

Low Fertility in China: Trends, Policy and Impact

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INTRODUCTION

The People's Republic of China is known as a developing country with a population up-to-now the largest in the world. The Fifth National Population Census in 2000 reports the total population of the mainland China at 1.27 billion (Zhuang and Zhang 2003), and the 1 Percent National Population Sample Survey (mini-census) carried out in November 2005 reports the population at 1.31 billion (NSB 2006)¹. China is also known as a country with a most stringent and government-directed family planning program and fertility policy, has experienced a dramatic fertility decline from 5 to 6 children per women in the 1950s to less than 2 in recent years. The 2000 census reports China's total fertility rate at 1.4 (NSB 2003). The rapid changing situation of China's population dynamics calls for a review of fertility transition in China in terms of its trends, policy, and impact. The paper will first discuss the population dynamics in China in terms of growth, birth rate, and fertility in recent years, and then turns to the issue of fertility policy implemented by the government in China in terms of policy fertility, and finally will look into the impact of fertility decline in terms of population aging, gender equality, sex ration at birth, and labor supply, etc.

POPULATION GROWTH AND FERTILITY TRENDS IN CHINA

For long time, the rapid population growth and the possible negative impact of the over-growth to the socioeconomic development of the country has been the overriding focus of concern for the government and society alike. Even after the 2000 Census reported a TFR way below replacement, and the historical transition of the reproductive pattern from a typical high fertility to a typical low fertility in half a century has been well acknowledged (Chen and Guo 2006), it was still argued that "while its fertility has declined to below replacement at the level of 1.8, the annual births will 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). Nevertheless this assertion has soon been questioned by the situation witnessed in recent years.

¹ The discussion in the paper has excluded the three Chinese areas of Hong Kong, Macao, and Taiwan.

Table 1 Population Changes: 2000-2004

Year	Year-end Total Population (million)	Crude Birth Rate (‰)	Births (million)	Crude Death Rate (‰)	Deaths (million)	Natural Growth Rate (%)	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

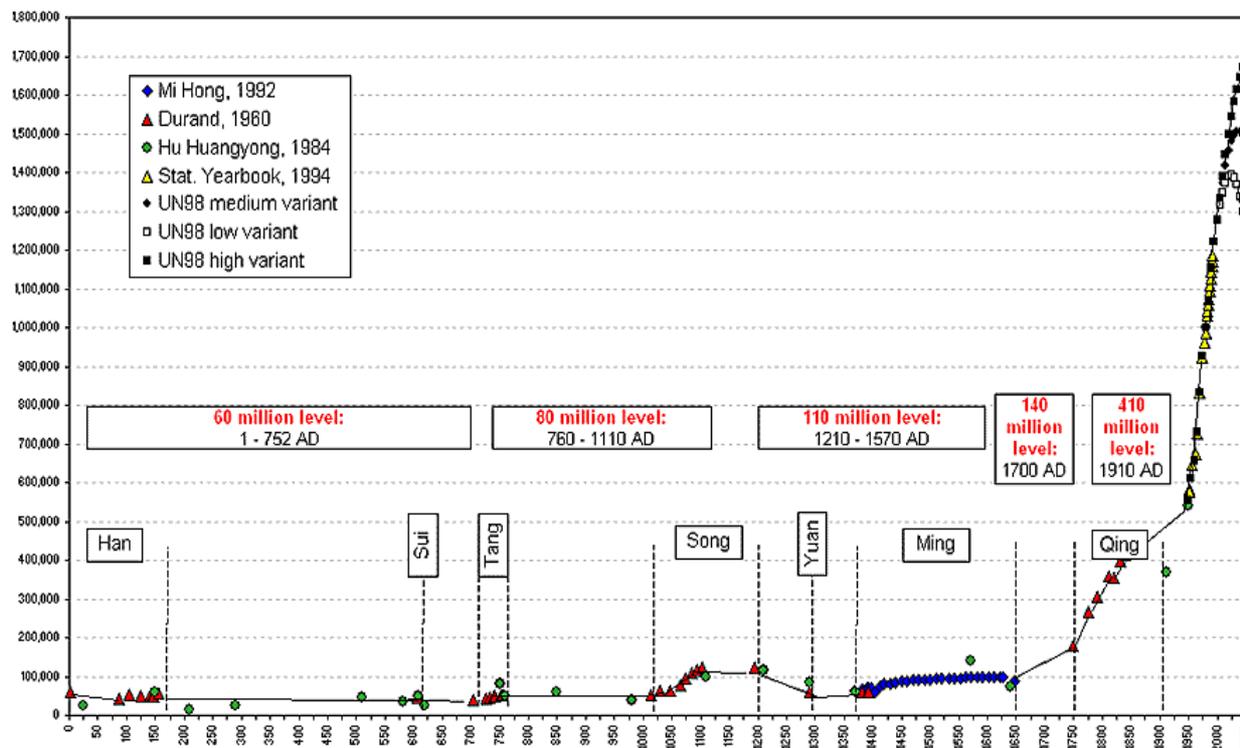
Sources: NSB 2005, 2006.

Table 1 is compiled with data published by the National Statistics Bureau of China with results from the annual population change sample surveys and the 1 percent national population sample survey. It shows that while the total population has been continuing to increase since 2000, the annual growth of the population has been decreasing, from more than 9.5 million to around 7.6 million. The declining trend is quite apparent. It is because that while the number of deaths has been remaining virtually no change at the level of more than 8 million, the crude birth rate and the number of births both have both been decreasing over years. The birth rate has declined from 14 per thousand in 2000 to 12.4 per thousand in 2005, and the number of births has declined from close to 18 million to a bit more than 16 million, a decrement of about 2 million in 5 years. As a result, population growth rate has declined to below 0.6 percent. In fact all the 31 provinces of the country thus have a population growth rate below 1 percent except for the three remote provinces of Tibet (1.12 %), Ningxia (1.12 %), and Xinjiang (1.09 %). At this situation, it is no longer tenable for China to claim itself as a country with "rapid population growth".

The slow-down trend of population growth can also be seen from the predictions for the timing of the arrival of peak population and the population size at the peak for China. A decade ago, it was widely regarded that China will not achieve zero population growth until the mid-21st century with a peak population of 1.6 billion; by the turn of the century, the prediction turned to the 2040s with a population of 1.5 billion. The growing consensus now is for the early 2030s with a population less than 1.5 billion. Most recent projection from the United Nations is that China's population will get peak at 2030 with a population of 1.446 billion, while India will have a population of 1.449 billion, surpassing China to be the largest population country in the world (United Nations 2005).

China has not always been a country with rapid population growth. In the long history, the population had been growing quite slowly due to high birth rate compensated by high death rate. The rapid population growth as a demographic phenomenon was not seen until the 17th century when mortality started to decline while birth rate remained at a high level as shown in Figure 1 (Poston et al. 2005). This pattern is consistent with what is suggested by the demographic transition theory. It meanwhile indicates that rapid population growth is a one-time phenomenon in the prolong history, and is about to be over after dominating China's population dynamics for several hundred years.

Figure 1: Population Growth of China, A.D. 0 -2050



Source: Heilig 1999

Fertility is most commonly observed by total fertility rate (TFR). China’s measurement of its fertility once was claimed to be “of very high quality” in the early 1980s (Coale, 1984), but turns to be a focus of debate over years, particularly since the mid-1990s. It was expected to have an answer to the debate with the results of the 2000 population census. Surprisingly, the 2000 census reported a fertility level only at 1.22.² This result has been widely considered “unacceptable”, and even for the National Statistics Bureau to see it as “too low”. More debates arise on China’s fertility level in recent years, and the estimation ranges from as low as 1.35 to as high as 2.3 (see in Chen and Guo 2006). Among them, several studies employing various methods have argued China’s TFR at the level “between 1.5 and 1.6” in the year 2000 (Guo 2004; Retherford et al. 2005; Zhang and Zhao 2006), while the official figure is insisted at “about 1.7 to 1.8” (Chen and Guo 2006).

² NSB (2003) later adjusted the 2000 total fertility rate to 1.4 according to the short form of the census.

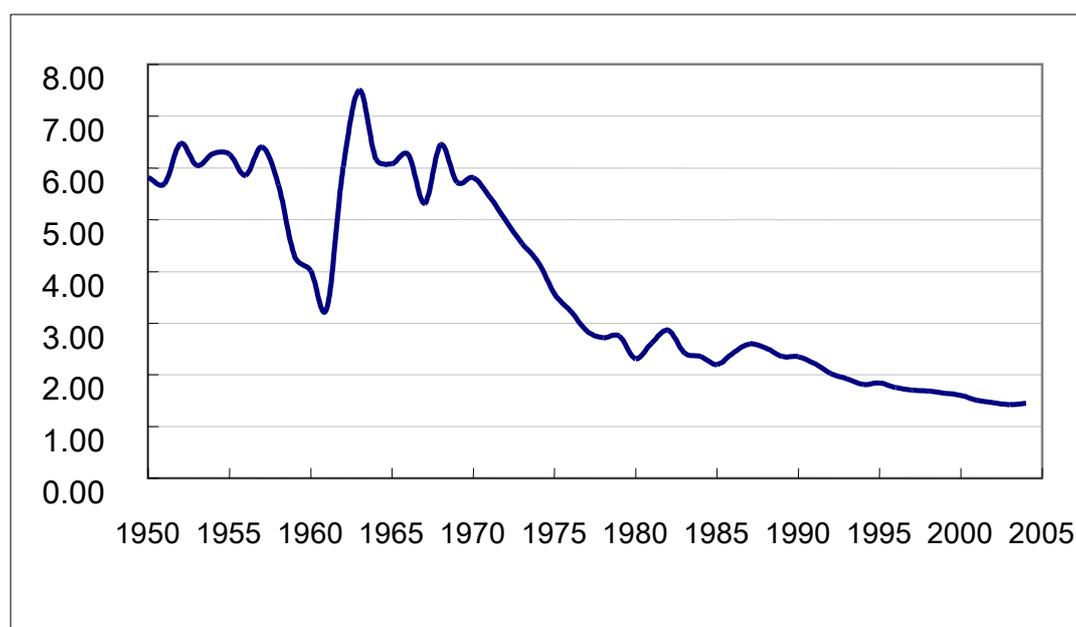
Table 2: Age-specific Fertility Rates and Total Fertility Rate in China: 2000 - 2004

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

Sources : 2002: 2000 Population Census, 2001-2004: Annual Population Change Sample Surveys

Despite the on-going debate, the National Statistics Bureau continues to publish the detailed fertility information by age, sex, and parity every year based on the results from the annual population change sample surveys. The age-specific fertility rates and total fertility rate in China for 2000-2004 are shown in Table 2, which reveal quite consistent trend of China's fertility at the level around 1.4 in the early 21st century. Whatever is the method and data source used to determine the fertility level China has today, one thing is hardly refutable that China's fertility has truly fallen below replacement level of 2.1. China's fertility transition has entered into the stage of a low fertility (see Figure 2).

Figure 2 Total Fertility Rate in China: 1950-2004



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 its strong family planning program. Yet little is known that China's fertility policy, while a national priority for over two decades, has evolved to contain a highly localized feature. As a result, China's national fertility policy has often been known mostly as a "one-child policy".

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

Fertility policy in China can be grouped into four categories: 1) one-child policy (one child per couple), 2) 1.5 children policy (those whose first child is a girl may have a second child), 3) two-children policy (two children per couple), and 4) three-children policy (three children per couple).

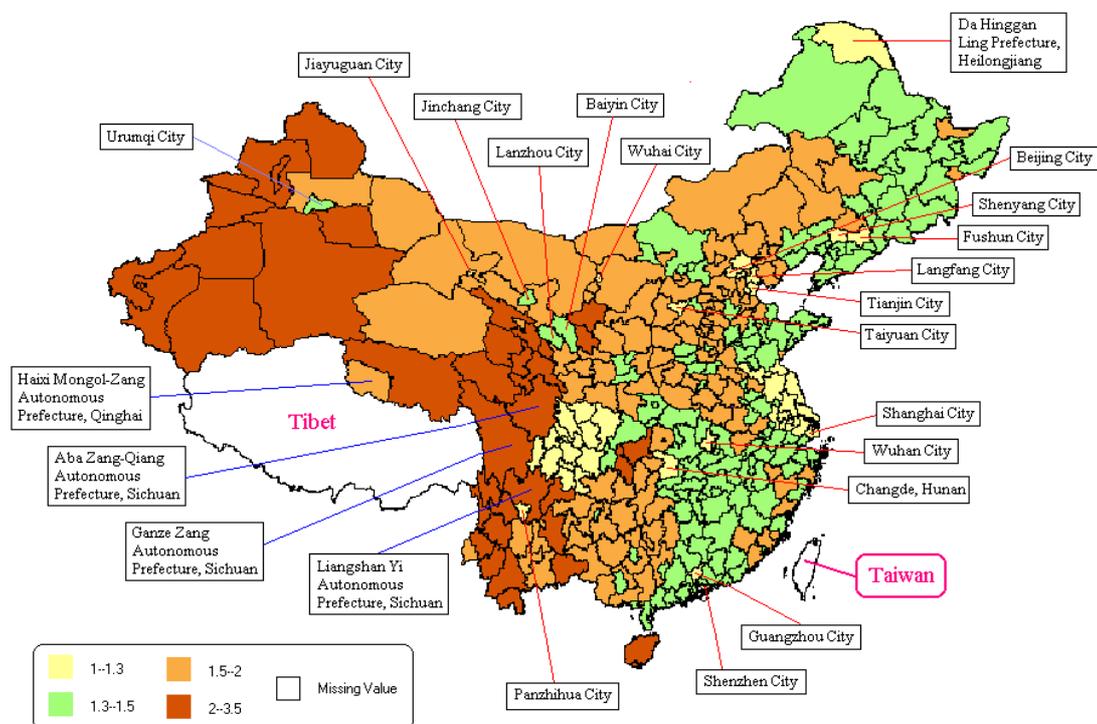
Map 1 highlights the geographic diversity of fertility policy measured by policy fertility for China's prefectures, an administrative level below province. Tibet is excluded in the calculation and mapping due to lack of data on fertility policy at the sub-provincial level. For the sake of simplicity, it is grouped policy fertility into four categories: 1) 1.0 – 1.3, corresponding with regions with a predominately one-child policy; 2) 1.3-1.5, corresponding to areas with a mixture of one-child and one-and-half children policies; 3) 1.5-2.0, corresponding to areas with a one-and-half and two-children policies; and 4) 2 or higher, for areas with a two- or more-children policy.

The four color shades of the map represent different levels of policy fertility, from the lowest (1-1.3, with the lightest color) to the highest (2 – 3.5, darkest color). It is evident from this map that the areas with the most stringent fertility policy are mainly the 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 East and Central China, whereas most prefectures with the highest policy fertility (above 2, darkest color) are distributed in the Central and West regions of the country.⁴ These are mostly areas with a high concentration of minority populations.

³ This part is based on Gu et al. 2006; Gu et al. forthcoming.

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.

**Map 1: Geographic Distribution of Policy Fertility,
 Prefecture Level, China, Late 1990s**



The population distribution by policy fertility for China as whole is presented in Table 3. Slightly above a third of the population (35.4 percent) fall into the one-child policy category. Over half of the national population (53.6 percent) falls into the 1.5 children policy category. Combined, these two categories encompass nearly 90 percent of China's national population, who are subject to a below-replacement fertility policy. Only about 10 percent of the population (9.7 percent) fall into the two-child category, and the percentage of population under three-child policy is even more trivial, only one percent.

What proportion of China's population could have only one child, if they follow fully the policies as summarized above? Taking the one-child couples in the 1.5-children policy areas into account, 63 percent of all couples in China could end up with only one child, 36 percent with two children, and only one percent with three or more.

Table 3 Demographic Distribution of Fertility Policy, China, Late 1990s

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

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 as low as barely above 1 (1.06) in Shanghai and Jiangsu, to as high as well above two (2.37) in Xinjiang. China's provinces can therefore be grouped into four categories by their fertility policy. First, there are six provinces in category one with a policy fertility level less than 1.30. There are twelve provinces in category two, with policy fertility between 1.30 and 1.50. There are seven provinces in category three with policy fertility above 1.5 but below 2. Finally, five provinces are in category four, where policy fertility is above two. Most of them are from the West 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 provinces have a policy fertility level at 1.3 or lower, 12 provinces in the 2000 census reported a fertility level that was lower than 1.2. The differences between the policy required fertility and the census observed fertility for the 30 provinces are quite marginal. Relatively large differences (above 0.5 children) are found only in three provinces.

Sub-nationally, distribution of fertility policy also follows a gradient of economic development level, from the east to the west by these three broad economic development regions. The economically most developed East region has the largest shares of prefectures and population, and also the highest share of the population falling under the requirement of the one-child rule (69.6 percent). The overall policy fertility level for this region is only 1.39. The economically least developed West region has the second largest share of prefectures (36.7 percent), but the smallest share of the national population (28.8 percent). Overall policy fertility requirement for the region is also the most lenient, at the level of 1.56. The policy targeted fertility for the Central is in between at the level of 1.47. Map 2 shows a graphical depiction of this policy gradient following this regional classification.

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Table 4: Policy Fertility and Recorded Fertility of China's Provinces, circa 2000

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

Source: Observed fertility is from the 2000 population census (NBS, 2003), in which the national total fertility rate was re-reported at 1.4.

than 7 percent, a definite indication of China to become an aging society. More recent data from the 2005 1 percent mini-census report that China's population aged 60 and above accounts for 11 percent and aged 65 and above 8 percent. More important than proportion is the size of the elderly people. It implies a population of age 60 and above about 144 million and age 65 and above about 100 million.

The elderly support becomes an acute social issue to be addressed, particularly in China's rural areas. Traditionally, rural people tend to heavily rely on the children for elderly support, but with sharp reduction of children to have, the practice becomes no longer feasible. At the same time, the coverage of the social security program for the rural population is not forthcoming in the near future. Moreover, because of accelerated population movement triggered by the market oriented economy, more young people tend to leave the village for cities. At a result, while the rural fertility is higher than urban fertility, the degree of population aging turns to be higher in rural areas than urban areas. Compared to 1982 (the Third National Census), in 2000 the urban elderly aged 65 and above has increased from 4.5 percent to 6.4 percent, while in rural areas it increased from 5.0 percent to 7.5 percent (Gu 2006). "Unlike the case in the developed countries however, population aging occurs in China far before the realization of its modernization" (Gu and Peng 1992).

Population aging is far beyond an issue concerning the elderly support. It implies an overall transformation of the whole society. It is estimated that by the mid-21st century, likely more than one third of China's population is in age 60 and above, and among them more than 100 million aged 80 and above, every less than 2 young adults have to support one old person. China will become an aging society older than the oldest country in the world today. Figures 3 to 5 are the comparisons of population pyramids between 2000 and 2040 for China as a whole as well as Shanghai and Beijing, the two largest metropolitan cities in China (Poston et al. 2005). It shows that in a few decades, China's population structure will soon turn from a pyramid to a pillar shape, and for Shanghai and Beijing, the population pyramid will become even upside-down. What challenges a society may face with an aging population structure as such is still a huge question to be answered. As a far more than complete account it can be seen that the childbearing and rearing facilities will likely become superfluous and services for the elderly will become in dire need, people tend to reduce the consumption for saving to pay the medical cost at own high age, and labor supply will be on the way to shrink.

Figure 3: Population Structure of China, 2000 (Shaded) and 2040

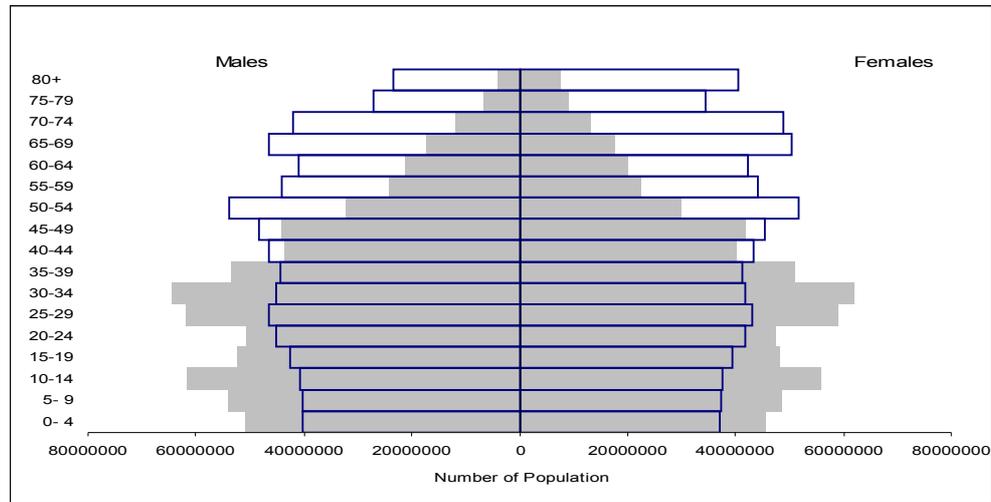


Figure 4 Population Structure of Shanghai, 2000 (Shaded) and 2040

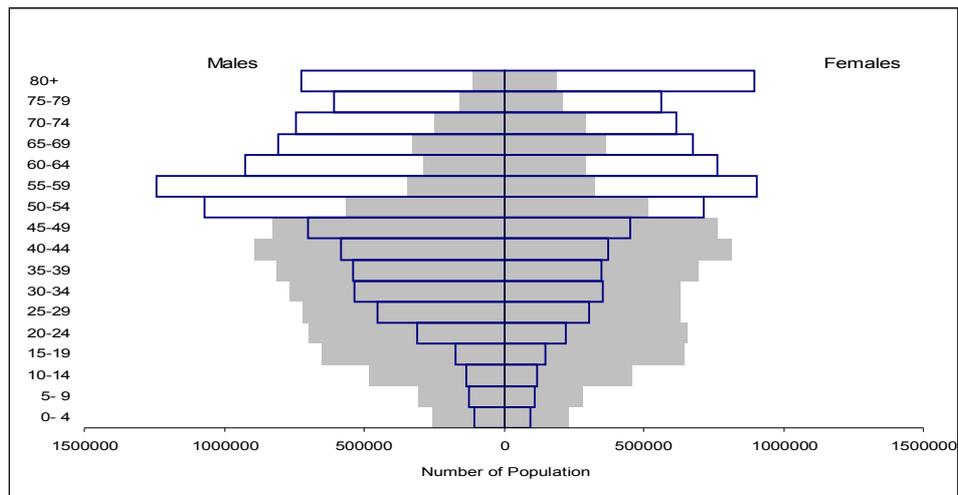
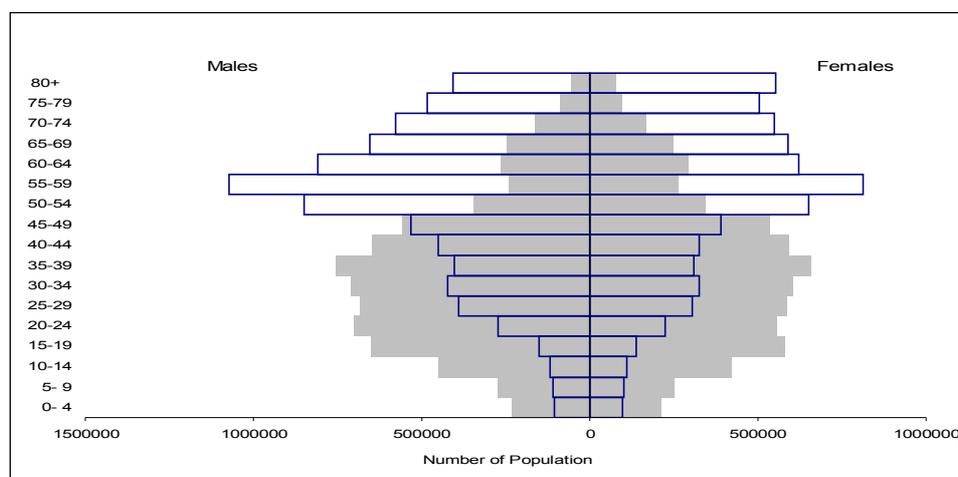


Figure 5: Population Structure of Beijing, 2000 (Shaded) and 2040



Along with mortality decline and increase of life expectancy, the sexual disparity in life expectancy tends to be more apparent. Table 5 is the life expectancy by sex in China for selected years in the last two decades. While the overall life expectancy has been increasing in China from 67 years to 73 years, the disparity of it between male and female has become greater from less than 3 years in the early 1980s to more than 4.6 years in the early 2000s. It can be expected more the case in the future. Because women tend to live longer than men, it will end up with more women than men surviving in the high age. The higher the age the more so the case. This trend can also be noticed from the population pyramids shown in Figure 3 to Figure 5. At the 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 the sense, the issue of population aging is in fact an issue of the aging females.

But the impact of population aging is not only on the elderly females but also on the females at young and mid ages. The responsibility of elderly care often more likely lies on the shoulders of women, i.e. daughters or daughter-in-laws. Should they spend more time and energy for their parents, they may have to spend less time and energy for their career and making contribution to the society. When life expectancy moves upward the care time for the elderly will take longer period, which even become a case of younger elderly taking care of the older elderly. What means a plus to the family support would be very much likely a minus to the career and the society (Gu and Peng 1992). This comes up an issue related with population aging and women's status. Population aging seems to call for an overall reconstruction of social functions and social structures.

Table 5: Life Expectancy by Sex in China for Selected Years : 1981 - 2002

Year	Total	Male	Female	Diff.(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

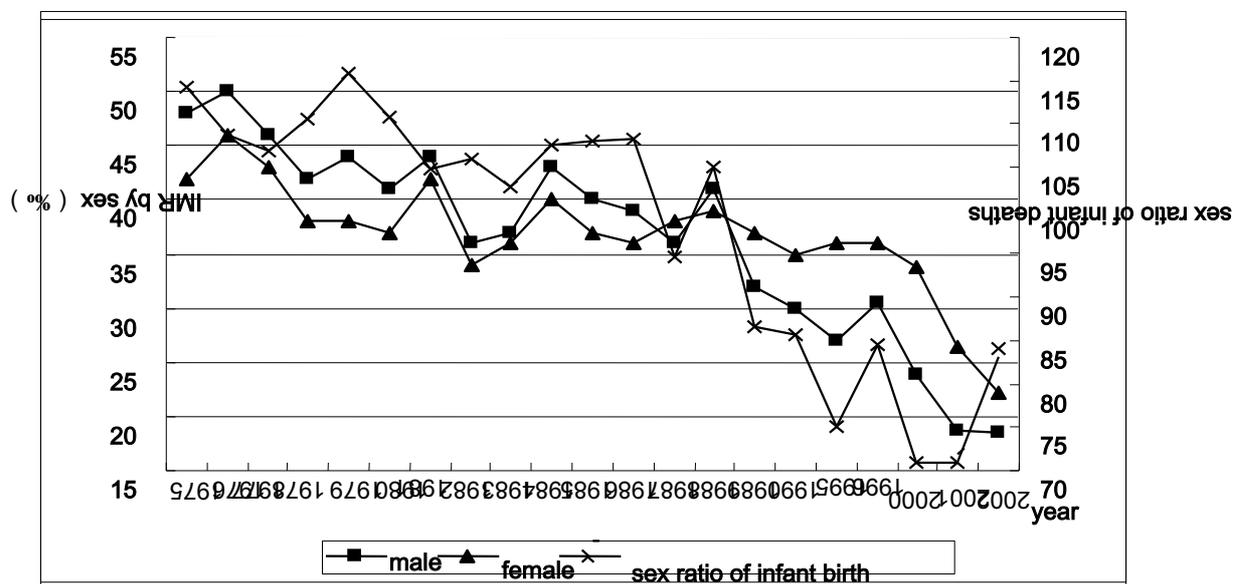
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2001	72.31	70.24	74.59	- 4.35
2002	72.88	70.69	75.25	- 4.56

Source: NSB, 2003

Another issue related with rapid fertility decline is arguably the abnormal sex ratio at birth (SRB) as well as the infant mortality. China's sex ratio among new-born babies has risen since the mid-1980s. The 1990 population census reports China's SRB at 111, much above the acceptable normal level observed internationally. The abnormality of SRB reported from census received much concern but also created a great debate about the trueness of the reported abnormality (Zeng et al. 1993; Gu and Roy 1995). The debate has lasted for ten years until the release of the results of the 2000 population census, which reported China's SRB up to 117, way above the normal level. The abnormality of SRB has been observed in China for two decades. While China is not the only population with abnormal SRB, it is the population with the most serious abnormal SRB for a longest period in the world.

Figure 6 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 witnessed the rising of sex ratio at birth in China but also the case of abnormality in infant mortality rate (IMR) by sex. While the overall IMR in China has been declining, the IMR for girls went abnormally higher than that for boys. And the sex ratio of infant deaths went to below 100, and becomes more so in recent years (see Figure 6). The over-high sex ratio at birth and the over-low sex ratio among infant deaths can be seen as two sides of the one coin of sexual selection in childbearing, i.e. "before-birth solution" and "after-birth solution", and reflects the sexual discrimination in childbirth and child survival (Li et al. 2006). It has been much discussed that among other factors, the occurrence of abnormal SRB has a lot to do with the rapidity of fertility decline, which intensifies the conflict between the number and sex of children people intend to have (Gu and Roy 1995).

Last but not the least to be discussed briefly is labor supply as far as the impact of low fertility is concerned. A smaller birth cohort will naturally bring up a smaller labor cohort in later decades. It is predicted that assuming the current fertility continues, China will soon observe a rapid decline in labor supply in the late 2020s from 966 million to 761 million by the mid-21st century. While the size of labor force will remain at a huge level, the reduction of the labor population will be quite sharp, a rate of reduction of 100 million per decade, or 10 million per year. And the labor population itself will become aging as well (Guo et al. 2006). "Labor shortage" has been reported since the spring of 2004. Though it occurs due to various reasons, some Chinese economists nevertheless have started to claim that China's labor force has turned to from a period with "abundant supply" to a period with "limited surplus"(Cai and Wang 2006).

The paper has sketchily discussed the fertility transition 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 aging, gender equality, sex ratio of the newborns and infant deaths, and labor supply, etc. The arrival of below replacement fertility in China requires a re-understanding of the population dynamics and a review of the population policies to address the issues brought up by low fertility. "Low fertility" as a demographic phenomenon has been observed not only in Europe but also in Asia, not only in developed countries, but also in developing countries, not only in traditionally "high fertility" countries but also in traditionally "low fertility" countries. There are 65 countries accounting for 43 percent of the world population with a fertility below replacement, 31 countries among them with 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 concern of international society (UN 2000). It is even claimed to be "the norm in post-transitional societies" (Demeny 1997; Bongaarts 2001). The understanding of the global trend of below replacement fertility as well as the implication to the policy response to it is still at the beginning.

REFERENCES

- Bongaarts, John. 2001. "Fertility and Reproductive Preferences in Post-Transitional Societies". *Population and Development Review* 27, Supplement: *Global Fertility Transition*, 260-281.
- Cai, Fang and Wang Meiyuan. 2006. "Aging and Labor Shortage in China". Chapter 5 in *Greenbook of Population and Labor (2006), Report on China's Population and Labor No. 7, Demographic Transition and Its Social and Economic Consequences* (edited by Fang Cai and Baochang Gu): 143-160. Beijing: Social Science Academic Press.
- Coale, A. J. 1984. *Rapid Population Change in China, 1952-1982*. Washington, DC: National Academy Press.
- Chen, Li and Zhenwei Guo. 2006. "Analysis on Population Situation in 2005", Thematic Report 1 in *Greenbook of Population and Labor (2006), Report on China's Population and Labor No. 7, Demographic Transition and Its Social and Economic Consequences* (edited by Fang Cai and Baochang Gu): 3-19. Beijing: Social Science Academic Press.
- Demeny, Paul. 1997. "Replacement-Level Fertility: The Implausible Endpoint of the Demographic Transition." In G.W. Jones, R.M. Douglas, J.C. Caldwell, and R.M. D'Souza (eds.), *The Continuing Demographic Transition*. Oxford: Clarendon Press.
- Gu, Baochang. 2003. "Population, Reproductive Health and Poverty in China", in *Population and Poverty: Achieving Equity, Equality and Sustainability - Population and Development Strategies*, No. 8, Chapter 4: 63-77. UNFPA, New York, USA.
- Gu, Baochang. 2006. "China's Population Dynamics in the New Period." Chapter 1 in *Greenbook of Population and Labor (2006), Report on China's Population and Labor No. 7, Demographic Transition and Its Social and Economic Consequences* (edited by Fang Cai and Baochang Gu): 61-83. Beijing: Social Science Academic Press.
- Gu, Baochang and Xizhe Peng. 1992. "Consequences of Fertility Decline: Cultural, Social and Economic Implications in China". *Impact of Fertility Decline on Population Policies and Program Strategies*. Korea Institute for Health and Social Affairs, Seoul, South Korea: 49-66.
- Gu, Baochang, Krishna Roy. 1995. "Sex Ratio at Birth in China with Reference to Other Areas in East Asia: What We Know". *Asia-Pacific Population Journal* 10, 3: 17-42.
- Gu, Baochang, Wang Feng, Guo Zhigang, and Zhang Erli. 2006. "Fertility Policy and Policy Fertility in China: A Quantitative Analysis". Presented at the Annual Meeting of Population Association of America, March 30-April 1, 2006, Los Angeles, USA. **I**
- Gu, Baochang, Wang Feng, Guo Zhigang, and Zhang Erli. Forthcoming. "Truths and Myths about China's One-Child Policy: an Analysis of Local and National Fertility Policies at the Turn of the Century". *Population and Development Review*.
- Guo, Zhigang. 2004. "Study for fertility of China in the 1990s." *Population Research* 28, 2: 10-19 (in Chinese).

Comparative Workshop on Low Fertility
22-23 February 2007, Singapore
Organized by Asia Research Institute & Faculty of Arts and Social Sciences,
National University of Singapore

- Guo, Zhigang, Zhang Erli, Gu Baochang, Wang Feng, Xie Zhenming. 2006. "Current Fertility and Future Perspectives of Population Development in China". In *21st Century Population and Economic Development in China* (edited by Zeng Yi, Li Ling, Gu Baochang, and Justin Yifu Lin): 67-94. Beijing: Social Science Academic Press.
- Heilig, Gerhard K. 1999. *Can China Feed Itself? A System for the Evaluation of Policy Options*. IIASA, Austria, Laxenburg. CD-Rom, Version 1.1.
- KIHASA/ESCAP. 1992. *Impact of Fertility Decline on Population Policies and Program Strategies*. Korea Institute for Health and Social Affairs, Seoul, South Korea.
- Li, Shuzhuo, Wei Yan, and Jiang Quanbao. 2006. "Girl Child Survival in China: Past, Present and Prospect". *Market and Demographic Analysis* 1: 2-16.
- National Statistics Bureau. 2003. *Highlights of Data from 2000 the Fifth National Population Census*.
- National Statistics Bureau. 2005. *2004 China Population*. China Statistics Press.
- National Statistics Bureau. 2006. *Communiqué of Major Figures from 2005 1 Percent National Population Sample Survey*.
- Poston, Dudley, Baochang Gu, and Hua Luo. 2005. "The Effects of the Fertility and Mortality Transitions on the Elderly and Eldercare in China, and in Shanghai, Beijing, and Tianjin", in *Papers of the International Symposium on Population and Sustainable Development Strategy*: 94-115. Shanghai: Shanghai Academy of Social Science Press.
- Retherford, R. D., M. K. Choe, J. Chen, X. Li, and H. Cui. 2005. "Fertility in China: How much has it really declined?" *Population and Development Review* 31, 1: 57-84.
- Wang, Feng. 2005. "Can China afford to continue its one-child policy?" *Asia Pacific Issues*, No. 77. East-West Center, Honolulu, Hawaii.
- Zhang, Guangyu and Zhongwei Zhao. 2006. "Reexamining China's fertility puzzle: Data collection and quality over the last two decades." *Population and Development Review* 32, 2: 293-321.
- Zhuang, Yaer and Liping Zhang. 2003. *Basic Data of China Population Since 1990*. China Population Press.
- United Nation. 2000. *Below Replacement Fertility*. The United Nations. New York, USA
- United Nations. 2005. *World Population Prospects: The 2004 Revision*. Population Division, Department of Economic and Social Affairs, the United Nations. New York, USA.
- Zeng, Yi, Tu Ping, Gu Baochang, Xu Yi, Li Bohua, and Li Yongping. 1993. "Causes and Implications of the Recent Increase in the Reported Sex Ratio at Birth in China". *Population and Development Review* 19, 2: 283-302.