

# The Path to Below Replacement Fertility in the Islamic Republic of Iran

*Recent statistics have shown that the majority of provinces in the Islamic Republic of Iran have experienced below replacement levels of fertility. A rise in age at marriage and declines in the progressions to the second and third order births associated with reduction in desired family size have contributed to low fertility in this country.*

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Low fertility has become an important area of demographic research as fertility in many countries has fallen to levels well below replacement. Advanced countries have experienced low fertility trends for decades (United Nations,

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2000), and some are experiencing lowest-low fertility (i.e. TFR below 1.3) (Kohler, Billari and Ortega, 2002; Caldwell, 2006). Less developed countries, by contrast, have recently experienced low fertility levels, and there no longer seem to be any barriers to most countries reaching replacement level and subsequently falling below that level. According to the United Nations, by 2000, around 44 per cent of the world population lived in countries where fertility had fallen below the replacement level. This proportion is expected to increase to 67 per cent by the year 2015 (United Nations, 2000). According to the United Nations median variant projections, approximately 80 per cent of the world's population is projected to live in countries with below-replacement fertility before mid-century (United Nations, 2002a). Several East and North-East, as well as North and Central Asian countries have attained below replacement in recent decades (Gubhaju and Moriki-Durand, 2003; Atoh, 2001; Hirschman, Chamrathirong and Guest, 1994; Knodel, Chamrathirong and Debavalya, 1987). However, countries have attained low fertility in different ways (Perelli-Harris, 2005) and thus, every country and region may have a unique experience in reaching low fertility. For instance, Hirschman, Chamrathirong and Guest (1994) have argued that the distinctive attributes of East Asian countries such as Hong Kong, China; Singapore; the Republic of Korea; and Taiwan Province of China in terms of rapid economic growth and Confucian cultural heritage would not make them a model for fertility decline in other countries in Asia.

The consequences of low fertility at both the macro- (national/country) and micro- (family/individual) levels also may differ according to the timing and the pathways by which low fertility is attained. Advanced countries today are now experiencing such demographic, social and economic consequences of low fertility as negative population growth and projected shortages of labour.

Although studies have focused on low fertility in recent years, theories of low fertility remain in the early stages of development. Social scientists have proposed different explanations for the fall of fertility to below-replacement level or to lowest-low fertility. Postponement of marriage and childbearing is one of the main factors pushing fertility in many advanced countries to the lowest end (Bongaarts and Feeney, 1998; Bongaarts, 2002). Post-modern materialistic views towards life and childbearing along with the second demographic transition (Lesthaeghe and Willems, 1999) and economic insecurity (Kohler, Billari and Ortega, 2002) have been mentioned as other factors leading to low fertility. The difficulties confronting women arising from coherence in the levels of gender equity in individual-oriented and family-oriented societies have also been proposed as one of the main forces driving fertility to a low level (McDonald, 2000b). However, given different pathways by which below-replacement is achieved (Perelli-Harris,

2005), studies should take into account the social context (McNicoll, 1980, 1985, 1994; Greenhalgh, 1988: 630) in analysing family-formation behaviour.

The Islamic Republic of Iran experienced a sharp fertility decline during the late 1980s and throughout the 1990s, and reached replacement-level fertility in 2000. In 1996, only four provinces displayed below-replacement fertility, but recent statistics have shown that this level of fertility is no longer exceptional. In 2003, the TFR in rural areas of the majority of provinces was below 2.1. The rapid fall of fertility as well as the attainment of such low levels of fertility in an Islamic context calls for attention.

The key instances of fertility change in this country have been: the onset of modest fertility decline, mainly in urban areas, in the early 1970s; a resurgence in fertility rates from 1976 to 1984; and the renewed onset of fertility decline since 1984 (Aghajanian and Mehryar, 1999; Abbasi-Shavazi, 2000, 2002a, 2002b; Mehryar, 2005). Those changes coincide rather neatly with three political periods: the later stages of the Shah's regime; the Islamic Revolution and the war against Iraq; and a subsequent period of renewed modernization and pragmatism. There appears, then, to be a broad relationship between dramatic political events and fertility trends. The obvious linkage would be the shifts in population policy that took place over the period: antinatalism and a government-sponsored family planning programme in the later stages of the Shah's regime; denunciation of family planning and encouragement of early marriage in the post-Revolutionary period; followed by a pragmatic return to antinatalism in the post-1988 period (Abbasi-Shavazi, Mehryar, Jones and McDonald, 2002).

This article aims to review the phenomenal fertility change which occurred in the Islamic Republic of Iran during the period 1972-2003 and to discuss the pathways by which the below replacement-level fertility have been achieved in this country. Mean age at first marriage and age at the first and last birth are analysed. Progression to second and third birth are also examined. Finally, the future prospects for fertility as well as their policy implications are discussed.

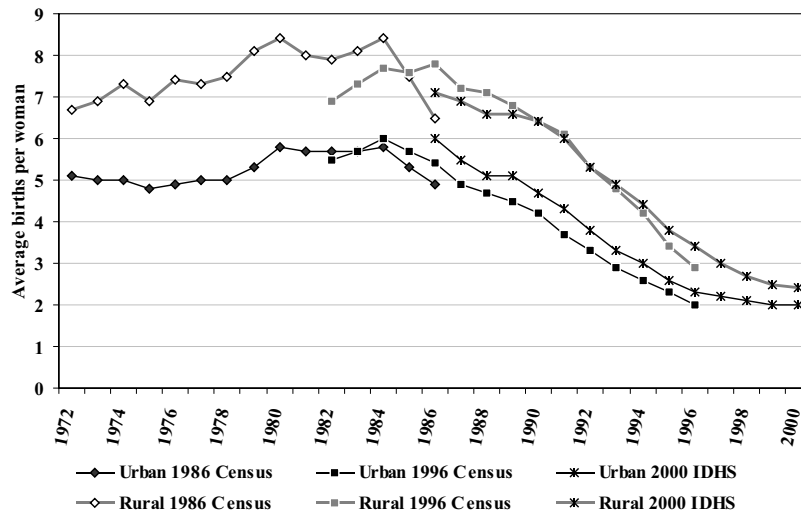
### **Fertility levels in the Islamic Republic of Iran: 1972–2000**

The fertility transition in the Islamic Republic of Iran has passed through different phases from 1972 to 2000. TFR decreased from around 7.7 in 1966 (Amani 1970, 1996) to around 6.5 in 1976 (Padidar Nia, 1977: 133-136). Then it rose again to 7.0 by the end of the 1970s during 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). 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 5.5 in 1988. The decline of fertility was slow until the Government population policy was reversed and a new family planning programme was officially inaugurated in 1989. The TFR fell sharply from that time, dropping from 5.5 in 1988 to around 2.8 in 1996, and then reached replacement level by 2000 (Abbasi-Shavazi and McDonald 2005, 2006).

Trends in TFR for rural and urban areas of the Islamic Republic of Iran from 1972 to 2000 are shown in figure 1. 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 Gholipour, 1995; Mirzaie 2005).

**Figure 1. Own-children estimates of total fertility rates for rural and urban areas of Iran (Islamic Republic of), 1972-2000**



Sources: All age-specific and total fertility rates at national, rural-urban and provincial levels in this article 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). Also see Abbasi-Shavazi and McDonald (2005, 2006) for further details.

Interestingly, the trends in fertility in both rural and urban areas during the 1980s and 1990s mirror those of the national level discussed earlier. The IDHS results showed that fertility continued to decline by the mid-1990s, although the trends in both rural and urban areas have 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, and recent statistics show that rural areas also attained replacement level in recent years. Fertility in rural areas declined from around 4.8 in 1993 to 2.7 in 1998 and 2.4 in 2000. Using Vital Horoscope Data (VHD) collected by health houses during 1993-2003, Naghavi and others (2005) demonstrated that the TFR in rural areas of Islamic Republic of Iran declined from 3.9 in 1993 to 2.4 in 1998 and 2.2 in 1999. The level remained stable at 2.0 from 2000 to 2003.

The fertility rates based on the IDHS are slightly higher than those obtained from the VHD. This may be because the reference date for the VHD is the Iranian calendar year, while that of the IDHS is the census year. For instance, the data for the year 2000 based on the IDHS refers to the births that occurred from October 1999 to September 2000, while those obtained from the VHD are based on the births that occurred from March 2000 to February 2001. Given the declining trend of fertility, it is likely that the difference between the results is due to lower fertility during the calendar year upon which the VHD is based. Another reason is that the IDHS covers all population of rural areas including mobile nomads and remote rural places – not under coverage of the health houses – while the data from the VHD is only based on the population of rural areas under the coverage of the health houses. Thus, it is possible that rural areas which are not under the coverage of the health houses experienced higher fertility than those under the coverage of health houses. Despite the differences, the two data sets confirm that Iranian rural areas have also been experiencing replacement-level fertility in recent years.

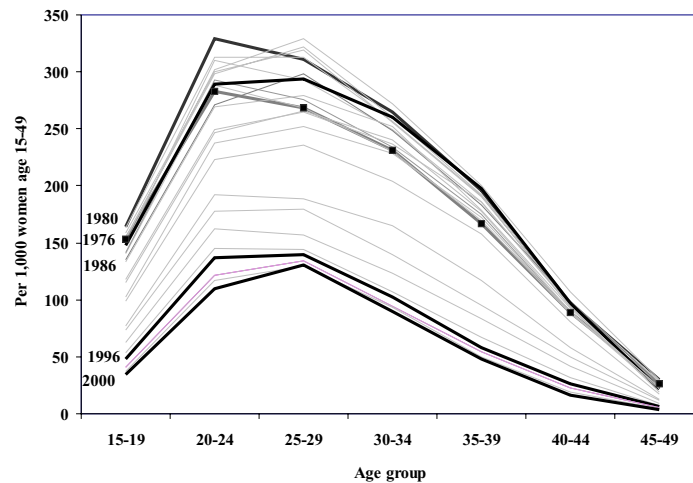
An examination of total fertility rates by province suggests that fertility transition has been socially inclusive; that is, fertility at the provincial levels had converged to the national level by the end of the period (see also Abbasi-Shavazi, 2000, 2002b). However, provinces located on the borders of the country such as Sistan and Baluchistan and Hormozgan still exhibit higher fertility than other provinces. Signs of the attainment of below-replacement fertility in the Islamic Republic of Iran appeared during the early 1990s. The four developed provinces of Gilan, Semnan, Tehran and Isfahan reached a below-replacement level of TFR by 1994-1996 (Abbasi-Shavazi, 2001). 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.

### Fertility patterns, 1972–2000

Figure 2 shows age-specific fertility for the period 1976–2000. The own-children estimates of ASFRs for single calendar years from 1972 to 2000 based on the 1986 and 1996 censuses as well as the 2000 IDHS have been presented elsewhere (Abbasi-Shavazi and McDonald, 2005, 2006).

In 1976, the highest age-specific fertility rate was recorded for age group 20–24 (283 per 1,000 women) followed by age groups 25–29 (268 per 1,000 women) and 30–34 (231 per 1,000 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. This behaviour did not last long 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 the Islamic Republic of Iran, 1976, 1980, 1986, 1996 and 2000**



*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). Also see Abbasi-Shavazi and McDonald (2005, 2006) for further details.

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 1986. However, there was a remarkable fall in fertility in all age groups during the 1990 to 1996 period, partly owing to the revival and successful implementation of the family planning programme 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.

ASFRs for rural and urban areas for the period 1976-2000 (data not presented here) revealed that, in general, the trends in age patterns of fertility for both rural and urban areas during the period were similar to those at the national level (Abbasi-Shavazi and McDonald, 2005; 2006). The gaps between the TFRs in rural and urban areas had narrowed considerably by the end of the 1990s. 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.

### **Pathways to below-replacement level fertility**

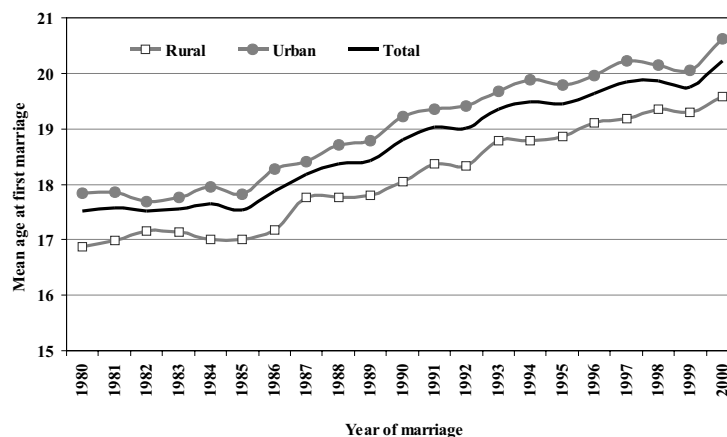
#### **Change in mean age at first marriage**

In any study of fertility, marital status and change in marriage patterns are important to the extent that they affect three stages of reproduction: intercourse, conception and parturition. Change in age at marriage has been an important factor in societies where below-replacement level fertility has been attained. For example, Jones (2004) noted that rising age at marriage has contributed to the fall of fertility in Asian countries in recent decades. Delayed marriage has been a principal factor accounting for the fertility decline in Japan since the early 1970s (Ogawa and Retherford, 1993; Ogawa, 2003).

A profound change in mean age at marriage has occurred in the Islamic Republic of Iran over the last two decades (figure 3). The extent of the change is concentrated in the years since the mid-1980s. Pronatalist ideology and encouragement of early marriage at the time of the Islamic Revolution kept age at first marriage constant during the first half of the 1980s. However, women's mean age at marriage started to rise in 1985 and by 2000, the figure had risen to around 20.2 years. The change in mean age at marriage is consistent with fertility transition over the last two decades. Interestingly, the stall of fertility decline during 1979-1984 matches the constant mean age at marriage during the same

period. By contrast, the fall of fertility since 1985 has been accompanied by a sharp increase in age at marriage.

**Figure 3. Mean age at first marriage, women married from 1980 to 2000 by area of residence, Iran (Islamic Republic of)**



Source: IDHS, 2000.

The female singulate mean age at marriage (SMAM) and age-specific proportions married at the 1976, 1986 and 1996 Iranian Censuses were examined in an earlier study (Abbasi-Shavazi, 2000). The results showed that SMAM for the Islamic Republic of Iran increased slightly from 19.5 in 1976 to 19.7 years in 1986, followed by a sharp increase, by around 12 per cent, from 19.7 to 22 years between 1986 and 1996. The proportion of women ever married declined moderately in all age groups from 1976 to 1986, except for age group 20-24. In 1976, around 34 per cent of women were ever-married by ages 15-19, and 78 per cent by ages 20-24. These figures declined by 2 to 3 percentage points between 1976 and 1986. However, there was a sharp decline in proportions married at all ages, except ages 40-44 and 45-49 between 1986 and 1996. The declines at ages 15-19 and 20-24 were substantial. The proportion of ever married women at ages 15-19 declined from 33.5 per cent in 1986 to 18.6 per cent in 1996. The percentage of women married at ages 25-29 decreased also from 90 in 1986 to 85 in 1996.

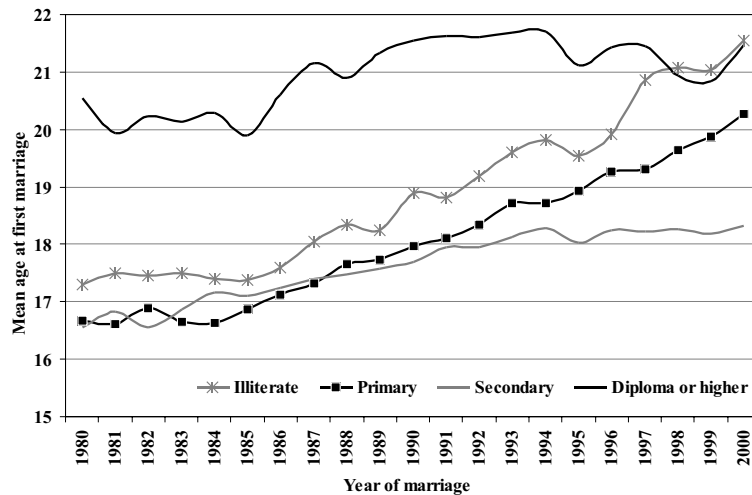
There has been a sharp increase in the mean age at first marriage for both rural and urban areas from the mid-1980s. The mean age at first marriage increased from around 16.8 for rural areas and 17.7 for urban areas in 1985 to around 19.5 and 20.5 in 2000, respectively (figure 3). In rural areas, the female singulate mean



age at first marriage increased from 19.7 in 1986 to 22.1 in 1996, whereas in the urban areas the figure rose from 20.1 to 22.0. In both urban and rural areas, marriages were delayed to later ages with sharp reductions in the proportions ever married at ages 15-19 and 20-24 (Abbasi-Shavazi, 2000).

The change in marriage pattern is consistent with the other socio-economic changes that have unfolded in the Islamic Republic of Iran over the last two decades. The educational attainment of Iranian women during the past two decades consistently stands out as a factor contributing directly and indirectly to the country's fertility decline. Female literacy for the age groups 6 years and above increased from 15 per cent in 1956 to 35 in 1976, to 74 per cent in 1996 (Abbasi-Shavazi, 2000; 2002a) to 76 per cent in 2000 (Ministry of Health and Medical Education, 2002) and to 80 per cent in 2006 (Statistical Center of Iran, 2007). There is a large gap between the mean age at first marriage for women with diploma and higher as compared with other levels of education.

**Figure 4. Mean age at first marriage by level of education, marriages from 1980 to 2000, Iran (Islamic Republic of)**



Source: IDHS, 2000.

The recent high age at marriage for illiterate women and women educated only up to the primary school level is due to the fact that, by 2000, this represented a very small and select group (figure 4). As education increases, the marriage market is not favourable for illiterate and lowly educated women and, thus, there

will be less chance for them to marry. With the rise in female education and with a marriage squeeze in the country (Doroudi Ahi, 2001), illiterate and lowly educated women are disadvantaged. By contrast, girls who pursue their education to the tertiary level prefer to postpone their marriage until they graduate from university or until they secure a job for themselves. However, girls with secondary education are more likely to marry at younger ages. This may be partly because they leave school in order to marry. In general, with the advancement of education and the fact that a significant proportion of girls continue their education, the age at marriage has been/will be pushed upward. This will have a negative impact on fertility as both marriage and childbearing are being/will be postponed.

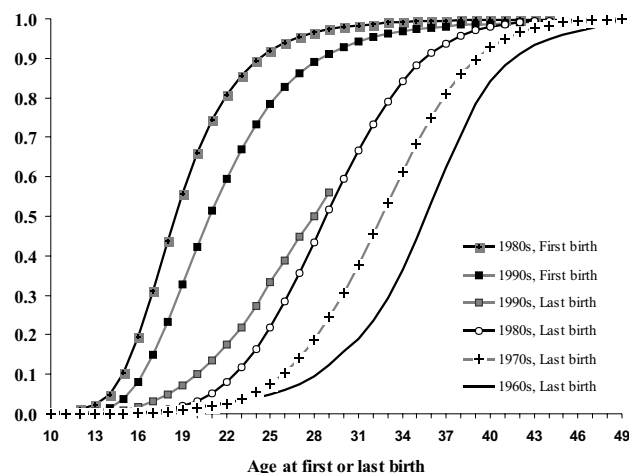
One important question is to what extent the significant fall of fertility has been due to changes in nuptiality and marital fertility. Abbasi-Shavazi decomposed the changes in fertility during the two periods of 1976-1986 and 1986-1996 into two main components of nuptiality and marital fertility. He showed that around 85 per cent of the changes in overall fertility were due to marital fertility indicating that most of the fertility decline was due to control within marriage. Around 15 per cent of the change is attributable to changes in nuptiality, specifically an increase in age at marriage and thus a reduction in the proportion of women married at early ages. Given the higher level of education and the increase in mean age at marriage in recent years, it is likely that the contribution of nuptiality on fertility has increased (See Hosseini-Chavoshi, McDonald and Abbasi-Shavazi, 2007). Nevertheless, the main story of the sharp fertility decline in the Islamic Republic of Iran revolves around fertility control within the marriage.

### **Shortening reproductive life span**

The ages at which women initiate and end childbearing are an important area of research, as they influence a variety of demographic and non-demographic phenomena (Pebley, Casterline and Trussell, 1982; McDonald, 1984). For instance, it has been shown that the size of completed families appears to be strongly influenced by age at first motherhood (Presser, 1971; Bumpass, Rindfuss and Janosik, 1978: 75; Knodel, 1987: 153-154). The age at which women end their childbearing is also related to the pace of fertility transition and has considerable impact on the level of fertility. Knodel (1987: 145) argued that in populations in which family limitation is common, the age of the mother at last birth is lower than in natural fertility populations, while age-specific marital fertility rates tend to show a more rapid decline at younger ages and to be particularly low at older ages. In brief, over the course of fertility transition, the age at first and the age at last birth change so that the reproductive life span of women declines substantially.

Figure 5 illustrates the change in age at first and last birth for Iranian women by marriage cohort. A dramatic change in the reproductive life spans of Iranian women married since the 1980s has occurred. The figure shows the cumulated proportions of each marriage cohort that had had a first birth by a given age among all those who ever had a first birth. It also shows the equivalent cumulated proportions by age for those who had had their last birth. It is to be noted that where the woman has only one birth across her lifetime, the first and the last births coincide.

**Figure 5. Cumulated distributions of age at first birth and last birth\* for marriage cohorts, Iran (Islamic Republic of)**



Source: IDHS, 2000.

Note: \*Last birth was defined using all of the following indicators: if the woman's last delivery was unwanted; if the woman wanted no more children at the time of the IDHS; if the woman had secondary infertility; if the woman or her husband had been sterilized; if the woman had reached menopause or had had a hysterectomy; if the woman was 40 years old or more and her last child was older than five years. The distribution for age at last birth for the 1990 cohort is not complete as they are still young and have not completed their childbearing.

The graph shows that age at first birth shifted upwards from the 1980s to the 1990s. With the advance of female education, increased age at marriage and the shift to delay of the first birth within marriage (see below), age at first birth rose considerably. For the 1980s marriage cohort, 50 per cent of first births occurred before age 18.5 years. For the 1990s cohort, the 50 per cent level was reached at age 20.8 years. Nevertheless, this is still relatively young for what is now a relatively highly educated population.

While age at first birth was moving up, age at last birth was moving down and by much larger amounts (figure 5). The 50 per cent level for age at last birth was 35.7 years for the 1960s marriage cohort, 32.5 years for the 1970s cohort, 28.7 years for the 1980s cohort and 27.9 years for the 1990s cohort. There will be a small bias downward in the most recent cohort because the calculation is made only for those who have completed their childbearing. Despite this caveat, childbearing has evidently been truncated to a very short age range mainly in the early 20s. This gives rise to issues about the delivery of a family planning programme to a population where a very substantial proportion of women complete their childbearing by age group 25-29. It also raises issues about the ways in which this early cessation of childbearing will change women's lives in a society where labour force participation rates for women have been low.

### **Progression to the second birth**

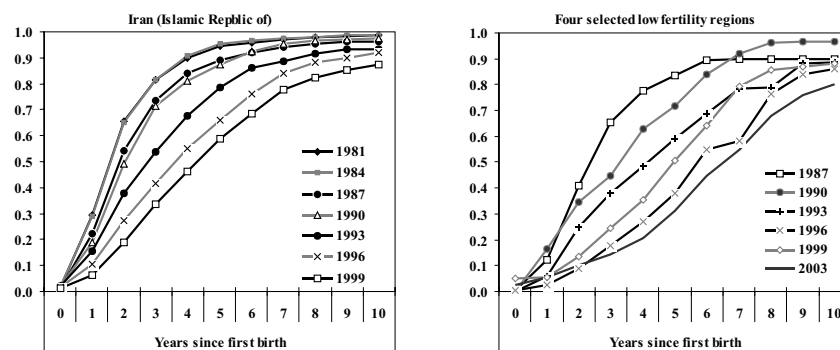
The vast majority of Iranian women (95 per cent) progress to have their first birth within the first two years of their marriage. This pattern has changed little over the last three decades, though there are slight signs of the delay of the first birth within marriage in recent years (Hosseini-Chavoshi, McDonald and Abbasi-Shavazi, 2007). Lifetime progression to the second birth for Iranian women (figure 6) was very high in the early years of the revolution (99 per cent), fell slowly to 97 in 1990 and then more sharply to 87 per cent in 1999.

The same result is observed in the selected low fertility provinces of Isfahan, Gilan, Yazd and the city of Tehran. Lifetime progression to the second birth for women in the four selected provinces was very high during the period 1985-1989 (around 99 per cent), fell slowly though with some fluctuations, to around 92 per cent in 1990, and then with some yearly fluctuation reduced slightly to around 88 per cent during 1990 and 1999 before falling to around 70 per cent by 2002-2004. Note that the yearly fluctuations are due to the relatively small number of cases and not to actual trends. These trends correspond closely to the observed trends in the total fertility rate discussed earlier.

In what is probably one of the most significant findings of this analysis, figure 6 shows the onset of a very substantial delay of the second birth. For example, the proportion of Iranian women having their second birth within 3.5 years of their first birth fell from 81 per cent in 1981 to 72 per cent in 1990 and then to 34 per cent in 1999. The difference between the 1981 and 1999 figures in the third year after the first birth (47 percentage points) is much wider than the corresponding difference in the tenth year after the first birth (12 percentage points). This is highly suggestive that what is being observed here is a wide spacing of the interval between the first and

second births (tempo), rather than a “stopping at one” pattern (quantum). Thus, the percentage of women who stop at one child may not be as high as 13 per cent for any real cohort. By contrast, the result of the 2002 Iran Fertility Transition Survey (IFTS) on preferences of women confirm an emerging trend in some parts of the country, especially the province of Gilan, for one child only.

**Figure 6. Cumulative parity progression, synthetic cohorts, first birth to the second birth, Iran (Islamic Republic of) and four low fertility regions, 1981–2003, selected years**



Source: Iran 2000 Demographic and Health Survey. Source: Iran 2005 Low Fertility Survey

Progression to the second birth is even slower in the low fertility provinces. The interval between the first and second births is now becoming very long indeed in these provinces with only 30 per cent progressing to a second birth within five years of the first birth. The timing of the widening of the second birth interval corresponds closely with the reintroduction of the nationwide family planning programme. Prior to 1990, there is little evidence of a change in the interval between the first and the second birth suggesting that this was not an explanation of the movements in fertility from the mid-1970s to the late 1980s.

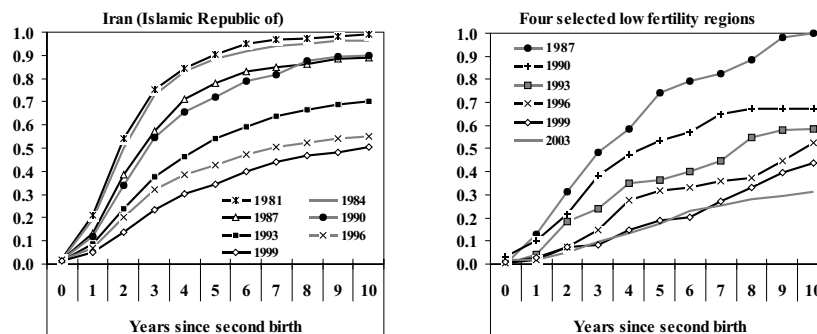
### Progression to the third birth

It is with progression to the third birth that one begins to observe the substantial changes in the quantum of fertility. In the early 1980s, the synthetic lifetime measure shows that 96-97 per cent of women in the Islamic Republic of Iran who had had a second child continued to the third. By 1999, this had fallen to 60 per cent. The results of the ILFS in figure 7 also show that during 1985-1987, almost all women in the four low fertility provinces who had had a second child continued to have a third child. The figure declined to around 56 per cent in 1993, before it fell to around 30 per cent during 2002-2004.

The trend over the period closely mirrored the trend in the total fertility rate – high in the early 1980s, a slow decline to 1990 and more rapid decline thereafter. It is very evident that “stopping at two” is the central story of fertility decline in this country. It is also evident that this new pattern had commenced prior to the reestablishment of the family planning programme. This programme can be considered to have facilitated and accelerated a pattern of behaviour that had become established in parts of the society since the mid-1980s. Abbasi-Shavazi, McDonald and Hosseini-Chavoshi based on analysis of the 2002 Iran Fertility Transition Survey proposed that the economic aspirations of the population were raised by the revolution but the failure of household economic outcomes to meet expectations had become clearly evident by the mid-1980s.

In addition, it was evident to parents by the mid-1980s that their children would have better opportunities for education and social advancement in the new society if they were able to support their children through education. Stopping at two must have been seen by parents as a strategy to improve their own economic outcomes and the educational opportunities of their children.

**Figure 7. Cumulative parity progression, synthetic cohorts, second birth to the third birth, Iran (Islamic Republic of) and four low fertility regions, 1981–2003, selected years**



Source: Iran 2000 Demographic and Health Survey. Source: Iran 2005 Low Fertility Survey.

The annual cumulative progressions (figure 7) indicate another very interesting trend not evident from age-based analyses. The emergence of “stopping at two” seems to have been preceded by a long-term trend towards wider spacing of the second and third births, a trend that continued through the early 1980s when fertility rates were at their highest. For example, based on the 1975-1979 cross-sections, 54 per cent of women had moved from their second to their third

birth by the end of the second year; for the 1980-1984 cross-sections, at the height of the high fertility period, 49 per cent had done so. This percentage then declines further in subsequent years. This may mean either that couples were already attempting unsuccessfully to stop at two or that they were indeed attempting to widen the interval between the second and third birth.

Movement to the third birth is slower among women in low fertility regions for all birth cohorts as shown in the right panel of figure 7. For the 1987-1990 cross-sections, before the revival of the family planning programme, 30 per cent had moved from their second to their third birth by the end of the second year, but less than 8 per cent had done so since 2000. The lifetime progression to the third birth has been around 30 to 40 per cent since 1999. This means that in these low-fertility regions either couples are successfully practising contraception or attempting to terminate childbearing at two children.

### **Summary and conclusions**

This article aims to examine the fertility trends and patterns in recent decades and to explore the pathways by which below-replacement level fertility has been achieved in the Islamic Republic of Iran. Single calendar year time in the total fertility rate allowed a precise association of the fertility decline to the timing of the momentous sociopolitical and population policy shifts before and after the 1979 Islamic Revolution. Fertility has declined considerably to below-replacement level, and most of the provinces are now experiencing below replacement level fertility. What are the pathways by which the below replacement level fertility has been achieved?

Changing marriage over the last three decades has been a contributing factor behind the fertility decline in the Islamic Republic of Iran. Age at marriage has risen considerably since the mid-1980s. Given that age at marriage is much higher among educated women than among non-educated women and given the considerable yearly rise in achieving higher levels of education, age at marriage can be expected to continue to rise in the future. This will lead to further postponement of fertility. Nuptiality change explained around 15 per cent of the decline in fertility between 1986 and 1996. However, the contribution of marriage to fertility decline will increase over the coming years.

A desire for small family size is a widely held ideal among Iranian women. The ideal family size of Iranian women is concentrated on two children. The result of the 2002 Iran Fertility Transition Survey (IFTS) conducted in the four selected provinces of Gilan, West Azarbaijan, Yazd and Sistan-Baluchistan showed that the majority of women, on average, desired only two children. Surprisingly, in

Gilan province, around 24 per cent of women aged 20-29 and around 18 per cent of those aged 40-49 indicated one child as their ideal number of children (Abbasi-Shavazi, McDonald and Hosseini-Chavoshi, 2003). The IDHS indicated that most women have their first birth soon after their marriage when they are still in their early twenties. Hosseini-Chavoshi, McDonald and Abbasi-Shavazi (2007) argued that widespread adoption and implementation of a two-child family norm is the essential story of fertility decline in this country. Their results showed that there is strong evidence of a cross-sectional cessation of childbearing for all women with parity two or more.

Fertility decline has led to the concentration of childbearing into a much narrower range of ages. The interval between the median age at first birth and the median age at last birth fell from around 11 years for the 1980s marriage cohort to around three years for the 1990s marriage cohort. Early cessation of childbearing raises policy issues in relation to the delivery of family planning and to the role of women.

There is also strong evidence of a widening of the interval between the first and the second birth post-1990. The interval between the second and the third birth has been widening from the 1970s onwards. This interval was actually longer during the years of very high fertility in the early 1980s than it had been in the 1970s. This may have been due to attempts to control fertility when contraception was not readily available.

Taken together, the individual level trends and the provincial level trends are likely to lead to fertility in the Islamic Republic of Iran falling well below replacement in the coming years. This will coincide with the entry of the very large post-revolutionary birth cohort into the childbearing ages. Thus, fortuitously, in terms of total number of births, the low fertility rate will not necessarily lead to further undercutting of the age distribution but to a dampening of the echo effect of the post-revolutionary cohort.

### **Policy implications**

What are the implications of low fertility? The new generation of Iranian women is much more highly educated than previous generations. This is likely to create a demand for paid employment both before the first birth and after the last birth. Given high economic aspirations, the motivation for women to take up paid employment is likely to be strong and the shortening of the reproductive span will facilitate such a trend. However, such a trend would be counter to existing social constraints on the employment of women. It could also come at a time when the demand for jobs from young men will be at an all-time high because of the entry into the labour market of a huge post-revolution baby-boom cohort.



Iran's population, though still young at present, will age rapidly in the future. In 2002, only 5 per cent of the population of the country were aged 65 and over, but this will increase to 22 per cent by 2050 (United Nations, 2002b). Behind this shift are the rapid fertility decline and substantial improvements in life expectancy. The increase and subsequent fall over the last two decades has created a unique age structure, representing a very young population, which will lead to a rapidly ageing population in the coming decades. The issue of ageing in the Islamic Republic of Iran becomes much more salient and current, however, if note is taken of the considerable movement of young people from rural to urban areas. The results presented in this paper suggest that the post-revolutionary antinatalist policy may no longer be relevant, as most of the targets of the policy have been reached. There have been discussions at the Ministry of Health on re-activating the National Population Council of Iran to re-design the population policy based on the current demographic situation. However, it will take some time before the new government policy is completed and its results achieved. Thus, as in the past, couples and individuals will follow their own way to determine the future of Iranian demography.

### **Endnote**

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## References

- Abbasi-Shavazi, M. J. (2000). "Effects of Marital Fertility and Nuptiality on Fertility Transition in the Islamic Republic of Iran", Working Papers in *Demography*, No. 84, Australian National University, Canberra, Australia.
- \_\_\_\_\_ (2001). "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.
- \_\_\_\_\_ (2002a). "Recent changes and the future of fertility in Iran", *Completing the Fertility Transition*, United Nations, Population Division, New York, pp. 425-439.
- \_\_\_\_\_ (2002b). "Convergence of fertility behaviours in Iran: Provincial fertility levels, trends and patterns in Iran" [Persian], *Social Science Journal*, vol. 18, pp. 201-231.
- \_\_\_\_\_ and P. McDonald (2005). "National and Provincial-level Fertility Trends in Iran: 1972-2000", Working Paper in *Demography*, No. 94, Australian National University, Canberra, Australia.
- \_\_\_\_\_ and P. McDonald (2006). "Fertility decline in the Islamic Republic of Iran, 1972-2000", *Journal of Asian Population Studies*, vol. 2, No. 3, pp. 217-237.
- \_\_\_\_\_ P. McDonald and M. Hosseini-Chavoshi (2003). "Changes in Family, Fertility Behavior and Attitudes in Iran", Working Paper in *Demography*, No. 88, Australian National University, Canberra, Australia.
- \_\_\_\_\_ M. Hosseini-Chavoshi, B. Delavar and P. McDonald (2004). *Fertility Transition in Iran: Evidence From Four Selected Provinces*, Department of Demography, University of Tehran, Tehran.
- \_\_\_\_\_ A. Mehryar, G.W. Jone and P. McDonald (2002). "Revolution, war and modernization: Population policy and fertility change in Iran", *Journal of Population Research*, vol. 19, No. 1, pp. 25-46.
- Aghajanian, A. (1991). "Population change in Iran, 1966-86: A stalled demographic transition?", *Population and Development Review*, vol. 17, pp. 703-715.
- \_\_\_\_\_ (1995). "A new direction in population policy and family planning in the Islamic Republic of Iran", *Asia-Pacific Population Journal*, vol. 10, No. 1, pp. 3-20.
- \_\_\_\_\_ and A. Mehryar (1999). "Fertility transition in the Islamic Republic of Iran: 1967-1996", *Asia-Pacific Population Journal*, vol. 14, No. 1, pp. 21-42.

- Amani, M. (1970). *Births and Fertility in Iran*, Division of Population Research [Persian], Institute for Social Studies and Research, University of Tehran, Tehran.
- \_\_\_\_\_ (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.
- Azimi, H. (1981). *Population Growth and Its Needs, Budget and Planning Organization* [Persian], Department of Human Resources and Social Planning, Tehran.
- Atoh, M. (2001). "Very low fertility in Japan and value change hypotheses", *Review of Population and Social Policy*, No. 10, pp. 1-21.
- Bongaarts, J. (2002). "The end of the fertility transition in the developed world", *Population and Development Review*, vol. 28, No. 3, pp. 419-443.
- \_\_\_\_\_ and G. Feeney (1998). "On the quantum and tempo of fertility", *Population and Development Review*, vol. 24, No. 2, pp. 271-291.
- Bumpass, L.L., R. R. Rindfuss and R.B. Janosik (1978). "Age and marital status at first birth and the pace of subsequent fertility", *Demography*, vol. 15, pp. 75-86.
- Caldwell, J.C. (2006). *Demographic Transition Theory*, Springer, Dordrecht.
- 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.
- Greenhalgh, S. (1988). "Fertility as mobility: Sinic transitions", *Population and Development Review*, vol. 14, No. 4, pp. 629-674.
- Gubhaju, B. and Y. Moriki-Durand (2003). "Fertility transition in Asia: Past experiences and future directions", *Asia-Pacific Population Journal*, vol. 18, No. 3, pp. 41-68.
- Hirschman, C., J. Tan, A. Chamrathirong and P. Guest (1994). "The path to below-replacement level fertility in Thailand", *International Family Planning Perspectives*, vol. 20, No. 3, pp. 82-87 and p.107.
- Hosseini-Chavoshi, M., P. McDonald and M.J. Abbasi-Shavazi (2007). "The Iranian fertility decline, 1981-1999: An application of the Synthetic Parity Progression Ratio Method", *Population*, vol. 61, No. 5-6, pp. 701-718.

- Jones, G.W. (2004). "Asian Demographic Transitions: Transition to What?", paper presented at the 12th Australian Population on: Population and Society: Issues, Research, Policy, 15-17 September, Canberra, Australia.
- Knodel, J. (1983). "Natural fertility: Age patterns, levels, and trends." In Rodolfo A. Bulatao and Ronald D. Lee (eds.), *Determinants of Fertility in Developing Countries*. New York: Academic Press, pp. 61-102
- \_\_\_\_\_ (1987). "Starting, stopping, and spacing during the early stages of fertility transition: The experience of German village populations in the 18<sup>th</sup> and 19<sup>th</sup> centuries", *Demography*, vol. 24, No. 2, pp. 143-162.
- \_\_\_\_\_ A. Chamratrithirong and N. Debavalya (1987). *Thailand's Reproductive Revolution: Rapid Fertility Decline in a Third World Setting*, Madison, University of Wisconsin Press.
- Kohler, H.P., F. Billari and J.A. Ortega (2002). "The emergence of lowest-low fertility in Europe during the 1990s", *Population and Development Review*, vol. 28, pp. 641-680.
- Ladier-Fouladi, M. (1997). "The fertility transition in Iran", *Population: An English Selection*, vol. 9, pp. 191-214.
- Lesthaeghe, R. and P. Willems (1999). "Is low fertility a temporary phenomenon in the European Union?", *Population and Development Review*, vol. 25, No. 2, pp. 211-228.
- McDonald, P. (1984). *Nuptiality and Completed Fertility: A Study of Starting, Stopping and Spacing Behaviour*, Comparative Studies No. 35, World Fertility Survey, London.
- \_\_\_\_\_ (2000a). "Gender equity, social institutions and the future of fertility", *Journal of Population Research*, vol. 17, No. 1, pp. 1-16.
- \_\_\_\_\_ (2000b). "Gender equity in theories of fertility transition", *Population and Development Review*, vol. 26, No. 3, pp. 427-439.
- McNicoll, G. (1980). "Institutional determinants of fertility change", *Population and Development Review*, vol. 6, No. 3, pp. 441-462.
- \_\_\_\_\_ (1985). "The nature of institutional and community effects on demographic behaviour: A discussion", in J. Casterline, (ed.), *The Collection and Analysis of Community Data*, International Statistical Institute, Voorburg, pp. 177-184.
- \_\_\_\_\_ (1994). "Institutional analysis of fertility", in K. Lindahl-Kiessling and H. Lanberg, (eds.), *Population, Economic Development and the Environment*, Oxford University press, Oxford, pp. 199-299.

- Mehryar, A.H. (2005). "Shi'ite teachings, pragmatism and fertility change in Iran", in G.W. Jones and M. Karim (eds.), *Islam, the State and Population*, Hurst and Co., London, pp. 118-156.
- \_\_\_\_\_ and R. Gholipour (1995). "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* [Persian], Tehran, Islamic Republic of Iran.
- Mirzaie, M. (2005). "Swings in fertility limitations in Iran", *Critique: Critical Middle Eastern Studies*, vol. 14, No. 1, pp. 25-33.
- Naghavi, M. and others (2005). *Changing Health Situation of Iranian Rural People* [Persian], Deputy for Health, Ministry of Health and Medical Education, Tehran.
- 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, Tehran.
- Ogawa, N. (2003). "Japan's changing gentility mechanisms and its policy implications", *Journal of Population Research*, vol. 20, No. 1, pp. 89-106.
- \_\_\_\_\_ and R.D. Retherford (1993). "The resumption of fertility decline in Japan: 1973-92", *Population and Development Review*, vol. 19, pp. 703-741.
- Padidar-Nia, H. (1977). *Population Dynamics in Iran: New Estimates on Mortality and Fertility*. PhD Thesis, University Microfilms International, Ann Arbor, Michigan, United States of America .
- Pebley, A.R., J. B. Casterline and J. Trussell (1982). "Age at first birth in 19 countries", *International Family Planning Perspectives*, vol. 8, No. 1, pp. 2-7.
- Perelli-Harris, B. (2005). "The path to lowest-low fertility in Ukraine", *Population Studies*, vol. 59, No. 1, pp. 55-70.
- Presser, H.B. (1971). "The timing of the first birth, female roles, and Black fertility", *Milbank Memorial Fund Quarterly*, vol. 49, pp. 329-362.
- Smith, P. (1983). "The impact of age at marriage and proportions marrying on fertility", in Rodolfo A. Bulatao and Ronald D. Lee (eds.), *Determinants of Fertility in Developing Countries*, New York: Academic Press, pp. 473-531.
- Statistical Center of Iran (2007). *Population and Housing Census 2006: Selected Results*, Statistical Center of Iran, Tehran.

United Nations (2000). *Below Replacement Fertility*, Population Division of the Department of Economic and Social Affairs, United Nations, New York.

\_\_\_\_\_ (2002a). *Completing the Fertility Transition*, Population Division of the Department of Economic and Social Affairs, United Nations, New York.

\_\_\_\_\_ (2002b). *Population Ageing: 2002* (Data Sheet), Population Division, United Nations, New York.

VandenHeuvel, A. and P. McDonald (1994). "Marriage and divorce", in D. Lucas and P. Meyer (eds.), *Beginning Population Studies*, Canberra: Australian National University, pp. 69-90.

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