4,254	24.4	3.7	24.0	5,558	17.9	2.7	18.0
Primary (1-5)	2,276	24.9	3.5	25.0	2,441	17.9	2.8	18.0
Secondary (6-19)	1,937	26.0	3.4	26.0	1,283	18.6	2.7	18.0
Higher secondary (11+)	1,162	27.6	3.7	27.0	192	21.3	3.1	21.0
1987-1992								
No education	967	25.7	4.2	25.0	1,018	19.2	3.1	19.0
*maktab***	3,731	24.8	3.7	25.0	3,697	18.6	2.7	18.0
Primary (1-5)	2,537	26.1	3.7	26.0	3,084	18.6	2.9	18.0
Secondary (6-10)	2,568	27.3	3.9	27.0	2,813	19.6	2.8	19.0
Higher secondary (11+)	1,015	29.0	3.8	29.0	206	23.5	3.1	23.0

Notes: * No schooling, * * Religious (Muslim) education, * * * Standard deviation.

Socio-economic and demographic factors related to age at first marriage

The mean and median age at first marriage of brides and grooms in different educational categories calculated from marital status registration data (DSS) are presented in table 5. This table also reveals a consistent increase over the years in the age at first marriage pattern among females. This is true for all the categories of education. In the recent period, 1987-1992, the mean age at marriage among females with no formal schooling has exceeded 19 years and is about three years higher than for similarly educated women during the period 1975-1980. But the rate of increase is more prominent among women who had a higher secondary and above education than those in the other categories. The differentials by education indicate that the mean age at marriage becomes noticeably high only among women with the highest level of education (higher secondary and above). As indicated previously, compared with women having no schooling, the age at first marriage was lower among those with only a religious (Muslim) education. An

increasing trend in the age at first marriage is also observed among males. This is true for all categories including those with no formal schooling. The highest mean age at first marriage, i.e. 29 years, is found among males with higher secondary and above education in the period 1987-1992.

Table 6: Mean and median age at first marriage of brides and grooms, by grooms' occupation, 1975-1992

Occupation of grooms	Grooms				Brides			
	N	Mean	S.D.	* Median	N	Mean	S.D.	* Median
1975-1980								
Farming	4,416	23.7	3.7	24.0	4,416	16.5	2.1	16.0
Agricultural labourer	480	22.8	4.3	22.0	480	16.1	2.0	16.0
Non-agricultural labourer	2,452	23.7	3.5	24.0	2,452	16.5	2.0	16.0
Services	1,906	25.8	3.4	26.0	1,906	16.9	2.2	17.0
Business	1,282	24.7	3.9	25.0	1,282	16.8	2.3	16.0
Others	639	24.0	3.8	24.0	639	16.3	2.5	16.0
1981-1986								
Farming	4,342	24.8	3.6	25.0	4,342	17.9	2.7	18.0
Agricultural labourer	695	24.1	3.7	24.0	695	18.2	3.6	18.0
Non-agricultural labourer	2,736	24.4	3.5	24.0	2,736	17.9	2.7	18.0
Services	2,021	26.5	3.7	26.0	2,021	18.5	2.9	18.0
Business	1,134	25.7	3.8	26.0	1,134	18.0	2.5	18.0
Others	383	24.7	5.2	25.0	383	17.8	3.7	18.0
1987-1992								
Farming	3,254	26.1	3.9	26.0	3,254	19.0	2.8	19.0
Agricultural labourer	746	24.4	3.7	24.0	746	18.8	3.0	18.0
Non-agricultural labourer	3,088	25.8	3.9	26.0	3,088	18.7	2.7	18.0
Services	1,859	27.1	4.2	27.0	1,859	19.3	3.2	19.0
Business	1,144	27.1	3.9	27.0	1,144	19.4	3.2	19.0
Others	727	25.9	3.9	26.0	727	19.4	3.4	19.0

Note: S.D. = standard deviation.

Standard of living and outlook towards life are likely to differ according to the occupational status of both males and females in rural Bangladesh. The social status of brides is closely related not only to that of their parents but also to their husband's occupation (Shahidullah, 1979). This may be a factor in the parents' decision when choosing a suitable groom for their daughter. The mean and median ages at first marriage of brides and grooms by the groom's occupation are presented in table 6. In the case of females, a higher age at first marriage was found for those whose husbands were in service and business occupations followed by farming (own land) and non-agricultural labourers during the period 1975-1980. During the period 1981-1986 higher age at marriage was observed among the wives of men working in service occupations followed by agricultural labourers and businessmen. In contrast, during the period 1987-1992, higher age at first marriage was found among the females who married businessmen, followed by those who married men employed in services. Hence, it is evident from the table that men involved in service and business occupations appear to have a tendency to marry somewhat older women than those in the other occupational groups, but the difference is very little. For males, a higher age at marriage was found for those in service and business occupations than for the other occupational groups during the period under study. Farmers owning land were usually somewhat older at first marriage than agricultural labourers, the latter showing the lowest mean age at marriage among all occupational categories.

An analysis of age at first marriage using multivariate techniques

In the preceding sections, the association of certain explanatory variables with the female and male age at marriage have been discussed. In order to understand the significance of these variables when taken together, multiple regression analysis technique is used to meet the objectives of the study in defining the variation in the age at marriage.

Table 7: Multiple regression of bride's age at first marriage on socio-economic and demographic variables

Variables			B	SE B	Sig. of T
Wife's education[a]					
	maktab *	(Education 1)	0.0526	0.0561	0.3481
	Primary (1-5 years)	(Education 2)	-0.0419	0.0642	0.5138
	Secondary (6-10 years)	(Education 3)	0.2727	0.0873	0.0018
	Higher secondary (11+)	(Education 4)	2.8306	0.2013	0.0000
Husband's occupation[b]					
	Agricultural labourer	(Occupation 1)	-0.3822	0.1099	0.0025
	Non-agricultural labourer	(Occupation 2)	0.0784	0.0599	0.1907
	Services (all kinds)	(Occupation 3)	0.1818	0.0771	0.0184
	Business (all kinds)	(Occupation 4)	0.1087	0.0709	0.1252
	Others	(Occupation 5)	-0.3982	0.1068	0.0002
Period[c]					
	1981-1986	(Period 1)	1.6312	0.0851	0.0000
	1987-1992	(Period 2)	3.0248	0.1048	0.0000
Two-way interaction:					
	Education 1	Period 1	-0.1768	0.0877	0.0437
	Education 2	"	-0.1222	0.1019	0.2304
	Education 3	"	0.1839	0.1312	0.1608
	Education 4	"	0.2239	0.2838	0.4302
	Education 1	Period 2	-0.6887	0.1067	0.0000
	Education 2	"	-0.7513	0.1127	0.0000
	Education 3	"	-0.0407	0.1306	0.7554
	Education 4	"	1.1785	0.2859	0.0000
Two-way interaction:					
	Occupation 1	Period 1	0.6502	0.1464	0.0000
	Occupation 2	"	-0.0857	0.0853	0.3151
	Occupation 3	"	-0.0012	0.1723	0.9944
	Occupation 4	"	0.0634	0.0995	0.5241
	Occupation 5	"	-0.2936	0.1131	0.0094
	Occupation 1	Period 2	0.3840	0.1473	0.0091
	Occupation 2	"	-0.3754	0.0878	0.0000
	Occupation 3	"	0.0603	0.1535	0.6945
	Occupation 4	"	-0.2119	0.1025	0.0386
	Occupation 5	"	-0.1235	0.1160	0.2870

Constant =	16.5395	Multiple R =	0.3990
R square =	0.1592	Adj R square =	0.1586
F =	199.1476	Sig. of F =	0.0000

Notes: * Religious (Muslim) education.
Reference categories: a illiterate, b farming, c 1975-1980.

The result of the multiple regression with regard to brides' age at marriage on socio-economic and demographic variables is presented in table 7. The purpose of the analysis is to understand the change in the dependent variable (i.e. female age at marriage) for a unit change in selected explanatory variables, such as wife's education, husband's occupation and the period. Of the five categories of women's education, the women who do not have formal education, i.e. having no schooling are taken as the reference category. The influence of wife's education on age at marriage suggests that Muslim schooling and primary education have no significant effect on female age at marriage. In the case of women with 6-10 years of schooling, the age at marriage is significantly higher compared with illiterate women, while the rise in age at marriage appears highly significant among women educated at the higher secondary and above level in rural Bangladesh. The B coefficient of 2.8 in the case of higher secondary and above education indicates that the age at first marriage was almost three years higher among the women who had a higher secondary and above education compared with the illiterate women. Of the six categories of occupation, farming is considered to be the reference category. The ages at marriage of brides getting married to husbands in the "other" occupation

group, or to agricultural labourers, are significantly lower compared with those who got married to farmers. But those who got married to men engaged in service occupations did so at relatively older ages.

The explanatory variable period is considered in order to observe the extent of increase in age at marriage over the two periods 1981-1986 and 1987-1992. The 1975-1980 period is considered as the reference category. It reveals that female age at marriage increased significantly (by 1.6 and 3 years, respectively) during the periods 1981-1986 and 1987-1992 compared with 1975-1980. A significant negative interaction exists between the variables representing women with only a religious (Muslim) education and the period of marriage in their effect on the age at marriage. This means that the age at marriage among women with only a religious (Muslim) education compared with those having no schooling decreased further over the years. A similar decline in age at marriage among women with primary education was also observed during the recent period, 1987-1992. On the other hand, the interaction between women with higher secondary and above education and that period (1987-1992) was positive and significant. This means that, for this highest level of education group, the increase in age at marriage accelerated in the recent period.

Table 8: Multiple regression of groom's age at first marriage on socio-economic and demographic variables

Variables		B	SE B	Sig. of T
Husband's education[a]				
maktab *	(Education 1)	0.3566	0.1004	0.0004
Primary (1-5 years)	(Education 2)	0.5616	0.1022	0.0000
Secondary (6-10 years)	(Education 3)	0.9807	0.1073	0.0000
Higher secondary (11+)	(Education 4)	2.9609	0.1212	0.0000
Husband's occupation[b]				
Agricultural labourer	(Occupation 1)	-0.6306	0.1696	0.0002
Non-agricultural labourer	(Occupation 2)	0.2338	0.0910	0.0102
Services (all kinds)	(Occupation 3)	0.4225	0.1164	0.0003
Business (all kinds)	(Occupation 4)	0.8603	0.1090	0.0000
Others	(Occupation 5)	-0.8782	0.1588	0.0000
Period[c]				
1981-1986	(Period 1)	1.0484	0.1291	0.0000
1987-1992	(Period 2)	2.8571	0.1552	0.0000
Two-way interaction:				
Education 1	Period 1	-0.0874	0.1466	0.5509
Education 2	"	0.0148	0.1569	0.9248
Education 3	"	0.6325	0.1672	0.0002
Education 4	"	0.1979	0.1965	0.3138
Education 1	Period 2	-1.1900	0.1683	0.0000
Education 2	"	-0.2236	0.1731	0.1963
Education 3	"	0.7574	0.1787	0.0000
Education 4	"	0.8930	0.2168	0.0000
Two-way interaction:				
Occupation 1	Period 1	0.2001	0.2234	0.3704
Occupation 2	"	-0.4336	0.1286	0.0007
Occupation 3	"	-0.0282	0.1696	0.8681
Occupation 4	"	-0.1715	0.1518	0.2585
Occupation 5	"	-0.5556	0.2554	0.0296
Occupation 1	Period 2	0.4472	0.2235	0.0454
Occupation 2	"	-0.6522	0.1298	0.0000
Occupation 3	"	-0.2768	0.1719	0.1073
Occupation 4	"	-1.0204	0.1542	0.0000
Occupation 5	"	-1.6032	0.2272	0.0000

Constant =	23.1836	Multiple R =	0.3737
R square =	0.1397	Adj R square =	0.1390
F =	199.1476	Sig. of F =	0.0000

Notes: * Religious (Muslim) education.
Reference categories: a illiterate, b farming, c 1975-1980.

Table 8 shows the result of multiple regression of the grooms' age at first marriage on socio-economic variables. It is evident from the table that all four categories of education have a significant effect on the age at marriage of the husband. With an increase in each of the levels of education of the males, there is a significant increase in their age at marriage. In the five occupational categories for husbands, businessmen and men in service occupations have a higher age at marriage, followed by non-agricultural labourers. The remaining two occupations, agricultural labourers and "other" have a negative effect on age at marriage. Although the age at marriage of husbands increased significantly during the two periods (by 1.0 and 2.9 years, respectively), it showed interactions with education. Among those with secondary education, the increase in age at marriage (compared with no schooling) in the periods 1981-1986 and 1987-1992 is significantly higher than that in the period 1975-1980. The husbands with higher secondary and above education have also shown a significantly higher increase in their age at marriage in the period 1987-1992. The interaction between husbands' occupation and period shows that age at marriage was significantly lower among the non-agricultural labourers and "other" occupational categories than those of farmers (reference category) during the period 1981-1986. During the next period, the increase in age at marriage among agricultural labourers was found to be higher than that of the farmers. The gaps in the age at marriage between the non-agricultural labourers, businessmen and those in "other" occupations and the farmers were significantly lower in the period 1987-1992 compared with those in the period 1975-1980.

Table 9: Multiple regression of age difference between grooms and brides at first marriage on socio-economic and demographic variables

Variables		B	SE B	Sig. of T
Males age at marriage		**0.8423**	**0.0039**	**0.0000**
Wife's education[a]				
maktab *	(Education 1)	0.2228	0.0520	0.0000
Primary (1-5 years)	(Education 2)	0.3811	0.0527	0.0000
Secondary (6-10 years)	(Education 3)	-0.0752	0.0636	0.2371
Higher secondary (11+)	(Education 4)	-2.7265	0.1252	0.0000
Husband's education[b]				
maktab *	(Education 1)	-0.0495	0.0562	0.3776
Primary (1-5 years)	(Education 2)	-0.0234	0.0529	0.6586
Secondary (6-10 years)	(Education 3)	-0.0677	0.0581	0.2436
Higher secondary (11+)	(Education 4)	-0.1401	0.0729	0.0547
Husband's occupation[c]				
Agricultural labourer	(Occupation 1)	0.3109	0.1222	0.0110
Non-agricultural labourer	(Occupation 2)	-0.0103	0.0642	0.8729
Services (all kinds)	(Occupation 3)	0.1700	0.0729	0.0196
Business (all kinds)	(Occupation 4)	-0.0728	0.0811	0.3693
Others	(Occupation 5)	0.4215	0.1092	0.0001
Period[d]				
1981-1986	(Period 1)	-1.1567	0.0554	0.0000
1987-1992	(Period 2)	-1.9122	0.0610	0.0000
Two-way interaction:				
Occupation 1	Period 1	0.6376	0.1601	0.0001
Occupation 2	"	0.0058	0.0890	0.9484
Occupation 3	"	-0.1020	0.0979	0.2975
Occupation 4	"	0.3451	0.1168	0.0031
Occupation 5	"	-0.0051	0.1727	0.9766
Occupation 1	Period 2	-0.5378	0.1599	0.0008
Occupation 2	"	0.2466	0.0903	0.0063
Occupation 3	"	-0.0712	0.1022	0.4862
Occupation 4	"	0.0280	0.1188	0.8137

Occupation 5	"	-0.4767	0.1501	0.0015	
Constant =	-12.8696	Multiple R	=	0.7824	
R Square =	0.6122	Adj R square	=	0.6119	
F =	2020.5332	Sig. of F	=	0.0000	

Notes: * Religious (Muslim) education.
Reference categories: a illiterate, b illiterate, c farming, d 1975-1980.

A multiple regression is used to show the effect of socio-economic and demographic variables on the differences in age at first marriage between brides and grooms (table 9). It reveals that the higher is the age at marriage of men, the significantly higher is the age difference at marriage between brides and grooms. The result shows that, for women with only a religious (Muslim) or a primary education, there is a significantly higher age gap at marriage between the husband and wife than between illiterate women (reference category). In contrast, women with higher secondary and above education have a significantly lower age difference at marriage. For husbands who belong to the agricultural labourers, service and "other" occupations, there is a significantly higher age difference between husband and wife at marriage. It is evident that age differences were lower during the periods 1981-1986 and 1987-1992 compared with that of 1975-1980.

Conclusions and policy implications

People who belong to different socio-economic groups have different ages at marriage in almost all societies (Bogue, 1969). As the level of education increases, the age at marriage increases for both brides and grooms. In Bangladesh, education has been found to be correlated especially with the age at marriage of women in the younger age groups (10-24); the lower the level of education, the higher the proportion married at younger ages (Ahmed and Chowdhury, 1981). Shahidullah (1979), analysing Bangladesh Fertility Survey (BFS) data, found that the age at marriage of the wife is lowest if both husband and wife are illiterate. The age at marriage rises with an increase in the level of education of the wife. He also noted that, as long as the wife has no education, age at marriage appears to be low, irrespective of husband's level of education. These findings indicate that the effect of female education on age at marriage is stronger than the effect of male education. Thein and others (1988) found that the mean age at marriage for women who have completed secondary school was higher by more than two years than those who did not complete secondary-level education.

If this Bangladesh girl is able to pursue her education to a higher level, it is likely that she will marry later in life and have fewer children than her uneducated peers. (Photograph courtesy of Masayuki Nagashima)

Our study has found that education is by far the most powerful component in explaining the variability of age at first marriage, both for males and females. The occupation of husbands did not have much effect on explaining the variation in age at marriage. However, the fact that men in service occupations have the highest age at marriage whereas agricultural labourers have the lowest supports the general theory of social change. There has been a strong period effect, i.e. the mean age at marriage for males and females was significantly higher during the period 1987-1992 compared with 1975-1979. This means that, even in a traditional society, the modernizing process exerts dominance in a similar direction.

Social development and modernization expedite the structural change of a society by changing people's perceived values and by re-establishing old factors with novel ones in the calculus of human social life. The consequences of this transition are apparent in people's behaviour and attitudes. In some spheres of life, people react to the changes faster than in other spheres of life. However, to envisage changes in all spheres of life is a complicated, if not impossible, element. In an effort to provide a better understanding of social and demographic transitions, this study has attempted to observe a change in people's demographic behaviour with regard to family formation (marriage).

Few studies have been conducted in this area in Bangladesh and those that have used censuses or survey data. Information on age at first marriage is lacking in Bangladesh (Kabir and Rob, 1990). In this study, however, a careful design and a multivariate approach using longitudinal marital status registration data from the demographic surveillance system (DSS), Matlab were employed to investigate the transition and differentials in nuptiality patterns. The average age difference between brides and grooms at first marriage is more than seven years. The brides' age at first marriage is highly correlated with the age difference between brides and grooms. Women married at a younger age show the largest age difference between brides and grooms. Younger grooms tend to marry brides not much younger than themselves, but the age difference increases sharply as the age of the grooms increases. In the case of 2,099 grooms who married at ages 40 years and above, 84 had never been previously married; the age difference for this group was about 25 years

on average during the study period. A detailed regression analysis reveals that the age gap between husbands and wives has declined significantly over the years. It also shows that the higher the age at marriage of males the higher is the age gap. Women's education has a significant bearing on the age difference. Women with only religious (Muslim) and primary education have a significantly higher age gap at marriage compared with those who are illiterate (no schooling). However, women with higher secondary and above education were found to have a significantly lower age difference at marriage.

The present study therefore provides ample evidence to suggest that a concerted effort to increase age at marriage can have a number of beneficial effects. It can lead to a stabilization of the family by reducing the risk of divorce. Increases in the age at marriage can also result in lowering the age gap between husband and wife and hence can lead to a reduction in the incidence of widowhood. Increases in the age at marriage for females can have direct effects on reducing the level of fertility. In addition, delayed marriage will reduce the occurrence of high-risk births among girls and very young women and hence will result in a decline in the level of infant and maternal mortality. There is strong evidence to suggest that such a reduction in mortality will bring about substantial reduction in fertility (ESCAP, 1985).

Apart from effective legislation and its enforcement, suitable welfare schemes can also facilitate increasing the age at marriage. For example, through introducing a marriage bonus scheme in Tamil Nadu, India, the female age at marriage has been increased (Sureender, 1993): "Bonus is given to the delayed marriages in the form of interest-bearing bonds of Rs.50 a month for a period of six years (12 to 18 years) to girls of poor rural families cashable only after the attainment of 18 years of age".

The existing old and ineffective vital registration system should be amended; the issuing of a birth certificate or equivalent evidence needs to be made a legal requirement for marriage and other purposes, such as admission to educational institutions and entry into service. Owing to the lack of actual date of birth, adherence to legislation is impossible because it is very simple for marriage partners or guardians to conceal the couple's real age. For instance, countries such as China have promoted higher age at marriage through legislation. In contrast, there are countries such as India and Pakistan where the rise in age at marriage has not been achieved through legislation, as is also true in the case of Bangladesh. In Malaysia and Sri Lanka, a rapid increase in age at marriage has been achieved through non-legislative measures such as education, especially of girls and women, and socio-economic development (Duza, 1977; De Silva, 1997). The Government of Bangladesh has already taken steps to develop roads and improve communications, the mass media, electrification (especially in rural areas), education and health. In this regard considerable progress has already been made (BBS, 1988). The expansion of electricity in rural areas will promote agro-based and small-scale industries, and more educational institutions accepting girls as students will enhance opportunities for increased female employment. It will also enhance mass media coverage and help to modernize people's behaviour and attitudes towards the small family norm. A propagation scheme via the mass media might also be an effective means to change the traditional, religious and cultural values regarding "when to marry".

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Levels and Patterns of Infant and Child Mortality in Mongolia

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School education and information campaigns should be undertaken to educate teenagers about the risks of early pregnancy

Population growth in Mongolia was extremely low during the first five decades of the current century. However, because of subsequent improvements in living standards and the availability of a modern health care system, the population increased almost three times during the period 1950-1990. Its population density, 1.4 persons per square km, is one of the lowest in the world. Almost one-third of the national population lives in only three major cities, Ulaanbaatar, Darkhan and Erdenet. The remaining population is widely spread throughout rural areas, with concentrations along river valleys.

Until 1989, Mongolia had a centrally planned economy. After that year, it began to make the transformation to a market economy. This transformation resulted in a number of social and economic changes for the Mongolian people. Because of the difficulties they experienced during the transition period, their perceptions about matters such as desired family size, use of contraceptive methods and overall reproductive intentions have undergone a "sea change". These changes in perceptions have also affected the levels of infant and child mortality in the country. In this article, an attempt has been made to present information about the levels and patterns of infant and child mortality in Mongolia based on data from the country's first Demographic Survey conducted during October and November 1994 by the Population Teaching and Research Center (PTRC). Wherever feasible, comparisons have been also made with similar data available from other sources such as the population census and vital registration.

Past trends in fertility and mortality

When the Mongolian People's Republic was founded, the main goal of the Government was to transform the country from a traditional nomadic society into a modern industrial-agrarian one. Therefore, a policy of population expansion was considered necessary in view of the small size of the existing population, the vastness of the territory and the large potential for development of other resources. Consequently, a strong pro-natalist policy was adopted, limiting the availability of contraceptives and giving generous incentives to women who attempted to reach their maximum fecundity. In spite of the pro-natalist policy, fertility began to decline by the middle of the 1970s; the momentum of this trend increased during the 1980s. In 1989, Mongolia began making the transition from a centrally planned economy to a market economy, a process which has also affected considerably the country's fertility scenario. The current population policy, adopted by the Parliament recently, though pro-natalist in orientation, also emphasizes improvement in the quality of life by emphasizing childbearing that starts not at a young age and not continuing beyond 30 years of age, as well as promoting reasonably long birth intervals. In addition, legal barriers to the import, distribution and use of contraceptives have been removed. Another development during the transition was the legalisation in 1989 of first trimester abortions.

Like many other developing countries of the world, Mongolia also experienced a substantial reduction in mortality soon after the beginning of second half of this century. According to one estimate, the country's crude death rate during the 1940s was 30 per thousand. It declined from 12.3 per thousand during the 1960s to 6.38 per thousand in 1994. The age pattern of mortality is characterized by high infant and child mortality. The main causes of infant deaths are respiratory and diarrhoeal diseases. Mortality at older ages is comparatively high, especially for males. Correspondingly, mortality during the prime adult ages is relatively low for males but comparatively high for females, owing mainly to maternal mortality. Despite the availability of pre-natal care and almost universal (97 per cent) delivery of babies in hospitals, the maternal mortality rate has remained relatively high at 140 per 100,000 live births during the period 1985-1989; it decreased to 120 per 100,000 in 1991 and then increased suddenly to 220 per 100,000 in 1992. The increase was higher in rural areas, most probably due to a deterioration in maternity services. However, it has been decreasing continuously since then and stood at 101 per 100,000 in 1995.

Data sources

The data used in this article were collected in a large-scale demographic survey conducted by the PTRC during October and November 1994. The survey covered 1,760 households spread over five provinces and the capital city, Ulaanbaatar. The data collected related to past and present levels and patterns of fertility and mortality, fertility preferences and knowledge, attitudes and practice of family planning methods. The sample design adopted for the survey was a multi-stage, stratified, clustered, random sample of households and individuals in urban and rural areas.

Stratification was done by residence (remote rural, soum (district) centre, aimak (provincial) centre and Ulaanbaatar), age and sex, using a proportional method. This, in combination with the random selection procedure, made the survey a representative sample of the population living in Mongolia.

The survey questionnaire included a number of questions to ascertain the levels and trends of mortality for the Mongolian population. The first question asked was: How many children have you given birth to alive? This was followed by: Out of the children born alive, how many (a) are living with you, (b) are alive, but living elsewhere, and (c) have died? To check the result of these individual questions and to provide more detailed information, data were also collected on complete birth histories of the women, inquiring about the date of occurrence of each birth and the subsequent fate of the child. All female respondents who ever gave a birth were asked to provide information on the sex, the date of birth, survival status and age at death for each live birth.

The birth history data have been used to calculate direct estimates of infant and child mortality. For this purpose, probabilities of dying (nqx) pertaining to different age intervals have been computed. The probability of dying (calculated here) expresses the chance that a person in a particular population group who had been alive at the beginning of a certain period will die during that period. Thus, a cohort rather than period approach has been followed. For birth cohorts, i.e. children born during a certain time period, probabilities of dying have been calculated from the birth to the end of the first month (neonatal mortality), to the end of the first year (infant mortality) and to exact age five (child and under-five mortality). It is important to note that the probability of dying before the first anniversary of birth calculated in this article is not the same as the conventional infant mortality rate, which is computed as the ratio between the number of infant deaths and the number of births. The infant mortality rate is a central rate that does not describe the risk of dying. Nevertheless, both the probability of dying between birth and age 1 and the infant mortality rate are indicators of the relative frequency of the event of dying.

Assessment of data quality of the survey

For an assessment of data quality, three six-year periods, namely 1975-1981, 1982-1987 and 1988-1993, preceding the survey have been used. Owing to the relatively small sample size, fluctuations in the probabilities from year to year are apparent, whereas larger reference periods are likely to smooth out the differences. Therefore, for the calculation of mortality differentials and the establishment of associations between infant and child mortality and other demographic and socio-economic variables, a 12-year period preceding the survey has been used. Four five-year periods have been used to compare the survey data with those from other sources. As previously mentioned, while attempting the comparison over different periods the remarks on annual fluctuations in probabilities have to be kept in mind.

Table 1: Indices of early infant death by sex, for three 6-year birth cohorts, Mongolia, 1994

	Birth cohorts (Years preceding the survey)		
	1-6	**7-12**	**13-18**
Neonatal deaths/all infant deaths			
Male	0.38	0.37	0.34
Female	0.39	0.36	0.38

As is well known, the under-reporting of deaths is generally more common for children who died shortly after birth than those who died later. If early neonatal deaths are selectively under-reported, then an abnormally low ratio of deaths under seven days to all neonatal deaths and an abnormally low ratio of neonatal to infant mortality are likely to be observed. If such under-reporting is related to the child's sex or to the length of time preceding the survey, then the ratios would be affected in proportion to the extent of the under-reporting. For calculating the early neonatal death to infant death ratio, detailed information on the number of days of survival after birth were collected in the survey. However, for a substantial number of children (22.4 per cent) who died during the first month, the exact number of days living was not stated. This, together with the relatively small number of neonatal deaths, has resulted in a considerable bias in the computed ratios. Therefore, an estimation of under-reporting of children who died during the first week could not be attempted. However, the ratio of neonatal mortality to infant mortality could be safely computed. The results are given in table 1. The ratio is comparatively stable for both males and females. The slightly lower ratios for males in the period 13-18 years preceding the survey and for females 7-12 years preceding the survey denote a possible under-reporting of neonatal deaths during those periods. Since female neonatal mortality is expected to be lower owing to greater biological vigour at birth in the absence of any sex preference for boys, it is unusual to find a smaller male neonatal to infant mortality ratio for the latest and earliest periods.

Table 2: Probability of dying for infant and neonatal mortality and male mortality as a percentage of female mortality, 6-year birth cohorts, Mongolia, 1994

Birth cohorts (Years preceding the survey)

	1-6	7-12	13-18
Infant mortality			
Male	0.114	0.123	0.115
Female	0.070	0.072	0.097
Male mortality as percentage of female mortality	163	170	119
Neonatal mortality			
Male	0.043	0.045	0.039
Female	0.027	0.026	0.036
Male mortality as percentage of female mortality	157	176	108

Sex differentials in infant and neonatal mortality over time are presented in table 2. By analysing trends in these differentials, it is possible to examine misreporting of deaths. Normally, there is an excess of male mortality during infancy, especially during the neonatal period. Excess male mortality can be observed for children born during all three periods. However, male mortality as a percentage of female mortality, both for neonatal as well as for infant mortality, is extremely high during the first two periods preceding the survey. Lower female mortality may be due to sampling and non-sampling errors, as well as real sex differentials in infant and neonatal mortality developed over time. Regarding sampling errors, it could be that a selection bias might be affecting the results because of the relatively small sample size of the survey. However, such a large difference cannot be explained completely by sampling errors only. Non-sampling errors, i.e. under-reporting of female deaths in the latest periods or mis-stated sex, could be other possible factors. Regarding the latter, there is no evidence of misreporting of the sex of the child in the survey. The sex ratio at birth for the periods 1-6 years and 7-12 years preceding the survey are 105 and 103, respectively. Under-reporting of female infant deaths is likely in certain areas. Exploration of the large difference in sex-specific infant mortality should focus on whether and to what extent the disparity is due to under-reporting or a real variation in sex differentials in infant and neonatal mortality.

A problem common to most retrospective surveys is heaping of age at death on certain digits, such as 6, 12 and 18 months. This phenomenon introduces biases in rate calculation if the net result is to shift deaths from one age segment to another. Thus, heaping at 12 months causes concern because a certain fraction of these deaths, though reported to occur after infancy (i.e. at ages 12-23 months), may have actually occurred during infancy (i.e. at ages 0-11 months). Infant mortality (1q0) in this case would be biased downwards and child mortality (4q1) upwards.

Table 3: Distribution of reported deaths at age 1-23 months by age at death, for three 6-year birth cohorts preceding the survey, Mongolia, 1994

	Birth cohorts (Years preceding the survey)			
Age at death (months)	**1-6**	**7-12**	**13-18**	**Total**
1	15	16	11	42
2	11	9	9	29
3	7	14	16	37
4	10	3	8	21
5	10	9	4	23
6	8	7	4	19
7	9	5	3	17
8	5	6	5	16
9	4	5	5	14
10	2	4	3	9
11	2	1	4	4
12	5	11	5	21
13	3	2	2	7
14	1	1	2	4
15	0	0	2	2
16	1	1	0	2
17	0	1	1	2
18	2	0	0	2
19	0	0	1	1
20	1	1	3	5
21	0	0	0	0
22	1	0	0	1

23	0	0	0	0

Table 3 presents the distribution of deaths reported at ages 1-23 months by reported age at death for three six-year periods preceding the survey. Data show the distinct "heaps" of deaths at 3 and 12 months of age, with corresponding deficits in the adjacent months. Heaping at 12 months is most obvious during the period 7-12 years before the survey, whereas heaping at 3 months is apparent during the two earliest periods and not at all during the latest period. Digit preference at 6 and 18 months is not shown. Digit preference could substantially alter the rates calculated here. For instance, if as many as half of the deaths reported at "12 months" were reassigned to the infant age segment, infant mortality would be increased and child mortality would be decreased by 4 per cent for the period 7-12 years preceding the survey.

Unreported age at death is another potential problem in data of this type; however, respondents failed to provide age at death in 53 (7.8 per cent) of the 678 deaths reported in the birth history forms. As previously mentioned, most of these cases were a failure to report the age at death under one month (38 cases). Neonatal, post neonatal and infant mortality rates were not affected by this omission due to the fact that age at death was generally reported in months (zero) and not in number of days (see pages 52-53). Only in 15 cases of death (2.2 per cent) did the respondents fail to provide the age at death of the child above one month. In these cases, age at death was imputed using a procedure called "hot-deck".

Table 4: Number of children reported alive, either living at home or elsewhere, and number of children reported dead by the respondent, for boys and girls from individual questions and birth history forms, Demographic Survey of Mongolia, 1994

	Individual questions			**Birth history form**		
	Sons	**Daughters**	**Total**	**Sons**	**Daughters**	**Total**
Children alive	1,981	2,069	4,050	1,956	2,038	3,994
Living at home	1,774	1,754	3,528			
Living elsewhere	207	315	522			
Children dead	403	289	692	396	282	678
Children ever born	2,384	2,358	4,742	2,352	2,320	4,682
Death rate (per 1,000 children ever born)	169	123	146	168	121	145

Levels and trends in infant and child mortality

As previously mentioned, data on mortality were collected through individual questions as well as questions relating to life history; table 4 presents the relevant data.

It may be observed that the number of children surviving and those who had died, collected through the birth history form, appear to be slightly lower than the data collected through the individual questions. However, the differences in death rates for all children born calculated by both methods are very small.

Table 5: Probabilities of dying for infants and children for three 6-year birth cohorts preceding the survey, Mongolia, 1994

Reference period	**Neonatal mortality**			**Post-neonatal * mortality**			**Infant mortality ($_1q_0$)**			**Child mortality ($_4q_1$)**			**Under-five mortality ($_5q_0$)**		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
1988-1993	0.041	0.031	0.036	0.065	0.049	0.057	0.104	0.078	0.092	**	**	**	**	**	**
1982-1987	0.043	0.029	0.036	0.074	0.052	0.063	0.113	0.083	0.098	0.056	0.030	0.041	0.152	0.120	0.136
1975-1981	0.048	0.030	0.038	0.081	0.056	0.068	0.126	0.088	0.106	0.065	0.044	0.055	0.175	0.130	0.155

Note: * Computed as the difference between infant and neonatal mortality.
* * Not computed, because by the end of 1993 not all children had reached their fifth birthday.

Infant and child mortality for three six-year birth cohorts preceding the Demographic Survey of Mongolia (DSM) are shown in table 5. The estimated probability of dying from birth to age 1 (1q0) declines from 106 per thousand in the earliest period (1977) to 92 per thousand live births in the most recent period, i.e. 1992. The risk of dying during the first month of life has remained constant at about 36 per thousand live births; however, the percentage of infant deaths occurring in the first four weeks has increased slightly. As mentioned previously, this could be due to the under-reporting of male neonatal deaths in the earliest period. Thus, most of the decline in infant mortality can be ascribed to a declining mortality after the first month of life. This is a trend also observed in other countries where

infant mortality has declined.

Because of the use of the more reliable cohort method to compute the risks of dying, child (4q1) and under-five mortality (5q0) are calculated only for the two earliest periods. Both child and under-five mortality show a remarkable decline over the two periods.

Table 5 also presents the sex differentials in the mortality measured by all types of indicators. During all the reference periods, male mortality was found to be higher as compared with female mortality. For example, infant mortality during the period 1975-1981 for males was 0.126, which is about one and half times higher than that of females (0.088). There is no significant decline in the sex differentials in mortality over the same period. As also explained on pages 60-63 of this article, the higher male mortality may be due to the biological effects of sex on age-specific mortality, under-reporting of female deaths and some gender-related differences in child care practices in Mongolia. Fortunately, owing to various socio-political factors, the status of women in Mongolia is significantly higher than in many other developing countries of Asia and other developing regions of the world. Hence, female children in Mongolia do not suffer from the type of discrimination observed in some Asian countries, which are characterized by high female mortality.

Table 6: Probabilities of dying for infants and children according to four 5-year periods, comparing DSM data with other sources, Mongolia, 1994

Probability of dying	Reference period			
	1975-1979	1980-1984	1985-1989	1990-1994
Infant mortality				
Vital registration[1]	0.075	0.071	0.064	0.053
Census (1989)[2]	0.096	0.094	0.092	na
Survey (1994)[3]	0.117	0.096	0.088	0.102
Child mortality				
Vital registration[1]	0.039	0.054	0.039	0.028
Census (1989)[2]	0.053	0.051	0.049	na
Survey (1994)[3]	0.041	0.058	0.038	*
Life expectancy at birth				
Vital registration[1]	63.5	61.7	63.5	63.1
Survey (1994)[4]	60.6	60.0	61.8	55.4

Sources: 1State Statistical Office, Mongolia direct period estimates;
2 State Statistical Office, Mongolia: indirect estimation (Neupert, 1995);
3 Demographic Survey of Mongolia, 1994: cohort estimates;
4 Estimated life tables are the same as those based on vital registration data, except that 1q0 is substituted by the value for 1q0 from the 1994 DSM.
Notes: * Not computed because by the end of 1993 not all children reached their fifth birthday;
na = not available.

As mentioned previously, owing to the relatively small sample size, annual fluctuations in the probabilities of dying are apparent. Therefore, the choice of the reference period influences the outcome of the calculation. Large reference periods are likely to smooth out the differences. However, for reasons of comparison of mortality with other sources, four smaller five-year periods have been used in this study. Further, while interpreting the differences for each period, the remarks on annual fluctuations in probabilities should be kept in view. In table 6, the infant and child risk of dying, calculated with data from three different sources, is shown. The probabilities of dying, computed from vital registration data issued annually by the State Statistical Office of Mongolia, are direct calculations of mortality. Census data have been used to estimate indirectly infant and child mortality using the Paloni-Heilgman technique. This method is based on the use of United Nations model life tables for less developed countries (Neupert, 1994).

Substantial differences in infant mortality can be observed for all periods between the estimates from vital registration data and survey data as well as the indirectly estimated mortality risks from the census data. On average for the period 1975-1989, a child's risk of dying before his or her first birthday is about 30 per thousand live births more according to the survey data than for the vital registration estimates. In the estimates of child mortality from the vital statistics data and DSM almost no difference was observed. The pattern for indirect child mortality estimates, however, deviates from the other methods, especially for the periods 1975-1979 and 1985-1993. This is probably due to a real rise in child mortality during the period 1980-1984; the incidence of infectious diseases among children was reported to have been higher in 1984 compared with other years. Moreover, indirect

measurement techniques using model life tables cannot fully reflect the real child mortality levels and annual fluctuations.

Under-registration of infant deaths seems to be apparent in the civil registration/vital statistics system. Although the degree of completeness of the registration of vital events has, in general, been high, especially for adults (Neupert, 1992), the exception is the registration of early-age deaths. According to current legislation, parents must register the birth of a child within one month of its occurrence. However, as in other countries, parents frequently consider it futile to register both the birth and death of a child who dies immediately or at a very early age. It is likely that many of the infant deaths that occurred before the child reached one month of age may never have been registered. Even if the child died after a month and the birth had been registered, parents might have failed to register the death. This may especially be the case in rural areas where ties with the government administration are weaker and burial permits are generally not necessary (Neupert, 1994).

As previously mentioned, even the DSM encountered problems related to under-registration, especially for female infant and child deaths. Probabilities of dying for both sexes together would increase in the absence of under-registration of female infant and child deaths. Expectation of life at birth would be substantially lower using the survey's estimates of infant mortality. As may be seen from table 6, there is a difference of 2.9 years for the earliest period and 1.7 years for the periods 1980-1984 and 1985-1989. The largest difference (7.7 years) in life expectancy for both sexes together pertains to the most recent period, 1990-1993. However, this is due not only to increasing infant mortality levels, but also to the rising mortality levels of adults.

In general, declining trends can be found in infant and child mortality estimates both from registration and DSM. But the decline is moderate, especially taking into account declining fertility levels. It is also known that declining fertility has a positive effect on mortality levels (Taucher, 1989).

Differentials in infant and child mortality

For preparing any health programme aimed at reducing mortality, information about mortality differentials according to various socio-demographic variables, such as location of residence, education and age of the mother, her age at the time of the child's birth and order of birth, would be helpful in identifying target groups.

Table 7: Probabilities of infants and children dying for a 12-year period preceding the survey, by background characteristics of the mother, Mongolia, 1994

	Neonatal mortality[1] (NNM)	**Post-neonatal mortality[3] (PNNM)**	**Infant mortality[1] ($_1q_0$)**	**Child mortality[2] ($_4q_1$)**	**Under-five mortality[2] ($_4q_0$)**
Residence					
Remote bag	0.053	0.070	0.123	0.083	0.198
Soum centre	0.023	0.051	0.074	0.038	0.100
Aimak centre	0.027	0.061	0.088	0.032	0.118
Ulaanbaatar	0.028	0.049	0.076	0.025	0.099
Province					
Arhangai	0.050	0.087	0.137	0.067	0.206
Dundgovi	0.034	0.062	0.096	0.040	0.112
Uverhangai	0.037	0.076	0.113	0.086	0.188
Hovd	0.034	0.027	0.062	0.021	0.077
Hentii	0.031	0.056	0.087	0.058	0.141
Ulaanbaatar	0.027	0.049	0.076	0.025	0.098
Education (Highest level attained)					
None & primary	0.058	0.075	0.134	0.082	0.203
Grades 0-8	0.027	0.081	0.108	0.052	0.154
Grades 9-10	0.036	0.050	0.086	0.023	0.088
Professional school	0.037	0.047	0.084	0.043	0.119
Higher	0.017	0.031	0.048	0.032	0.086
Total	0.036	0.059	0.095	0.049	0.138

Notes: 1 Refers to the birth cohort 1982-1993.
2 Refers to the birth cohort 1978-1989.

3 Computed as the difference between infant and neonatal mortality.

Table 7 presents infant and child mortality rates by urban-rural residence, aimak and the level of mother's education. As previously stated, mortality rates are calculated for a 12-year period, so that the rates for each population subgroup are based on an adequate number of events. It should be noted that child and under-five mortality rates, refer to children born during the period 1978-1989, and that infant and neonatal mortality refers to the birth cohort 1982-1993. Two different reference periods were used, because of the cohort approach adopted for calculating the probabilities of dying.

Under-five mortality (5q0) in urban Mongolia (Ulaanbaatar: 99 per thousand) was half of that in the rural areas (198 per thousand). For aimak centres it is 19 per cent higher than in Ulaanbaatar, indicating that health care and perhaps health behaviour are different in those areas than in the capital. In soum centres, infant and under-five mortality are surprisingly low. Whether this finding is an artefact of the survey method or a real phenomenon needs further inquiry.

The urban-rural differential exists at all ages as may be seen from table 7. The rural category includes remote rural areas and soum centres; the urban category consists of aimak centres and Ulaanbaatar. Under-five mortality during the 12 years preceding the survey is 57 per cent higher in rural areas (185 per thousand) than in urban areas (118 per thousand). In disentangling under-five mortality in child mortality and infant mortality, the survey shows a much larger rural-urban difference for child mortality (excess child mortality in rural areas is 134 per cent and excess infant mortality in the same areas is 30 per cent). These substantial differences suggest that both social factors and access to health services are important contributors to the greater risk of dying among rural children.

In the provinces, infant, child and under-five mortality rates show large differences, although it should be noted that the sample size is rather small for one to reach firm conclusions for the situation in aimak. The chance of a child's dying during the first five years of life in Arhangai and Uverhangai is far greater than for children in Dundgovi and Hovd. Post-neonatal and child mortality in Hovd are markedly low, indicating perhaps a better control over the more serious illnesses during these ages, namely respiratory and diarrhoeal diseases. The data for Hentii are suspicious since child mortality is relatively high compared with infant mortality. As previously mentioned, selective under-reporting of female neonatal deaths in this province may be responsible for this unexpected trend in the data.

A strong relationship between child survival chances and mother's level of education was also found in the survey. Children of mothers with no or only primary education experienced about two times the level of under-five mortality compared with the children of women educated up to secondary or higher levels (grade 9 or higher). The risk of dying for children under-five of mothers who attained grade 9 or 10 as the highest level of education is lower owing to an unusually low probability of dying for children 1-4 years of age. None the less, each incremental change in education is associated with significant gains in the survival of children. As expected, the children of mothers who attended university have the highest survival chances.

Table 8: Probability of infants and children dying for a 12-year period preceding the survey, by selected demographic characteristics, Mongolia, 1994

	Neonatal mortality[1] (NNM)	Post-neonatal mortality[3] (PNNM)	Infant mortality[1] ($_1q_0$)	Child mortality[2] ($_4q_1$)	Under-five mortality[2] ($_4q_0$)
Sex of the child					
Male	0.044	0.074	0.118	0.053	0.155
Female	0.027	0.044	0.071	0.045	0.121
Mother's age at birth					
15-24	0.034	0.066	0.100	0.053	0.135
25-34	0.037	0.053	0.090	0.046	0.105
35-49	0.041	0.053	0.094	0.037	0.140
Birth order					
1	0.036	0.043	0.079	0.048	0.120
2-3	0.032	0.065	0.097	0.052	0.142
4-5	0.037	0.063	0.100	0.036	0.130
6+	0.040	0.072	0.113	0.060	0.162
Previous birth interval					
<2 years	0.042	0.083	0.124	0.065	0.194
2-3 years	0.031	0.060	0.091	0.041	0.108

>3 years	0.026	0.047	0.073	0.039	0.103

Notes: 1 Refers to the birth cohort 1982-1993.
2 Refers to the birth cohort 1978-1989.
3 Computed as the difference between infant and neonatal mortality.

Table 8 presents differentials in infant and child mortality by various demographic characteristics of the mother and the child. Infant mortality is 66 per cent higher among males than females. A part of the difference can be explained by the expected biological effects according to the child's sex on age-specific mortality. However, the difference is unusually large. Whereas both neonatal and post-neonatal risks of dying show the same difference, i.e. 63 and 68 per cent, respectively, child mortality (4q1) is only 17 per cent higher among males than females. This lends support to the assumption that under-reporting of female deaths under one year has taken place. Indeed another important reason for the difference might be some gender-related differences in child care practices during the last decade. This is an area that requires research.

With regard to differences in under-five mortality (5q0) by maternal age at birth, a pattern frequently observed in other countries is that mortality is highest for children of young mothers; it falls for births to mothers aged 20-35 years and rises again for births to women 40 years and older. The survey results do not resemble the U-shaped pattern just described. Although infant and child mortality are higher for children of young mothers, the risk of dying does not significantly increase at older ages. Both post-neonatal mortality and child mortality (4q1) decline for children born to young mothers (aged 15-29 years) and to older ones (aged 35-49 years). Behavioural differences in child care are among possible reasons for the decrease in mortality with the age of the mother. Only for neonatal mortality can higher risks be observed for children of older women. The results can be influenced by the relatively small number of children born to older women who were surveyed. Further intensive research may be required to explain the deviation from the normal pattern of age-specific maternal mortality. A positive relationship was found between birth order and post-neonatal, infant and child mortality. The risk of dying increases with higher birth orders. However, no association seems to exist for neonatal mortality.

The pace of childbearing has a powerful effect on the survival chances of Mongolian children. Under-five mortality (5q0) is almost two times higher among children born after an interval of less than two years than among children born after an interval of four years or more. The birth interval effect is notable for mortality in each age group. Birth interval length strongly affects survival chances throughout the first five years of life. This may indicate that the relationship in Mongolia is not simply related to maternal depletion and pregnancy outcome (which would be expected to influence specifically early infant mortality), but may also be associated with constraints on breastfeeding and other nutritional inputs, child care and the use of health services.

Conclusions

Comparison of estimates of infant and child mortality worked out from the survey data and those available from census and vital registration data reveal that survey estimates are higher. The survey also found a strong relationship between the levels of infant and child mortality and various socio-demographic variables. The survey data reveal that short birth intervals, combined with high birth orders and young age at birth for the mother, are the main factors leading to heightened risk of infant and child mortality. Since more than one quarter (25.6 per cent) of recent births in Mongolia occurred less than 24 months after a prior birth, and almost one-sixth (14.6 per cent) of all women would have fallen into that category, if a child were conceived at the time of the survey, this finding underscores the need to reduce, through greater and effective use of contraception, the number of closely spaced births. Furthermore, given that women under 20 years of age account for more than one-fifth of all women giving birth to children with a 20 per cent higher risk of dying, widespread action, in the form of school education and information campaigns, should be undertaken to educate teenagers in the fields of health and hygiene, and about the risks of early pregnancy.

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Determinants of Contraceptive Method Choice in Rural Bangladesh (Demographers' Notebook)

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Bangladesh has experienced a dramatic decline in fertility, unprecedented for a country with such poor social and economic conditions. The total fertility rate (TFR) declined from about 7.0 children per woman in the 1970s to around 3.5 per woman in the period 1993-1994 (ESCAP, 1981; Mitra and others, 1994). The Bangladesh Family Planning Programme is recognized as a success story in the contemporary third world (Cleland and others, 1994). However, the country still has a high population growth rate and needs to reach replacement-level fertility as soon as possible. The national contraceptive prevalence rate (CPR) of about 45 per cent (as of 1993) should be raised to over 70 per cent to achieve replacement-level fertility.

One factor that could play a positive role in this regard would be the enhancement of the efficacy of family planning services by broadening the contraceptive options offered to people in rural areas. Since individual contraceptive preferences, beliefs and needs vary within populations, service programmes should accommodate the widest possible range of method preferences among the potential contraceptive users (Phillips and others, 1984). This does not necessarily mean that every family planning service would have to provide all methods, but the overall programme efforts should be sufficient so that the prospective users have reasonable, if not absolutely equal, access to a variety of methods (Bruce, 1990).

While the programmatic and socio-economic determinants of contraceptive use at the national and regional levels have been studied in Bangladesh, very little is known about the determinants of contraceptive method choice or method mix. The objectives of this study are, therefore, to examine (a) the programmatic, demographic, socio-cultural, attitudinal and regional determinants of contraceptive method choice, and (b) the shifts in contraceptive method mix over the past decade.

The 1993-1994 Bangladesh Demographic and Health Survey (BDHS) revealed that 45 per cent of couples were using contraception (Mitra and others, 1994). The method-specific rates were 17.4 per cent oral contraceptive pill users, 9.2 per cent permanent method (sterilization) users, 8.4 per cent traditional method users, 4.5 per cent injectable users, 2.2 per cent IUD users, and 3.0 per cent condom users. In other words, about two-fifths of Bangladeshi couples practising contraception use pills, more than one-fourth use permanent methods, and about one-fifth use traditional methods. In addition, about 10 per cent are users of injectables, 5 per cent IUDs and 5 per cent condoms. As these methods vary substantially in terms of effectiveness, a key goal of the family planning programme is to provide an effective method mix. An understanding of the determinants of method choice is required for developing a more effective family planning programme strategy.

Methods and procedures

Data sets

The study uses data sets from both national and regional surveys. The national contraceptive prevalence surveys (CPSs) of 1983 and 1991 had samples of 10,305 and 12,347 married women of reproductive age (MWRA), respectively (Mitra and others, 1985 and 1991). In our analysis, we included MWRA from rural areas only: 7,682 and 8,873 women, respectively, from the CPSs of 1983 and 1991.

Total family health care includes family planning in modern Bangladesh. (Photograph courtesy of SOPIRET

Also used was the data set of a fertility survey conducted by the Maternal Child Health and Family Planning (MCH-FP) Extension Project (Rural) of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). The fertility survey was conducted in 1990 in the Project sites among 5,839 MWRA. Women who were pregnant during the surveys were excluded from the analysis, since they were not exposed to any contraceptive method choice.

Family planning programme

Within the Bangladesh family planning programme, MCH-FP services are delivered through a community-based distribution (CBD) approach. At the community level, services are delivered by family welfare assistants (FWAs) at the door-step and by family welfare visitors (FWVs) and medical assistants (MAs) at family welfare centres (FWCs) and satellite clinics (SCs).

A female FWA is a grassroots-level worker who visits MWRA every two months to provide counselling on MCH-FP and deliver oral pills and condoms. MCH-FP services are also provided through FWVs and trained paramedics located at FWCs. There is one FWC for about 4,000 MWRA and their family members, a total of about 25,000 people. FWCs are open to the villagers three days a week, and offer MCH-FP and primary health care services. FWVs hold SCs (two SCs per week) at eight locations scattered in the catchment areas of each FWC. MWRA can visit the SC locations and receive MCH-FP and primary health care services. Injectables, IUDs and management of contraceptive side-effects are provided by FWVs at FWCs and SCs. FWAs refer clients to the service centres for these services.

FWAs and FWVs also motivate clients to obtain tubectomies and vasectomies which are provided at the Thana Health Complex (THC) located at the thana (subdistrict) headquarters. An FWA usually accompanies a potential tubectomy or vasectomy client to the THC. Cash is given to clients as a compensation for wages lost on the day of surgery as well as for transportation. A new garment is given to each client prior to surgery, as an added incentive to undergo the procedure, with the expectation that a clean garment will help to prevent infection.

Variables

The following five categories of factors that may affect contraceptive use and method choice of MWRA were considered in the analysis: programmatic, demographic, socio-cultural, attitudinal and regional.

Among the programmatic factors were included household visitations of FWAs, MWRA's attendance at an SC, and MWRA's attendance at an FWC. One variable was included, which captures the extent of knowledge of an MWRA about contraceptive methods. This is an individual-level variable, but is strongly affected by the activities of the MCH-FP programme on information, education and communication (IEC) as well as by the activities of FWAs and FWVs.

Considered among the demographic and socio-economic variables were maternal age, number of living children, gender composition of living children, maternal education and religion. The following attitudinal variables were used in the MCH-FP Extension Project data set: "whether or not an MWRA or her husband approves of family planning". Table 1 gives a brief description of the independent variables or factors that may affect contraceptive use.

The variables that may capture regional variation are also shown in table 1. Contraceptive behaviour was compared between four divisions: Chittagong, Dhaka, Khulna and Rajshahi. For the MCH-FP Extension Project data, contraceptive use was between Abhoynagar and Sirajgonj, the two field sites of the Extension Project. Abhoynagar and Sirajganj are in Khulna Division and Rajshahi Division, respectively.

Contraceptive use and method choice are the dependent variables. The 1983 CPS shows that about 20 per cent of MWRA used contraception: 3 per cent, pills; 1 per cent, injectables and IUDs; about 8 per cent had tubectomies or vasectomies; and 7 per cent used condoms and traditional methods (figure 1). The 1991 CPS shows that 40 per cent used contraceptives: about 15 per cent, pills; 4 per cent, injectables and IUDs; 10 per cent had tubectomies and vasectomies; about 3 per cent used condoms; and 9 per cent, traditional methods. The method mix of the method-specific rates are: 35 per cent pill users, 11 per cent IUD and injectable users, 26 per cent permanent method users, 6 per cent condom users, and 22 per cent traditional method users.

Data analysis

The association between contraceptive use and various factors was modelled, using logistic regression. The contraceptive method choice was modelled, using multinomial logit regression (Maddala, 1983).

Table 1: Mean characteristics of sample Bangladeshi women

Factors	National surveys (CPSs)		Regional survey
	1983	1991	1990
Programme:			
FWA visited woman's home in previous 6 months (%) (rc = Did not visit)	30	41	85
Woman ever visited family welfare centre (FWC) (%) (rc = Never visited)	a	a	37
Woman ever visited satellite clinic (SC) (%) (rc = Never visited)	a	a	12
Number of modern contraceptive methods known by the woman	5	7	a
Demographic:			
Age of woman	28	28	30

Number of living children	4.7	3.0	2.9
Number of living sons	1.6	1.5	1.5
Socio-cultural:			
Education of woman			
Primary	23	27	23
Above primary (rc = No education)	6	11	9
Muslim (rc = Hindu)	88	88	87
Attitudinal:			
Woman approves of family planning (rc = Does not approve of family planning)	a	a	89
Husband approves of family planning (rc = Does not approve of family planning)	a	a	78
Region:			
Division (rc = Chittagong):			
Dhaka	28	28	b
Rajshahi	27	27	b
Khulna	20	19	b
Sample size (N)	**6,859**	**8,209**	**5,248**

Notes: a Data not available;
b Data are from two particular areas;
rc = Reference category.

Categories of contraceptive methods, the dependent variable, in the multinomial logit regression were: (a) pills, (b) injectables and IUDs, (c) tubectomies and vasectomies (permanent methods) and (d) other methods which include condoms, rhythm, withdrawal, abstinence and indigenous/herbal methods of family planning. These categories apply to the CPS data analysis. For the MCH-FP Extension Project data, the categories were the same except that injectables and IUDs were separate categories. For the multinomial logit regression, the reference category of the dependent variable was the "non-user" of contraception. Table 1 shows the independent dummy variables and their reference categories as well as the means of the independent variables.

Figure 1: Contraceptive method-mix according to national surveys in Bangladesh, 1983 and 1991

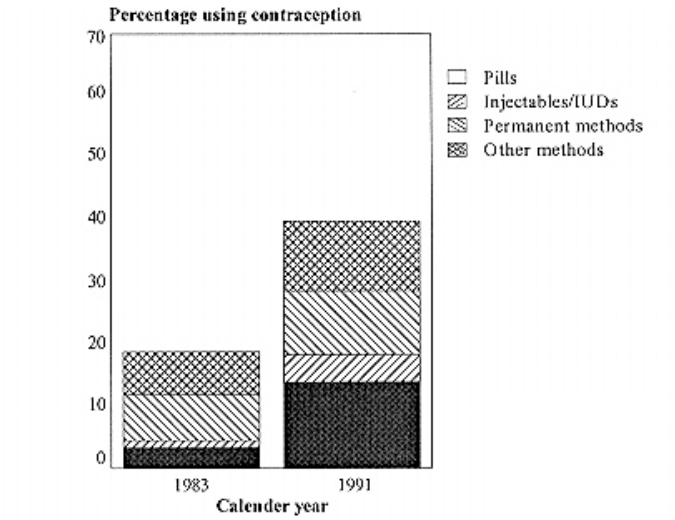
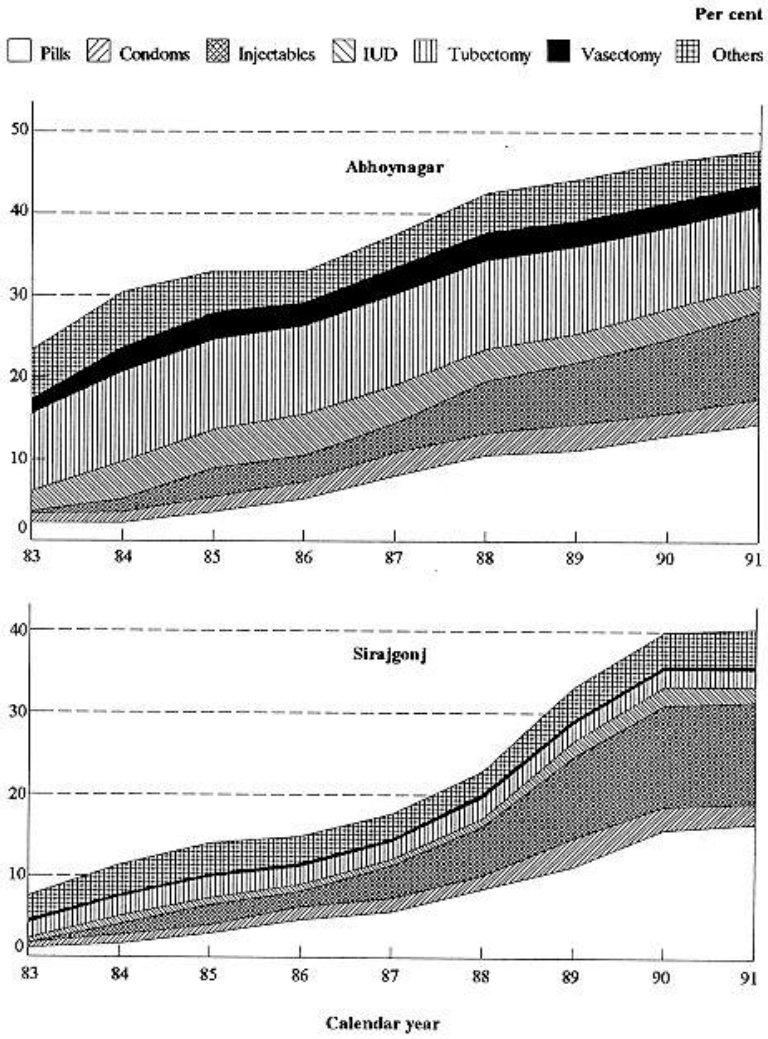


Figure 2: Trends in contraceptive method mix during period 1983-1991 in Abhoynagar and Sirajgonj



Results

Figures 1 and 2 show the contraceptive method mix, as revealed by the national and regional surveys, respectively. Contraceptive use in Bangladesh more than doubled by 1991, compared with that of 1983 (figure 1). The increase is attributable to an increase in all methods, but a marked increase in the use of pills. Most of the increase in contraceptive use in Abhoynagar and Sirajgonj is attributable to the increase in the use of pills and injectables. The use of other methods increased only slightly, while the use of some methods remained static. There are two points worth mentioning. The Extension Project in Abhoynagar and Sirajgonj introduced door-step injectable contraceptive services provided by FWAs at the end of 1983, after which injectables became quite popular among women (figure 2). In the rest of the country, injectables are provided by FWVs at FWCs and SCs. But tubectomies and vasectomies never gained importance in the MCH-FP programme in Sirajgonj (figure 2).

Table 2: Logistic regression coefficients of programmatic, demographic and socio-cultural factors that are associated with the use of contraception in Bangladesh

Factor	Contraceptive prevalence surveys		Regional survey
	1983	1991	1990
FWA visited woman's home in previous 6 months	0.247**	0.567**	0.289*
Woman ever visited FWC	[a]	[a]	0.549**
Woman ever visited SC	[a]	[a]	0.239**
Number of modern contraceptive methods known by the woman	0.340**	0.319**	[a]
Age of woman	0.189**	0.225**	0.165**
Age of woman squared			

	-0.003**	-0.003**	-0.003**
Number of living children	0.327**	0.413**	0.523**
Number of living children squared	-0.029**	-0.042**	-0.051**
Number of living sons	0.346**	0.351**	0.192**
Number of living sons squared	-0.043*	-0.050**	b
Education of woman:			
Primary	-0.008	0.052	0.226**
Above primary	0.570**	0.555**	0.382**
Muslim	-0.682**	-0.422**	-0.044
Woman approves of family planning	a	a	1.663**
Husband approves of family planning	a	a	1.547**
Division:			
Dhaka	0.478**	0.633**	c
Khulna	0.423**	0.813**	c
Rajshahi	0.682**	1.059**	c
Abhoynagar	c	c	0.255*
Constant	-6.988**	-7.737**	-7.251**
-2 Log-likelihood	6,348	10,959	7,229

Notes: * p<.01;
* * p<.001;
a Data not available;
b Not included in the model;
c Not applicable.

Logistic regression results

Table 2 presents logistic regression coefficients derived from the analysis of the national and regional data sets. A logistic regression coefficient can be exponentiated to translate it into an odds ratio, an approximation of relative risk. For example, according to the 1991 CPS, the use of contraceptives by a woman was 1.76 [exp(0.567)] times higher if she had been visited by an FWA than that of a woman who had not been visited by an FWA in the previous six months (table 2). Similarly, in 1991, a Muslim woman's contraceptive use was 0.51 [exp(-0.682)] times higher than that of a non-Muslim woman.

All programmatic factors are positively associated with contraceptive use. The CPS results showed that contraceptive use was higher among MWRA who were visited by an FWA than among those who were not visited by such a worker, indicating that an increase in the coverage of FWA home visitation may increase contraceptive use. This association, however, should be interpreted with caution because it is also possible that the contraceptive users selectively received more visits from FWAs than non-users. The strength of association between FWA visits and contraceptive use more than doubled from 1983 to 1991. This indicates that the community-based distribution programme has become more effective in the last decade. Women who visited FWCs or SCs were more likely to use contraception. Contraceptive use increases with the number of contraceptive methods of which a woman is aware.

In Abhoynagar and Sirajgonj, more women prefer to use injectables, a method especially popular among younger women. (Photograph courtesy of the Feature Bureau, Press Information Department, Dhaka)

Contraceptive use increased with maternal age but declined after a woman reached 37.5 years in the national sample of 1991 and after having reached 27.5 years in the Abhoynagar and Sirajagonj samples (tables 2 and 3). The contraceptive users in Abhoynagar and Sirajgonj were, on average, 10 years younger than the users in the national sample. Contraceptive use was quite high among the younger women who used contraceptive methods for birth-spacing purposes in Abhoynagar and Sirajgonj. In Abhoynagar and Sirajgonj, there was a high use of injectables -- a method more common among young women than older ones. There was a low prevalence of permanent methods; these were more common among older women. The contraceptive method mix made the age profiles of the two samples different. Contraceptive use increased with the number of living children but declined after five children had been born, both in the national and regional samples. It also increased with the number of living sons, but declined after three to four sons had been born, indicating that parents have a preference for a certain gender composition of children of both sexes.

The educated or non-Muslim women had a higher use of contraception than the uneducated or Muslim women. As expected, approval of family planning by both wife and husband had a significant and positive influence on contraceptive use.

There was a strong regional variation in contraceptive use. In 1991, contraceptive use in Dhaka, Khulna and Rajshahi divisions was, respectively, 1.88, 2.25 and 2.88 times higher than that of Chittagong. Abhoynagar had 1.24 times higher contraceptive use than Sirajgonj.

Differentials of contraceptive use increased between 1983 and 1991 for FWA's visit, demographic variables and across divisions. An increased regional variation over time reflects a more rapid increase in contraceptive use outside Chittagong Division.

Multinomial logit results

Multinomial coefficients are presented in tables 3 and 4.

Table 3: Multinomial logit regression coefficients of programmatic, demographic and socio-cultural factors that are associated with the use of contraception: Bangladesh national surveys

Factor	Pills		Injectables/IUDs		Permanent methods		Others	
	1983	1991	1983	1991	1983	1991	1983	1991
FWA visited woman's home in previous 6 months	1.021**	1.527***	0.592**	1.045***	0.083	-0.894***	0.238*	0.483***
Number of modern contraceptive methods known by the woman	0.459***	0.264***	0.467***	0.348***	0.266***	0.406***	0.400***	0.319***
Age of woman	0.058	0.178***	0.042	0.119+	0.438***	0.652***	0.106*	0.189***
Age of woman squared	-0.002	-0.003***	-0.001	-0.003*	-0.007***	-0.009***	-0.002*	-0.003***
Number of living children	0.472**	0.571***	1.119***	0.819***	0.572***	0.646***	0.306***	0.294***
Number of living children squared	-0.045**	-0.053***	-0.150**	-0.064**	-0.071***	-0.093***	-0.015+	-0.024***
Number of living sons	0.262**	0.095*	0.225	0.110+	0.191***	0.181***	-0.010	0.081*
Education of woman:								
Primary	0.469**	0.181*	0.688*	-0.005	-0.641***	-0.430***	0.219+	0.371***
Above primary	1.239***	0.840***	0.991*	-0.000	-1.190***	-0.864***	0.898***	1.016***
Muslim	-0.528*	-0.055	-0.813***	-0.222	-0.775***	-0.783***	-0.568***	-0.534***
Division:								
Dhaka	0.396+	0.428***	0.285	0.628***	0.716***	0.982***	0.354*	0.532***
Khulna	-0.627*	0.476***	-0.010	1.313***	0.790***	1.089***	0.371*	0.718***
Rajshahi	0.260	0.893***	0.785*	0.859***	0.937***	1.410***	0.585***	0.879***
Constant	-7.456***	-7.967***	-8.926***	-8.801***	-11.314***	-16.741***	-6.647***	-8.159***

Notes: + p<.10;
* p<.05;
* * p<.01;
* * * p<.001.

Programme factors

Use of all contraceptive methods was associated with FWA's home visitation, but the magnitude and direction were different, and the strength of association increased over time (table 3). The association was stronger for pills, injectables and IUDs than for other methods. It is encouraging to note that the use of traditional methods was also higher among the women who were visited by FWAs. This finding probably indicates that FWAs were able to

motivate couples to use at least some form of contraception, although FWAs do not record such methods in their record books. Higher use of traditional methods in the area of an FWA does not reflect her level of performance and, therefore, it is not likely that the FWA would encourage couples to use traditional methods. It may be possible that FWAs made frequent visits to the households of users of traditional methods with an expectation that they would be able to motivate these women to use the modern methods. This might have led to a positive association between FWA home visitation and the use of traditional methods.

The strong and negative association between the adoption of tubectomies and vasectomies and FWA's home visitation indicates that FWAs are less likely to visit a couple who has adopted a permanent method.

Table 4: Multinominal logit regression coefficients of programmatic, demographic and socio-cultural factors that are associated with the use of contraception in Abhoynagar and Sirajgonj

Factor		Pills	Injectables	IUDs	Permanent methods	Others
FWA visited woman's home in previous 6 months		1.907***	1.583**	1.954*	-1.229***	0.053***
Woman ever visited FWC		0.395***	0.483***	1.736***	1.317***	0.135
Woman ever visited SC		0.076	0.465***	1.230***	-0.094	0.046
Age of woman		0.186***	0.070*	0.161	0.728***	0.187**
Age of woman squared		-0.003***	-0.002***	-0.004*	-0.009***	-0.003**
Number of living children		0.503***	0.737***	1.086***	0.045	0.531***
Number of living children squared		-0.047***	-0.069***	-0.115***	-0.031*	0.044***
Number of living sons		0.235***	0.242***	0.178+	0.251***	0.134*
Education of woman:						
	Primary	0.447***	0.017	0.168	-0.501**	0.700***
	Above primary	0.572***	-0.741**	0.884**	-0.741**	1.331***
Muslim		0.063	0.231	-0.462*	-0.199	0.035
Woman approves of family planning		1.944***	3.257***	17.507	0.914*	1.272***
Husband approves of family planning		2.000***	1.229***	0.963**	2.567***	0.793***
Abhoynagar	-0.038	-0.019	0.216	1.871***	0.164	
Constant		-8.627***	-7.858***	-25.353	-20.657***	-8.664***

Notes: + p<.10;
* p<.05;
* * p<.01;
* * * p<.001.

The stronger association between the use of IUDs and the permanent methods and attendance at an FWC probably indicates that their adoption was either at an FWC or the users were screened through the paramedics at the FWC (table 4). The significant positive association between the use of injectables and IUDs and SCs probably indicates that the clients were either screened or provided with these methods at the SCs. The use of pills and permanent methods was not associated with attendance at an SC (table 4).

The use of other methods was not associated with attendance at an FWC or SC. Knowledge of a number of different modern contraceptive methods was positively associated with the use of all contraceptive methods (table 3). The degree of association declined over time, except for the permanent methods, indicating widespread knowledge of modern contraceptive methods.

Demographic factors

We observed in the logistic regression analysis that there is an age pattern of contraceptive use, i.e. contraceptive use increased with age and number of living children and then declined. Multinomial logit coefficients indicate that the age pattern differed by methods. Injectables and IUDs were preferred by relatively young or low-parity women, indicating that these women tended to adopt a more effective and long-acting method for birth-spacing purposes. In

contrast and as expected, the permanent methods were preferred by the relatively older or high-parity women. Other methods (condoms and traditional methods) were preferred by relatively older women. In the national sample the age effects on various methods were stronger in 1991 than in 1983 (table 3).

Socio-economic and cultural factors

The use of pills and other methods (condoms and traditional methods) increased with education among the national samples in 1983 and 1991 and the regional sample in 1990 (tables 3 and 4), while the use of the permanent methods decreased with education among all samples. In Abhoynagar and Sirajgonj, the use of injectables decreased with education, while the use of IUDs increased with education (table 4). According to the surveys conducted in 1990 and 1991, pills and other temporary methods (IUDs, condoms and traditional methods) were preferred by the educated, while injectables and permanent methods were more common among the uneducated. The higher adoption of the permanent methods (tubectomy and vasectomy) by the relatively poor or uneducated is partially explained by the provision of incentives offered by the family planning programme (Cleland and Mauldin, 1991).

The higher use of pills, condoms and traditional methods by the educated than by the uneducated is probably related to differential side-effects (actual or feared) of methods. Condoms and traditional methods have no side-effects. The users of injectables, however, have frequent complaints, including spotting, bleeding and amenorrhoea, while the users of pills have complaints, including headache, nausea and weakness. It is possible that educated women have a higher tolerance of the side-effects and discomforts associated with pills, condoms and traditional methods than those of injectables.

There may also be provider-biases in the areas of counselling. FWAs and FWVs probably assume that pills and condoms can be more efficiently used by the educated than by the uneducated. They probably counsel the uneducated women to use injectables as a relatively long-acting method that does not require "user-skills". In contrast, the educated probably make their own decision on which method to use. Also, it is possible that educated couples procure pills and condoms from sources other than FWAs; thus, FWAs may not have much influence on the method choice of these clients.

Muslims had lower use of any methods in 1983, although the method-specific religious differentials were smaller in 1991. Hindus had a higher use of contraception than Muslims, but the use of pills and injectables was higher for Muslims than Hindus in the recent survey. The findings indicate that birth spacing might be more common among Muslims, whereas family limitation might be more common among Hindus.

Approval of family planning by women had a strong influence on contraceptive use for almost all methods in the regional sample. The results showed that both the wife and husband's approval of the use of contraceptives was important for the adoption of any method (table 4). However, the wife's approval was more important for non-permanent than permanent methods, usually tubectomy.

Regional variation

Table 4 shows that the higher contraceptive use in Abhoynagar than in Sirajgonj in 1990 was explained largely by the difference in the use of the permanent methods. Table 3 shows that, in 1983, the regional variation of the use of pills, injectables and IUDs was not important. The use of the permanent and other methods was substantially higher in Dhaka, Khulna and Rajshahi than in Chittagong in both 1981 and 1993.

Conclusion

A multivariate analysis of correlates of contraceptive method choice in 1983, 1990 and 1991 was undertaken among national and regional samples of women. Multinomial logit models, an appropriate statistical technique, were used for contraceptive method-choice analysis.

Programmatic, demographic and socio-cultural differentials of contraceptive method-choice were documented. The use of pills, condoms, traditional methods, injectables and IUDs was higher among the women who were visited by FWAs than among those who were not visited by FWAs in the previous six months. FWA home visitation was low among the users of permanent methods (tubectomy and vasectomy). The use of all methods, except traditional methods, was higher among the women who visited FWCs than among those who did not visit FWCs. The use of injectables and IUDs was higher among the women who visited SCs than among those who did not visit SCs. Injectables and IUDs were preferred by the young or low-parity women, while the permanent methods were preferred by the older or high-parity women. Relatively older women preferred the use of condoms and traditional methods. Pills, condoms and traditional methods were more common among the educated women, while injectables and permanent methods were more common among the uneducated women. According to recent surveys, the acceptance of permanent methods, condoms and traditional methods was lower among Muslims than Hindus. The wife's and husband's approval of family planning use positively influenced the adoption of all methods; however, the wife's approval was more important for the temporary methods than for the permanent methods (usually tubectomy).

An understanding of how various factors considered in the study influence the method choice of rural Bangladeshi couples is not known from our study. Further qualitative studies should therefore be undertaken in order to provide a clear understanding of the differentials of method choice. However, the following comments may be helpful for improving the national programme.

The Bangladesh family planning programme has been remarkably successful in recent years, even without emphasizing the delivery of the two permanent methods, tubectomy and vasectomy. Recent success is believed to be due to the strengthening of the community-based distribution programme where FWAs distribute pills and condoms at the door-step (see Kamal and Sloggett, 1996). This belief is corroborated by our findings that the use of all methods, except the permanent methods, was higher among the women who were visited by FWAs. Increased contacts with FWAs at the community level can further raise contraceptive use, particularly pills and condoms, especially in the low-performing areas of Chittagong Division where the FWA contact rate is low.

The current community-based distribution programme is expensive, requires huge management resources and, thus, is donor-dependent. Moreover, FWAs distribute only pills and condoms which have limited use-effectiveness (Bairagi and Rahman, 1996). Currently, pills represent two-fifths of the methods used, and condoms and traditional methods account for one-fifth (Mitra and others, 1994). The method mix and limited use-effectiveness of the most commonly used methods are likely to limit the programme's impact on fertility reduction. Family planning education through the mass media, family planning workers, and other media dissemination about the proper use of pills, condoms and traditional methods can increase the use-effectiveness of these methods. Counselling about the limited effectiveness of traditional methods may lead to a shift from these methods to more effective modern methods.

Clinical methods (injectables, IUDs, tubectomies and vasectomies) are more commonly used by the uneducated or poor women than their educated or richer counterparts. These methods are more effective and are provided from the fixed-site service centres and thus are more cost-effective. The family planning programme could become more cost-effective and have a greater impact on fertility if the delivery of clinical methods received a higher priority in the national programme.

Injectables can be delivered both at the door-step and at fixed-site service centres. Delivery of injectables from service centres would ensure better quality of care, be less expensive and reduce the problems related to the disposal of syringes, which has implications also for the spread of blood-borne diseases such as AIDS and hepatitis.

Shifting the focus of the family planning programme from non-clinical methods to include clinical methods, with an assurance of quality of care and delivery from fixed sites, could make the programme more effective and sustainable. However, it has been found that the use of FWCs is low to moderate and that of SCs is very low (Mozumder and others, 1995; ICDDR,B, 1994), perhaps because of cultural considerations such as purdah (seclusion of women). If delivery of contraceptives from the fixed-site centres could be successfully promoted, this would bring women out of their homes, which would indirectly foster women's mobility. In turn, women's outward mobility would expose them to a wider variety of resources, and information, contraceptive options and greater accessibility to child and maternal care, and other influences.

Management improvement, enhanced quality of care at FWCs and SCs, increased awareness of the availability of services at these centres and workers' motivation for higher use of these centres by villagers may increase the use of clinical methods of contraceptives. This, in turn, would lead to a more effective contraceptive method mix in Bangladesh.

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