

Low Fertility in China: Trends, Policy and Impact

The arrival of below replacement fertility in China requires us to revisit population dynamics and review population policies to better address the issues brought forward by low fertility.

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China currently is the country with the largest population in the world. The Fifth National Population Census in 2000 reports that the total population of mainland China stands at 1.27 billion (Zhuang and Zhang, 2003), while the 1 Percent National Population Sample Survey (mini-census) carried out in November 2005 reports the total population to be at 1.31 billion (National Statistics Bureau (NSB), 2006).¹ China is also the country with the most stringent and government-directed family planning programme and fertility policy, having experienced a dramatic decline in fertility from 5 to 6 children per woman in the

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1950s to less than 2 in recent years. The 2000 census reports China's total fertility rate (TFR) to be at 1.4 (NSB, 2003). The rapid changes occurring in China's population dynamics call for a review of the fertility transition in China in terms of trends, policy and impact. This article will first discuss the population dynamics ongoing in China in terms of growth, birth rate and fertility and then examine the fertility policy implemented by the Government of China, before exploring the impact of fertility decline in terms of population ageing, gender equality, sex ratio at birth and labour supply.

Population growth and fertility trends in China

The rapid population growth and its possible negative impact on the socio-economic development of the country has long been a primary concern for the Government and society alike. Even after the 2000 Census reported a TFR well below replacement level, and the historical transition of the reproductive pattern from a typical high fertility to a typical low fertility one had been acknowledged (Chen and Guo, 2006), it was still argued that "while its [the country's] fertility has declined to below replacement at the level of 1.8, the annual births remain at 20 million and population increment at 10 million. The demographic profile of China is characterized by low fertility level with rapid population growth" (Gu, 2003). It was even predicted that the annual births would remain at 20 million and population increment at 10 million. This assertion, however, has been strongly questioned by the situation witnessed in recent years.

Table 1. Population changes: 2000-2006

Year	Year-end total population (million)	Crude birth rate (per thousand)	Births (million)	Crude death rate (per thousand)	Deaths (million)	Natural growth rate (per cent)	Population growth (million)
2000	1267.43	14.03	17.71	6.45	8.14	0.758	9.57
2001	1276.27	13.38	17.02	6.43	8.18	0.695	8.84
2002	1284.53	12.86	16.47	6.41	8.21	0.645	8.26
2003	1292.27	12.41	15.99	6.40	8.25	0.601	7.74
2004	1299.88	12.29	15.93	6.42	8.32	0.587	7.61
2005	1307.56	12.40	16.18	6.51	8.49	0.589	7.69
2006	1314.48	12.09	15.84	6.81	8.92	0.528	6.92

Sources: NSB 2005, 2006, 2007.

Table 1 presents data published by the National Statistics Bureau of China based on the annual population change sample surveys and the 1 per cent National Population Sample Survey in 2005. It shows that, while the total population has been continuously increasing since 2000, the annual growth of the population has been decreasing from more than 9.5 million in 2000 to less than 7 million in 2006. The declining trend is quite apparent. While the number of deaths has remained virtually unchanged at about 8 million, the crude birth rate and the number of births have both been decreasing. The birth rate has declined from 14 per thousand in 2000 to 12 per thousand in 2006, while the number of births has declined from close to 18 million to less than 16 million – a decline of about 2 million over a five-year period. As a result, the population growth rate has declined to below 0.6 per cent. In fact the population growth rates of all the 31 provinces of the country are below 1 per cent, except for the three remote provinces of Tibet (1.12 per cent), Ningxia (1.12 per cent) and Xinjiang (1.09 per cent). Consequently, it is no longer tenable to claim that China is a country with “rapid population growth”.

The declining trend of population growth can also be seen from the predictions regarding the timing for reaching China’s peak population. A decade ago, it was predicted that China would not achieve zero population growth until the mid-twenty-first century, with a peak population of 1.6 billion. By the turn of the century, zero population growth was estimated to be achievable by the 2040s with a population of 1.5 billion. The growing consensus now is that it will be reached in the early 2030s with a population less than 1.5 billion. The most recent projections from the United Nations estimate that China’s population will peak in 2030 with a population of 1.458 billion, while India will have a population of 1.506 billion, surpassing China as the largest country in the world in terms of population size (United Nations, 2007).

China has not always been experiencing rapid population growth. In the long history, the population had been growing quite slowly owing to a high birth rate compensated by a high death rate. Rapid population growth as a demographic phenomenon did not occur until the 17th century, when mortality started to decline while the birth rate remained at a high level (Poston, Gu and Luo, 2005). This pattern is consistent with what is suggested by the demographic transition theory. It indicates that rapid population growth is a one-time phenomenon although in China it spanned over several centuries. Now this growth is about to be over after having dominated China’s population dynamics for so long.

Fertility is most commonly assessed by observing a country’s total fertility rate (TFR). China’s measurement of fertility was claimed to be “of very high quality” in the early 1980s (Coale, 1984) but the accuracy of the statistics has been

the focus of debate for many years now, particularly since the mid-1990s. A more reliable estimate was expected to arise with the 2000 population census results. However, surprisingly, the 2000 census reported a fertility level of only 1.22.² This has been widely considered “unacceptable”; even the National Statistics Bureau deemed the figure “too low”. More debates arose on China’s fertility level in recent years, the estimations ranging from as low as 1.35 to as high as 2.3 (see Chen and Guo, 2006). Among them, several studies employing various methods have estimated China’s TFR to have ranged “between 1.5 and 1.6” in the year 2000 (Guo, 2004; Retherford and others, 2005; Zhang and Zhao, 2006), while the official figure remains at “about 1.7 to 1.8” (Chen and Guo, 2006).

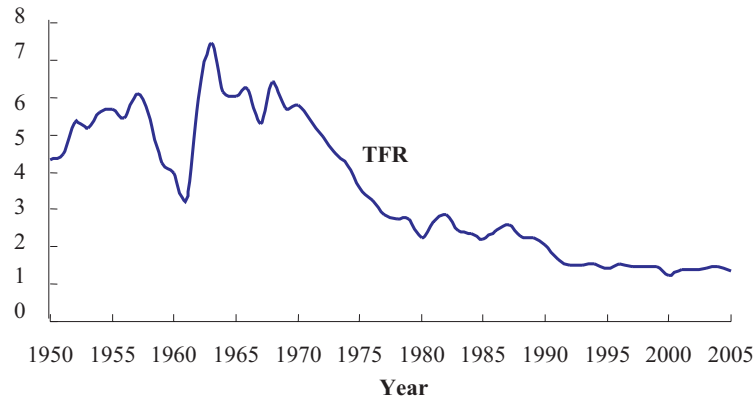
Table 2. Age-specific fertility rates and total fertility rate in China: 2000-2005

Age-specific fertility rate (per thousand)	Year					
	2000	2001	2002	2003	2004	2005
15-19	5.96	2.70	2.68	5.25	5.56	6.34
20-24	114.49	107.70	113.15	122.67	120.85	114.46
25-29	86.19	115.37	106.09	102.44	107.60	91.70
30-34	28.62	40.06	42.68	38.28	42.21	40.22
35-39	6.22	9.22	9.68	8.65	10.14	10.98
40-44	1.46	1.83	1.88	1.77	1.93	2.05
45-49	0.68	0.60	0.37	0.56	0.41	0.77
TFR	1.22	1.39	1.38	1.40	1.44	1.34

Sources: 2002: 2000 Population Census, 2001-2005: Annual Population Change Sample Surveys.

Despite the ongoing debate, the National Statistics Bureau continues to publish the detailed fertility information by age, sex, and parity every year based on the results of the annual population change sample surveys. The age-specific fertility rates and total fertility rates in China for 2000-2005 are shown in table 2, demonstrating a consistent trend of fertility at around 1.4 in the early twenty-first century. Whatever the method employed and the data source used to determine the fertility level in China, it is hardly refutable that China’s fertility has now fallen below the replacement level of 2.1. China’s fertility transition has definitely reached the stage of a low fertility (see figure 1).

Figure 1. Total fertility rate in China: 1950-2005



Source: NSB, 2005.

Fertility policy and policy fertility in China³

It is well-known that China's fertility decline and its population control have relied heavily on a draconian fertility policy and a strong family planning programme. However, less is known about the country's fertility policy, a national priority for over two decades, which is actually highly localized. As a result, China's national fertility policy has been known mostly as a "one-child policy".

Following numerous modifications made to the initial one-child policy over two decades, what is now the desired or expected fertility level for each of China's provinces and for China as a whole? To quantify the outcome of fertility policies in various localities and populations across the country, the term policy fertility was coined as a quantitative indicator summarizing the fertility level implied by the policies on fertility implemented in a given region.

Fertility policies in China can be grouped into four categories: (a) one-child policy (one child per couple); (b) 1.5 children policy (those whose first child is a girl may have a second child); (c) two-children policy (two children per couple); and (d) three-children policy (three children per couple).

The areas with the most stringent fertility policy are mainly those of municipalities directly under the jurisdiction of the central government, provincial capital cities. Most prefectures with a policy fertility of 1.3-1.5 are located in eastern and central China, whereas prefectures with the highest policy fertility (above 2.0) are mostly found in the central and western regions of the country.⁴ These are usually areas with a high concentration of minority populations.

The population distribution by policy fertility for China as a whole is presented in table 3. Slightly more than a third of the population (35.4 per cent) falls into the one-child policy category. Over half of the total population of the country (53.6 per cent) falls into the 1.5 children policy category. Combined, these two categories encompass nearly 90 per cent of China's population, which is subject to a below-replacement fertility policy. Only 9.7 per cent of the population falls within the two-child category, while the percentage of population under the three-child policy is even more trivial (about one per cent).

Table 3. Demographic distribution of fertility policy, China, late 1990s

Policy	Population (million)	Percentage
One-child policy	439.16	35.4
1.5-children policy	664.94	53.6
Two-children policy	120.33	9.7
Three-children policy	16.13	1.3
Total	1,240.56	100.0

Which proportion of China's population could have only one child, as per the policies summarized above? Taking the one-child couples in the 1.5-children policy areas into account, 63 per cent of all couples in China would end up with only one child, 36 per cent two children, and one per cent of the population only is allowed to have three or more.

The estimated policy fertility levels for China's provinces are presented in table 4. Next to the policy fertility level for each province is the observed total fertility level as reported in China's 2000 census (NBS, 2003). Table 4 shows that the average policy fertility among Chinese provinces varies widely, from a low of one or slightly higher (1.06) in Shanghai and Jiangsu, to a high of two or more

(2.37) in Xinjiang. China's provinces can therefore be grouped into four categories according to their fertility policy. There are six provinces classified in category one with a policy fertility level of less than 1.3. There are 12 provinces in category two, with policy fertility between 1.3 and 1.5. Seven provinces are classified in category three with a policy fertility ranging from above 1.5 to below two. Finally, five provinces fall in category four, where policy fertility is above two. All but one (Hainan) of these latest provinces are located in the western region of China. Moreover, at the provincial level, policy required and census observed fertility levels are very close to each other. As seen in table 4, whereas only six of China's 30 mainland provinces (excluding Tibet) have a policy fertility level at 1.3 or lower, 12 provinces according to the 2000 census reported a fertility level of 1.2 or lower. The differences between the policy's required fertility and the census observed fertility for the 30 provinces are generally quite marginal. Relatively large differences (above 0.5 children) are found only in three provinces (Jiangxi, Guizhou, and Xinjiang).

Subnationally, the distribution of fertility policy follows a gradient of economic development levels, from east to west. The economically most developed eastern region has the largest share of prefectures and population, as well as the highest share of population falling under the requirement of the one-child rule (69.6 per cent). The overall policy fertility level for this region is only 1.39. The economically least developed western region has the second largest share of prefectures (36.7 per cent), but the smallest share of national population (28.8 per cent). Overall the policy fertility requirement for the region is also the most lenient (1.56), allowing over 40 per cent of the population to have two or more children. The policy targeted fertility for the central region is moderate and stands at 1.47.

Thus, as explained above, China's fertility policy encompasses much variation, both geographically and demographically. Nevertheless, the majority of the Chinese population (more than 70 per cent) lives in areas where the policy fertility level ranges from 1.3 to 2.0 children per couple. Meanwhile, the one-child policy remains a core element of China's fertility policy and inevitably exerts an enormous impact on the country's demographic processes. Should all couples living in various regions follow strictly the current fertility policies, more than 60 per cent of Chinese couples would still end up having only one child. Based on local fertility policies and corresponding population distributions, the overall average fertility targeted by the fertility policies for China as a whole was estimated to be 1.47 at the end of the 1990s. This is a level far below the replacement.

Table 4. Policy fertility and observed fertility of China's provinces, circa 2000

Province	Policy fertility	Observed fertility	Difference (P - O)	Province	Policy fertility	Observed fertility	Difference (P - O)
Between 1.0 and 1.3				Anhui	1.48	1.5	-0.02
Shanghai	1.06	0.7	0.36	Fujian	1.48	1.1	0.38
Jiangsu	1.06	1.0	0.06	Shanxi	1.49	1.7	-0.21
Beijing	1.09	0.7	0.39	Between 1.5 and 2.0			
Tianjin	1.17	0.9	0.27	Henan	1.51	1.7	-0.19
Sichuan	1.19	1.4	-0.21	Shaanxi	1.51	1.3	0.21
Chongqing	1.27	1.5	-0.23	Guangxi	1.53	1.8	-0.27
Between 1.3 and 1.5				Gansu	1.56	1.3	0.26
Liaoning	1.38	1.1	0.28	Hebei	1.59	1.5	0.09
Heilongjiang	1.39	1.0	0.39	Inner-Mongolia	1.60	1.2	0.40
Guangdong	1.41	1.1	0.31	Guizhou	1.67	2.4	-0.73
Jilin	1.45	1.0	0.45	2.0 and above			
Shandong	1.45	1.3	0.15	Yunnan	2.01	2.0	0.01
Jiangxi	1.46	2.0	-0.54	Qinghai	2.10	1.7	0.40
Hubei	1.47	1.1	0.37	Ningxia	2.12	1.8	0.32
Zhejiang	1.47	1.2	0.27	Hainan	2.14	1.8	0.34
Hunan	1.48	1.5	-0.02	Xinjiang	2.37	1.7	0.67

Source: Observed fertility based on the 2000 population census (NBS, 2003), in which the national total fertility rate was again reported at 1.4.

Impacts of low fertility in China

The impact of low fertility is not a new topic for demographers. It was, for example, addressed as early as in December 1991 in a Seminar on Impact of Fertility Decline on Population Policies and Programme Strategies: Emerging Trends for the Twenty-First Century held in Seoul (KIHASA/ESCAP, 1992), during which the case of China was discussed (Gu and Peng, 1992). Low fertility will have repercussions, among others on population ageing, gender equality, sex ratio at birth and infant mortality, and labour supply.

Along with the decline in fertility and the improvement in life expectancy, population ageing will naturally arise as a demographic consequence. The faster the fertility declines the faster population ageing occurs. Ageing started to attract wider attention in China after the release of the 2000 census results which reported the country's population aged 60 and above to exceed 10 per cent, while persons aged 65 and above accounted for more than 7 per cent – a definite indication of China becoming an ageing society. More recent data from the 2005 mini-census reveal that China's population aged 60 and above accounts for 11 per cent and those aged 65 and above for about 8 per cent. Most importantly, in terms of actual size and numbers, these proportions translate into approximately 144 million persons aged 60 years and above and 100 million aged 65 and more.

Support to the elderly becomes an acute social issue to be addressed, particularly in China's rural areas. Traditionally, rural people have been relying heavily on the younger generation for elderly support, but with the sharp reduction in the number of children, the practice becomes no longer feasible. Meanwhile, the coverage of the social security programme for the rural population is unlikely forthcoming in the near future. In addition, owing to accelerated population movements triggered by the market-oriented economy, an increasing number of young people leave their native villages. As a result, although fertility in rural areas is higher than in urban areas, the pace of population ageing turns out to be faster in rural areas than in urban areas. Compared with 1982 (the Third National Census), the number of urban elderly aged 65 and above has increased from 4.5 per cent to 6.4 per cent in 2000, while in rural areas, it increased from 5.0 per cent to 7.5 per cent (Gu, 2006). "Unlike the case in the developed countries however, population ageing occurs in China far before the realization of its modernization" (Gu and Peng, 1992).

Population ageing extends far beyond the issue of elderly support. This process implies an overall transformation of the entire society. It is estimated that

by the mid-twenty-first century, more than one third of China's population is likely to be aged 60 and above, with more than 100 million 80 years and above, which will mean that less than every 2 young adults will have to support one older person. Figures 2, 3 and 4 present comparisons of population pyramids between 2000 and 2050 for China as a whole as well as Shanghai and Beijing, the two largest metropolitan cities in China.⁵ It shows that within a few decades, China's population structure will evolve from a pyramid shape to a pillar shape, while for Shanghai and Beijing, the population pyramid will simply turn upside-down. The challenges a society with such an ageing population structure will face remain to be answered. To begin with, childbearing and child-rearing facilities are likely to become superfluous while by contrast services for older persons will become in dire need. Also, people will tend to reduce their consumption in order to save and pay for their own medical costs in old age. The labour supply will also start shrinking.

Figure 2. Population structure of China, 2000 (in shaded areas) and 2050

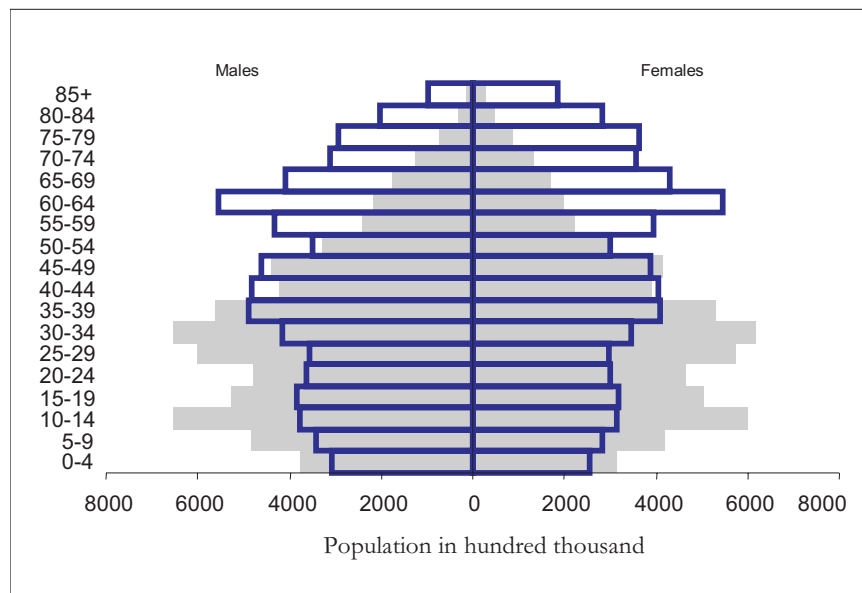


Figure 3. Population structure of Shanghai, 2000 (in shaded areas) and 2050

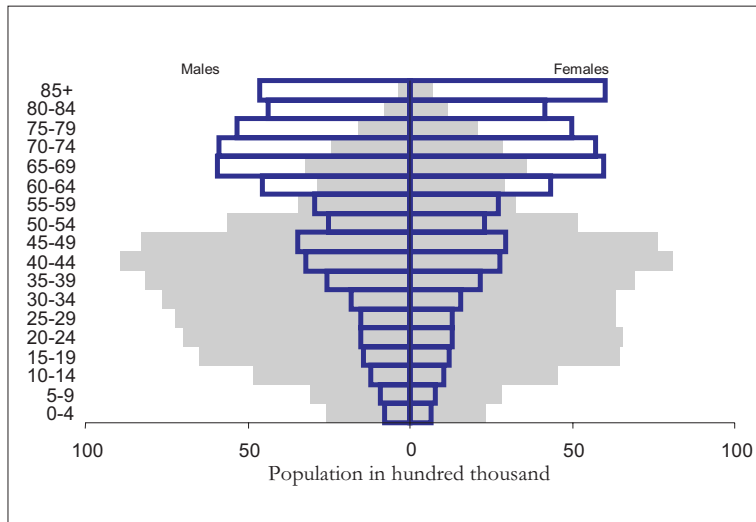
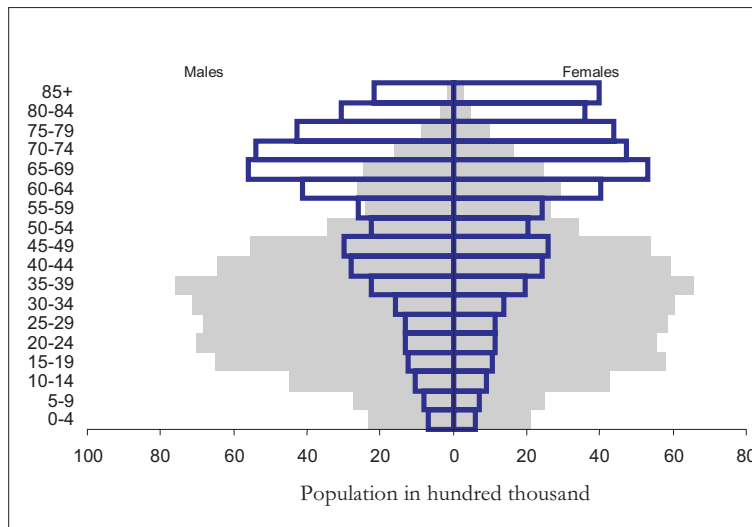


Figure 4. Population structure of Beijing, 2000 (in shaded areas) and 2050



Along with mortality decline and increase in life expectancy, the sexual disparity in life expectancy is becoming more apparent. Table 5 presents the life expectancy by sex in China for a few selected years over the last two decades. While the overall life expectancy has been increasing from 67 to 73 years, the disparity between male and female has widened from less than 3 years in the early 1980s to more than 4.6 years in the early 2000s. This gap can be expected to further widen in the future. Because women tend to live longer than men, more women than men will survive in old age. The higher the age, the lesser the number of men. This trend can also be observed from the population pyramids shown in figures 2, 3 and 4. At high ages, the bar for female tends to be longer than that for male. The 2004 annual sample survey suggests that the sex ratio by age tends to fall below 100 at age 65 and even below 60 at age 80. In this regard, the issue of population ageing heavily concerns women. However, the impact of ageing is not only on elderly women but also on women at young and middle ages. The responsibility of elderly care often lies on the shoulders of women, i.e. daughters or daughters-in-law. Should they devote more time and energy to their parents, they will naturally have less time and energy for their career and for making other contributions to the society. As life expectancy grows, so does the period during which older persons will need care, giving rise to situations in which younger elderly will take care of older elderly. What is a plus in terms of family support will likely translate into a minus for these care-givers' careers and the society at large (Gu and Peng, 1992). This becomes an issue related to population ageing and women's status. Population ageing seems to call for an overall review of social functions and social structures.

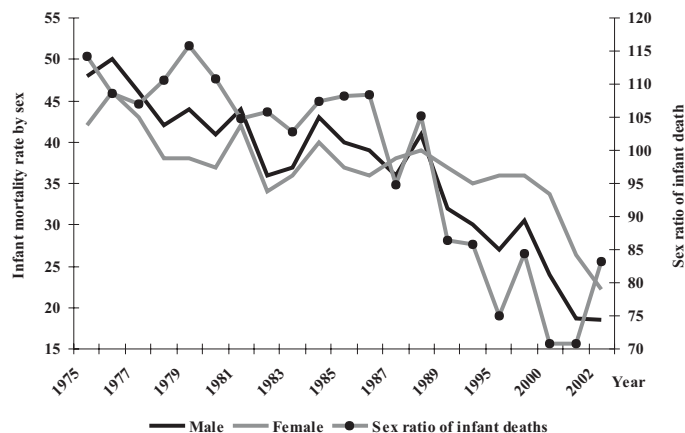
Table 5. Life expectancy by sex in China for selected years: 1981 2002

Year	Total	Male	Female	Difference in years (M-F)
1981	66.77	66.28	69.27	2.99
1990	68.55	66.84	70.47	3.63
1996	70.80	68.71	73.04	4.33
2000	71.40	69.43	73.33	-3.90
2001	72.31	70.24	74.59	4.35
2002	72.88	70.69	75.25	4.56

Source: NSB, 2003.

Another issue related to rapid fertility decline is arguably the abnormal sex ratio at birth (SRB) as well as the infant mortality. China's sex ratio (number of males to 100 females) among new-born babies has risen since the mid-1980s. The 1990 population census reports China's SRB to stand at 111, much above the acceptable level observed internationally. The abnormality of the country's SRB raised much concern and gave rise to an animated debate about the authenticity of the reported abnormality (Zeng and others, 1993; Gu and Roy, 1995). The debate has been continuing for about ten years until the release of the 2000 population census results, which reports China's SRB at 117, even higher than previously reported. The abnormality of the SRB has thus been observed in China for two decades. While China is not the only population with a skewed SRB, it is the population with the most abnormal SRB for a longest period in the world.

Figure 5. Infant mortality rate by sex and sex ratio of infant deaths in China for selected years: 1975-2002



Source: NSB, 2003.

Over the last two decades, not only did we witness a rising sex ratio at birth in China but also an increasingly abnormal infant mortality rate (IMR) by sex. While the overall IMR has been declining, the IMR for girls rose abnormally higher than that for boys. The sex ratio of infant deaths plunges below 100, and even more so in recent years (see figure 5). The excessively high sex ratio at birth and the excessively low sex ratio among infant deaths can be seen as two sides of the same coin of sexual selection in childbearing, i.e. “before-birth solution” and “after-birth solution”, and reflects sexual discrimination in childbirth and child survival

(Li, Wei and Jiang, 2006). It has been much discussed that among other factors, the occurrence of abnormal SRB has a lot to do with the pace of fertility decline, which in turn intensifies the conflict between the number and sex of children people intend to have (Gu and Roy, 1995).

Finally, the labour supply, as impacted by low fertility, ought to be briefly discussed. A smaller birth cohort will naturally bring about a smaller labour force in later decades. Assuming that the current fertility continues, China will experience a rapid decline in labour supply in the late 2020s, from 966 million to 761 million by the mid twenty-first century. While the size of the labour force will remain huge in terms of actual numbers, the reduction of the labour population will be quite sharp, declining by about 100 million per decade, or 10 million per year. The labour population itself will age as well (Guo and others, 2006). A relative “labour shortage” has been reported since the spring of 2004. Though it occurs owing to various reasons, some Chinese economists have started to claim that China’s labour force has turned from a period of “abundant supply” to a period of “limited surplus” (Cai and Wang, 2006). It is claimed that in the next few years (around 2013), the growth of the labour force population in China will even approach zero (Cai and Du, 2007).

Conclusions

This article has sketchily discussed the fertility transition ongoing in China with regard to population growth and fertility decline, fertility policy as measured by policy fertility, as well as the impact of low fertility on population ageing, gender equality, sex ratio of newborns and infant deaths, as well as labour supply. The arrival of below replacement fertility in China requires us to revisit population dynamics and review population policies to better address the issues brought forward by low fertility. “Low fertility” as a demographic phenomenon has been observed in Europe as well as in Asia, in developed and developing countries, in traditionally “high fertility” countries and “low fertility” countries alike (Gubhaju and Moriki-Durand, 2003; Morgan and Taylor, 2006). There are 65 countries accounting for 43 per cent of the world population with a fertility below replacement, 31 countries among them have a TFR less than 1.5 and more countries are expected to reach the “very low fertility” level. “Below replacement fertility” has gradually become a global trend in population dynamics and a genuine concern for the international community (United Nations, 2000). It is even claimed to be “the norm in post-transitional societies” (Demeny, 1997; Bongaarts, 2001). The understanding of this trend of below replacement fertility and its implications for policy response is still in its infancy. If China wishes to avoid serious negative consequences associated with below-replacement fertility

in the long run, the need to revisit of China's current fertility policy is compelling (Wang, 2005).

Endnotes

1. The discussion in this article has excluded the three areas of Hong Kong, China; Macao, China and Taiwan Province of China.
2. NSB (2003) later adjusted the 2000 total fertility rate to 1.4 according to the short form of the census.
3. This part is based on Gu, Wang, Guo and Zhang, 2006; Gu, Wang, Guo and Zhang, 2007.
4. In a classification commonly used in China, the 31 mainland provincial units are divided into three broad economic regions: the most developed "East" region, which includes 11 provinces of Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Hainan; the least developed "West" region, which includes 12 provinces of Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Inner-Mongolia, Guangxi; and 8 provinces in between as "Central" region, which includes Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan.
5. Developed by Cai Yong based on data from 2000 population census.

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