



DEMOGRAPHY AND SOCIOLOGY PROGRAM

RESEARCH SCHOOL OF SOCIAL SCIENCES

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Working Papers in
Demography

No. 94

February 2005

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Keywords: Fertility transition in Iran, national trends, provincial levels, below-replacement fertility, future of fertility in Iran, the own-children method

Abstract

The Islamic Republic of Iran has experienced major cultural, religious, political, economic and demographic changes during the last three decades. The three decades following the 1966 Census are very important as they reveal the demographic changes occurring due to different population policies in Iran; an antinatalist policy adopted by the monarchy during 1967–78; a pronatalist policy during 1979–1988; and an antinatalist policy introduced by the Islamic government since 1988. Therefore, Iran is a remarkable case study of the interwoven processes of cultural, social, economic, political and demographic change.

This paper aims to review the trends and changes in fertility in Iran. Own-children data from the 1986 and 1996 Censuses as well as the 2000 Iran Demographic and Health Survey (IDHS) allow us to analyze single-year fluctuations of fertility over the last three decades. The paper describes the levels, trends and patterns of fertility in Iran by rural and urban areas during the period 1972–2000. Then, provincial-level fertility trends and patterns are examined at both rural and urban areas. Next, attention is then given to the attainment of below-replacement level fertility in various provinces of Iran. Finally, the future prospect for fertility is discussed.

The results show that Iran experienced modest decline in fertility during the 1970s followed by a rise in fertility during the 1976–1984 period, partly due to the suspension of the family planning program by the government. The rise was, however, short lived. The Total Fertility Rate began to decline from 1985 and has declined sharply since 1988 dropping from 5.5 in 1988 to below 2.8 in 1999. It reached near-replacement level (2.26) during the period 1998–2000. The figure for the year 2000 is 2.17. The decline has been observed in all provinces and urban and rural areas of the country despite varying levels of socio-economic development. Several provinces and urban as well as rural areas of the country have experienced below-replacement level fertility. We argue that fertility in Iran will continue to fall in the present decade and, maybe, beyond this decade. A long period of below replacement fertility that corresponds with the years in which the very large post-revolutionary birth cohort passes through the childbearing years would be a favourable outcome for Iranian development as it would limit the expected rise in births ensuing from the baby-boom generation's echo effect, so long as this does not lead to social entrenchment of very low fertility (under 1.5 births per woman).

* This paper is based on the findings of a Postdoctoral Research undertaken by the first author at the Demography and Sociology Program of the Australian National University (ANU) during 1998–2000, and also benefited from the results of a joint project by the two authors on the Iran Fertility Transition Survey (IFTS) during 2001–2003. The two projects were supported by the Wellcome Trust. Valuable assistance from Meimanat Hosseini-Choavoshi, and support from the Statistical Center of Iran and the Iran Ministry of Health and Medical Education for providing the data necessary for this paper are gratefully acknowledged.

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Introduction

Earlier papers dealing with fertility levels and trends in Iran have covered the period, 1972 to 1996 (Abbasi-Shavazi 2000a,b, 2001a,b, 2002a). The primary objective of this paper is to update these results with the most recent data on the levels and trends of fertility in Iran as well as on rural and urban fertility and provincial-level variations. This paper covers the years from 1972 to 2000. Attention is given to the attainment of below-replacement fertility and the future of fertility in Iran.

Data and method

The 1986 and 1996 Censuses and the 2000 Iran Demographic and Health Survey (IDHS) are used to provide estimates of fertility levels and trends over the last three decades based on the own-children method. The own-children method is an indirect technique that uses the reverse-survival procedure to estimate fertility measures for the years prior to a census or household survey. Based on the information on the household record, children under the age of 15 are matched to women aged 15–64 in the same household, with the assumption that the women are the mothers of the children enumerated in the same household. This provides a table of all matched children by their own age and the age of their mothers at the time of the enumeration. An adjustment is made to include children where a match to a mother cannot be made. This is done on the assumption that the mothers of unmatched children have the same age distribution as the mothers of the matched children. A life table appropriate to the population is then used to reverse survive the children back over each of the 15 years preceding the census or survey to obtain the number of births by age of mother in previous years. The numbers of women at each age at the enumeration are also reverse survived using the life table to obtain estimates of the numbers of women at each age in the population in each of the previous 15 years. Age-specific fertility rates and total fertility rates are then calculated for each year by dividing the number of reverse-survived births by the number of reverse-survived women. The details and the application of the technique have been elaborated elsewhere (Cho 1971, 1973; Cho, Grabill and Bogue 1970; Cho, Retherford and Cho, 1986; Dugbaza 1994; Grabill and Cho 1965; Jain 1989; Rindfuss 1976, 1977; Rindfuss and Sweet 1977; Retherford and Cho 1978; Retherford et al. 1979; Retherford, Cho and Kim 1984; Retherford and Thapa, 1999).

Abbasi-Shavazi (1999, 2001c) has given several reasons to justify the use of the own-children method in Iran. The reasons include the incompleteness of vital registration data and the improvement of Iranian census data, particularly age reporting (Saraie 1995; Mirzaie, Koosheshi and Naseri 1996; Keshtkar 2000). Moreover, more than 95 per cent of children under 15 live with their natural mothers. Given the sharp decline in fertility in Iran in recent years, unlike other indirect methods of fertility estimation, the own-children method allows estimation of current fertility for a range of years prior to an enumeration. Accordingly, time trends and fluctuations in fertility can be measured.

Estimates of fertility obtained through the own-children method can be affected by age misreporting and under-enumeration. Single-year age distributions of the population of Iran in the 1976, 1986, 1996 Censuses and the IDHS were carefully analysed in an earlier

paper (Abbasi-Shavazi 2001a). There were some signs of age heaping and digit preference at the 1976 Census, but progressively less so at the 1986 and 1996 Censuses. This conclusion applied to the province level as well as to the national level. Improvements in census coverage and age reporting have been documented by other studies (Leete and Alam 1997; Mirzaie et al. 1996). The improvement in age reporting can be attributed to the rising levels of education as well as to the fact that the interviewers registered age on the basis of respondents' identity cards. This contributed greatly to the accuracy of age reporting at the 1996 Census. Despite modest age misreporting at single years of age, given that this study will estimate age-specific fertility rates in five-year age groups, the effects of age misreporting on the results are minimal. Careful analysis of the results showed that the rates for the single years, 1972, 1973, 1974, 1985 and 1986 based on the 1986 Census, are slightly under estimated. This is also true for the years 1982 and 1983 based on the 1996 Census. However, the main purpose of this paper is to present the overall trend of fertility over the period of the study, not single-year fluctuations. Single-year fluctuations in such remote provinces as Sistan and Baluchistan, Hormozgan and Ilam are mainly due to age misreporting, and thus, provincial analysis for single-year trends should be made with care.

Table 1. Percentages of children matched to their mothers in the household by urban and rural areas, Iran, IDHS 2000

Age	Total	Iran		Rural		Urban	
		Matched	Unmatched	Matched	Unmatched	Matched	Unmatched
0	100	98.3	1.7	98.2	1.8	98.5	1.5
1	100	98.2	1.8	98.3	1.7	98.0	2.0
2	100	98.0	2.0	98.0	2.0	98.0	2.0
3	100	98.1	1.9	98.0	2.0	98.3	1.7
4	100	97.8	2.2	97.8	2.2	97.8	2.2
5	100	97.3	2.7	97.1	2.9	97.6	2.4
6	100	97.2	2.8	97.2	2.8	97.2	2.8
7	100	97.0	3.0	96.8	3.2	97.2	2.8
8	100	97.0	3.0	97.0	3.0	97.0	3.0
9	100	96.8	3.2	96.5	3.5	97.2	2.8
10	100	96.8	3.2	96.9	3.1	96.6	3.4
11	100	96.4	3.6	96.3	3.7	96.5	3.5
12	100	96.0	4.0	96.0	4.0	96.0	4.0
13	100	95.7	4.3	95.7	4.3	95.7	4.3
14	100	94.7	5.3	94.7	5.3	94.8	5.2
Total	100	96.8	3.2	96.8	3.2	96.9	3.1

Minor problems may arise due to matching of (own) children to their mothers for the own-children estimates. Our investigation showed that around 97 per cent of children were matched to their mothers in the household in the IDHS (Table 1). Overall, the percentages of non-own children were very low in all the data sets used.

Having considered the effects of age reporting, mortality, migration and matching of children to their mothers on the own-children fertility estimates, Abbasi-Shavazi concluded that the method produced satisfactorily reliable fertility results for Iran (Abbasi-Shavazi 1999, 2001a, 2001c).

Fertility levels, trends and age specific patterns: a detailed description

National trends: Total fertility rates: 1972–2000

The fertility transition in Iran has passed through different phases from 1972 to 2000 (Table 2). The first Iranian family planning program was implemented by the Pahlavi regime in 1966. However, the changes in fertility during the late 1960s and early 1970s were small. TFR decreased from around 7.7 in 1966 (Amani 1970, 1996) to around 6.5 in 1976 (Paydar Nia 1977: 133–136)³, and then rose again to 7.0 in 1980.

Although the use of family planning methods was approved by Ayatollah Khomeini in 1979, the pre-revolutionary family planning program was suspended immediately after the Islamic Revolution. Although, no specific population policy was introduced after the revolution, the new government adopted a pronatalist approach. The legal minimum age at marriage for girls and boys was reduced from 15 and 18 to 13 and 15 years, respectively (Azimi 1981)⁴. The War with Iraq created a pronatalist atmosphere by which families were encouraged to have more children and economic incentives were provided. Despite this, the high fertility regime was short lived, and fertility started to decline by the mid-1980s. TFR declined from 7.0 in 1980 to around 6.3 in 1986, and further to around 5.5 in 1988. The decline of fertility was slow until the government population policy was reversed and a new family planning program was officially inaugurated in December 1989. TFR fell sharply after 1988 dropping from 5.5 in 1988 to around 2.8 in 1996, a decline of almost 50 per cent in eight years (Table 2 & Figure 1). The low level of fertility in Iran has been confirmed by the results of the Population Growth Estimation Survey (PGES) conducted by the Statistical Centre of Iran in 1998 (Statistical Centre of Iran 1999) and the Iran Demographic and Health Survey (IDHS) conducted in 2000. The own-children estimates of fertility for Iran based on the 2000 IDHS show that the TFR has declined further and reached near-replacement level (2.26) during the period 1998–2000. The estimate for the year 2000 is 2.2 (Ministry of Health and Medical Education 2002).

³ Padidar Nia (1977: 133–136) estimated that total fertility in Iran was 6.6 in 1974 (8.1 for rural and 4.5 for urban women). He argued that the large rural population, with high illiteracy and poor access to medical facilities, exposed Iran to conditions resulting in very high fertility, and thus, the fertility had been approximately unchanged during two decades — 1956 and 1974.

⁴ Marriage for girls aged 9 to 12 could only be possible subject to their physical ability, medical approval, and legal permission from the court.

Table 2. Own-children estimates of total fertility rates, Iran, 1972–2000

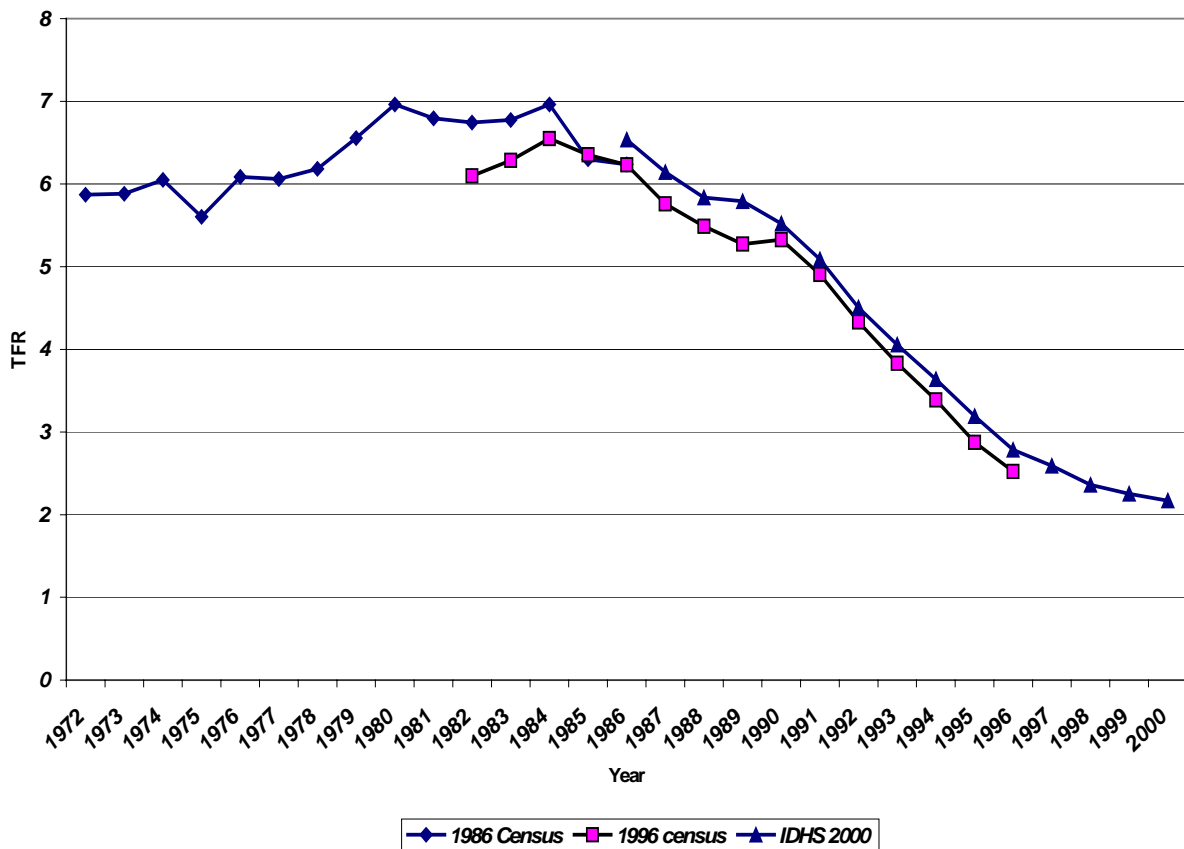
Year	Total			Urban			Rural		
	1986 Census	1996 Census	2000 IDHS	1986 Census	1996 Census	2000 IDHS	1986 Census	1996 Census	2000 IDHS
1972	5.9			5.1			6.7		
1973	5.9			5.0			6.9		
1974	6.0			5.0			7.3		
1975	5.7			4.8			6.9		
1976	6.1			4.9			7.4		
1977	6.1			5.0			7.3		
1978	6.2			5.0			7.5		
1979	6.6			5.3			8.1		
1980	7.0			5.8			8.4		
1981	6.8			5.7			8.0		
1982	6.7	6.1		5.7	5.5		7.9	6.9	
1983	6.8	6.3		5.7	5.7		8.1	7.3	
1984	7.0	6.6		5.8	6.0		8.4	7.7	
1985	6.3	6.4		5.3	5.7		7.5	7.6	
1986	6.2	6.2	6.5	4.9	5.4	6.0	6.5	7.8	7.1
1987		5.8	6.1		4.9	5.5		7.2	6.9
1988		5.5	5.8		4.7	5.1		7.1	6.6
1989		5.3	5.9		4.5	5.1		6.8	6.6
1990		5.3	5.5		4.2	4.7		6.4	6.4
1991		4.9	5.1		3.7	4.3		6.1	6.0
1992		4.3	4.5		3.3	3.8		5.3	5.3
1993		3.8	4.1		2.9	3.3		4.8	4.9
1994		3.4	3.6		2.6	3.0		4.2	4.4
1995		2.9	3.2		2.3	2.6		3.4	3.8
1996		2.5	2.8		2.0	2.3		2.9	3.4
1997			2.6			2.2			3.0
1998			2.4			2.1			2.7
1999			2.3			2.0			2.5
2000			2.2			2.0			2.4

Source: All age-specific and total fertility rates at national, rural-urban, and provincial levels in this paper were calculated by the first author using the own-children method applied to the 1986 and 1996 Censuses, and the 2000 Iran Demographic and Health Survey. Only figures for urban and rural areas at the national level during 1972–1986 are from Nourollahi (2000).

Notes: Minor inconsistencies between the rates for rural/urban areas and for the total population are due to different assumptions being used for the two figures. Figures for the three years preceding the 1986 Census are lower than the corresponding rates based on the 1996 Census, and this may be due to underreporting of children under two in the 1986 Census. The rates for the period 1986 and 1996 based on the IDHS are slightly higher than those from the 1996 Census. There are several possible explanations of these small differences including non-response, assumptions made about mortality levels in the past, small differences in the time references of the different measures and under-enumeration.

The 1986 and 1996 Censuses as well as the IDHS were conducted during October–November. Thus the rates for single years refer to 12-month periods prior to the enumeration. For example, the rate for 1980 refers to November 1979–October 1980.

Figure 1. Own-children estimates of total fertility rates for Iran, 1972–2000



Source: See Table 2.

Fertility trends in Iran over the past three decades, and particularly the sharp decline in recent years are interesting and deserve due attention for the following reasons. First, while other scholars have noted the rise and fall of Iranian fertility after the 1979 Revolution (Aghajanian 1991, 1995; Aghajanian and Mehryar 1999; Mehryar and Gholipour 1995a, 1995b; Saraie 1997; Mirzaie 1998), what has not been observed is the stability of the trend in the years before the revolution. This suggests that the fertility decline that commenced with the introduction of the family planning program in 1966 had lost its momentum in these years. Second, although the fertility decline accelerated from the 1990s with the reinstatement of the family planning program, the decline had commenced from 1985 onwards. Third, the very sharp fertility decline of fertility in Iran as an Islamic country is remarkable, particularly considering the socio-political situation in Iran in the 1980s.

Early evidence of the spectacular decline of fertility in Iran in the late 1980s and early 1990s was greeted with incredulity by many overseas observers as well as some demographers inside Iran (Abbasi-Shavazi et al. 2002). The Five Year Development Plan in the late 1980s targeted a decline in TFR to 2.3 by 2010 and the family planning program was developed around this target. In reality, this target was achieved a decade earlier but, in 1993, Zanjani (1993) had argued that fertility would decline to only 3.85 by the period, 2016–2021. He argued at the time that even this target might not be achieved given the fact that the experience of other countries in Asia such as India, Pakistan and Bangladesh where family planning programs had been implemented earlier was that

fertility had declined only slowly. He also pointed out that the family planning program in Iran was not coercive and, thus, it might not be as effective as had been planned.

This was also true for the projections made by the Population Division of the United Nations in the 1990s. In the UN population projections, revised every two years, the assumed TFR for the 1995–2000 period in Iran was as follows: in the 1990 projections, 4.30; in the 1992 projections, 5.40; in the 1994 projections, 4.52; in the 1996 projections, 4.77; in the 1998 projections, 2.80. Hence, it was not until the 1998 projections that the Population Division accepted the reality of Iran's fertility decline.⁵ By this time, the results of the 1996 Census had made it obvious that fertility had fallen much faster than had previously been believed. The 2000 UN projections provided three variants for the future of fertility for the period 2000 to 2050. According to the high, medium and low variants, by 2005–09, TFR in Iran would decline to 2.60, 2.32 and 1.98, respectively. The corresponding figures for the period 2010–2014 would be 2.60, 2.10 and 1.60, respectively.

Clearly, prior to the 1996 Census, while some earlier evidence was available, demographers were unwilling to conclude that the fall in TFR in Iran was so rapid. In addition, much of the West was unaware of the demographic and social changes inside Iran. The international stereotype portrayed by the media was that Iran was a traditional society resistant to many aspects of social change, especially matters affecting women's lives such as family planning.

National trends: Age-specific fertility rates, 1972–2000

The own-children estimates of ASFRs for Iran from 1972 to 2000 based on the 1986 and 1996 censuses as well as the IDHS are shown in Table 3. Figure 2 also shows the age specific fertility during the period, 1976–2000. The age patterns for the years 1976, 1980, 1986, 1990, 1996 and 2000 which are important turning points for the fertility transition in post-revolutionary Iran have been highlighted.

⁵ After the 1979 Revolution, Iran was internationally isolated by Western countries, and as a result, official statistics for population were not usually available or being used by international agencies. Thus, some of the statistics and demographic measures were based on estimates from data available prior to the revolution. Academic links between demographers inside Iran with scholars in the West were not effective. However, a few Iranian demographers were able to shed light on the post-revolutionary demographic transition in Iran through their publications. Of particular note were the works of Aghajanian (1991 and 1995), Aghajanian and Mehryar (1999), Ladiere-Fouladi (1996), Mirzaie (1998), Roudi (1999, 2002), and Paydarfar (1987, 1995). However, Abbasi-Shavazi's analysis on fertility transition has been important in making the information available to international readers. First, it showed the trend of fertility for single years over the last three decades. It also provided trends at both the national and provincial levels. The findings of the Iranian fertility transition were presented at such international conferences as the IUSSP conferences in Bangladesh (Abbasi-Shavazi 2000a), Tokyo (Abbasi-Shavazi 2001a) and Brazil (Abbasi-Shavazi et al. 2002), as well as the Expert Group Meeting on Completing the Fertility Transition organized by the Population Division of the United Nations in New York in March 2002 (Abbasi-Shavazi 2002a), and in seminars at the Australian National University, the University of Michigan and the University of North Carolina in Chapel Hill. Some of the papers were also published as ANU Demography Working Papers (Abbasi-Shavazi 2000b; Abbasi-Shavazi, McDonald, and Hosseini-Chavoshi 2003), and one in a special issue of the INED *Population & Société* (Abbasi-Shavazi 2001b).

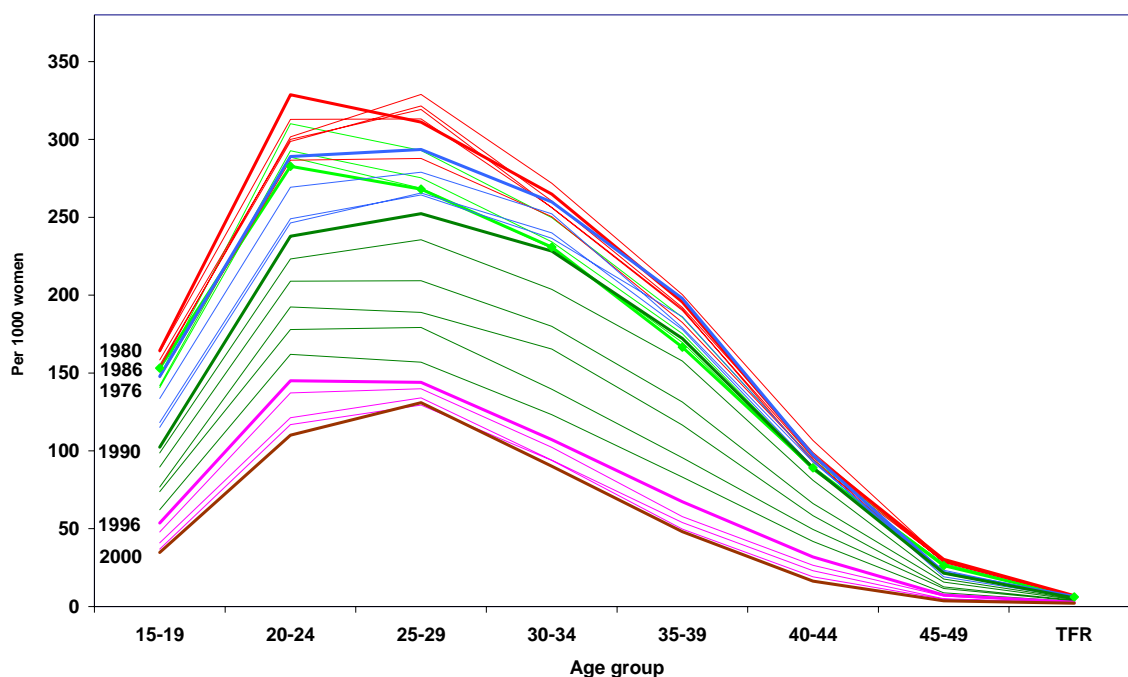
Table 3. Own-children estimates of the age specific fertility rates for Iran, 1972 to 2000, 1986, 1996 Censuses and the IDHS 2000

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
1986 census								
1972	154.0	259.7	261.7	225.3	164.6	84.1	24.9	5.87
1973	154.4	262.3	260.8	225.8	164.0	84.5	24.1	5.88
1974	161.2	268.8	267.3	231.3	167.9	87.5	25.9	6.04
1975	156.2	262.1	237.0	201.8	158.3	82.5	22.6	5.60
1976	153.1	282.8	268.1	230.9	166.7	89.1	26.4	6.08
1977	140.6	288.7	268.6	230.1	169.6	87.6	27.0	6.06
1978	141.9	292.7	275.4	234.2	175.2	89.3	27.7	6.18
1979	148.3	310.1	292.9	249.8	185.8	94.4	29.6	6.55
1980	164.3	328.8	311.1	264.9	195.6	97.1	30.3	6.96
1981	163.6	312.9	313.2	256.4	191.0	93.0	29.0	6.79
1982	158.4	300.1	319.3	256.1	190.2	95.8	28.8	6.74
1983	155.0	298.7	321.5	260.5	192.1	98.9	28.3	6.77
1984	153.3	301.6	328.9	271.8	200.4	106.7	29.5	6.96
1985	135.0	271.2	298.0	248.1	183.0	98.7	25.9	6.29
1986	132.2	266.0	282.5	252.2	185.1	101.2	28.3	6.23
1996 Census								
1982	149.9	283.9	279.3	235.8	167.8	83.7	19.3	6.09
1983	150.7	289.8	288.0	245.5	175.5	87.5	20.1	6.28
1984	154.0	297.4	298.1	257.7	185.9	94.8	22.2	6.55
1985	147.0	286.7	287.8	250.4	182.4	94.7	21.6	6.35
1986	142.6	277.2	279.5	244.1	183.1	96.1	24.0	6.23
1987	125.8	252.0	257.7	225.1	170.4	87.5	33.6	5.76
1988	115.1	240.9	249.5	219.0	165.1	85.3	22.7	5.48
1989	106.3	232.0	240.8	210.9	159.7	82.2	22.5	5.27
1990	105.1	236.2	244.2	213.5	160.5	83.1	22.9	5.32
1991	101.5	226.1	224.9	191.5	140.5	74.8	22.0	4.90
1992	90.5	207.9	202.8	166.9	117.8	61.8	18.4	4.33
1993	78.4	190.5	184.1	147.0	99.8	50.8	15.6	3.83
1994	68.7	174.4	168.3	127.8	83.3	41.4	13.6	3.38
1995	56.6	153.2	149.3	107.8	66.3	31.3	10.4	2.87
1996	45.3	135.2	136.4	96.2	56.6	25.5	9.1	2.52
IDHS 2000								
1986	147.7	289.0	293.5	259.8	197.9	97.3	21.7	6.53
1987	133.7	269.3	279.0	252.2	179.0	92.9	22.4	6.14
1988	118.2	249.1	264.4	236.5	186.1	94.0	19.1	5.83
1989	115.2	246.3	265.6	240.0	177.9	89.7	23.3	5.78
1990	102.4	237.9	252.4	228.3	172.1	89.1	21.5	5.51
1991	98.7	223.3	235.6	203.7	157.7	81.1	17.6	5.08
1992	89.6	209.8	209.3	180.0	131.3	66.2	15.7	4.50
1993	76.8	192.4	188.9	165.4	116.6	58.4	12.6	4.05
1994	73.8	177.9	179.3	139.6	95.6	49.5	11.7	3.63
1995	62.2	162.0	157.0	123.2	83.1	41.8	8.8	3.19
1996	53.7	145.1	144.0	107.2	67.3	31.9	7.4	2.78
1997	47.9	137.2	139.9	102.3	57.8	26.5	6.7	2.59
1998	40.9	121.3	134.0	94.0	54.0	23.1	5.0	2.36
1999	36.9	116.8	129.4	93.8	49.8	19.1	4.8	2.25
2000	34.7	110.1	131.0	90.1	48.1	16.3	3.7	2.17

Source: See Table 2.

As depicted, marked differences in age patterns of fertility were apparent during these years. In 1976, the highest age-specific fertility rate was recorded for age group 20–24 (283 per 1000 women) followed by age groups 25–29 (268 per 1000 women) and 30–34 (231 per 1000 women). This age pattern remained in place in 1980 although fertility had risen overall. From 1976 and 1980, rises in fertility were evident for all age groups. However, during the first half of the 1980s, although the TFR remained high and nearly constant, the age pattern shifted towards later childbearing and the peak of childbearing occurred in age group 25–29. The falls in fertility at younger ages were matched by rises at older ages. Thus, Iranian women had a relatively early childbearing pattern in the first year of the revolution consistent with the pronatalist ideology adopted by the government. People had positive attitudes at the time of the revolution and were motivated to have more children early in their lives. This behaviour did not last long however and as age at first marriage increased, fertility shifted to a relatively later childbearing pattern.

Figure 2. Own children estimates of age specific fertility rates for Iran, 1976, 1980, 1986, 1996 and 2000



Source: See Table 2.

The figure depicts a decline in fertility from 1986 to 1990, particularly in the young age groups, 15–19, and 20–24. Age specific fertility rates in age groups 25–29 and 30–34 were also lower in 1990 than those in 1986. However, there was a remarkable fall in fertility in all age groups during the 1990–96 period (Figure 2) due to the revival and successful implementation of the family planning program during this period. Age specific fertility rates continued to fall from 1996 to 2000, although the rate of decline was slower as there was less scope for further decline during this period. There was also an indication of a further shift towards delayed childbearing during the last period.

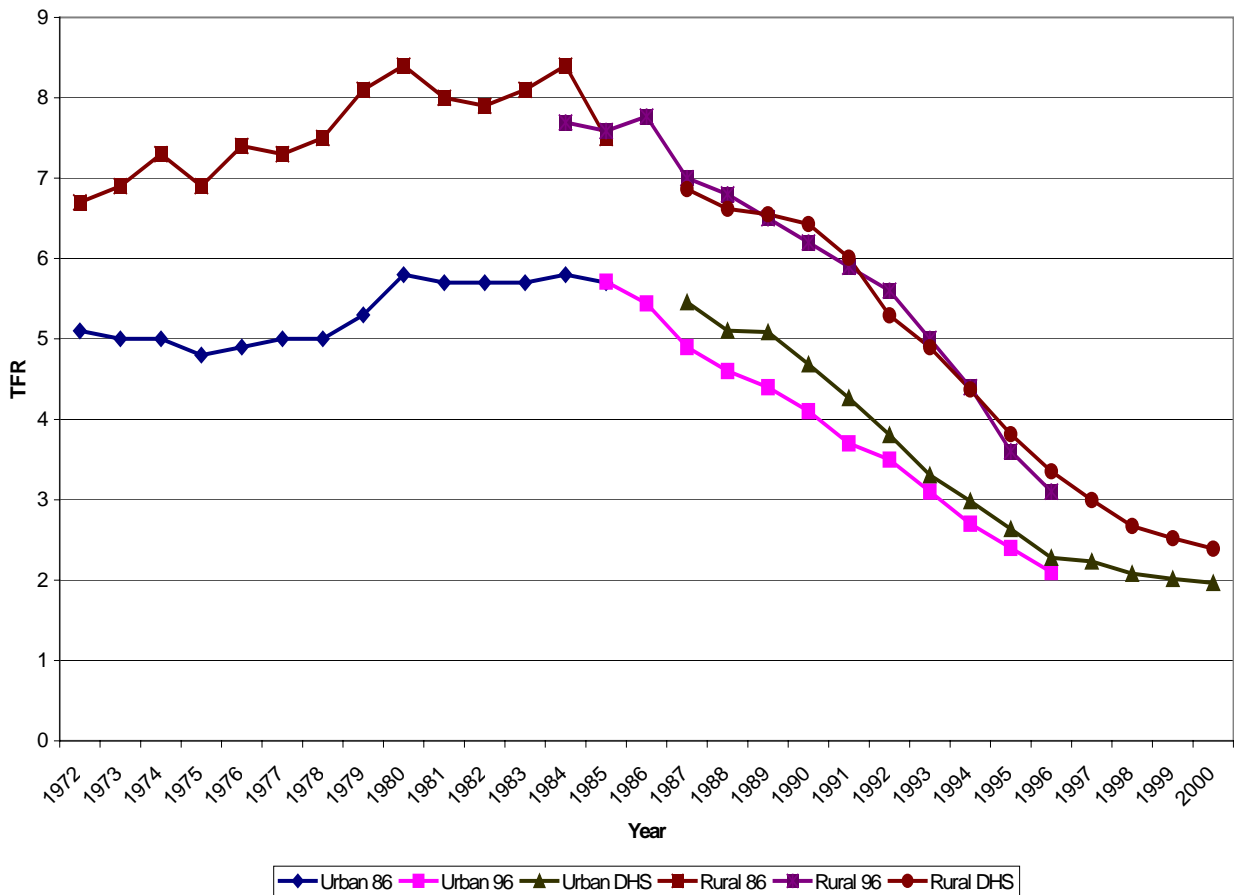
The steep fertility decline in all age groups between the periods suggests that simultaneously young couples were starting their childbearing later, married women were spacing their births further apart and older women were stopping their childbearing. This

interpretation would explain the very sharp fall in total fertility that has occurred in Iran since the late 1980s.

Total fertility rates for rural and urban areas, 1972–2000

Trends of TFRs and ASFRs for rural and urban areas of Iran from 1972 to 2000 are shown in Figure 3 (see also Tables 4.1 and 4.2). As depicted, fertility rates were much higher in rural areas than in urban areas during the 1970s. This is consistent with the findings of earlier studies (Aghajanian 1991, 1995; Mehryar and Golipour 1995a; Mirzaie 1998). Paidar-Nia (1977) had estimated that, in 1974, total fertility rates in rural and urban areas were 8.1 and 4.5, respectively.

Figure 3. Own-children estimates of total fertility rates for rural and urban areas of Iran, 1972–2000



Source: See Table 2.

Interestingly, fertility in both rural and urban areas started to increase two years before the revolution and peaked in 1979–80, suggesting that the family planning delivery system may have been starting to break down in the years prior to the revolution. Fertility then remained high and relatively flat until the mid-1980s. There was a gradual decline during 1986 and 1989, before the fertility transition in both rural and urban areas accelerated in the 1990s. The decline in rural areas was much steeper than in urban areas. The IDHS result showed that fertility continued to decline by the mid-1990s, although the trend in both rural and urban areas has slowed down recently. The large gap between TFRs in rural and urban areas has narrowed substantially. The total fertility rate in urban areas reached

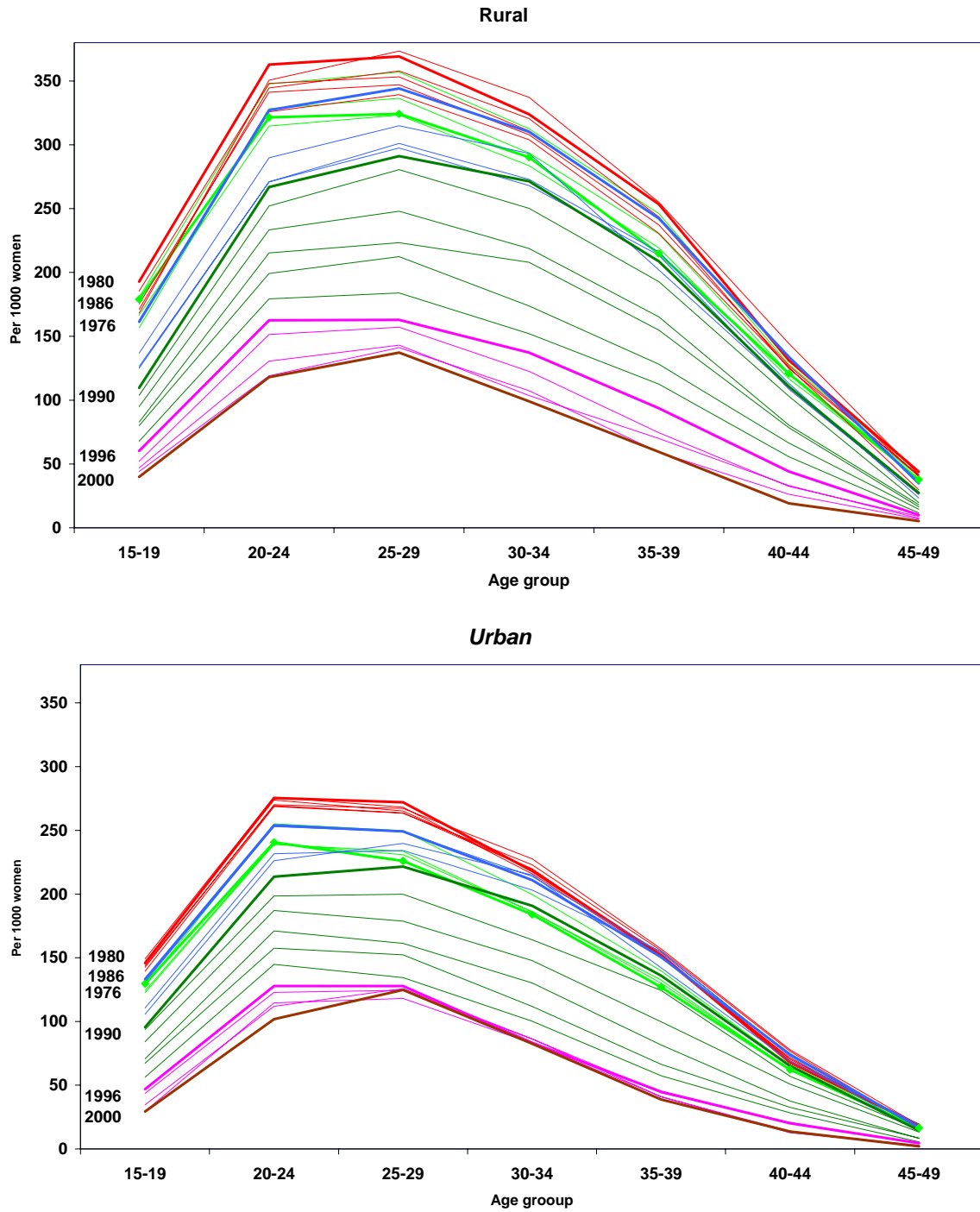
below replacement fertility by the late 1990s. In 2000, the TFR in urban and rural areas of Iran was around 2.0 and 2.4, respectively.

Age patterns of fertility for rural and urban areas

Figure 4 shows ASFRs for rural-urban differences for the period 1976–2000, with highlighted figures for 1976, 1980, 1986, 1990, 1996 and 2000. As the figure reveals, in general, the trends in age patterns of fertility for both rural and urban areas during the period were similar to the national level: large declines for all age groups with the largest declines being in the young age groups. By the end of the period, rates in rural areas were still falling at all ages, but the falls in urban areas had begun to slow down, especially at the older ages. Consequently, as with TFRs, the gaps between rural and urban areas had narrowed considerably by the end of the 1990s.

Fertility decline in both rural and areas has been observed in other developing countries, and particularly in South and West Asia as well as in the Middle East (Rashad 2000). What is interesting about the Iranian fertility transition, however, is the speed of fertility decline in rural areas in the recent decade. The similarity of the transition in both urban and rural areas is another feature characteristic of the fertility transition in Iran. The expansion of education and health networks in post-revolutionary Iran reduced the gap between rural and urban areas that was apparent prior to the revolution. This has contributed to the reduction of fertility in rural areas of Iran.

Figure 4. Trends of age-specific fertility rates for rural and urban areas, Iran, 1972–2000



Source: See Table 2.

Table 4.1 Own-children estimates of the age specific fertility rates for rural areas of Iran, 1972 to 2000, 1986, 1996 Censuses and the IDHS 2000

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
1986 census								
1972	161.3	287.3	292.5	264.4	197.4	106.5	32.1	6.7
1973	166.7	197.5	298.9	272.2	202.1	108.6	31.5	6.9
1974	182.5	315.6	318.3	288.0	211.0	116.2	35.5	7.3
1975	172.8	302.8	298.0	267.8	196.0	109.9	30.7	6.9
1976	179.1	321.4	324.1	290.2	214.8	120.8	37.8	7.4
1977	166.7	314.7	323.2	283.6	219.3	116.8	38.3	7.3
1978	156.6	328.1	336.4	293.6	230.1	121.1	40.6	7.5
1979	180.6	347.5	356.9	312.6	246.1	128.1	43.5	8.1
1980	192.9	362.8	369.2	323.9	253.5	131.2	44.0	8.4
1981	185.5	348.2	353.2	310.9	242.3	124.9	41.4	8.0
1982	175.3	341.2	347.0	307.9	237.2	127.0	40.6	7.9
1983	171.2	344.5	357.8	320.5	243.5	134.0	40.2	8.1
1984	168.2	350.6	373.4	337.2	255.1	144.3	41.8	8.4
1985	143.8	309.4	335.1	304.8	230.9	131.6	36.1	7.5
1986	122.4	268.1	291.8	266.2	208.3	118.7	34.4	6.5
1996 Census								
1982	163.7	306.7	308.7	270.1	202.6	104.4	25.7	6.9
1983	165.6	320.8	330.0	291.1	217.5	114.0	27.6	7.3
1984	169.0	332.2	344.4	306.5	231.0	124.4	30.8	7.7
1985	162.5	325.8	339.2	304.0	230.6	125.8	29.8	7.6
1986	161.4	327.1	344.1	310.1	242.4	133.9	34.8	7.8
1987	143.3	300.6	323.2	291.8	229.6	123.9	33.9	7.2
1988	133.1	289.4	315.6	289.0	226.6	122.7	34.4	7.1
1989	121.5	278.6	305.4	278.2	220.0	119.6	34.5	6.8
1990	109.5	260.9	289.2	265.4	207.9	113.2	32.6	6.4
1991	107.1	255.0	277.3	249.2	191.4	107.9	32.9	6.1
1992	94.9	229.8	245.4	216.6	162.7	90.8	28.0	5.3
1993	83.6	211.0	224.3	194.3	141.8	77.1	24.6	4.8
1994	74.1	190.4	201.5	168.5	120.5	64.3	21.6	4.2
1995	60.6	161.4	169.3	134.0	91.4	47.4	15.9	3.4
1996	48.7	138.6	147.9	114.9	77.1	38.9	14.0	2.9
IDHS 2000								
1986	148.2	303.5	318.8	286.0	222.1	111.1	26.9	7.1
1987	136.9	289.9	314.9	293.3	202.0	109.9	26.2	6.9
1988	126.4	271.0	301.1	273.0	216.0	113.1	23.4	6.6
1989	125.0	271.0	297.4	268.1	213.5	108.6	26.5	6.6
1990	109.6	266.9	291.1	271.4	208.7	110.7	27.3	6.4
1991	103.8	252.0	280.5	250.3	192.8	103.0	19.7	6.0
1992	95.0	233.3	247.9	218.8	165.2	80.5	18.1	5.3
1993	82.8	215.3	223.3	207.9	154.9	78.4	16.5	4.9
1994	80.1	199.1	212.4	173.7	128.2	66.4	14.6	4.4
1995	67.9	179.3	184.0	152.1	112.6	55.7	11.8	3.8
1996	60.3	162.5	162.9	137.3	93.6	44.1	10.1	3.4
1997	52.1	151.4	157.1	122.6	74.6	32.5	8.9	3.0
1998	46.9	130.6	143.0	103.6	70.1	33.1	7.5	2.7
1999	44.1	119.1	141.1	107.4	59.2	26.3	6.8	2.5
2000	40.0	118.0	137.2	99.0	59.5	19.2	5.3	2.4

Source: See Table 2.

Table 4.2 Own-children estimates of the age specific fertility rates for urban areas of Iran, 1972 to 2000, 1986, 1996 Censuses and the IDHS 2000

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
1986 census								
1972	132.2	241.1	234.1	194.5	136.8	65.2	17.9	5.1
1973	130.3	238.9	228.6	190.1	131.7	64.5	17.2	5.0
1974	131.4	237.3	225.3	187.9	131.1	63.6	17.2	5.0
1975	130.7	235.2	219.0	179.3	121.7	59.9	15.2	4.8
1976	129.6	240.7	226.0	183.9	126.9	62.2	16.5	4.9
1977	124.2	239.8	230.9	186.1	130.1	62.5	17.4	5.0
1978	122.7	238.9	233.5	185.9	132.5	61.7	16.8	5.0
1979	127.9	255.1	249.6	199.7	139.7	65.5	17.9	5.3
1980	145.8	275.5	272.1	218.0	152.2	68.4	18.8	5.8
1981	149.1	276.0	268.2	215.8	150.8	66.8	18.3	5.7
1982	146.9	273.8	265.2	219.9	151.5	70.3	18.3	5.7
1983	143.8	269.4	263.7	219.4	150.8	71.3	17.9	5.7
1984	142.6	270.2	267.2	227.6	157.0	77.8	18.6	5.8
1985	128.4	246.6	246.0	210.3	145.6	73.9	17.2	5.3
1986	117.6	222.7	220.9	189.3	136.3	69.6	17.8	4.9
1996 Census								
1982	131.4	260.2	265.4	217.8	148.1	70.2	14.7	5.5
1983	143.6	275.4	267.6	221.6	151.8	71.7	14.8	5.7
1984	146.7	281.3	275.9	232.4	160.7	77.5	16.2	6.0
1985	139.4	268.7	263.5	223.0	155.6	76.6	15.9	5.7
1986	133.1	254.0	249.2	210.9	150.5	74.1	16.8	5.4
1987	116.7	229.3	227.1	195.4	138.3	66.5	15.7	4.9
1988	105.3	217.9	218.9	184.8	132.4	64.0	15.5	4.7
1989	97.8	20.9.4	211.1	178.6	128.2	61.1	15.4	4.5
1990	89.7	196.3	195.6	164.3	117.1	56.0	14.4	4.2
1991	85.6	184.6	175.0	142.5	98.4	47.3	12.9	3.7
1992	76.6	171.5	159.8	124.6	81.8	38.5	10.5	3.3
1993	65.4	156.2	144.0	108.4	67.6	30.7	8.4	2.9
1994	56.6	144.0	132.8	94.5	55.8	24.5	7.3	2.6
1995	47.0	129.6	121.9	83.5	46.7	19.3	6.0	2.3
1996	37.4	116.3	114.4	76.5	40.4	15.7	5.2	2.0
IDHS 2000								
1986	147.4	277.7	272.1	234.8	171.3	81.2	14.4	6.0
1987	131.0	253.0	249.0	213.9	154.2	73.6	17.2	5.5
1988	110.7	231.6	234.2	203.2	154.9	72.5	13.5	5.1
1989	105.7	226.2	239.7	215.0	142.2	68.8	19.3	5.1
1990	95.5	213.7	221.6	190.8	136.0	65.1	14.5	4.7
1991	93.7	198.5	199.9	164.1	124.3	57.0	15.3	4.3
1992	84.2	187.1	178.7	147.7	99.8	50.8	13.2	3.8
1993	70.7	171.1	161.3	130.3	81.6	37.6	8.3	3.3
1994	67.4	157.5	152.4	111.8	66.5	32.6	8.5	3.0
1995	56.4	144.9	134.4	100.2	57.4	28.3	5.5	2.6
1996	46.9	127.8	127.8	83.4	44.9	20.2	4.5	2.3
1997	43.7	122.9	124.5	86.2	43.9	20.8	4.2	2.2
1998	34.7	111.9	125.8	86.3	40.8	14.0	2.3	2.1
1999	29.6	114.7	118.1	82.8	41.1	12.7	2.8	2.0
2000	29.3	101.8	124.9	82.6	38.8	13.7	2.1	2.0

Source: See Table 2.

Provincial fertility trends

Iran's population is heterogeneous in that it includes a number of ethnic groups. In addition to the majority Persian group, the main groups are Arab, Baluch, Kurd, Lore, Turk, and Turkmen. Three provinces in the northwest contain Turkish communities and two provinces in the west contain Kurdish communities. In the southern part of Iran, three provinces on the Persian Gulf contain a mixture of Arabs and Persians. Baluchi live in the province of Sistan-Baluchistan located in the South Eastern part of Iran, while Persians populate the central plateau of Iran. Although regional dialects are spoken, the official Farsi language is understood throughout the country. Around 99.5 per cent of the population is Muslim, the vast majority of whom (around 92 per cent) belong to the Shiite sect of Islam while the remaining eight per cent are Sunni. There is a strong overlap of ethnicity with religious sect as most of the non-Persian ethnic groups are mainly Sunni.

Until the early 1990s, Iran was administratively divided into 24 provinces (Ostans), but the number was increased to 26 in 1996, and to 28 in 2000⁶. Provinces vary markedly across various indices of socio-economic development (Mehryar and Gholipour 1995b; Mehryar and Tajdini 1998). In general, Sistan-Baluchistan, Kogiluyeh-Boyerahmad, Ilam, West Azarbaijan and Kurdistan are considered to have a low level of socio-economic development while Tehran, Semnan, Gilan, Mazandaran, Esfahan, and Yazd are among the highly developed provinces. As a centralised society, there is also a pronounced geographical development pattern in Iran. Provinces at the borders of the country are usually less well developed, while those in the central areas and particularly those close to the capital, Tehran, are well developed.

Thus, it is interesting to examine whether fertility trends and patterns at the national level differ from those by province over the last three decades. In what follows, we will discuss trends of total fertility rates as well as age specific fertility rates across provinces. Total fertility rates by province from 1972 to 2000 based on the 1986 and 1996 censuses, and the 2000 IDHS are presented in Tables 5.1, 5.2 and 5.3, respectively. Given that the tables present TFRs for 28 provinces for 30 years, it is difficult to focus on individual provinces by single year. Thus, we discuss only the general findings of provincial-fertility differences and similarities for the period.

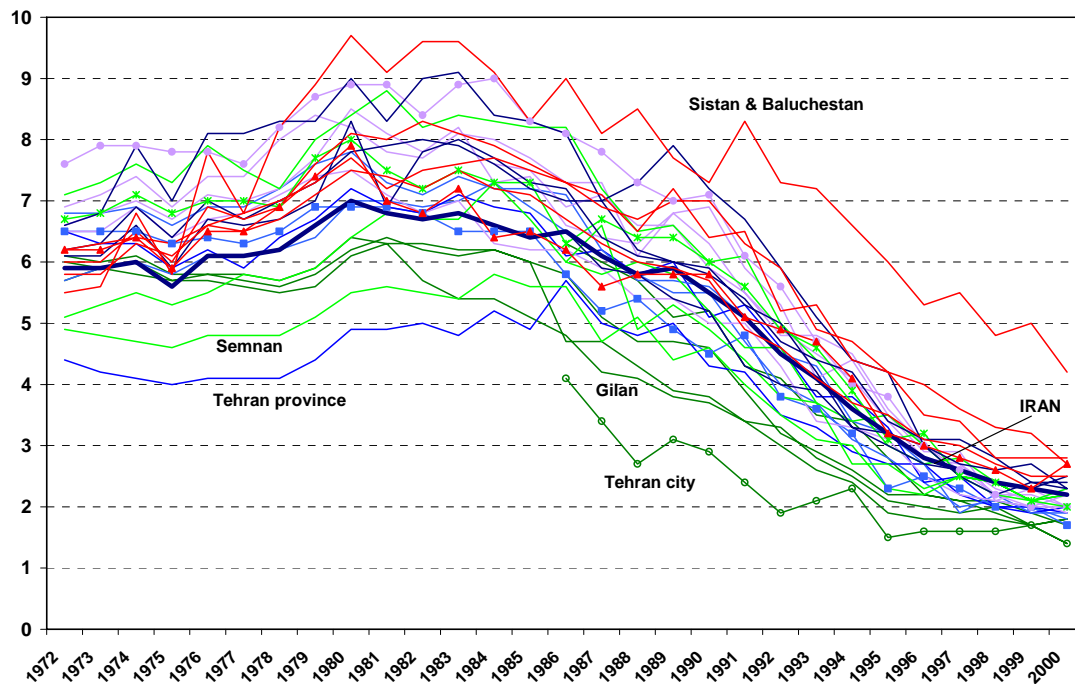
In general, the trends of fertility by province resemble those at the national level over the last three decades; a rise at the time of the 1979 Islamic Revolution, a turning point in the mid-1980s followed by a slow decline during the late 1980s and sharp decline during the 1990s. TFRs in all provinces started to decline in the mid-1980s, the exceptions being Gilan and East Azarbaijan where the transition had already been under way from 1982. The turning point in the mid-1980s is a national phenomenon and all provinces regardless of their level of development are included in this trend. In other words, demographic similarity has been observed across socio-economic diversity since the mid-1980s. There is some evidence that family planning services were being provided by the private sector and health network systems in the country from 1984. This might explain some of the decline, but the phenomenal shift from high fertility in 1984 in all provinces at the same time needs to be explained. It is also notable that fertility in all provinces declined even before the start of family planning program in 1988. Similar to the national trends, a sharp fall in fertility rates was observed in most provinces from 1989 onwards. The speed of the decline since 1989 is remarkable which may have been mainly due to the revival of the

⁶ The number of provinces increased to 30 in 2004 but the focus on this paper is on fertility trends in the provinces included in the 1986 and 1996 Censuses and the 2000 IDHS.

family planning program in 1988 and the associated endorsements of the program by prominent people in the country.

In addition, there were marked differences across provinces during the 1970s. A comparison of TFRs for provinces with those for the national average showed that women from most provinces displayed higher fertility, while only a few provinces had lower fertility than the national average in the 1970s and 1980s. However, due to the remarkable downward trend in fertility of most provinces since the late 1980s, provincial levels of fertility have converged to the national level by the end of the period (Figure 5), and the provincial-fertility gap during the 1970s and 1980s, has now been narrowed substantially (see also Abbasi-Shavazi 2000a).

Figure 5. Trends in the total fertility rate by province, Iran, 1972–2000



Source: See Table 2.

Tables 5.1, 5.2 and 5.3, as well as Figure 5, show the diversity of provinces in terms of the level of fertility during the 1972–2000 period. As can be seen, Sistan-Baluchistan stood out from other provinces with clearly the highest fertility from 1980 onwards (a startling 9.5 children per woman in the early 1980s), and the fertility decline there has continued to lag well behind the rest of the county. On the other hand, Tehran, Gilan and Semnan have displayed considerably lower fertility than the national average and all other provinces. Our analysis showed that Tehran City had the lowest fertility followed by Gilan, Mazandaran, Ghazvin, and Isfahan provinces while on the other hand, Sistan and Baluchistan province displayed the highest fertility followed by Hormozgan, Khoozistan, Kordestan, and West Azarbaijan as compared with all other provinces during the three-year period 1998–2000. The very low fertility experienced by Tehran City from the early 1990s onwards is an indication of the possibility of reaching very low fertility in Iran, and particularly in urban areas in the future.

Table 5.1. Total fertility rates by province, Iran, 1972–86, based on the 1986 Census

Province	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Iran	5.9	5.9	6.0	5.6	6.1	6.1	6.2	6.6	7.0	6.8	6.7	6.8	7.0	6.3	6.2
Ardebil															
Azarbijan (East)	6.5	6.5	6.9	6.4	6.7	6.8	7.1	7.4	7.5	7.1	6.8	7.0	6.9	6.3	5.8
Azarbijan (West)	6.2	6.2	6.4	5.9	6.5	6.5	6.9	7.4	7.9	7.0	6.8	7.2	6.8	6.2	5.4
Booshehr	6.1	6.1	6.6	5.9	6.7	6.6	6.7	7.0	8.3	6.9	7.8	8.0	8.0	6.9	6.8
Chaharmahal & Bakhtiari	7.1	7.3	7.6	7.3	7.9	7.5	7.2	8.0	8.4	8.8	8.2	8.4	9.2	8.2	7.2
Esfahan	5.7	5.9	5.8	5.7	5.8	5.8	5.7	5.9	6.4	6.3	6.3	6.2	6.3	5.9	5.4
Fars	5.7	5.9	6.0	5.8	6.1	6.1	6.2	6.4	7.0	7.0	6.9	7.0	7.4	6.5	6.1
Gilan	6.0	5.9	6.0	5.7	5.7	5.6	5.5	5.6	6.1	6.3	5.7	5.4	5.6	5.0	4.4
Hamadan	6.8	6.8	6.9	6.6	6.9	6.9	7.2	7.6	7.8	7.3	7.1	7.4	7.9	7.5	6.9
Hormouzan	6.0	6.0	6.5	6.0	6.9	6.7	6.9	7.6	8.1	8.0	8.3	8.1	8.9	7.2	7.1
Ilam	7.6	7.9	7.9	7.8	7.8	7.6	8.2	8.7	8.9	8.9	8.4	8.9	10.1	8.5	7.1
Kerman	6.2	6.3	6.9	6.4	7.0	6.7	7.0	7.3	7.8	7.9	8.0	7.9	8.2	7.0	6.5
Kermanshah	6.5	6.3	6.3	5.9	6.2	5.9	6.4	6.7	7.2	6.9	6.8	7.1	7.4	6.7	6.1
Khoozestan	6.2	6.3	6.4	6.3	6.6	6.8	7.0	7.3	7.7	7.2	7.5	7.6	8.1	7.3	6.9
Khorasan	5.8	5.8	6.3	6.1	6.6	6.5	6.7	7.1	7.5	7.4	7.2	7.5	7.7	7.1	6.4
Kohgiluyeh & Boyeirahmad	6.6	6.8	7.9	7.0	8.1	8.1	8.3	8.3	9.0	8.3	9.0	9.1	9.8	8.1	8.3
Kordestan	6.6	6.8	7.0	6.7	7.1	7.0	7.2	7.7	8.5	8.1	7.8	8.2	8.3	7.5	6.7
Lorestan	6.9	7.1	7.4	6.9	7.4	7.4	8.0	8.4	8.2	7.8	7.7	8.1	8.5	7.4	6.6
Markazi	6.5	6.5	6.5	6.3	6.4	6.3	6.5	6.9	6.9	6.9	6.8	6.5	6.7	6.3	5.7
Mazandaran	6.1	6.0	6.1	5.8	5.8	5.7	5.6	5.8	6.2	6.4	6.2	6.1	6.3	5.7	4.9
Qom															
Semnan	4.9	4.8	4.7	4.6	4.8	4.8	4.8	5.1	5.5	5.6	5.5	5.4	5.6	5.2	4.4
Sistan & Baloochistan	5.5	5.6	6.8	5.8	7.8	6.8	8.2	8.9	9.7	9.1	9.6	9.6	10.0	7.9	6.7
Tehran	4.4	4.2	4.1	4.0	4.1	4.1	4.1	4.4	4.9	4.9	5.0	4.8	4.8	4.5	4.3
Yazd	5.1	5.3	5.5	5.3	5.5	5.8	5.7	5.9	6.4	6.8	6.7	6.7	7.0	6.3	5.2
Zanjan	6.7	6.8	7.1	6.8	7.0	7.0	6.9	7.7	8.0	7.5	7.2	7.5	7.9	7.4	6.7

Source: See Table 2.

Table 5.2. Total fertility rates by province, Iran, 1982–96, based on the 1996 Census

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Iran	6.1	6.3	6.6	6.4	6.2	5.8	5.5	5.3	5.3	4.9	4.3	3.8	3.4	2.9	2.5
Ardebil	6.8	7.5	7.6	7.5	7.7	7.1	6.9	6.4	6.9	6.3	5.3	4.4	4.2	3.3	2.9
Azarbijan (East)	5.9	6.2	6.3	6.2	6.0	5.6	5.2	4.9	4.5	4.2	3.5	3.2	2.8	2.3	2.0
Azarbijan (West)	6.0	6.4	6.4	6.5	6.3	6.2	6.0	5.8	5.4	5.1	4.7	4.3	3.7	3.0	2.6
Booshehr	6.9	7.3	7.7	7.3	7.2	6.6	6.1	6.2	5.9	5.5	4.8	4.1	3.5	3.0	2.6
Chaharmahal & Bakhtiari	7.5	7.7	8.3	8.2	8.1	7.2	7.1	6.8	6.3	6.0	5.3	4.6	3.8	3.1	2.6
Esfahan	5.9	5.9	6.2	6.0	5.7	5.1	4.8	4.7	4.3	3.7	3.2	2.8	2.4	2.1	1.9
Fars	6.5	6.8	7.3	6.9	6.8	6.1	5.9	5.7	5.1	4.8	4.1	3.5	3.0	2.6	2.3
Gilan	5.3	5.2	5.4	5.1	4.9	4.4	4.1	3.7	3.8	3.5	3.2	2.7	2.3	2.0	1.8
Hamadan	6.4	6.7	7.2	7.2	7.1	6.5	6.2	5.9	5.6	5.2	4.5	3.8	3.3	2.8	2.5
Hormouzan	7.4	7.5	7.9	7.6	7.7	7.3	7.2	7.0	6.8	6.5	6.0	5.3	4.6	3.8	3.3
Ilam	7.7	8.2	9.0	8.3	8.3	8.0	7.5	7.2	6.9	6.3	5.5	4.7	4.1	3.3	2.8
Kerman	7.1	7.3	7.6	7.2	7.3	6.7	6.5	6.1	5.8	5.4	4.8	4.2	3.8	3.1	2.7
Kermanshah	6.1	6.6	6.9	6.8	6.6	6.0	5.8	5.6	5.3	4.9	4.3	3.7	3.4	2.9	2.5
Khoozestan	6.9	7.3	7.7	7.5	7.5	6.9	6.6	6.6	6.0	5.8	5.2	4.8	4.2	3.5	2.9
Khorasan	6.5	7.0	7.2	7.1	7.1	6.5	6.4	6.1	5.7	5.1	4.6	4.1	3.7	3.2	2.9
Kohgiluyeh & Boyeirahmad	7.8	8.0	8.4	8.3	8.8	7.9	8.1	8.0	7.2	6.8	5.9	5.3	4.6	3.6	3.1
Kordestan	6.8	6.8	7.3	7.4	7.6	7.2	7.3	7.2	6.5	6.0	5.2	4.8	4.4	3.6	2.9
Lorestan	7.2	7.6	8.0	7.7	7.7	7.2	6.9	6.6	6.2	6.1	5.2	4.4	3.9	3.2	2.6
Markazi	6.1	6.2	6.5	6.5	6.4	5.7	5.6	5.2	4.7	4.4	3.8	3.3	2.9	2.5	2.2
Mazandaran	5.9	6.0	6.2	6.0	5.7	5.1	4.8	4.7	4.4	4.1	3.5	3.1	2.6	2.3	2.1
Qom	6.5	6.2	6.8	6.4	6.3	5.7	5.5	5.4	5.0	4.4	3.9	3.4	3.1	2.7	2.5
Semnan	5.4	5.5	5.8	5.6	5.5	4.7	4.7	4.5	4.0	3.7	3.2	2.9	2.6	2.2	2.0
Sistan & Baloochistan	7.9	8.4	9.1	8.3	9.6	8.2	9.0	8.2	7.8	8.2	7.1	6.6	6.0	4.6	3.4
Tehran	5.1	5.0	5.2	4.9	4.6	4.2	3.9	3.8	3.5	3.0	2.7	2.3	2.2	2.0	1.8
Yazd	6.6	6.9	7.3	6.7	6.4	5.8	5.4	5.4	4.7	4.1	3.8	3.3	2.8	2.5	2.3
Zanjan	6.8	6.8	7.3	7.3	7.2	7.0	6.6	6.6	6.0	5.6	5.0	4.3	3.8	3.1	2.6

Source: See Table 2.

Table 5.3. Total fertility rates by province, Iran, 1986–2000, based on the IDHS 2000

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Iran															
Ardebil	6.9	7.1	6.6	6.6	5.9	5.5	4.9	4.5	4.1	3.4	2.8	2.7	2.2	2.2	2.0
Azarbijan (East)	6.2	5.9	5.4	5.4	5.0	5.0	4.3	3.4	3.3	3.1	2.5	2.2	2.1	2.0	2.2
Azarbijan (West)	6.2	5.6	5.8	5.8	5.8	5.1	4.9	4.7	4.1	3.2	3.0	2.8	2.6	2.3	2.7
Booshehr	7.2	6.4	6.1	6.0	5.9	5.3	5.0	4.2	3.3	3.2	3.0	2.5	2.2	2.4	2.3
Chaharmahal & Bakhtiari	8.2	7.2	6.5	6.6	6.0	6.1	5.0	4.4	3.7	3.0	2.7	2.8	2.4	2.1	2.2
Esfahan	5.8	5.1	4.7	4.7	4.6	3.9	3.2	2.9	2.6	2.2	2.2	2.1	2.1	1.9	1.7
Fars	6.5	6.1	5.8	5.5	5.5	4.7	4.0	3.7	3.1	2.8	2.4	2.0	2.1	2.0	1.8
Ghazvin	6.3	6.0	5.7	5.1	5.2	4.3	4.1	3.5	3.4	2.8	2.2	2.1	1.9	1.7	1.8
Gilan	4.8	4.2	4.1	3.8	3.7	3.4	3.3	2.8	2.5	2.1	2.0	1.9	2.0	1.7	1.4
Golestan	6.0	5.8	6.0	5.8	5.2	4.6	4.6	3.7	3.4	3.5	3.0	2.5	2.4	2.1	2.3
Hamadan	7.1	6.2	5.7	5.7	5.6	5.1	4.5	4.3	3.4	3.2	2.7	1.9	2.2	1.9	1.9
Hormouzgan	7.3	6.9	6.7	7.0	7.0	6.3	5.9	4.9	4.7	4.2	4.0	3.6	3.3	3.2	2.7
Ilam	8.1	7.8	7.3	7.0	7.1	6.1	5.6	4.7	4.0	3.8	3.0	2.6	2.2	2.0	2.0
Kerman	7.0	7.0	6.2	6.0	5.8	5.4	4.7	4.4	4.2	3.4	3.1	3.1	2.8	2.4	2.4
Kermanshah	6.1	6.2	5.8	6.0	5.1	5.3	4.6	3.8	3.8	3.3	2.4	2.5	2.0	2.0	1.9
Khoozistan	7.3	7.1	6.5	7.2	6.4	6.5	5.2	5.3	4.4	4.2	3.5	3.4	2.8	2.8	2.8
Khorasan	6.7	6.3	6.0	5.9	5.7	4.9	4.6	4.1	3.7	3.5	3.1	3.0	2.7	2.5	2.5
K & B	8.1	7.0	7.3	7.9	7.2	6.7	5.9	5.1	4.4	4.2	3.0	2.7	2.6	2.7	2.3
Kordestan	6.6	6.4	6.3	6.8	6.3	5.5	4.8	4.8	4.5	3.6	3.0	2.7	2.3	2.1	1.9
Lorestan	7.3	7.3	6.1	6.8	6.9	5.9	5.3	4.1	4.4	3.5	2.9	2.9	2.1	2.3	2.0
Markazi	5.8	5.2	5.4	4.9	4.5	4.8	3.8	3.6	3.2	2.3	2.5	2.3	2.0	2.0	1.7
Mazandaran	4.7	4.7	4.3	3.9	3.8	3.4	3.0	2.6	2.4	1.9	1.8	1.8	1.8	1.7	1.8
Qom	6.5	5.9	5.8	5.4	5.2	4.3	4.0	3.9	3.3	3.0	2.7	2.6	2.4	2.3	2.5
Semnan	5.6	4.7	5.1	4.4	4.6	4.0	3.5	3.1	3.0	2.3	2.2	2.5	2.2	2.1	2.2
S & B	9.0	8.1	8.5	7.7	7.3	8.3	7.3	7.2	6.6	6.0	5.3	5.5	4.8	5.0	4.2
Tehran without city	5.7	5.0	4.8	5.0	4.3	4.2	3.5	3.3	2.9	2.7	2.7	2.2	2.0	1.9	2.0
Yazd	6.0	6.6	4.9	5.3	4.9	4.4	3.8	3.7	2.7	2.7	2.3	2.5	2.4	2.3	2.2
Zanjan	6.3	6.7	6.4	6.4	6.0	5.6	4.9	4.6	3.9	3.1	3.2	2.5	2.4	2.1	2.0
Tehran city	4.1	3.4	2.7	3.1	2.9	2.4	1.9	2.1	2.3	1.5	1.6	1.6	1.6	1.7	1.4

Source: See Table 2.

To summarise, despite fertility variations among provinces during the period of the study, remarkable downward trends were clearly visible in all provinces. Despite the similarity in fertility trends, there are some differences among provinces. Those provinces with very high fertility declined sharply from 8.0 children per woman in the 1970s to around 3–4 children per woman in 1996. The speed of the decline in such low-fertility provinces as Gilan, Semnan, Tehran, Yazd and Mazandaran was less than that of the high-fertility provinces. The gap between the fertility of provinces with high fertility and the national average has narrowed substantially. As discussed, fertility decline and changes in reproductive patterns have become widespread in provinces of Iran since the mid-1980s.

Fertility differentials by province: age specific fertility rates, 1972–2000

Tables 6.1, 6.2, and 6.3, show ASFRs for all provinces during the periods 1975–1977, 1978–80, 1985–87, 1988–90, 1992–94, and 1998–2000. These figures provide a clear trend and understanding of the unique fertility transition across Iran before and after the Islamic revolution.

The first point to be made is that the general shape of the age specific fertility curves is very similar across provinces. Also, overtime, the fertility pattern changed in broadly the same way across provinces. Between 1975–77 and 1978–80, fertility rose in all provinces although the magnitude of the increase varied substantially among the provinces. The rise for such low fertility provinces as Gilan, Mazandaran and Isfahan was not significant, while such provinces as Booshehr, Ilam, West Azarbaijan, Kermanshah, Khoozistan, Khorasan, and Sistan and Baluchistan, characterized by a low level of development, experienced a considerable increase during the revolution. The increases in fertility were concentrated more at the peak ages of childbearing, 20–34 years.

In the ten-year period, 1978–80 to 1988–90, in the high fertility provinces, the rates at all ages tended to fall back to what they had been in 1975–77. On the other hand, the falls at each age were much more marked in this period for the low fertility provinces: Gilan, Markazi, Isfahan, and Mazandaran. The falls in these low fertility provinces tended to be concentrated in the peak ages of fertility, 20–34 years, rather than in the older ages, although falls are also evident for age group 15–19 in these provinces in this period.

In the next period, 1988–90 to 1992–94, large falls were evident in almost all provinces with more of a concentration at the older ages, as would be expected with the recommencement of the family planning program. In the final period, 1992–94 to 1998–2000, fertility at all ages continued to fall but this time with more emphasis on the two youngest age groups, 15–19 and 20–24. By the final period, age group 25–29 had been established as the peak age for fertility in almost all provinces. By the late 1990s, most provinces displayed relatively similar age patterns of fertility.

Figure 6. Age specific fertility rates by province, Iran, for five three-year periods from 1975 to 2000

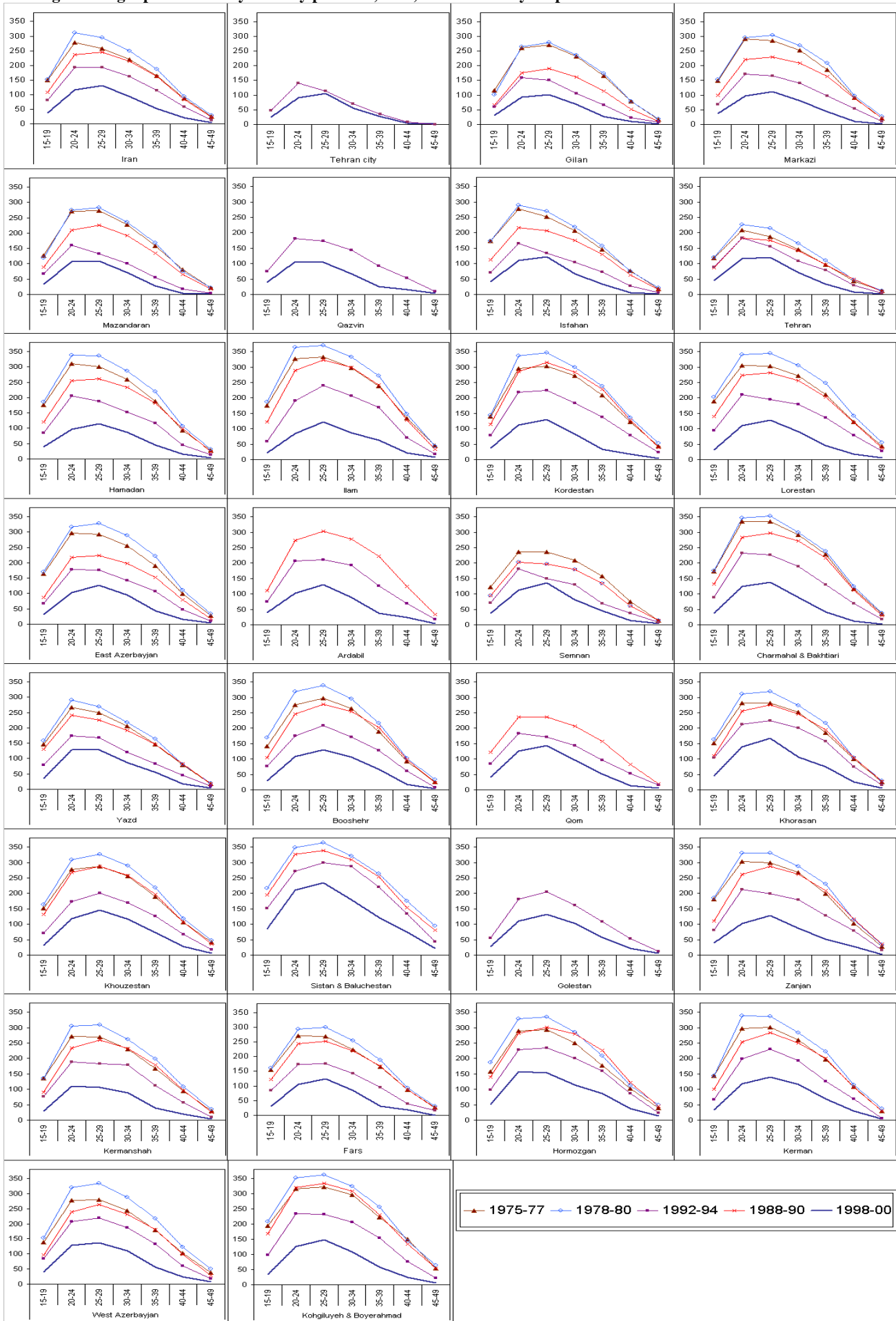


Table 6.1. Age specific fertility rates by province, Iran, 1975–77 and 1978–80, based on the 1986 Census

Province	1975–77								1978–80							
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR
Iran	150	278	258	221	165	87	25	5.9	152	311	294	250	186	94	29	6.6
Ardabil																
Azerbaijan E.	165	296	292	256	190	98	28	6.6	171	317	328	288	222	111	33	7.3
Azerbaijan W.	138	277	279	243	179	102	39	6.3	153	320	333	287	217	122	50	7.4
Booshehr	142	276	298	263	189	92	25	6.4	170	319	339	295	216	103	34	7.4
Charmahal & B.	173	335	334	291	229	116	35	7.6	176	346	352	300	239	124	38	7.9
Esfahan	173	277	252	207	146	76	18	5.7	173	290	270	218	157	75	21	6.0
Fars	154	271	268	224	166	87	26	6.0	161	293	299	254	188	92	30	6.6
Gilan	115	261	270	232	165	79	17	5.7	102	264	279	235	174	79	19	5.8
Hamadan	177	311	300	260	189	93	27	6.8	187	338	336	286	219	106	32	7.5
Hormozgan	158	289	293	250	177	102	40	6.5	187	329	334	286	208	113	49	7.5
Ilam	175	326	332	298	239	133	45	7.7	188	364	371	333	271	148	43	8.6
Kerman	143	298	302	260	196	108	30	6.7	143	339	336	284	222	115	37	7.4
Kermanshah	135	271	269	231	168	95	30	6.0	136	306	310	261	198	108	36	6.8
Khorasan	152	282	282	252	186	100	26	6.4	164	312	319	274	217	105	30	7.1
Khuzistan	151	278	288	256	189	106	41	6.5	163	310	326	290	218	118	47	7.4
Kohgiluyeh & B.	195	316	322	297	222	150	55	7.8	208	352	362	324	256	145	64	8.5
Kordistan	140	296	303	272	208	123	44	6.9	144	337	346	299	238	136	54	7.8
Loristan	189	305	303	272	211	122	43	7.2	202	340	344	306	248	142	56	8.2
Markazi	148	291	284	251	185	90	21	6.3	152	296	304	269	208	98	26	6.8
Mazandaran	126	272	274	228	159	81	21	5.8	118	276	283	235	168	76	22	5.9
Qom																
Semnan	122	236	236	208	157	75	13	5.2	94	202	197	179	133	62	13	4.4
Sistan & B.	206	349	353	325	263	170	78	8.7	194	326	338	309	254	154	80	8.3
Tehran	118	209	187	145	96	44	11	4.1	121	226	214	165	110	47	11	4.5
Yazd	146	267	249	205	146	79	17	5.5	158	290	270	218	165	82	20	6.0
Zanjan	181	304	299	268	199	103	28	6.9	186	330	331	287	231	114	33	7.6

Source: See Table 2.

Table 6.2. Age specific fertility rates by province, Iran, 1985–87 and 1988–90, based on the 1996 Census

Province	1985–87								1988–90							
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR
Iran	138	272	275	240	178	93	26	6.1	109	236	245	214	162	84	23	5.4
Ardabil	150	318	329	296	235	130	28	7.4	111	274	303	277	223	124	33	6.7
Azerbaijan E.	125	264	267	234	180	95	18	5.9	87	217	224	198	152	79	18	4.9
Azerbaijan W.	124	275	291	255	194	101	29	6.3	97	239	263	231	181	99	29	5.7
Booshehr	128	291	322	300	227	111	25	7.0	105	246	278	254	202	98	24	6.0
Charmahal & B.	174	339	346	311	242	124	31	7.8	131	284	298	272	216	112	29	6.7
Esfahan	159	264	245	207	150	75	15	5.6	113	217	207	175	129	63	15	4.6
Fars	161	290	293	260	196	99	24	6.6	121	243	251	218	168	86	24	5.6
Gilan	91	219	234	198	141	69	12	4.8	67	175	190	162	114	52	11	3.9
Hamadan	164	308	303	266	207	111	26	6.9	120	255	262	234	182	98	24	5.9
Hormozgan	164	308	324	299	236	129	43	7.5	139	282	301	280	227	123	45	7.0
Ilam	173	347	360	330	259	136	35	8.2	123	289	323	300	242	128	34	7.2
Kerman	129	302	322	288	222	120	31	7.1	100	254	283	251	200	107	29	6.1
Kermanshah	126	281	294	260	197	103	27	6.4	91	234	259	233	180	96	26	5.6
Khorasan	143	300	310	275	212	115	26	6.9	110	256	276	247	195	104	27	6.1
Khouzistan	165	308	322	289	221	118	35	7.3	132	267	288	258	196	106	35	6.4
Kohgiluyeh & B.	198	354	361	316	243	145	47	8.3	168	320	335	308	231	134	54	7.8
Kurdistan	144	316	326	294	230	130	38	7.4	114	285	315	283	228	127	40	7.0
Loristan	181	319	323	288	228	131	38	7.5	139	273	282	256	202	120	38	6.6
Markazi	134	268	271	246	195	104	19	6.2	99	221	230	209	163	88	21	5.2
Mazandaran	116	254	268	228	160	76	17	5.6	90	209	225	191	134	66	17	4.7
Qom	160	276	266	236	176	94	20	6.1	122	237	236	207	158	82	20	5.3
Semnan	122	236	236	208	157	75	13	5.2	94	202	197	179	133	62	13	4.4
Sistan & B.	206	349	353	325	263	170	78	8.7	194	326	338	309	254	154	80	8.3
Tehran	114	221	209	171	137	53	11	4.6	86	184	176	141	96	49	10	3.7
Yazd	174	296	271	228	175	95	18	6.3	131	242	225	191	146	84	17	5.2
Zanjan	146	304	314	283	224	128	32	7.2	110	262	288	262	208	117	36	6.4

Source: See Table 2.

Table 6.3. Age specific fertility rates by province, Iran, 1985–87 and 1988–90, based on the 2000 IDHS

	1992–94								1998–00							
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR
Iran	80	193	193	162	115	58	13	4.1	38	116	131	93	51	20	5	2.3
Ardabil	74	207	211	192	126	69	17	4.5	40	103	130	88	38	24	3	2.1
Azar E	68	178	176	143	107	47	9	3.6	31	102	127	95	43	16	3	2.1
Azar W	84	208	219	187	132	61	18	4.5	41	128	136	111	56	24	9	2.5
Booshehr	77	176	209	172	128	62	7	4.2	30	109	129	106	67	17	3	2.3
C & B	88	233	226	189	129	69	18	4.8	37	124	137	89	42	12	2	2.2
Esfahan	71	166	133	105	73	27	5	2.9	41	111	123	66	33	5	1	1.9
Fars	84	173	175	143	94	39	16	3.6	31	105	124	84	31	19	1	2.0
Ghazvin	75	181	174	144	92	54	10	3.7	40	106	104	67	26	16	3	1.8
Gilan	60	160	150	105	67	23	8	2.9	32	93	102	68	27	10	3	1.7
Golestan	55	181	205	162	109	54	11	3.9	27	111	131	103	58	21	5	2.3
Hamadan	86	206	189	153	117	46	13	4.0	39	96	115	87	45	15	4	2.0
Hormozgan	98	228	234	201	159	86	24	5.1	52	158	154	115	86	37	13	3.1
Ilam	60	191	240	207	169	70	17	4.8	21	85	122	86	63	22	8	2.0
Kerman	67	198	231	193	126	68	6	4.4	33	118	139	116	69	30	3	2.5
Kermanshah	77	189	184	179	113	58	9	4.0	30	110	106	89	39	20	4	2.0
Khuzista	104	212	224	200	157	75	16	4.9	45	140	167	107	74	26	6	2.8
Khorasan	70	174	201	169	126	67	17	4.1	31	119	146	116	73	27	6	2.6
K & B	99	235	232	207	155	76	23	5.1	35	126	148	108	59	25	6	2.5
Kordestan	79	218	225	183	138	79	24	4.7	38	113	129	82	34	18	3	2.1
Lorestan	95	210	195	180	136	78	27	4.6	31	110	127	91	46	18	5	2.1
Markazi	68	171	165	140	97	54	11	3.5	37	97	112	81	44	11	2	1.9
Mazandaran	67	160	132	101	55	17	3	2.7	34	107	109	71	28	3	1	1.8
Qom	84	183	172	144	96	53	15	3.7	41	126	143	96	52	13	5	2.4
Semnan	71	182	149	130	68	38	7	3.2	38	112	135	81	45	13	3	2.1
S & B	152	271	300	288	220	134	43	7.0	85	211	235	180	123	74	22	4.6
Tehran without city	89	184	156	109	78	29	3	3.2	46	117	121	70	33	8	1	2.0
Yazd	80	175	169	121	83	45	9	3.4	36	128	129	88	55	17	3	2.3
Zanjan	80	212	199	180	127	78	15	4.5	39	102	127	87	51	27	1	2.2
Tehran city	47	140	113	70	36	8	1	2.1	25	91	105	55	27	5	2	1.5

Source: See Table 2.

Rural and urban fertility by province

Our results also show that, in general, the trends of TFRs for both rural and urban areas of the provinces were identical to the national level. Appendix Tables 1.1, 1.2, 1.3 and 1.4 display the age-specific and total fertility rates for the selected periods based on the 1996 Census and the IDHS. Although, rural areas of most provinces had very high fertility by the early 1980s, their fertility fell sharply after the re-introduction of family planning program in 1989. The decline during the 1990s in rural areas was substantial and the age patterns of fertility in both areas of the same province are more-or-less similar.

Summary of fertility trends

While differences in levels of fertility are still evident across the country, these differences reflect those that already existed in the mid 1970s. However, the extent and speed of the fertility decline has been a nationwide phenomenon affecting all provinces, rural and urban in much the same way. The transition has been socially inclusive, that is, all provinces, regardless of their level of socio-economic development and their distance from the capital city, followed trends and patterns broadly similar to the national average across the periods. The remaining provinces with relatively high fertility tend to have small population numbers so that the effect of their high fertility on the national average is not very substantial. There is also a geographic pattern of fertility in Iran. Provinces located on the borders of the country are those that have had very high fertility, while provinces in the central part of Iran, particularly those close to the capital, Tehran, have displayed lower fertility. This provincial level pattern extends back at least to the mid-1970s.

The pattern and duration of these provincial differences suggest that their origins may be cultural (ethnicity and sect of religion). It seems likely that long-standing cultural differences between regions play a role in accounting for differences in the receptivity of contraceptive use and lower fertility but it is difficult to demonstrate such influences in conclusive or quantitative manner. The results of the Iran Fertility Transition Survey (Abbasi-Shavazi, McDonald and Hosseini-Chavoshi 2003) are also suggestive of the potentially important role played by cultural factors in explaining differences in fertility across provinces. Nevertheless, the ubiquitous nature of fertility change over the past three decades means that we also need to identify common features within Iranian society that have facilitated the rapid spread of reproductive changes across regional boundaries.

Attainment of below-replacement fertility

Signs of the attainment of below-replacement fertility in Iran appeared in the first-half of the 1990s. The four developed provinces of Gilan, Semnan, Tehran and Isfahan reached a TFR of below-replacement level by the period 1994–1996 (Abbasi-Shavazi 2001a). The IDHS results also revealed that, by the end of the 1990s, below-replacement fertility was no longer the exception as around 50 per cent of provinces had had that experience. Gilan recorded the lowest fertility in 1998–2000, 1.7 births per woman, and the TFRs in such provinces as Esfahan (1.9), Ghazvin (1.8), Mazandaran (1.8) and Markazi (1.9) were below 2.0. Lower fertility was also apparent among other provinces as, out of 28 provinces, a further 22 had TFRs between 2 and 3 children per woman. Only two provinces, Hormozgan (3.1) and Sistan & Baluchistan (4.6) had TFRs above 3.0 (Table 6.3). In Tehran City, the fertility rate was as low as 1.5. By the late 1990s, the low fertility pattern was not only characteristic of highly developed provinces or urban areas but was also evident in some, more remote rural areas. Our results show that the TFRs were below 2.0 in the urban parts of 14 provinces while 13 provinces had urban TFRs between 2.0 and 3.0. TFR remained high (4.1) in only the urban

areas of Sistan and Baluchistan (Appendix Table 1.4). Similarly, in rural areas, four provinces had TFRs below 2.0 while 19 provinces had TFRs between 2.0 and 3.0. Only 4 provinces had TFRs in their rural areas that were above 3.0 (Appendix Table 1.2). The TFR for Iran as a whole was 2.2 during the same period, 1998–2000 and 2.0 in the year 2000.

These results are consistent with the findings of the Population Growth Estimation Survey (PGES) conducted in 1998 (Statistical Centre of Iran 1999). The PGES classified the provinces of Iran into five regions according to their mortality and fertility levels. The first region includes those provinces with the lowest fertility and mortality while the fifth region consists of those provinces with the highest levels of fertility and mortality. The five regions correspond closely to a classification by level of development, from highest to lowest. According to the 1998 PGES, the TFR for Iran as a whole was 2.06, while the TFRs in urban and rural areas were recorded as 1.88 and 2.39, respectively. Of the five regions included in the survey, three had replacement level fertility or below. The least developed regions, Regions 4 and 5, had TFRs of 2.4 and 2.9 (Table 7).

Table 7. Total fertility rates for different regions, Iran, 1998

Region ¹	Total	Urban	Rural
<i>Iran</i>	<i>2.06</i>	<i>1.88</i>	<i>2.39</i>
Region 1	1.68	1.61	1.97
Region 2	1.88	1.81	2.02
Region 3	2.16	1.97	2.42
Region 4	2.41	2.14	2.80
Region 5	2.91	2.68	3.14

Note: 1) Region 1 includes the provinces of Tehran and Gilan. Region 2 includes the province of East Azarbayjan, Ghom, Isfahan, Mazandaran, Yazd, Markazi, Semnan and Golestan. Provinces included in Region 3 were Kermanshah, West Azarbayjan, Fars, Kerman, Khorasan, Zanjan, Ardabil, Hamadan and Ghazvin. Region 4 consists of Ilam, Chaharmahal Bakhtiari, Khozestan, Hormozgan, Lorestan and Booshehr provinces. Region 5 comprises of the provinces of Kordestan, Kohgiluyeh and Sistan and Baluchistan.

Source: Statistical Centre of Iran, 1999.

Number of births and the distribution of births by birth order

Registration statistics show that the number of births in Iran peaked in 1980, declined slightly during the period, 1981–1985, and continued to decline afterwards (Civil Registration Organization 2001; Ladier Fouladi 1997).

The changing distribution of women according to the number of their births provides useful insight into the fertility decline. Table 8 presents the percentage distribution of women aged 15–49 years by birth order for rural and urban areas in 1976 and 2000. It is apparent that the percentage with five or more births has drastically reduced from around 47.0 per cent in 1976 to around 30.0 per cent in 2000. The fall in the proportion of women with high parity has occurred in both rural and urban areas, although the percentage with five or more births in rural areas (38.0 per cent) was significantly higher than that in urban areas (25.0 per cent). As a result of the reduction of higher order births, there has been a sharp increase in the percentages of women with 1 and 2 births, and to some extent in the percentages of those with 3 and 4 births. In 2000, slightly more than one-third of women had one or two births. While the measures shown in Table 8 may be affected by shifts in the age structure of women within the age range 15–49 years, the movements observed are very large.

Table 8. Percentage distribution of women aged 15–49 years by birth order, Iran, rural and urban areas, 1976 and 2000

<i>Birth Order</i>	<i>Iran Fertility Survey 1976</i>			<i>IDHS 2000</i>		
	<i>Total</i>	<i>Urban</i>	<i>Rural</i>	<i>Total</i>	<i>Urban</i>	<i>Rural</i>
0	9.5	9.2	9.8	11.7	11.2	12.6
1–2	22.8	27.2	18.3	34.3	37.1	29.1
3–4	21.0	22.9	19.2	24.4	26.4	20.3
5+	46.7	40.7	52.7	29.6	25.3	38.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Agha, 1985; Figures for 2000 were calculated based on the data from the Iran Demographic and Health Survey, 2000.

The future of fertility in Iran

The main task of this paper has been to analyse fertility levels and trends over the last three decades. We have shown that fertility has declined sharply in Iran as a whole, and that rural and urban areas as well as all provinces have followed similar trends. We now turn to the question of plausible directions for the future of Iranian fertility. Will fertility in Iran rise again in the near future, will it level off at the current level, or will it decline further?

In what follows, we argue that Iran will experience slight fertility decline during the current decade before it levels off in the future. Necessarily the speed of the decline will be very slow as compared to the past decades. We will also speculate about the possibility of rising fertility in the future.

1. Continuing fertility decline

Several reasons justify further fertility decline in Iran during the current decade, 2000–2010. First, as discussed earlier, provincial as well as rural and urban differences in fertility are still evident in Iran. In the majority of provinces, the fertility level at the end of the 1990s was between 2.0 and 3.0. We can expect that fertility will continue to fall in this large group of provinces that have middle-range fertility at least to levels around 2.0 but even to levels below 2.0. This will be the main driving force for lower fertility in the country as a whole in the current decade. The cultural (religion and ethnicity) and socio-economic (education, level of economic development) factors that explain relatively higher fertility in Sistan Baluchistan, Hormozgan, and Ilam will remain pertinent and so we can expect that fertility will remain higher in these provinces than in other provinces in the future. Nevertheless, fertility in these provinces has been falling as well and so we can expect some continued decline. This will also tend to lower fertility at the national level.

Second, the continued process of urbanisation is another reason that lower fertility can be expected in the future. According to the 1996 Census, around 60 percent of the population were living in urban areas and it has been estimated that, by 2020, around 75 per cent of the population will live in urban areas.

Third, the level of education is increasing rapidly. Children of all social classes, particularly the poor, have access to education, and the small educational differences in the society will be reduced further in the future. The level of education of young women has increased over the last two decades and the gap between male and female education has narrowed substantially (Abdollahyan 2004). This has resulted in increased gender equity within the household in Iran and women have the major role in fertility decision-making. Although the level of female employment is still low, given the ‘rising expectation’ for Iranian women (Shadi-Talab 2001),

it is likely that the level of women's labour force participation will increase in the future. Age at first marriage for women is also increasing significantly as a result of the increases in women's education. Doroudi-Ahi (2001) has shown that there is a sex imbalance in the marriage ages in Iran; that is, the number of women in the marriage ages is higher than that for men. This is due to the post-revolutionary baby boom by which the number of men in older cohorts who were born before the revolution is much smaller than the number of women of younger cohorts who are the babies of the early post-revolution years. Brides will be much less in demand as the cohort size rises and hence a lower proportion may marry or they will marry men more their own age. This will increase the age at marriage for women at least for the current decade.

For men in particular, as the decade progresses, the very large, post-revolutionary birth cohort will experience a highly competitive labour market. This will mean that they will need to invest even more in job searching and the building of their own human capital through education and work experience. It also means that their actual standard of living may fall below their aspirations. This process tends to delay family formation and will be another factor likely to contribute to lower fertility (Easterlin 1976).

The higher status of women in Iran will also tend have a negative effect on fertility in the future. This is in line with the 'gender equity' argument made by McDonald (2000), and supports Dyson's (2002) hypothesis that one of the main factor of the fall of fertility in developing countries is that 'women become more like men'. Shadi-Talab (2001) has also noted that "Iranian girls gradually practice democracy within the family, and patriarchal power is slowly diminishing. Although, attitude change is a very slow process, the interaction between education and changes in norms and value system is observable in the share of girls participation at universities from the most deprived provinces and far from their home town." Commenting on gender equality in Iran, Mir-Hosseini (2002: 95) expressed that 'the presidential elections of 1997 showed that no political tendency can ignore the new generation of women who have come of age during the life of the Islamic Republic and who are demanding equal opportunities and rights on all fronts. Women are now a force that must be reckoned with' (see also, Kian-Thiebaut 2002: 56–73).

Fourth, as Caldwell, Caldwell and McDonald (2000) have argued, the contributions of governments to population control in Asian countries have been very important. The very large, post-revolutionary baby boom will itself start having children in the 2000–2010 decade and, even with low fertility, this will lead to a considerable increase in the number of births compared to recent years. Because of this 'echo effect', the decade has been described as "the decade of population crisis" [*daha-e bohran-e jamiyyat*] in Iran. The Iranian Government has indicated its determination to limit the number of births in this decade. All responsible government departments and institutions, as well as NGO's are committed to this policy. Numerous brochures and pamphlets have been distributed in family planning departments. A two-child policy [*two is enough*] is advertised everywhere; in bus stops, public spaces, parks, cinemas, and even on children's toys and chocolate boxes! Population and family planning is being taught as a compulsory unit to all university students. All the efforts are concentrated on the improvement of health, the expansion of reproductive health services, as well as the reduction of fertility in rural areas and the provinces with high fertility. These programs will not only affect the attitudes of childbearing women, but also will shape the fertility attitudes and behavior of the young generations.

The results of qualitative research on fertility behavior of women in Yazd province (Abbasi Shavazi et al. 2002) as well as the results of the Iran Fertility Survey (Abbasi-Shavazi,

McDonald and Hosseini-Chavoshi 2003) have shown that most women who had a low level of education preferred to have only two or three children, and there was no difference between place of residence (rural and urban areas) as well as the economic status of the women. We have even found a strong preference for one child as an ideal among women in Gilan Province. This confirms that there has been widespread ideational shift towards a small family size norm.

Furthermore, the effectiveness of family planning methods is another factor supporting further fertility decline. According to the IDHS, the contraceptive prevalence rate was around 72 per cent in 2000. There exists a small gap between the level of CPR in rural and urban areas. However, a significant proportion of pregnancies (around 33 per cent) were still unintended. Of these, around 18 per cent were unwanted and 15 percent were mistimed (Abbasi-Shavazi et al. 2004). With the improvement of the quality of the family planning services, the level of unwanted pregnancies is likely to be reduced, and thus, fertility will decline further. On the other hand, current patterns of behaviour mean that many Iranian women plan to complete their fertility at a relatively young age (mid 20s) at which ages, sterilisations are generally not available. This can mean an increased risk of having an unwanted pregnancy.

Finally, as Chesnais (2000: 126) argued, the impact of globalization on social life in other countries should not be ignored. No specific country or region can be seen in isolation from other countries in the exchange of ideas and culture today. However, Iranian society is less open to such influences than many other countries.

2. The possibility of rising fertility

Will Iran or any of its provinces experience an increase in their fertility in the future? Some believe that economic hardship will end soon and then people will compensate for their low fertility. This seems an overly optimistic assessment of the economic future of the coming young generations and, in any case, what counts is economic status relative to economic aspirations and there is lots of evidence to suggest that aspirations of young people are running well ahead of the likelihood that they will achieve their aspirations.

The other proposition is that the low fertility that has been observed may be temporary. The reason is that fertility has fallen simultaneously at all ages. The low fertility of the older women may have been a response to past high fertility. However, it is possible that those now experiencing low fertility in their 20s, will in their thirties, have higher fertility than women who are now in their thirties. If this happens, there would be a tendency for the TFR to rise over time. This is described by demographers as a tempo effect. However, given the high level of education and the change of values for the young generation, it is unlikely that couples will change their fertility behaviour in the future. In addition, women of the post-revolutionary baby boom who will start their childbearing in the present decade have a smaller ideal family size, and thus, the proposed tempo effect may not be large. While increases in fertility have been observed in some highly industrialised countries since the mid 1980s (all Nordic countries, France, the United States) and these increases may have been due to a tempo effect, the increases have been small. At the same time, many other countries in the same category have not yet experienced a tempo effect although their fertility has been below replacement for many years (Germany, Japan, Southern Europe). Thus, the state of knowledge of the behaviour of populations subsequent to the attainment of below replacement fertility is still unpredictable. Germany's fertility has been below replacement for 35 years. Hence, tempo effects can be longer than a researcher's lifetime in their coming.

It may also be possible that, with the rapid fall of the fertility, the government will lose its interests in population control, or adopt a pronatalist policy in the future. Caldwell, Caldwell

and McDonald (2000) note that low levels of fertility in some developing countries have caused surprisingly little reaction outside academic circles. They state that one reason for the slow government reactions is “population momentum; the fact that age structures are still adjusting to the relatively new low fertility levels and in most cases will not fully adjust for decades”. Given that Iran is faced with the prospect of a “post-revolutionary baby boom”, no official policies are likely to be implemented with regard to low fertility. Thus, the possibility of Iran adopting pronatalist policies in the near future is unlikely.

The other reason why low fertility may not attract policy attention in the near future is the fact that not all provinces have experienced below-replacement fertility. Some provinces, particularly in rural areas, still have higher fertility than the national level. Besides, some government officials and experts believe that the current low level of fertility is due mainly to recent economic hardship, and thus fertility may rise again after this economic hardship is over.

Even if the government were to introduce a pronatalist policy, it may not affect people’s fertility decision making easily. Women who were interviewed in the Iran Fertility Transition Survey (Abbasi-Shavazi *et al.* 2003) indicated that they would not increase their fertility even if the government provided incentives to do so. Economic factors have been involved in the onset of fertility decline, but the small family size has become a norm in the society. The level of future fertility in Iran depends upon the decisions that will be made by the current and the next generation. If the coming generations come to the conclusion that having a small family size will disadvantage them, then they may decide to increase their fertility. However, given the experience of the advanced countries today, it is unlikely that the fertility will simply increase in the future. Once the small family size norms internalises, it is difficult to change it at least in the relatively short term.

Some may argue that with the presence of sex preference in the society, fertility is likely to remain high and/or will not decline further. Recent statistics have shown that sex preference, and particularly son preference, is no longer an issue in fertility decision-making. Women interviewed in the IDHS (Ministry of Health and Medical Education 2002) were asked about their attitudes on the sex of their next child. The majority of the women did not have any sex preference for their future births. Interestingly, among the women who had a sex preference, a higher proportion indicated that they would prefer a girl to a boy. This is counter to the generally held view that son preference is one of the factors of high fertility in developing countries in general, and Asian countries in particular.

On balance, the above discussion indicates that our view is that fertility in Iran is likely to continue to fall in the present decade and is likely to remain low for the foreseeable future.

Summary and discussion

Fertility trends in Iran over the last three decades have been reviewed in this paper. The total fertility rate declined moderately during the early 1970s, before it rose in the years surrounding the revolution. The suspension of the family planning program contributed to the higher fertility in these years. The early years after the 1979 revolution were marked by the effectively pronatalist approach taken by the Islamic government, although no specific population policy was introduced. The pronatalist ideology seems to have had a small impact on fertility for a few years during the early 1980s, however, it also seems that couples started to control their fertility by the mid-1980s, well before the revival of the family planning program in 1989. Kaveh-Firouz and Abbasi-Shavazi (2004) have argued that implicit policies of the government such as the improvement of the health system, rural development and the

expansion of education throughout the country indirectly contributed to the onset of the fertility decline in the 1980s, and undoubtedly helped the success of family planning program in the 1990s.

A few observations can be made from this paper. First, the speed and age-specific pattern of the decline was a nationwide phenomenon. Second, the transition has been socially inclusive; that is all provinces, regardless of their level of socio-economic development and their distance from the capital city, closely followed trends and patterns that were similar to the national level. Third, the fertility transition in Iran occurred somewhat independently of official population policies. Fertility rose even before the stopping of the family planning program in 1979 and started to decline by the mid-1980s, before the inauguration of the official family planning program in 1988. Fertility rose from the early half of the 1970s to the early half of the 1980s by around 20–30 per cent, reaching a peak in 1984. Subsequently, it has fallen by around 70 per cent. Fertility has fallen to below replacement level in some provinces and to below 3.0 in almost all provinces. Despite the phenomenal decline of fertility in all provinces of Iran, some differentials remain across the country. Provinces located on the borders of the country have had relatively higher fertility while provinces in the central part of Iran, particularly those close to the capital, Tehran, have displayed lower fertility. This reflects both ethnic and religious differences and differing levels of socio-economic development. However, the few provinces with high fertility also have small population sizes so the effect of their high fertility on the national average has not been very substantial.

A number of important aspects of the Iranian fertility decline need to be dealt with in any comprehensive explanation. One is the fact that the decline began before the shift to an anti-natalist policy. Another is the pervasiveness of the fertility decline. Unlike the early stages of fertility transitions in many countries, there is no evidence of selective declines at the young and old extremes of the childbearing ages, but rather a decline across all age groups. Likewise, there is no evidence of diffusion of fertility decline from urban to rural areas, but rather a simultaneous and substantial decline across all geographic regions and in both urban and rural areas. Over time, there was a considerable degree of narrowing of urban-rural and regional differences both in fertility levels and in contraceptive prevalence rates.

While the early years of the revolution produced a psychology conducive to higher fertility, the effect was temporary as confirmed by the fact that fertility in Iran began to decline as early as 1984, well before the official inauguration of the family planning program in 1989. In the most advanced provinces (those with the lowest fertility then and now), there was no rise in fertility in the early years of the revolution suggesting that they were not influenced by the effectively pronatalist policies of the time.

The family planning program implemented in December 1989 has clearly made an important contribution to the continued fertility transition. By mobilizing various government organizations and the mass communication network, the program succeeded in diffusing ideas throughout the entire country about the value of small families and about methods of family limitation. The contraceptive prevalence rate (CPR) rose from 37 per cent in 1976 to around 72 per cent in the year 2000. The CPR in rural areas has increased from 20 per cent in 1976 to 67 per cent in 2000; the corresponding figures for urban areas are 54 per cent and around 78 per cent, respectively (Mehryar et al. 2001).

Why has the Iranian family planning program been so successful in such a short time? In what follows, we argue that the social and cultural context of the society along with certain government policies such as rural development, health improvement, and the rise of literacy

paved the way for a successful family planning program introduced by the Islamic government.

Government policies such as the extension of public education, particularly for girls, the establishment of the health network system, and the increase in access to electricity and safe water, transport and communication in remote areas of Iran all are likely to have had an indirect effect on fertility decline. High aspirations and investments by families in their children's schooling are also likely to have affected couples' fertility decision making. Iranian girls and women stay more years in school and university than was the case previously and this factor delays marriage and childbearing. The level of education for women at reproductive ages has increased substantially over the last four decades, and the education gap between rural and urban areas has narrowed considerably.

Furthermore, the official program introduced by the government in 1989 enjoyed the support of religious leaders. Some religious leaders were opposed to the first family planning program implemented before the revolution. However, Ayatollah Khomeini issued the first approval for the use of family planning methods in 1979. Despite this, the family planning program was suspended after the revolution, but studies have shown that family planning services were available through clinics during the early 1980s (Mehryar et al. 2001). The support of religious leaders in the late 1980s legitimised the family planning program, and the government provided family planning services to people with religious support.

The decline in infant mortality was also likely to be an important factor in the demand for fewer births and a smaller family size. The infant mortality rate declined from around 114 per 1000 live births in 1975 to 65 per 1000 in 1986, and 29 in 2000. The establishment of the health network system and its extension to rural and deprived areas of the country has been one of the key factors in reducing infant mortality (Abbasi-Shavazi *et al.* Fourthcoming). Urbanisation has also contributed to the decline as, by 1996, more than 60 per cent of the population, were living in urban areas.

However, there are indications that the impacts of government policy were only part of the story. Interestingly, in spite of an active campaign by a variety of official and unofficial organizations in favour of early marriage and reproduction as well as the presence of strong economic and social incentives for marrying early and having children, the age at first marriage increased during the early 1980s (Abbasi-Shavazi 2000b). Fertility also clearly began its fall prior to the introduction of the government's family planning program.

There is a strong case that economic hardship relative to material aspirations accelerated the fall in fertility in Iran from the mid-1980s. Economic pressure has been a major factor in the postponement of marriage. Although the revolution gave rise to increased economic aspirations through its promise that wealth would be more widely shared across the society, in reality, Iran experienced increased economic hardship after the revolution, particularly in the decade after the War with Iraq. Further, lack of economic progress has meant that the cost of living has risen dramatically in recent years. Young people tend to delay their marriage until they get a salaried job to be able to afford the high living costs. The increasing cost of rearing children, particularly the cost of education, is another important factor in family decision-making.

The weight of argument seems to be strongly in the direction that fertility in Iran will continue to fall in the present decade and, maybe, beyond this decade. It is likely that regional differences in fertility will continue to narrow and that the economic pressure on young people will increase as the very large, post-revolutionary cohorts attempt to enter the labour

market. As a result, they can be expected to spend more years in education and more time working before marriage. Migration to the lower-fertility, urban areas will continue. The demand for (and cost of) housing will also rise as this large generation attempts to form its own families. At the same time, there will be no fall in economic aspirations; indeed, aspirations are likely to continue to rise particularly through exposure to standards in other countries. This is highly likely to give rise to increases in age at marriage while, at the same time, the imbalance in the sexes caused by the large post-revolutionary cohort, will also lead to later marriage. Postponement of first births will be the outcome and this will draw down the fertility rate in the present decade. As age at marriage in Iran is presently low by world standards, there is considerable scope for increase. Thus, a shift towards later childbearing could extend over a long period of time keeping fertility low during those years. It is also likely that cost pressures will induce families to limit the number of their children to two and this has become government policy as well. The two-child norm is now widely advertised and promoted by government. A long period of below replacement fertility that corresponds with the years in which the very large post-revolutionary birth cohort passes through the childbearing years would be a favourable outcome for Iranian development as it would limit the expected rise in births ensuing from the baby-boom generation's echo effect, so long as this does not lead to social entrenchment of very low fertility (under 1.5 births per woman).

References:

- Abbasi-Shavazi, M. J. 2002a. Recent changes and the future of fertility in Iran, paper presented at the Expert Group Meeting on *Continuing Fertility Transition*, Population Division of the United Nations, March 13–18, New York.
- Abbasi-Shavazi, M. J. 2002b. 'Convergence of fertility behaviours in Iran: Provincial fertility levels, trends and patterns in Iran'. *Social Science Journal* (Persian). 18: 201–231.
- Abbasi-Shavazi, M. J. 2001a. Below replacement fertility in Iran: progress and prospects, paper presented at the workshop on *Low Fertility in Advanced Countries: Trends, Theories and Policies*, Tokyo, 21–23 March.
- Abbasi-Shavazi, M. J. 2001b. 'Fertility revolution in Iran'. *Population & Société*. 373: 1–4, INED, Paris.
- Abbasi-Shavazi, M. J. 2001c. 'Assessment of the own-children method of estimating fertility in Iran using 1986 and 1996 Censuses'. *Social Science Journal* (Persian): 16(2): 105–135.
- Abbasi-Shavazi, M. J. 2000a. National trends and social inclusion: Fertility trends and differentials in the Islamic Republic of Iran, paper presented at the IUSSP Conference on *Family Planning in the 21st Century*, Dhaka, 16–21 January.
- Abbasi-Shavazi, M. J. 2000b. Effects of marital fertility and nuptiality on fertility transition in the Islamic Republic of Iran. Working Papers in Demography, No. 84, The Australian National University, Canberra,.
- Abbasi-Shavazi, M. J. 1999. 'Advantages and problems of the own-children method of estimating fertility using census data'. *Journal of Population* (Persian), 29–30: 1–21.
- Abbasi-Shavazi, M.J., Hosseini-Chavoshi, M., Koosheshi, M., and Naghavi, M., Fourthcoming, Trends and emerging issues of health and mortality in the Islamic Republic of Iran, Proceeding of the Seminar on Emerging Issues of Health and Mortality, ESCAP, Bangkok, 27–29 September 2004.

- Abbasi-Shavazi, M. J., Hosseini-Chavoshi, M., Delavar, B., Aghajanian, A. and Mehryar, A. 2004, Unintended Pregnancies in the Islamic Republic of Iran: Levels and Correlates, *Asia-Pacific Population Journal*, 19 (1): 27–38.
- Abbasi-Shavazi, M. J., McDonald, P., and Hosseini Chavoshi, M. 2003, Changes in Family, Fertility Behavior and Attitudes in Iran, Working Paper in Demography No. 88, Australian National University.
- Abbasi-Shavazi, M. J., McDonald, P., Hosseini Chavoshi M. and Kaveh Firouz, Z. 2003. 'Study of womens' views on fertility behaviours using qualitative methods in Yazd province'. *Journal of Social Sciences* (Persian). 20: 169–203.
- Abbasi-Shavazi, M. J., Mehryar, A., Jones, G. and McDonald, P. 2002. 'Revolution, war and modernization: Population policy and fertility change in Iran'. *Journal of Population Research*. 19(1): 25–46.
- Abdollahyan, H. 2004. 'The Generations Gap in Contemporary Iran', *Journal of Welt Trends*. 44: 78–85.
- Agha, H. 1985. Study of fertility in Iran and its relation with socio-economic indicators based on the Iran Fertility Survey (Persian). Population Studies Center, University of Shiraz, Shiraz.
- Aghajanian, A. 1991. 'Population change in Iran, 1966–86: a stalled demographic transition?' *Population and Development Review*. 17: 703–715.
- Aghajanian, A. 1995. A new direction in population policy and family planning in the Islamic Republic of Iran. *Asia-Pacific Population Journal*. 10(1): 3–20.
- Aghajanian, A. and Mehryar, A. H. 1999. Fertility transition in the Islamic Republic of Iran: 1967–1996, *Asia-Pacific Population Journal*. 14(1): 21–42.
- Amani, M. 1996. An attempt on historical outlook of the trends of births and death rates and study of the stage of demographic transition in Iran (Persian), *Journal of Population*, Vol. 13–14: pp.71–83.
- Amani, M. 1970. Births and fertility in Iran, Division of Population Research (Persian), Institute for Social Studies and Research, University of Tehran, Tehran.
- Azimi, H. 1981. Population growth and its needs. Budget and Planning Organization (Persian), Department of Human Resources and Social Planning, Tehran.
- Caldwell, J. Caldwell, P. and McDonald, P. 2000. 'Consequences of low fertility and policy responses: a global perspective', in Korea Institute for Social Affairs and United Nations Population Fund, *Low Fertility and Policy Responses to Issues of Ageing and Welfare*. KIHASA, Seoul.
- Chesnais, J. C. 2000. 'Determinants of below-replacement fertility'. In United Nations Population Division. *Below Replacement Fertility*. Population Bulletin of the United Nations, New York, pp. 126–136.
- Cho, L. J. 1973. 'The own-children approach to fertility estimation: an elaboration'. in *International Population Conference*, Liege, International Union for the Scientific Study of Population, Liege, pp. 263–279.
- Cho, L. J. 1971. 'Preliminary estimates of fertility for Korea'. *Population Index*. 37: 3–8.
- Cho, L. J., Grabill, W. H. and Bogue, D. J. 1970. *Differential Current Fertility in the United States*, University of Chicago, Chicago.

- Cho, L. J., Retherford, R. D. and Choe, M. K. 1986. *The Own-Children Method of Fertility Estimation*. University of Hawaii Press, Honolulu.
- Civil Registration Organization. 2001. Vital statistics, Unpublished figures, Tehran, Iran.
- Doroudi Ahi, N. 2001. Marriage and sex imbalance in ages at marriage: Marriage squeeze in Iran, 1966–1996 (Persian). MA thesis, Department of Demography, Faculty of Social Sciences, University of Tehran, Tehran.
- Dugbaza, T. 1994. *Recent Trends and Differentials in Aboriginal and Torres Strait Islander Fertility, 1981–1991*. Australian Bureau of Statistics, Canberra.
- Dyson, T. 2002. On the future of human fertility in India, paper prepared for the Expert Group Meeting on Continuing the Fertility Transition, Population Division of the United Nations, New York, 11–14 March.
- Easterlin, R. 1976. 'The conflict between aspirations and resources'. *Population and Development Review*. 2(3–4), pp. 417–25.
- Grabill, W. H. and Cho, L. J. 1965. 'Methodology for the measurement of current fertility from population data on young children'. *Demography*. 2: 50–73.
- Jain, S. K. 1989. *Estimation of Aboriginal Fertility, 1971–86: An Application of the Own-children Method of Fertility Estimation*. Australian Bureau of Statistics, Canberra.
- Kaveh-Firouz, Z. and Abbasi-Shavazi, M.J. 2004. Population policy change and its impacts on fertility trends in Iran (Persian), Proceeding of the 1st Conference of the Population Association of Iran, Tehran, pp: 371–396.
- Keshtkar, M. 2000. 'Age heaping in the 1996 Census'. *Population* (Persian). 31–32(1): 101–118.
- Kian-Thiebaut, A. 2002. 'Women and the making of civil society in post-Islamist Iran'. In Eric Hooglund (ed.), *Twenty Years of Islamic Revolution: Political and Social Transition in Iran since 1979*, Syracuse University Press, Syracuse, New York: 56–73.
- Ladier-Fouladi, M. 1997. 'The fertility transition in Iran'. *Population: An English Selection*. 9: 191–214.
- Leete, R., and Alam, I. (1997). Population, Socio-Economic and Health Statistics of the Islamic Republic of Iran. Unpublished Report, New York: United Nations Population Fund.
- McDonald, P. 2000. 'Gender equity, social institutions and the future of fertility'. *Journal of Population Research*. 17(1): 1–16.
- Mehryar, A. H., Delavar, B., Hosseini, M., Farjadi, G. and Naghavi, M. 2001. Iranian miracle: how to raise contraceptive prevalence rate to above 70 % and cut TFR by two-thirds in less than a decade? Paper presented at the IUSSP Conference, Salvador, Brazil, 18–24 August.
- Mehryar, A. H. and Tajdini, F. 1998. Population and development in the Islamic Republic of Iran: a review of the main findings of the 1996 Census and other sources of data. Working Paper, Institute for Research on Planning and Development, Tehran.
- Mehryar, A. H. and Gholipour, R. 1995a. The rise and fall of fertility rates of Iranian population after the Islamic Revolution. Working Paper, Institute for Research on Planning and Development, Tehran.
- Mehryar, A. H. and Gholipour, R. 1995b. Provincial differences in fertility in Iran, 1976–1991. Working Paper, Tehran: Institute for Research on Planning and Development, Tehran.

- Ministry of Health and Medical Education. 2002. *Iran Demographic and Health Survey*, Tehran, Iran.
- Mir-Hosseini, Z. 2002. 'Religious modernists and the "women question"'. In In Eric Hooglund (Ed.), *Twenty Years of Islamic Revolution: Political and Social Transition in Iran Since 1979*, Syracuse University Press, Syracuse, New York: 74–95.
- Mirzaie, M. 1998. Swings in fertility limitations in Iran. Working Paper in Demography, No. 72, Australian National University, Canberra.
- Mirzaie, M., Koosheshi, M. and Naseri, M. B. 1996. Estimation and analysis of vital-demographic indicators of Iran, 1986 and 1991. Institute of Research and Social Studies, University of Tehran (Persian).
- Nourollahi, T. 2000. Estimation of the levels and trends of fertility in Iran using the own-children method, 1972–1996 (Persian), MA thesis, Department of Demography, University of Tehran.
- Padidar-Nia, H. 1977. Population dynamics in Iran: New estimates on mortality and fertility. PhD Thesis. Ann Arbor, Michigan, USA: University Microfilms International.
- Paydarfar, A. 1995, Effects of multi-family housing on marital fertility in Iran: Population policy implications, *Social Biology*, Vol 42(3–4): 214–225.
- Paydarfar, A. 1987, Marital fertility and family structure among the urban population of Iran, *Journal of Comparative Family Studies*, Vol 18(3): 389–402.
- Rashad, H. 2000. 'Demographic transition in Arab countries: A new perspective'. *Journal of Population Research*. 17(1): 81–101.
- Retherford, R. D. and Thapa, S. 1999. 'The trend of fertility in Nepal'. *Genus*. LV(3–4): 61–97.
- Retherford, R. D., Pejaranonda, C., Cho, L. J., Chamrathirong, A. and Arnold, F. 1979. *Own-children Estimates of Fertility for Thailand Based on the 1970 Census*. East-West Center, Honolulu.
- Retherford, R. D. and Cho, L. J. 1978. 'Age-parity-specific birth rates and birth probabilities from Census or survey data on own children'. *Population Studies*. 32: 567–81.
- Retherford, R. D., Cho, L. J. and Kim, N. I. 1984. 'Census-derived estimates of fertility by duration since first marriage in the Republic of Korea'. *Demography*. 21: 537–58.
- Rindfuss, R. R. 1976. 'Annual fertility rates from census data on own children: comparisons with vital statistics data for the United States'. *Demography*. 13: 235–49.
- Rindfuss, R. R. 1977. Methodological Difficulties Encountered in Using Own-children Data: Illustration from the United States. East-West Center, Honolulu.
- Rindfuss, R. R., and Sweet, J. A. 1977. *Postwar Fertility Trends and Differentials in the United States*. Academic Press, New York.
- Roudi, F. 2002. Iran's family planning program: Responding to a nation's need, Population References Bureau, Washington DC.
- Roudi, F. 1999. 'Iran's revolutionary approach to family planning'. *Population Today*, 27 (7): 4–5.
- Saraie, H. 1997, Demographic transition of Iran: A preliminary report (Persian), *Journal of Social Sciences*, 9 (Winter issue): 1-18.

Saraie, H. 1995. 'On the appropriateness of Whipple's index for evaluation of quality of population statistics in the Iranian population censuses'. *Population* (Persian). 13-14: 25-38.

Shadi-Talab, J. 2001. Iranian women: rising expectations. Paper presented at MESA, Florida, 27-28 November.

Statistical Center of Iran. 1999. Results of the Population Growth Estimation Survey, First Phase 1998-99. Tehran (Persian).

Zanjani, H. 1993. A Study of Fertility in Iran, Centre for Urban Studies and Research, Ministry of Housing and Urban Planning, Tehran (Persian).

Appendix Table 1.1. Own-children estimates of age specific fertility rates, 1982–84 and 1988–90, based on the 1996 Census, rural areas of Iran by province

Rural	1982–1984								1988–1990							
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR
Iran	166	320	328	290	217	114	28	7.3	121	276	303	277	218	118	34	6.7
Ardabil	169	329	345	305	233	129	27	7.7	107	286	337	317	255	145	39	7.4
Azerbaijan E.	157	314	319	285	215	108	22	7.1	98	265	297	276	219	118	28	6.5
Azerbaijan W.	139	298	312	280	206	106	35	0.0	102	275	320	294	237	134	40	0.0
Kermanshah	145	322	336	296	241	123	35	7.5	93	265	317	296	234	128	36	6.8
Booshehr	145	330	367	340	261	124	31	8.0	115	283	341	313	243	125	32	7.3
Charmahal & B.	203	367	365	325	243	139	31	8.4	146	324	346	314	255	139	37	7.8
Esfahan	197	327	314	269	200	103	20	7.1	127	258	262	234	183	94	22	5.9
Fars	199	354	363	325	246	128	30	8.2	137	301	328	298	234	127	37	7.3
Gilan	113	271	283	241	169	78	13	5.8	71	188	213	190	137	65	13	4.4
Hamadan	181	333	330	293	223	120	27	7.5	126	301	318	290	230	127	33	7.1
Hormozgan	189	342	351	304	240	131	42	8.0	155	316	348	327	257	144	57	8.0
Ilam	212	381	395	356	272	152	48	9.1	137	325	369	341	276	150	46	8.2
Kerman	159	336	356	323	246	139	34	8.0	120	288	327	306	251	137	40	7.3
Khorasan	153	316	330	297	227	125	24	7.4	113	288	328	303	246	132	34	7.2
Khouzistan	202	362	378	340	258	145	47	8.7	162	337	371	337	262	151	58	8.4
Kohgiluyeh & B.	210	340	342	300	238	140	41	8.1	178	347	367	324	251	150	62	8.4
Kurdistan	140	304	313	278	208	121	33	7.0	107	319	364	329	269	151	50	7.9
Loristan	214	356	354	320	256	149	49	8.5	159	305	340	308	250	154	51	7.8
Markazi	148	297	315	280	217	106	19	6.9	94	237	271	257	206	110	26	6.0
Mazandaran	132	290	308	257	184	86	18	6.4	96	224	249	218	155	78	21	5.2
Qom	198	319	303	264	188	96	18	6.9	132	260	261	225	167	89	20	5.8
Semnan	131	273	282	256	191	87	14	6.2	102	222	249	227	178	84	15	5.4
Sistan & B.	222	343	353	331	261	181	79	8.8	200	339	355	334	276	174	94	8.9
Tehran	168	300	288	245	180	87	20	6.4	134	249	241	209	160	84	21	5.5
Yazd	192	341	324	279	214	114	20	7.4	134	272	275	243	193	113	22	6.3
Zanjan	169	318	319	286	227	122	28	7.3	116	302	345	317	249	143	44	7.6

Source: See Table 2.

Appendix Table 1.2. Own-children estimates of age specific fertility rates, 1992–94 and 1998–00, based on the 2000 IDHS, rural areas of Iran by province

Rural	1992–94								1998–2000							
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR
Ardabil	74	207	211	192	126	69	17	4.5	40	103	130	88	38	24	3	2.1
Azar E	68	178	176	143	107	47	9	3.6	31	102	127	95	43	16	3	2.1
Azar W	84	208	219	187	132	61	18	4.5	41	128	136	111	56	24	9	2.5
Booshehr	77	176	209	172	128	62	7	4.2	30	109	129	106	67	17	3	2.3
C & B	94	254	268	223	165	87	15	5.5	49	143	150	111	50	16	3	2.6
Esfahan	78	167	149	139	117	37	3	3.4	47	113	125	76	37	9	1	2.0
Fars	92	182	198	167	126	56	27	4.2	35	118	139	90	39	26	2	2.2
Gilan	66	166	167	125	75	30	13	3.2	39	93	103	70	28	8	2	1.7
Ghazvin	75	181	174	144	92	54	10	3.7	40	106	104	67	26	16	3	1.8
Golesta	55	181	205	162	109	54	11	3.9	27	111	131	103	58	21	5	2.3
Hamadan	98	240	242	187	145	59	15	4.9	45	94	122	107	60	25	7	2.3
Hormozga	98	228	234	201	159	86	24	5.1	52	158	154	115	86	37	13	3.1
Ilam	60	191	240	207	169	70	17	4.8	21	85	122	86	63	22	8	2.0
Kerman	63	223	255	239	173	93	10	5.3	36	113	149	127	79	39	5	2.7
Kermanshah	62	203	206	225	138	73	10	4.6	36	117	115	114	52	28	6	2.3
Khorasan	66	215	240	191	181	104	22	5.1	38	130	160	135	99	42	13	3.1
Khoozistan	120	247	276	244	221	110	18	6.2	61	162	204	125	95	35	11	3.5
Kohgiloooyeh	99	235	232	207	155	76	23	5.1	35	126	148	108	59	25	6	2.5
Lorestan	95	210	195	180	136	78	27	4.6	31	110	127	91	46	18	5	2.1
Markazi	64	185	191	185	120	70	16	4.2	47	95	109	74	44	14	2	1.9
Mazandaran	72	166	141	117	71	21	5	3.0	40	105	107	66	32	3	2	1.8
Qom	84	183	172	144	96	53	15	3.7	41	126	143	96	52	13	5	2.4
Semnan	71	182	149	130	68	38	7	3.2	38	112	135	81	45	13	3	2.1
S & B	165	310	304	336	266	150	46	7.9	98	237	256	191	144	103	22	5.3
Tehran without city	89	184	156	109	78	29	3	3.2	46	117	121	70	33	8	1	2.0
Tehran city																
Yazd	80	175	169	121	83	45	9	3.4	36	128	129	88	55	17	3	2.3
Zanjan	80	212	199	180	127	78	15	4.5	39	102	127	87	51	27	1	2.2

Source: See Table 2.

Appendix Table 1.3. Own-children estimates of age specific fertility rates, 1982–84 and 1988–90, based on the 1996 Census, urban areas of Iran by province

Urban	1982–1984								1988–1990							
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR
Iran	141	272	270	224	154	73	15	5.7	98	208	208	176	126	60	15	4.5
Ardabil	169	319	319	269	193	103	19	7.0	110	249	257	225	175	92	24	5.7
Azerbaijan E.	136	267	256	214	152	71	12	5.5	80	192	189	155	112	55	12	4.0
Azerbaijan W.	69	258	245	200	144	74	18	5.0	92	130	186	169	121	65	18	3.9
Kermanshah	140	289	287	240	171	82	21	6.1	95	220	234	203	151	78	20	5.0
Booshehr	140	309	330	299	207	95	19	7.0	97	228	247	229	175	81	18	5.4
Charmahal & B.	167	333	332	285	202	103	20	7.2	114	245	254	228	171	82	21	5.6
Esfahan	172	281	255	204	140	64	12	5.6	108	205	192	159	113	53	13	4.2
Fars	162	289	283	240	163	81	16	6.2	112	213	212	182	132	63	17	4.7
Gilan	103	237	237	189	125	51	9	4.8	64	163	171	138	90	37	7	3.3
Hamadan	166	282	270	235	158	79	15	6.0	114	219	216	185	135	68	15	4.8
Hormozgan	168	321	321	296	206	96	28	7.2	120	248	254	226	189	92	24	5.8
Ilam	178	349	363	324	248	124	26	8.1	117	272	302	277	224	113	25	6.6
Kerman	130	318	330	282	206	99	19	6.9	85	233	256	222	166	83	18	5.3
Khorasan	153	304	301	256	186	95	18	6.6	108	237	245	211	159	82	20	5.3
Khouzistan	162	303	312	273	194	91	23	6.8	118	238	254	226	168	86	24	5.6
Kohgiluyeh & B.	195	358	368	316	224	115	26	8.0	156	291	303	263	201	110	39	6.8
Kurdistan	146	310	315	275	213	103	30	7.0	103	252	270	237	182	98	28	5.9
Loristan	183	318	313	274	201	104	28	7.1	125	242	249	225	171	95	29	5.7
Markazi	137	271	268	225	168	80	13	5.8	102	210	208	180	131	68	15	4.6
Mazandaran	117	259	265	219	145	65	13	5.4	83	192	197	160	106	47	11	4.0
Qom	178	299	286	244	179	91	18	6.5	121	236	233	205	157	82	20	5.3
Semnan	128	252	253	208	148	58	9	5.3	96	194	191	162	115	51	11	4.1
Sistan & B.	204	351	353	316	231	142	52	8.2	191	320	327	289	235	132	62	7.8
Tehran	126	240	226	182	116	51	10	4.7	77	172	166	132	86	36	8	3.4
Yazd	195	330	302	243	177	88	15	6.7	130	234	203	177	132	74	15	4.8
Zanjan	152	290	293	252	187	102	22	6.5	103	228	238	211	161	87	27	5.3

Source: See Table 2.

Appendix Table 1.4. Own-children estimates of age specific fertility rates, 1992–94 and 1998–00, based on the 2000 IDHS, urban areas of Iran by province

Urban	1992–1994								1998–2000							
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR
Adrabil	78	191	157	156	104	44	21	3.8	37	113	119	79	24	22	3	2.0
Azar E	55	139	128	94	67	20	6	2.5	22	87	110	75	35	7	4	1.7
Azar W	79	169	181	146	92	38	11	3.6	37	128	113	92	45	17	2	2.2
Booshehr	74	175	186	146	107	60	3	3.8	31	110	122	105	58	17	1	2.2
C & B	67	177	158	130	73	37	16	3.3	24	105	125	71	36	8	1	1.8
Esfahan	62	165	120	81	42	19	8	2.5	36	108	121	59	30	3	0	1.8
Fars	75	163	156	122	63	22	4	3.0	26	88	107	79	25	11	0	1.7
Ghazvin	80	172	144	110	67	41	7	3.1	34	107	106	68	18	14	0	1.7
Gilan	52	154	136	89	59	16	3	2.5	26	94	100	65	26	11	4	1.6
Golestan	48	152	165	130	68	33	11	3.0	24	106	129	89	40	16	2	2.0
Hamadan	86	206	189	153	117	46	13	4.0	39	96	115	87	45	15	4	2.3
Hormozgan	76	185	199	149	123	64	18	4.1	45	131	133	83	56	23	5	2.4
Ilam	55	174	225	176	146	56	17	4.2	18	82	122	73	41	5	0	1.7
Kerman	72	173	212	151	85	41	2	3.7	31	124	129	106	60	22	1	2.4
Kermanshah	94	178	166	141	92	42	7	3.6	23	104	98	67	29	14	1	1.7
Khoozestan	88	178	180	154	95	40	13	3.7	26	115	132	94	52	16	1	2.2
Khorasan	75	136	174	147	81	31	10	3.3	24	108	133	103	49	13	0	2.2
K & B	81	199	185	173	123	61	26	4.2	23	101	139	105	44	21	6	2.2
Kordestan	80	203	182	138	83	48	21	3.8	36	100	113	77	28	16	2	1.9
Lorestan	96	178	162	137	93	68	8	3.7	27	100	114	88	44	15	3	2.0
Markazi	74	160	150	114	79	32	4	3.1	28	104	115	86	43	9	1	1.9
Mazandaran	63	153	123	84	39	11	0	2.4	25	110	111	75	24	3	0	1.7
Qom	80	184	158	133	85	56	16	3.6	33	137	146	95	50	10	6	2.4
Semnan	75	172	132	92	52	20	5	2.7	30	112	132	68	37	8	0	1.9
S & B	141	235	297	254	178	114	38	6.3	73	188	215	170	109	49	22	4.1
Tehran without city	66	164	143	116	71	25	0	2.9	40	110	110	68	32	8	0	1.8
Tehran city	46	139	113	70	36	8	1	2.1	25	90	105	54	27	5	2	1.5
Yazd	78	175	157	112	72	38	8	3.2	41	133	150	99	52	14	4	2.5
Zanjan	63	175	145	125	69	58	12	3.2	28	87	118	85	35	23	1	1.9

Source: See Table 2.