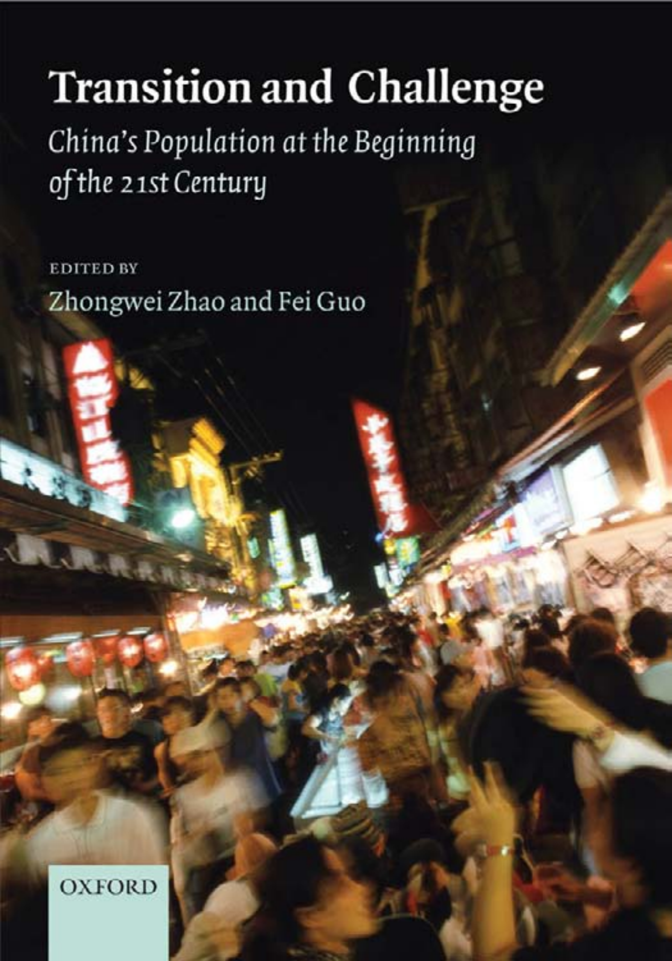
Transition and Challenge

China's Population at the Beginning of the 21st Century

EDITED BY

Zhongwei Zhao and Fei Guo



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Introduction

Zhongwei Zhao and Fei Guo

One of the most exciting places in the world in recent years has been China, where extraordinary social, economic, and demographic changes have taken place. China's radical economic reform started in the late 1970s and has generated enormous economic growth for more than a quarter of a century. As a result, the number of people living under the poverty line of US$1 a day fell by more than 400 million from the early 1980s to the early twenty-first century (Chen and Ravallion 2004). People's living standards improved considerably, with unadjusted per capita income increasing 27 fold in urban areas and 22 fold in rural areas from 1978 to 2004 (NBS 2005). After more than a century of successive struggles and unremitting efforts, China has once more become an economic super power in the world. China has also experienced great social and demographic changes in recent history. Life expectancy at birth for the population rose from about 35 years in the mid-twentieth century to more than 70 years at the beginning of the twenty-first century. Accelerated by its strict and nationwide family planning program, China's total fertility rate (TFR) fell from nearly six children per woman in the late 1960s to below replacement in the early 1990s, and has further declined to a lower level since. Because of recent economic development and the relaxation of government control on population movement, internal migration, which was negligible during most of the 1960s and 1970s, has increased rapidly in the last two decades. The floating population—those who have lived outside the county where their household registration is kept—now numbers more than 140 million (*People's Daily Online* 2005). Thanks to its remarkable mortality and fertility decline, China has now joined other demographically advanced countries on the path to a rapidly ageing society. Fundamental demographic changes of this kind have had, and will continue to have, significant influences on the society and its socio-economic development. This book concentrates on China's recent demographic changes and their wide-ranging consequences and profound long term impact. A brief review of China's demographic transition, major challenges brought about by this change, the development of population studies in China, and the production and organization of this book will provide necessary background information for a better understanding of these issues.

1.1 RAPID DEMOGRAPHIC TRANSITION

Demographic transition can be briefly defined as the process in which both mortality and fertility fall from high to low levels. China's demographic transition began with a rapid mortality decline. Mortality was rather high in historical China and this conclusion has been supported by evidence found among both ordinary people and members of upper classes (Barclay *et al.* 1976; Lee *et al.* 1993; Lee *et al.* 1994; Zhao 1997). Despite the fact that improvement in population survivorship was observed in some areas in the first half of the twentieth century (Campbell 1997), a nationwide mortality decline did not take place until the middle of the century. As suggested by some studies, mortality remained high in the 1930s and 1940s when the life expectancy at birth was likely to have been lower than 35 years (Barclay *et al.* 1976; Banister 1987). According to the data compiled by the Population Information and Research Centre of China, life expectancy at birth for the Chinese population increased to 56 in 1957, 64 in the early 1970s, and 68 in the year 1981 (Huang and Liu 1995). Because these figures are very likely to have been affected by underregistration of death, various adjustments have been made by a number of scholars in the last two decades. Banister (1987), for example, estimated that China's life expectancy at birth was about 50 in the year 1957, 61 in 1970, and 65 in 1981. Even these conservative estimates, however, suggest that China achieved great success in lowering mortality. Life expectancy at birth increased at a rate of about ten years per decade for 30 years, with the most rapid improvement observed from 1950 to 1957. This was not only faster than the increases recorded in European history, but also overtook that observed in Japan and Korea where mortality decline of the same magnitude took more than 40 years to complete (Zhao and Kinfu 2005). This achievement and China's successful experiences, along with those observed in Sri Lanka, Costa Rica, and some other populations, have been widely regarded as 'routes to low mortality in poor countries' (Caldwell 1986: 171).

China began its socio-economic reform in the late 1970s and has maintained rapid economic growth for the past quarter of a century. Among other effects, the reforms have led to great changes in health care and exerted a marked impact on population health. On the positive side, people's living standards, and consequently the levels of consumption and nutritional intake in the population, have risen considerably as a result of the dramatic economic growth and the successful poverty alleviation program. This and the notable improvement in health facilities in cities and advanced rural areas make it possible, for those who could afford them, to obtain high quality care and treatment when required. Largely due to these changes, life expectancy at birth for the national population further increased by five to seven years (depending upon the use of statistics from different sources) in the last two decades of the twentieth century (Ren *et al.* 2004; Zhao and Kinfu 2005). This is remarkable in comparison with the experience of some former republics of the USSR and Eastern European countries where mortality stopped declining or even increased during their recent reconstruction (Meslé 2004). China's recent socio-economic transformation has, however, also had some negative influences on public health. During the early years of the reforms, the cooperative medical system, which had existed widely in rural areas, collapsed. The urban health care systems also deteriorated considerably. Inequality in income distribution and health care has increased at an alarming speed. Marked mortality differentials between advanced and less developed areas, and between advantaged and disadvantaged social groups, have become a major concern (Zhao 2006). China's recent mortality decline has been moderate compared with what had been achieved in the first three decades after the founding of the People's Republic.

While a nontrivial fertility decline was already observed in some urban populations in the 1950s, the national fertility level remained rather high in China in the 1960s (Lavely and Freedman 1990). Facing increasing population pressure, the Chinese government launched an unprecedented family planning campaign in the early 1970s, which played a vital part in the extraordinary fertility decline which occurred over the last three decades of the twentieth century. China's TFR was around six children per woman during the 1950s and 1960s except in the years of the great famine. Driven by the family planning campaign, it fell rapidly to around 2.5 in 1980. The TFR fluctuated between 2.3 and 2.9 in the 1980s when patterns of changes were less clear (Yao 1995). Although these figures may have been slightly influenced by the underregistration of births, there has been a widely held consensus that they genuinely represent China's fertility changes over the period from 1950 to 1990. Further fertility reduction was recorded in the last decade of the twentieth century. The TFR fell to the level of below replacement fertility in the early 1990s. According to the 2000 census, the recorded TFR was only 1.2 in that year, a figure which obviously suffered from underregistration. Because of the deterioration in the quality of China's recent census data and certain fertility statistics, there has been great uncertainty about China's actual fertility level in recent years.

However, scholars and government statistical officials have all agreed that the TFR has been below replacement level for more than a decade. According to a number of recent studies, the TFR was most likely to have reached around 1.6 in the year 2000, and has stayed at that low since (Yu 2002; Yuan *et al.* 2003; Guo 2004; Retherford *et al.* 2005; Scharping 2005; Zhang and Zhao 2006). China's rapid fertility decline is extraordinary. Changes of the same magnitude have taken many more decades, or even centuries, to occur in most countries of the world.

China's current fertility regime has the following major characteristics. Marriage is still widely regarded as a pre-condition for childbearing, although premarital sex has increasingly become commonplace. Despite the fact that later childbearing has been promoted for decades, many women start their reproduction soon after marriage and the mean age at first birth was only slightly above 24 years at the end of the twentieth century. In contrast to the moderate interval between first marriage and first birth of 1.6 years, the interval between the first birth and second birth was rather long, at 5.7 years in 2000, which is directly related to the family planning regulations implemented in many regions (Ding 2003). The proportion of women remaining childless is extremely low. According to the Family Planning and Reproductive Health Survey conducted in 2001, those having never had children accounted for less than 2 per cent among women aged 35 to 39. Moreover, a considerable number of people still have two or more children, although the one child policy has been implemented in many areas for more than two decades and the period fertility rate has fallen to a rather low level. In the year 2000, the mean number of children ever born was 1.9 for women aged 35 to 39 and 1.5 for those aged 30 to 34. Nonetheless, these figures show that even cohort fertility is very likely to be kept at or below the level of replacement. A further noteworthy characteristic of China's contemporary fertility regime is that, because they have fewer children, women now actually stop reproduction at a much younger age than in the past.

Overall, the Chinese population had completed its demographic transition by the end of the twentieth century. Yet great disparities in fertility and mortality still exist across regions because of the considerable variations in government family planning policies, the implementation of family planning programs, people's fertility regulating behavior and levels of socio-economic development. Such differences are striking even at the provincial level. Many regions, especially large cities, reached replacement level fertility at a much earlier time and their current levels of fertility are much lower than the national average. Shanghai, for example, reached replacement level fertility in the early 1970s when the family planning program had just started across the country. According to the census results, its TFR was only 0.7 in 2000, among the lowest in the world. China's urban areas have, as a whole, reached a very low fertility level, with a TFR of 1.13 children per woman in the late 1990s. In contrast, the TFR in rural China was still close to the level of replacement (Lavely and Freedman 1990; Yao 1995; Zhao 2001; Zhuang and Zhang 2003). Considerable variations are also found in mortality. The 2000 census shows that, for example, life expectancy at birth reached 78.1 years in Shanghai, which was very close to the highest in the world, but it was only 64.4 years in Tibet. Similarly, Shanghai's infant mortality fell to 5.1 per thousand and was among the lowest in the world, but infant mortality was 55.5 per thousand or ten times higher in Xinjiang. These remarkable regional differentials will not disappear in the foreseeable future (Zhuang and Zhang 2003).

1.2 MAJOR DEMOGRAPHIC CHALLENGES

China's rapid mortality and fertility decline has led to a considerable change in the age structure of the population, and such a shift is expected to continue in the years to come. Considerable demographic changes of this kind have, on the one hand, provided many opportunities. As shown by some scholars, China's recent rapid economic development has at least partly benefited from the so-called demographic bonus or 'demographic dividend' (Bloom *et al.* 2003). On the other hand, these changes have also brought about many new and unforeseen challenges.

China's effective control of fertility since the early 1970s signifies that the number of births averted by the fertility decline is more than 300 million. Because of population growth momentum, however, China's population will continue to increase and this will remain a major demographic challenge for future socio-economic development. Differing from many European countries where negative population growth has already been recorded or will soon take place, China will not face such a situation in the next quarter of a century. According to the United Nations' medium variant population projection made in 2004, China's total population will increase from the current 1.32 billion to about 1.45 billion in 2030 before starting to decline. In other words, an extra 130 million people, a population greater than that of Japan, will be added to China's huge population in the next 25 years, or an average of 5.2 million per year (UN 2005). Although the implied annual population growth rate will be much lower than that observed in recent history, the demographic pressure imposed by this increase and by China's large population will remain a major concern in the near future.

China's working-age population (those aged 15 to 64) will further increase from the 934 million in 2005 to slightly more than one billion in 2015. Then it will gradually decline to 966 million in 2030 and 845 million in 2050 (UN 2005). With this massive and low cost workforce, China will increasingly become a strong competitor in international markets and a dominant economic power in the world. Having a workforce of this kind obviously has many advantages, if we consider only the dependency ratio in the population or the labor supply for development. China as a whole will not face the difficulty created by labor shortages which is likely to occur in many developed countries such as Italy and Japan. However, given the fact that China has already been burdened by a large number of underemployed peasants in rural areas and increasing unemployment in urban areas, providing adequate jobs for the growing working-age population will be a daunting task at least for the next two or three decades.

It should be noted that the United Nations medium variant population projection, from which the figures cited above are obtained, has been based on the assumptions that China's current TFR is about 1.7 and will gradually increase to 1.85 and stabilize at this level after 2015, and that the life expectancy at birth will rise steadily from the current 72 years to 79 years in 2050 (UN 2005). These assumptions may not be very realistic because China's fertility is most likely to have fallen to a level that is lower, and the mortality decline may be faster, than specified in the United Nations medium variant projection. If these differences remain or become larger, changes in the age composition of the Chinese population could be more dramatic than those indicated by the medium variant projection results. However, their impact on changes in population size and working-age population in the next two decades will be relatively small.

Another major demographic challenge is the increasing rural–urban migration. China's economic reform started in rural areas, but its major cities and special economic zones in coastal areas soon became the new engines of development. Many of these areas, stimulated by the large amount of investment driven by governments' favorable policies, have experienced extraordinary economic growth over recent decades. This created a great demand for labor supply and led to a rapid increase in internal, largely rural to urban, migration. According to some estimates, the floating population was around 11 million in 1982, rose to about 30 million when the 1990 census was taken, and now the number is more than 140 million (Liang's chapter in this book; *People's Daily Online* 2005). In Wuhan, one of the major cities in central China, temporary migrants made up only 5 per cent of the population in 1990, but they increased to 27 per cent and accounted for a large part of the labor force by 2000 (Yang 2003). In Shenzhen special economic zone, the population increased from 314 thousand in 1979 to more than seven million in 2000 and its overwhelming majority was migrants. By the end of 2004, the migrant population alone reached about six million and made up more than 80 per cent of the population in Shenzhen (Shenzhen Government 2006). Without the contribution made by migrants, recent rapid development witnessed in these areas would not have been possible.

In addition to the high labor demand generated by strong economic growth, China's increasing migration has also been fueled (and will become more so) by the extremely low fertility that has existed in urban and advanced rural areas for more than two decades. In Shanghai, for example, the TFR has been fluctuating around one for nearly a generation. This has already resulted in a very unbalanced age structure in the population. Japan has long been regarded as having a population which faces a problem of serious population ageing and great difficulty in balancing its age composition and its labor supply. However, the population age structure in Shanghai has already become, and will remain, far more unbalanced than that of the population of Japan. A similar situation is most likely to occur in Beijing and other large cities. If there was no migration, cities like Shanghai would have enormous difficulties in sustaining themselves, let alone acting as the powerhouse of China's economic growth.

Because of what has been said above, China's future development will be accompanied by a growing rural–urban migration. More importantly, such migration will increasingly become a precondition for, rather than a by-product of, future urban development, a trend that has not yet been fully appreciated by policy makers and academic communities. During the last two decades, rural–urban migration has played an extremely important part in creating China's economic growth miracle, but this vital role has not been entirely recognized. Migrants, even after having lived in urban areas for years, do not usually have the same rights and privileges as the local residents. They often take jobs that are not desired by their permanent counterparts (Yang and Guo 1996; Wang *et al.* 2002; Guo and Iredale 2004). Rural migrants are frequently seen as burdens imposed on urban dwellers and blamed for various problems. While large scale rural–urban migration has increasingly become inevitable, in few cities have policy makers adopted an integrated approach that is designed both to maintain sustainable development and to reduce the huge gap between rural migrants and permanent urban residents in their basic rights, living conditions, and long term entitlements. There is an urgent need to improve this unsatisfactory situation.

A further major demographic challenge that China will face is population ageing. In comparison with some other populations, Japan and South Korea for example, the proportion of old people is, and will be for some time, relatively low in China. It will take some 30 years for the proportion of China's elderly to reach a level similar to that recorded in present day Japan. China will become one of the fastest ageing populations in the world, however. According to the

2004 United Nations' medium variant projections, the number of people aged 65 and above will increase from 100 million in 2005 to 329 million in 2050. Their proportion in the total population will grow from 7.6 per cent to 23.6 per cent. The number of those aged 80 and above will increase at an even faster speed, from 15 million to 101 million, and their proportion from 1.1 per cent to 7.2 per cent. The rapid increase of elderly people will begin after 2015 when the post-war baby-boomer generation enters their old age (UN 2005).

What makes population ageing an urgent issue also lies in the fact that China does not have a widely established social security and pension system, which would provide basic financial support for the fast growing old-age population. According to the latest statistics released by the Chinese government about 47 million people, which includes primarily retirees living in urban areas, received various types of pensions or living allowances in 2004 (NBS and MLSS 2005). This figure includes many people who were under age 65 because a large number of Chinese retired or terminated their employment well before this age. In China's vast rural areas, the coverage of pension systems is still very low and the majority of rural elderly do not have any form of pension at all. As reported in a recently released government white paper, the Chinese government has started to experiment with a new old-age insurance program in 1,870 counties, where some 54.3 million people have participated in the scheme. The scheme has accumulated a fund running to 25.9 billion yuan, with nearly two million peasants drawing their old-age pension (IOSC 2005). In comparison with China's huge rural population, these numbers are rather small. Old-age security for the majority of the rural population is still centered mostly on families. Even in places where old age insurance is available, the amount of pension or allowance is often far from adequate.

Another related area is health care. In comparison with most developed countries, the proportion of the Chinese population covered by various types of health care schemes is quite small, which will further aggravate the pressure created by population ageing. According to a recent survey conducted by the Ministry of Health, some 40 per cent of people in cities and 80 per cent in the countryside do not have any health care coverage. The majority of the population has to pay for health expenses out of their own pockets. Because of the reduction in health care coverage and the rapid increase in the cost of health services, health expenses paid by individuals, as indicated by some studies, increased by 110 times between 1982 and 2002, far quicker than the growth in income (Rao and Liu 2004). Lack of adequate medical care and health services has already become a major difficulty in further reducing mortality, especially in less developed areas and among disadvantaged social groups including the elderly. Some experiments and pilot projects have been carried out in recent years to explore ways of improving social security and health care systems, but these will remain a major challenge for increasing healthy longevity in the foreseeable future.

1.3 DEMOGRAPHIC RESEARCH IN CHINA

While China has a long history of collecting demographic data and population issues were discussed thousands of years ago, systematic investigations into population issues did not begin until the early twentieth century (Zhu 1998; Tian 2002). During the nineteenth century, the second half of the nineteenth century in particular, China was repeatedly defeated by the western powers and became a weak nation in the world. Facing this harsh reality, many Chinese began to search for its reasons and the route toward revitalization. Under this broad social and political background, both pro- and anti-population growth views, as well as interest in other population issues, started to grow. There was considerable discussion on these issues in the first two or three decades of the twentieth century, which has been widely regarded as producing the first wave of population studies and the beginning of modern demography in China. This development was seriously interrupted by a series of wars in the 1930s and 1940s. The second wave of population studies occurred in the mid-1950s immediately following the 1953 population census (Zhai 2000; Tian 2002). The census surprisingly reported a larger than expected population total. This attracted the attention of the central government, which subsequently issued an instruction on controlling population in 1955 (Peng 1997). The population debate in the late 1950s centered on the 'New Population Theory' proposed by Ma Yinchu, the president of Peking University and a well-known economist of the time (Zha 1999). However, academic discussion of the population issue ended abruptly because of political intervention. Ma's new population theory was branded as Malthusianism and severely criticized. As a consequence, sociology and population studies became 'forbidden areas' and the subjects were no longer taught in academic institutions until the 1970s.

Facing its growing population pressure, the Chinese government launched a nationwide family planning campaign in the early 1970s. During the early stage of the campaign, there was a pressing need to provide theoretical justification for the necessity and feasibility of the birth control policy. This led to the third wave, or revitalization, of the population studies. Driven by the high demand, the number of researchers working on population issues increased rapidly during the 1980s and 1990s. There was almost no demographer working on population issues in China in the early 1970s, but demographic research institutes have now been set up widely in major universities and provincial social science academies. During the past two decades, these demographic institutions not only educated thousands of Chinese demographers, but also provided training and guidance for a large number of students or junior demographers from both developed and less developed countries.

There has been a marked expansion in the scope of population research in the last 30 years. In the late 1970s and early 1980s, studies mainly concentrated on the nature of China's population problems, theoretical considerations for population control, strategies of regulating population growth and methods of improving family planning programs. At the same time, demographic theories and analytical techniques developed in western countries were introduced to China. The domain of population studies expanded dramatically in the 1980s. Formal demography, largely focusing on the analysis of fertility, mortality, migration, population dynamics and projections, was widely taught in universities and used in research. Studies investigating the relationship between population changes, socio-economic development, environmental factors, and their regional variations also made remarkable progress. These achievements were to a large extent owing to the success of a number of censuses and surveys, which made such studies possible by providing a large amount of high quality demographic data. Another contributing factor to these changes was the return of western-trained Chinese demographers who played a major part in applying formal demographic techniques to China's population issues and demographic data.

These trends continued into the 1990s, when more diverse research approaches were used in the study of population. This period witnessed two noticeable developments in population research. First, an increasing concern has been directed towards the consequences associated with rapid fertility decline, for example, population ageing and support for old people, high sex ratio at birth and its long term impact, migration, and urbanization. Relaxing the one-child policy as a policy response to some of these issues has been recommended by many researchers. Second, since the International Conference on Population and Development which was held in Cairo in 1994, the Chinese government and researchers have made a considerable effort to improve the family planning program. Further progress has been made in the quality and reach of the program, which has been increasingly concentrating on the provision of better services and the protection of the right of parents and children, rather than simply on the control of the number of births and population growth. These changes have been reflected in recent research activities, especially those supported by the UNFPA. A large number of studies on ageing, sex ratio at birth, abortion, HIV/AIDS, consequences of removing of birth interval restrictions from family planning regulations, and quality-of-care approaches in family planning have been conducted in the last few years.

Despite their great achievement, demographers also face a number of challenges in advancing demographic research in China. First, the development of demography in China has been closely related to the family planning program. It has been mainly sponsored by the government and driven by the need to improve family planning and develop socio-economic policies. In China, as in many other countries, population studies as a discipline has distinguished itself largely as a 'policy science.' There is still a long way to go to further develop its 'social science' elements (Hodgson 1983). In comparison with studies of fertility and family planning, research in a number of areas such as mortality, historical demography, population theories and world population issues is still underdeveloped in China. One such example is the investigation of population issues in other countries. In major western countries, demographers work on population issues of both their home countries and other parts of the world. In contrast, there is hardly any Chinese researcher specializing in population issues in other countries, despite the fact that China has one of the largest demographic research teams in the world. Similarly, China has rich data for historical investigation of population changes. Overseas researchers, including some Chinese demographers working abroad, have made very impressive progress in this area in recent years. But to date, the development of historical demography has been very slow in mainland China. Available studies are largely descriptive and based on only aggregated population data. Very few demographers have used historical data, especially those recorded at the level of individuals, to examine fertility and mortality changes in the past. It is often overlooked that acquiring better knowledge of population changes in the past and in other countries is important for our understanding of demographic issues in contemporary China.

Second, because of its huge population and successful family planning program, China has made a significant contribution to slowing down the world's population growth. China also has the obligation of making a significant contribution to the development of demography, because of its great population size and large number of researchers involved in demographic research. In this respect, having a large population is indeed a notable advantage, which allows many research questions to be studied on the basis of a sizeable sample. Demographers in China have published many research findings in recent decades, but their contribution to population studies across the world is still disproportional and small. China's fertility and mortality decline has played an extremely important part in world demographic transition in the second half of the twentieth century. Detailed investigation into these changes and many other issues should make an important contribution to the development of population theories. Compared to the effort made in the study of fertility, however, there is still a lack of detailed examinations of mortality changes, although progress has been made in this area, especially in the investigation of mortality at very old ages.

Demographers in Mainland China have not yet seriously engaged in the theoretical debate of world population issues even though there is great potential to do so.

The third challenge facing Chinese demographers is to rapidly improve the quality of China's demographic data. For a very long time, there was no detailed demographic data available for demographic investigations in China. But this changed significantly in the 1980s, when the third national population census and a number of sample surveys collected very high quality and detailed demographic data. However, China failed to maintain its early success. The quality of recent census data and certain demographic statistics, the household registration data gathered by the Ministry of Public Security and the family planning statistics collected by the State Population and Family Planning Commission for example, deteriorated. For this reason, demographers have had great difficulty in producing an accurate fertility figure in recent years. While it was widely suggested that China's TFR fell to below replacement level in the early 1990s and has fallen further since, officially published data show almost no change in the adjusted TFR in the last ten years. Because of that, a wide range of fertility estimates were made under different assumptions, which led to great uncertainty about China's real fertility level. It had been hoped that this long-standing disagreement would be settled by the 2000 census. But rather than solving China's fertility puzzle, the census recorded a TFR of 1.2, which apparently underrepresented the actual level of fertility and sparked further controversies. This example conveys a serious message: if the deterioration in data quality cannot be halted and improved, there is a real danger that China's demographic data and demographic research could soon lose their credibility. While there is an urgent need to stop the downward trend in data quality, it is equally important to point out that China's demographic data, fertility data in particular, are often collected by different government departments for different purposes. There are considerable variations in quality and major problems among data obtained from different sources. Even in the same data set, the quality of the data can differ notably across sub-population groups. For example, the 2000 census considerably underrecorded young children, but the quality of the records of adult and old people was fairly high. The quality of most Chinese demographic data is in general reliable. They can provide a dependable base and useful evidence for the study of population changes in China including those presented in this book.

1.4 THE PRODUCTION AND ORGANIZATION OF THIS BOOK

In response to these challenges, a group of researchers from China and several western countries started a project in 2003. On the basis of their previous research and the latest available information, they conducted systematic studies on a wide range of issues that are of overriding importance in understanding Chinese population at the beginning of the twenty-first century. As a part of this effort, an international conference was held in Canberra, Australia, in December 2003 when many chapters included in this book were first presented. The book is, however, not a simple collection of conference papers. It concentrates on China's recent demographic changes and provides a comprehensive examination of all major demographic issues that exist at the beginning of the twenty-first century. Most of the contributors to the book are well-known experts on Chinese population and many of them have published extensively in international and Chinese demographic journals. As one of the most important joint adventures by both Chinese and western demographers in recent decades, this work provides a new update to, and the latest research findings made in, the study of Chinese population.

Following this introduction, Weiguo Zhang and Xingshan Cao's Chapter 2 systematically reviews the development and implementation of China's family planning policy and the impact of the family planning program. It shows that China's family planning program has gone through a number of stages since the later 1970s, which are characterized by noticeable policy shifts as a response to changes in socio-economic conditions, public support towards and the sustainability of the program, and international efforts to promote family planning and women's reproductive rights. While China's family planning program has made great achievements, it has also met a number of new challenges in recent years. To meet such challenges, urgent actions need to be taken to further improve the program. Chapter 3 by Thomas Scharping critically examines China's recent demographic data, especially the impact of the family planning program on the quality of fertility data. This study identifies various kinds of registration problems existing in different fertility data. It has convincingly shown that fertility data collected by China's recent censuses and those gathered by the Ministry of Public Security and the State Population and Family Planning Commission have deteriorated noticeably. The chapter is particularly useful in clarifying some confusing interpretations of China's recent demographic changes. However, as was pointed out earlier and demonstrated by Scharping himself, the quality of different demographic and non-demographic data often differs considerably. While the quality of some data is poor, most of the data could, when used with caution, provide sufficient evidence for the studies of China's population issues.

Chapters 4 and 5 examine fertility decline, especially the emergence of below replacement fertility and its long term impact. Zhigang Guo and Wei Chen (Chapter 4) summarize fertility decline in Mainland China in the 1970s and 1980s. They then analyze the 2000 census data by linking recorded children to their mothers, which reveals that China's TFR was likely to have reached about

1.6 at the end of the twentieth century. The authors, through the examination of tempo adjusted TFR, also provide very useful information on changes in cohort fertility. Edward Jow-Ching Tu, Xin Yuan, and Xia Zhang's Chapter 5 presents a detailed analysis of fertility transition in Hong Kong and Taiwan. While these two Chinese societies have very different political and social systems and are not subject to the strong influence of government enforced birth control policies, the trajectory of their fertility changes is broadly similar to that observed in the mainland. The chapter is particularly useful for those who are interested in the debate over tempo and quantum effects of fertility and for those who are interested in discovering the impact of recuperation on changes in cohort fertility.

Chapter 6 by Wei Chen and Chapter 7 by Yong Cai and William Lavely deal with two important issues which are closely related to China's family planning campaign and have attracted worldwide attention in recent years. Chen's chapter investigates long term changes in patterns of induced abortion among married women and their interrelationship with the implementation of the family planning policies, falling fertility and rising sex ratios at birth. It also identifies a number of factors which have markedly influenced patterns of abortion and the major characteristics of abortion in China. Cai and Lavely concentrate on another issue: rising sex ratio and its regional variations. Using data collected at the level of counties and districts through the 2000 census, their chapter examines regional patterns of sex ratio of children aged 0 to 4. Their results show great regional disparities in sex ratios among young children. Nearly half of China's population now lives in areas where the sex ratio of children aged 0 to 4 is above 120 boys per 100 girls, and rising sex ratios have already become a serious social problem.

Unlike fertility which has gone through a profound transition in the last few decades, changes in China's marriage patterns have been relatively small until recently. A very high proportion marrying, especially among women, remains a major characteristic distinguishing the Chinese from their counterparts in many developed and less developed countries and puzzles scholars interested in these issues. In Chapter 8 Guangyu Zhang and Baochang Gu examine recent changes in age at marriage and the proportion ever marrying, their impact on fertility decline, and recent increases in divorce and remarriage. Their comparative study provides the latest update on marriage behaviors and practice in China against a broad backdrop of changing marriage patterns around the world.

Chapters 9 and 10 of the book focus on mortality changes. Judith Banister's analysis concentrates on recent mortality decline, especially the impact of China's economic reform and poverty eradication program on further improving life expectancy. Her chapter (Chapter 9), which is largely based on data collected at the level of provinces and in some cases counties, shows that mortality in China has further decreased during the reform era. The major contributing factors to this achievement are rapid economic growth, the success in poverty alleviation in poor areas, and the considerable improvement in people's living standards brought about by these developments. Zhongwei Zhao's Chapter 10 investigates changes in age patterns of death and sex differentials in mortality. It also examines changes in causes of death in urban and rural areas and their impact on China's mortality patterns. The author shows that during China's mortality transition, causes of death have altered markedly and increasingly become similar to those found in developed countries. Because mortality reduction of the same magnitude has not taken place simultaneously in all age groups or in male and female populations, considerable changes have been observed in both age patterns of death and sex differentials in mortality. This conforms to a general trend recorded in many countries.

One of the major consequences of China's rapid fertility and mortality decline is population ageing. Until now, most studies addressing this issue have concentrated upon its negative effects such as rising dependency ratios and increasing burdens of old age support. These analyses are important in preparing society to meet these unprecedented challenges. Nonetheless, it is equally important to note the positive impact that could flow from the changing age composition of the population and its socio-economic implications. Feng Wang and Andrew Mason's Chapter 11 is one such attempt to draw our attention to this potential. The authors' demographic and economic analyses show that population ageing not only opens a demographic window for economic development through providing the first demographic dividend. It also has the potential to provide a second demographic dividend because changes in age structure influence the processes that lead to the creation of wealth. Such dividends could play a crucial part in China's future economic development.

The next three chapters examine the issue of migration. Chapter 12 by Zai Liang concentrates on major changes in government migration policies and reviews recent trends in migration and migration research. It identifies some emerging patterns of migration, such as increases in length of residence at the places of destination and an increase in family migration. The chapter also offers a comprehensive analysis of the spatial patterns of the floating population and provides important references for recent population movement in China. Fei Guo's Chapter 13 concentrates mainly on the impact of migration on migrants' communities at the places of destination, cities in particular. Results from this chapter show that migrant workers in Chinese cities are disadvantaged in terms of job opportunities and accessibility to welfare, such as unemployment allowances and formal job contracts. While it has now become easier for many migrants to work, stay and earn a cash income in the cities, many of them live in the most disadvantaged communities with poor living conditions. The third chapter on migration, Chapter 14, examines the changing profile of Chinese labor migration. Kenneth Roberts compares China's rural–urban migration with Mexico–US migration with respect to major factors affecting the origin, the destination, and the process of migration. His analysis shows that many similarities can be found between the two migrations. On the basis of this comparison, Roberts further explores potential changes in the profiles of China's migration and their future trends. These changes and developments are likely to have a significant impact on Chinese society.

The last two chapters are contributed by Isabelle Attané and by John Caldwell and Zhongwei Zhao. Attané's Chapter 15 examines demographic changes in China's major ethnic minority groups, and compares them with those observed in the population of the Han. Her analysis reveals great variations in fertility, mortality, age structure, and population growth among China's major ethnic groups. These variations are likely to have been related to differences in the implementation of government family planning policies, the level of socio-economic development, and the degree of sinicization. In the concluding chapter (Chapter 16), Caldwell and Zhao summarize the major findings of the book and examine China's population changes in a broader perspective. Their analysis shows that China, with its large population, has always been a major element of the world demography. Its recent fertility and mortality decline has played a crucial part in controlling the world population growth and improving its average life expectancy. Although contemporary Chinese society has some particular characteristics and China's recent demographic changes have been frequently subject to their influence, China's demographic transition is by and large similar to that taking place in many other parts of the world. China's economic and demographic success has provided some useful lessons for other countries. Equally, China could also benefit from the successful experiences gained elsewhere.

This publication, as indicated by the above introduction, is the result of research collaboration and hard work of many researchers and supporting staff including some whose papers have not been included in the volume. Without their contribution and help, the publication of this book would not be possible. The Demography and Sociology Program of the Australian National University, Macquarie University, and AUSAID have provided financial support for the 2003 Canberra international conference and for the production of this work. We would like to take this opportunity to express our sincere thanks to these organizations for their generous support. We are greatly indebted to Penny Kane, who has provided us with invaluable assistance from the start of the project, especially in editing and producing this book. We want to thank Monica Byrnes and Kun Zhao for having helped us to copyedit the book and to reproduce all tables and figures. We also want to thank Peter McDonald, Terence Hull, Adrian Hayes, Richard Smith, Mac Boot, and the participants of the 2003 conferences for their constructive comments, suggestions, and assistance. Finally, we want to extend our special thanks to all the authors for their strong support, diligent work, and important contribution to the book.

2

Family Planning During the Economic Reform Era

Weiguo Zhang and Xingshan Cao

China's family planning program has experienced an uneven trajectory, reacting to the ideological shifts, political changes, and social and economic transformations which have occurred in the second half of the twentieth century.[1] Facing the high fertility observed in the early years of the People's Republic, China started its government sponsored family planning program in the 1950s. This program was interrupted first by the great famine and then in the early years of the Cultural Revolution. It was resumed in the early 1970s when China started to implement a nationwide 'later-longer-fewer' birth control policy.[2] This policy was replaced by the so-called 'one-child' policy in 1979,[3] which was further adjusted during its implementation in the 1980s. In the mid-1990s, China's family planning program was reoriented toward reproductive health and quality of care. In the early twenty-first century, the enactment of the Population and Family Planning Law further legalized family planning in China.

China's family planning program has had far-reaching impacts on Chinese demography, economy and society. Official reports and scholarly research indicate that hundreds of millions of births have been averted and that the total fertility rate has dropped to 1.5–1.6 in 2000 (State Council 2000; Retherford *et al.* 2005).[4] Despite its great success, China's family planning program has contributed to some emerging problems such as acceleration of population ageing, sex selective abortion, a rising sex ratio and fertility data manipulation, which have given rise to grave concerns among Chinese scholars and policy makers (Merli and Raftery 2000). This chapter reviews the development and implementation of family planning policy in China, with a focus on the period of family planning policy reorientation which followed the state transition to a market economy. The first section reviews the development trajectory of the population policy in China. Section two focuses on discussion of various problems associated with policy implementation in the era of the market economy. The next section discusses the achievements and consequences of policy implementation in the past two decades, and reviews future policy options. We wrap up our discussion in the final conclusions.

2.1 TRAJECTORY OF CHINA'S POPULATION POLICY

China piloted its first official family planning program in the early 1950s. Government sponsored family planning programs already existed in some large cities in the late 1950s and early 1960s. They focused primarily on promoting the ideas of family planning and small families. Briefly interrupted by the great famine and then by the political and economic turmoil in the early years of the Cultural Revolution (1966–76), China resumed its national efforts in birth control in the early 1970s with a nationwide campaign implementing the 'later-longer-fewer' birth policy. This policy, however, was replaced by a more radical 'one-child' policy in 1979 (Banister 1984; Greenhalgh 2005). Under this policy, couples are allowed to have only one child except under certain special circumstances.[5]

In the years 1980 to 1983, the 'one-child' policy was mainly enforced through 'shock drives' (*tu ji*) such as intensive mass education programs and abortion-sterilization campaigns at the end of each year. These drives, usually with specific targets on contraception, could not be carried out easily. Faced with widespread resistance from peasants, the rigorous 'one-child' policy was modified first in April 1984 and then in May 1986 to incorporate more pragmatic contents (Greenhalgh 1986; Peng 1991; Feng *et al.* 1999; Feng and Ma 1999). The revised policy condemned coercion, urged voluntarism and persuasion, and advised a flexibility of approach. It allowed some couples to have a second child under certain situations (White 1990). In 1988, the family planning policy was once again modified, one significant change being that couples in rural areas with one daughter only were allowed to have a second child after a certain interval (Davin 1990). This change was implemented in 18 provinces by the end of 1988 (Peng 1991). With the relaxation of the 'one-child' policy, rather than 'shock drives' regular family planning work was emphasized and local cadres' responsibility for ensuring its success strengthened. A family planning 'one-veto' system (*yipiao foujue*) for cadres was introduced at the end of the 1980s in some provinces (Wu 1992; Zhang 2002).[6] Local cadres were evaluated on their performance in both economic and family planning work, with their family planning activity as the top priority for evaluation.[7]

The policy modifications of the 1980s represented reactions by the government to various changes in society. In fact, the structural and political changes in China during the early years of the economic reforms made policy adjustment necessary. The most important factor was public resistance. It has been argued that peasant hostility and acts of retaliation left the state no choice but to soften the policy. Tactical adjustments had to be made in order to relieve the tension between the government and the masses (Aird 1986; Hardee-Cleaveland and Banister 1988). Another major factor was economic reform itself. Politically, there was a shift in the balance of power between cadres and the peasants as a result of economic reform. Some peasants became less vulnerable to local authority. The provincial and local governments were also in a stronger position to deflect central state demands (White 1987, 1991; Greenhalgh 1990). Economically, the rural household responsibility system increased the demand of rural households for family labor. Moreover, the economic reforms made it difficult to reward one-child couples or penalize policy violators. But above all, the policy changes of the mid-1980s were a result of state pragmatism. The central government played a vital part in policy enactment, change, and implementation.

While confrontations between ordinary people and cadres may have triggered changes in the 1980s, international influences played an important role in China's reorientation of its population policy toward reproductive health in the late 1990s. Two international conferences in the mid-1990s had a great impact on China's family planning reorientation. One was the International Conference on Population and Development (ICPD) held in Cairo in 1994, and the other was the Fourth World Congress on Women held in Beijing in 1995. After the 1994 ICPD, the Chinese government made commitments to the promotion of women's reproductive health in China. China's continuous efforts to improve population quality, and to raise education levels and health standards of its population, readily accommodated many elements of such a policy shift (Winckler 2002: 381).

Besides international influences, two notable factors also prompted the reorientation of family planning programs. First, improved demographic research and data availability provided a scientific basis for population policy change. The development of China's 'one-child' policy was based on only sporadic data. But the population censuses conducted in 1982 and 1990 and a series of national fertility surveys in the 1980s and 1990s provided accurate and detailed demographic information for later policy making. Second, a new generation of more professional leaders in both the central and provincial governments aimed to improve the efficiency of their own organizations by modifying the implementation of family planning policies. The new officials wanted to regulate coercive practices and to increase the accountability of local party and government bodies. They were well aware of the fact that for people to cooperate, family planning rules must be reasonable.

The reorientation of family planning strategies was initiated in the mid-1990s and developed very quickly. First officially identified in 1995 by the State Family Planning Commission (SFPC), the principle of the reorientation was to switch policy implementation from a target driven to a client centered approach. Under this principle, family planning lost its narrow focus on contraception in favor of a relevant integration of reproductive health with women's empowerment (Gu *et al.* 2004). The main contents of this approach included quality of care (*youzhi fuwu*) and informed choice (*zhiqing xuanze*). The policy reorientation was initially subjected to an experiment in six pilot counties chosen by the SFPC in 1995. Within the pilot areas, birth quotas and targets were abandoned, and the birth permit which used to be required prior to pregnancy was also removed. The pilot program seemed to be successful. It was extended to 100 counties and districts in 1997, further to 200 counties and districts at the beginning of 1998, and to 300 counties and districts (more than 10 per cent of all counties) by the end of that year (Gu *et al.* 2004).

The Population and Family Planning Law of 2001 came into effect on 1 September 2002. As a part of the overall efforts of legal reform in China, the law specifies the rights and obligations of Chinese citizens in family planning and provides a legal basis for tackling population issues. In summarizing the experiences of family planning during the past three decades, the new population law goes beyond controlling population growth. It emphasizes humanitarian principles and prohibits coercion, abuse of power by officials, and infringement on people's legitimate rights and interests. It stipulates that women's social status should be improved; baby girls should not be discriminated against, maltreated or abandoned; and poverty stricken households who have followed the family planning policy should have special privileges if applying for loans and social relief (Zhang and Qiao 2002). This reflects a commitment by the Chinese government to the rule of law in the liberal economy. Concomitantly, it shows that the Chinese government has begun to expand its working focus from birth control alone to broader population issues.[8] Consequently, the State Family Planning Commission was renamed the State Population and Family Planning Commission. The law marked the beginning of a new era in China's family planning policies.

One of the most important articles in the population and family planning law referred to a social compensation fee. Fines for violations of family planning regulations, which were widely used in the past, were now substituted by a social compensation fee. That fee identified the legal responsibility, in monetary terms, of those who violated the law. Literally, it indicated that individuals or couples producing extra children represent a cost to society, and thus need to compensate the society. But there are many as yet unresolved issues with respect to how much should be paid and how to use the money collected. Social Compensation Fees are still collected through local governments and family planning officials (Dou and Chen 2001). Hence, local residents, and often the local officials, do not see much difference between the former family planning fine for unplanned births and the new social compensation fee for producing extra children.

The Chinese government maintains that the law neither relaxes nor tightens the family planning policy but rather it seeks to stabilize it. The original purpose for drafting the population and family planning law was to legitimize the administration of the policy and improve the rule of law. Even though the Chinese constitutional law points out that all couples have the responsibility to practice family planning, there were no specific articles in any law on how that responsibility was to be carried out. Many provinces introduced their own family planning regulations in the late 1980s, but there needed to be a unified law to set a standard for family planning program implementation. After two decades of discussion and review, the population and family planning law was finally enacted. Because of the huge regional disparities across China, the law provides only basic guidelines for the family planning policy. More detailed regulations are made by the provincial level people's congresses or their standing committees. As a result, there are considerable gaps between law-making at the macro level and law enforcement at the micro level.

2.2 POLICY IMPLEMENTATION IN THE ECONOMIC REFORM ERA

Implementation of the population policy in China, on the one hand, depends on the effectiveness of the administrative system. On the other hand, it is determined by the cooperation of, or resistance by, millions of families whose fertility desires do not necessarily follow the state designs. The state transition toward a market economy, combined with about three decades of family planning campaigns, has redefined the methods and the effectiveness of state intervention and reshaped families' fertility motivation. In response to these shifts, some new problems have emerged while some existing problems have become more serious. In this section, a number of issues related to family planning implementation in contemporary China will be discussed under four sub-headings.

2.2.1 Increasing Regional Variations

Both the formulation of Chinese population policy and its implementation are characterized by significant regional variations. Given the diversity of natural endowment, economic development, culture, and politics in Chinese provinces, universal family planning regulations are not practicable. Therefore, the central government only lays out general principles. A province's population size, local development level, ethnic composition, distance from the political center, level of political decentralization, etc., may all have implications for provincial family planning regulations. While overall population policy stabilized at the end of 1980s, there were marked variations in how, in particular with regard to regulations on second births, it was interpreted in different provinces (Feng and Hao 1992).[9]

However, variations in policy implementation are even more significant than the differences in policy itself. There are distinct variations in the implementation of family planning across China's provinces, and between urban and rural areas. Family planning is well implemented in urban areas. Urban women receive various benefits for having a single child; for example, maternity leave and childbearing insurance, and awards for one-child families. In the rural areas, however, the penalty system remains in effect. The terms for rewarding rural couples who have only a single child are either vague or taken into effect only seldom. For example, family planning regulations suggest that these couples should get priority or special benefits in their children's schooling and medical services, but most schools and hospitals charge for the services without distinguishing whether the children are from single child families. Policy implementation even varies greatly within a province, county by county, township by township, and across villages within a township where the same policy theoretically applies. For example, three important aspects of policy implementation: issuing birth certificates, penalizing unplanned pregnancies, and promoting contraception, can be practiced very differently in the same region. The policies are seldom applied at the local level as rigorously and mechanically as laid out in formal policy documents (Zhang 1999; Murphy 2003). Local officials balance pressures from authorities above and resistance from below and create a modified, usually less rigid, local policy in practical implementation. The common practice in Chinese villages is '*shang you zheng ce, xia you dui ce*' (for whatever policies top–down, there are countermeasures bottom–up). As Greenhalgh (1994) has pointed out, the central policy has been compromised in local policy through the practices of local cadres. This is a direct result of the 'top–down' approach adopted in the Chinese family planning program.

Regional variations in family planning became even more significant after the family planning program was reoriented toward quality of care and informed choice. Three aspects of the program illustrate these variations. First, there are great regional differences in the quality of family planning workers. In poor areas family planning workers, including administrative staff and medical staff, are usually less educated, badly paid, and fewer in quantity. The second variation is reflected in the level of progress made towards family planning reorientation. As discussed in the previous section, about one third of Chinese counties have introduced a quality of care program, which is greatly dependent on the level of local socio-economic development. Consequently, people in more developed counties are more likely to enjoy a flexible quality of care approach, whereas people in the less developed areas are still subject to strict enforcement measures. The final difference is in accessibility of family planning services, including medical and contraceptive services. Local family planning facilities and contraceptive supplies largely depend on the local economic development level. Although the government has put more investment into the western provinces, many rural villages in these provinces still suffer from limited access to family planning and medical services. According to the 2001 National Family Planning and Reproductive Health Survey, township level family planning facilities and village level contraceptive supplies in the east and coastal provinces are significantly better than those in the inland provinces.

2.2.2 Weakening Administrative Power

Enforcement of family planning policy in China is dependant on the nation's administration system. Cadres and staff at various administrative levels put policy into practice, as that policy transfers from the central government down to the grassroots level.[10] Although there are many non-governmental organizations (NGOs), such as family planning associations, their role in controlling fertility is quite limited.

Within the context of the market transition, the administrative structure for family planning at the grassroots weakened. Compared to the 1980s, family planning workers at the grassroots—particularly at the village—level, are less stable. It is difficult to recruit local workers who will dedicate themselves to family planning, especially in poor counties where the payment of their salary may not be guaranteed. Meanwhile, family planning work at the township or village levels is not perceived as a desirable job, because it often directly offends the interest of some families. The government aims to recruit young people below 35 years of age, with at least a high school education. But commonly, family planning workers at the village level tend to be older and less educated. These workers may have difficulties in learning the information and service techniques of reproductive health, and in improving their work style. For example, they tend to focus on family planning management rather than reproductive health services, and on completing specific tasks rather than dealing with questions about why individuals violate policies. They also focus on family planning enforcement by command rather than according to law, and on carrying out state policies on population control rather than safeguarding individual interests (Wei 2002).

The top–down administrative structure, together with the one veto system, created many problems in family planning implementation in the late 1980s and early 1990s. One such problem was the use of 'unrealistic' targets. County and township level officials, besides focusing on economic development, were greatly pressured by the family planning targets they were given to meet (Pei 1989). Therefore, the local level administration, after receiving its official family planning target from above, usually added a further 'cap' before passing it down, so as to put more pressure on the lower level administrators and ensure that any shortfall did not jeopardize the original target (see Greenhalgh 1990 for this practice in Shaanxi, and Zhang 1999 for Hebei). This could create considerable difficulties for family planning cadres working at the grassroots level.

Another problem has been deception and manipulation in family planning statistics (Merli 1998; Merli and Raftery 2000; Scharping, Chapter 3, this volume). Deliberate misreporting of statistics by local officials is frequently a strategy by which local governments mediate state policies according to local or individual interests. For instance, villages in Hebei and Hubei had birth underreporting of 37.3 per cent in 1993 (Zeng 1996; SFPC 2002). Family planning workers in 50 of the 52 towns and townships in a county in Zhejiang Province intentionally underreported births in the early 1990s (Zhang 2002). It was suggested that local officials may well have encouraged and even organized individuals to underreport. Problems of statistical deception and manipulation still existed in the early 2000s.

Corruption is a further problem that destroys the image of family planning in rural China. The power of local officials, though weakened in the era of market reforms, is still formidable. The imbalance of power between officials and local families may lead to the abuse of power by some corrupt officials who take bribes from those families who wish to have out-of-plan births and want to avoid economic penalties, or to avoid sterilization. Various studies have reported corrupt local officials abusing their power in family planning implementation to serve their own interests (Lu X. 2000; He 2001; SFPC 2002). Some local governments even rely on the family planning penalty payments as one of their major revenue sources (Dou and Chen 2001). There is a saying among cadres: 'look for the family planning office if you want to have dinner.' Corruption and abuses of power have generated distrust in many communities.[11]

Difficulties in coordinating different policies at the grassroots level also weaken administrative efficiency. For example, family planning policy encourages late marriage and late childbearing. However, in urban areas, unmarried young adults working in state institutions and work units are not entitled to their own home. Only married people are eligible for housing allocation. In rural areas, the reallocation of collective land to individual households was based on family size and did not take into account the implementation of family planning regulations. Families with more children got larger shares of the collective land, and the land contract remains valid for 30 years. Furthermore, young women, who usually join their husbands' families after marriage, are not entitled in some areas to obtain new land. This may influence women's perception of the value of sons and thereby create difficulties in persuading couples to follow the state family planning regulations. Finally, the coordination of various government departments in the implementation of family planning is also problematic. As one instance, the use of ultrasound B in health institutions, especially in private clinics, has not been well regulated by health administrations (Guo and Li 2002).

2.2.3 Social Equity and Family Planning

Another major issue is social equity or fairness in family planning at the grassroots level, which has been strongly affected by the increasing inequality of distribution. Since the start of the economic reform era and the adoption of the 'open door' policy at the end of the 1970s, the Chinese people have greatly improved their standard of living, but disparities in income and wealth among families have also increased. This polarization has occurred not only across various regions, but also within small communities. Consequently, the strategies adopted by the rich and the poor to get around the family planning regulations are different, and family planning workers also handle families who violate regulations in different ways.

The rising inequality, especially the increasing disparities in family income, makes the imposition of economic penalties less effective against rich families although they remain formidable for the poor. The rich can pay the fine or compensation fee for having extra children. They can also adopt a boy, which costs more than adopting a girl, if they fail to produce a son. The introduction of the social compensation fee may make extra birth(s) a legal privilege for rich families. However, it would be wrong to believe that the rich always pay.

Rich families usually have high social status in the local communities where they live. They may also be a part of a strong social network formed with local cadres or family planning workers.

At the same time, as has been frequently observed, poor and vulnerable families are in fact under greatest pressure to comply with family planning regulations. Such families have been, for instance, the main targets during family planning campaigns in Hebei (Zhang 1999). Also, family planning campaigns target small hamlets (small descent group settlements) with particular fierceness, as Murphy (2003) reported in her study in Jiangxi. Members of households with fewer men in their extended families are usually less capable of resisting family planning workers, and women in daughters only households are more likely to have family planning operations—primarily abortions, sterilizations, and IUD insertions. It is not the rigidity and intensity of implementation of family planning policy that has created such problems. Rather, it is the unfairness in implementation. Family planning becomes problematic when some families follow the regulations, while others violate them. The situation becomes even worse when those who follow the regulations are not rewarded as they should be, whereas those who violate them escape penalties.

Inequality in income distribution also destroys social equity in access to medical and family planning services. The prices of induced abortion, contraception, delivery, and other medical services have increased significantly in recent years. They also vary greatly across different hospitals, and urban high quality hospitals always usually charge more than those in rural areas. Consequently the poor, and rural people, are unable to receive high quality family planning and medical services. According to the third National Health Services Survey, conducted by the Ministry of Health, over 48.9 per cent of Chinese people could not afford the cost of medical services. About 36 per cent of respondents did not visit hospitals or doctors when they were ill. Both proportions have increased significantly by comparison with the results from previous surveys in 1993 and 1998 (MoH 2004).

2.2.4 Migrant Management

According to the 2000 Census, about 121 million rural laborers have migrated to urban areas to take up new economic opportunities. Previously, there was a widespread view that many rural people fled their home villages in order to have ‘unplanned’ births. These people are generally referred to as ‘excess birth guerrillas’ (Dalsimer and Nisonoff 1992). However, it may not be true that migrants are trying to avoid restrictions on numbers of children. A study conducted by Goldstein and his colleagues (1997) in Hubei, for instance, showed that migrants generally did not have more children than nonmigrants. Nonetheless, the massive floating population does bring many difficulties in the administration of family planning regulations.

One major problem with the migrant workers, from a management perspective, is the difficulty in identifying or controlling unplanned births. Migration does provide a viable channel for couples to have an 'unplanned' birth if they wish to do so. To strengthen family planning compliance among migrants, the State Council issued *Measures on Administration of Family Planning for the Floating Population* in 1991, and revised the measures in 1998 and again in 2004. According to the regulations, family planning staff in the destination cities should check migrants' relevant documents regarding marriage and childbearing, and the destination administration should issue such documents when those migrants cannot provide them. However, a survey on migrant workers conducted by the SFPC in 2002 found that the destination administration checked only 65.6 per cent of migrant women of childbearing age (15–49). Of those who did not hold appropriate documentation, a mere 24 per cent were subsequently issued relevant documents by the destination administration (SFPC 2002). The regulations also specify that women giving birth to children in hospitals in the destination cities need a birth permit issued by the family planning administration in their home town or villages. However, most hospitals and clinics are profit oriented, and they tend to ignore the state regulations. Many hospitals do not require a birth permit when women come for regular checks during pregnancy. Pregnant women can easily deliver their children in those hospitals, if they deposit enough money.[12] Children born in urban areas without birth permits are rather common. For example, about 60 per cent of births which were delivered in hospitals in Guangzhou were without a birth permit. The proportion may have reached as high as 80 per cent in some hospitals in recent years (Xu and Guo 2004). This, to a large extent, is related to the fact that some women attend hospitals only to deliver, when it is too late to prevent births.

Another problem, from a service perspective, is that it is also difficult to provide family planning services to migrants. It is officially mandated that married migrant women of childbearing age should receive gynecological check-ups and contraceptives at family planning stations in host cities. However, many migrants may not come to the stations to pick up free contraceptives or come for reproductive health services, even when these are provided free of charge. It often takes time for migrants to believe that these are purely health services rather than birth prevention initiatives through medical check-ups. Many migrants intentionally avoid interacting with family planning administrations whenever possible.

As large numbers of migrants settle down in the host cities, education and immunization for their children have become a serious problem. As reported in many newspapers and TV programs, migrants' children face various difficulties in getting formal education in their host cities because of the status of their agricultural household registration. For the same reason, it is also difficult for migrants to receive immunization for their children. Although the family planning policy does not directly address these issues, it does create some barriers because family planning is a part of the comprehensive management measures for migrants.

Currently, the Chinese government is making great efforts to improve reproductive health services for migrants. But the present administrative structure makes it difficult to reach such people, mainly for reasons of money and convenience. Various national and provincial regulations on the floating population specify that rural migrants must register in the public security bureau of the host cities to obtain a temporary residence card, and that the residents' committees in the cities are responsible for the family planning work among the migrants in their jurisdiction. They must report any inflow or outflow of people to the local public security bureau. However, for migrants, it is costly to gain a temporary residence card and to pay other fees. In any case many migrants live in enclaves, usually located in suburban areas and separated from other city residents. Even when they live together with city residents in the same compound, their lives are usually isolated. The urban residents' committees may not contact them at all, let alone monitor their pregnancies and births. Meanwhile, family planning officials in migrants' home villages may not know the whereabouts of the migrant women. Even when they have the information, they seldom follow up the women to prevent their unplanned pregnancies because of the high cost involved.

2.3 ACHIEVEMENTS, CONSEQUENCES, AND FUTURE POLICY PROSPECTS

China's population policy is aimed at controlling population growth as well as improving its population quality (State Council 2000). Driven by the family planning program, China's fertility declined rapidly, falling to a level below replacement in the early 1990s, and it has remained as low or lower for over a decade. As a result, hundreds of millions of births have been averted. The percentage of planned births has increased steadily in the last decade, while that of third or high parity children has dropped significantly. According to the SFPC, about 55 million families had accepted one-child certificates by 2000. The percentage of planned births increased from 88.3 per cent in 1995 to 94.6 per cent in 2002, and the percentage of third or higher parity births dropped from 4.2 per cent in 2001 to 1.7 per cent in 2003 (SFPC 2001/2003).

Evidence also shows that the reproductive health of individuals has improved in recent years. According to the statistics published by SFPC (2001/2003), the contraceptive prevalence rate among married women has remained at a high level (above 90 per cent) since the early 1990s, and the contraceptive mix has become more diversified. The proportion of women being sterilized declined from 41.7 per cent in 1992 to 36.0 per cent in 2002, while the proportion using IUDs increased from 40.1 per cent to 48.1 per cent. At the same time, the number of induced abortions declined significantly. In comparison to the first half of the 1990s, the second half of the decade witnessed a reduction in the volume of induced abortion by two thirds, and the abortion rate among married women is now around 2 per cent (SFPC 2001/2003, see more on abortion in Chapter 6, this volume). The family planning programs have also contributed to the transition toward late marriage.[13] Women's average age at first marriage increased from 22.2 in 1991 to 23.7 in 1999. The rate of late marriage for women in China remained at 58–60 per cent in the late 1990s, while the rate of early marriage for women dropped to 0.7 per cent in 2002 (SFPC 2001/2003, see further discussion on marriage in Chapter 8, this volume).

There have also been significant changes in people's reproductive behavior and fertility motivations, as a result of the 30-year family planning campaigns and the rapid social and economic transition experienced in China in recent decades (Feng and Zhang 2002). Empirical studies on fertility and fertility motivation have shown that a majority of couples would now wish to have one boy and one girl, rather than the preference of previous generations for having more boys than girls (Zhou and Huang 2000; Jiang 2002; Zhang 2002). This indicates that traditional son preference is no longer 'pervasive and extreme' in contemporary China (Arnold and Liu 1986: 223), though it persists, especially in rural area. Furthermore, the persistence of son preference does not mean that parents want to have as many sons as possible. On the contrary, many of them wish to limit their number. Similarly, gender biased fertility motivation does not mean that parents do not value their daughters. Many parents value daughters highly (Zhang 2002). Nevertheless, it is important to point out that some Chinese parents personally desire to have more than one child and will violate policy to have excess or unplanned births.

China's family planning policy has been controversial since its inception, with arguments that it is either negative, or positive, or mixed in its effects on human well-being. The policy has been criticized for violating human rights and the human cost in carrying out the state family planning programs has been perceived as unbearable (Aird 1990; Mosher 1995). Controversies over the family planning program involve also its unexpected consequences, which include an exceptionally high sex ratio at birth (Zeng *et al.* 1993; Chapter 7, this volume), sex-selective abortion (Chu 2001), manipulation of statistical data (Merli and Raftery 2000; Chapter 3, this volume), risk of destroying family kinship structure, an accelerated ageing process (Chapter 11, this volume), and corrupt management and coercive enforcement (Merli and Raftery 2000). The unbalanced sex ratio, high abortion rate and gender differentials in child mortality have been seen as detrimental to women.[14] The high sex ratio at birth and the one-child reproductive norm are likely to have long term negative influences on the age and sex composition of the population.

Faced with these problems, further modifying population policy becomes an urgent issue for both scholars and policy makers at the beginning of the twenty-first century. Initially intended to act as an emergency brake to curb population growth, the 'one-child' population policy has achieved some success, but with expensive costs (Chen 1999). With changes in government administration, and emerging new demographic patterns, new policy options or modifications should be taken into consideration.

There have been intensive discussions regarding future family planning policies among Chinese scholars and policy makers in recent years. Two extreme views emerged: one proposes to abandon the current compulsory family planning policies (Lin 2004), and the other wants to continue the rigid family planning policy to further reduce population size (Li 2002, 2004). However, views expressed by most scholars fall between these extremes. They agree that China needs to modify or relax its present population policy. But they differ in the extent and scope to which the policy should be modified and the specific time line for policy reforms (Qiao 1999; SFPC Research group 2000).

Nevertheless, population control still remains a priority for the Chinese government (Zha 2001). This is, to a large extent, related to the fact that government officials still have reservations about the low fertility rate which is claimed from various surveys. They are concerned that the apparent current low fertility may not be stable and that fertility may rise again (Yu and Yang 2000). The Chinese government is cautious lest a small policy shift lead to a much larger fluctuation in fertility and minor mistakes in dealing with population matters lead to serious consequences (Yu and Yang 2000). With these concerns in mind, Chinese policy makers are taking multiple factors into consideration, including China's demographic patterns and their socio-economic consequences, individual reproductive health and reproductive rights, and the rule of law, in formulating population policy for the twenty-first century. While Zhang Weiqing, Minister of the SFPC, has claimed that the present population policy has neither been strengthened nor weakened, a relaxation of policy is currently quietly taking place. For example, in Shanghai, remarried couples with a single child born in a previous marriage are allowed to have another child; some urban residents with special circumstances are allowed to have a second child, even without a four-year birth interval (*China Daily* 2003). There are experiments with a relatively soft two-children policy in Yicheng, Shanxi Province, and Chengde, Hebei province. All these policy changes are considered to be positive alternatives to the current population policy (Zhang 2000; Zhang and Pei 2000).

We therefore have good reasons to believe that the Chinese government is preparing for a possible change, or modification, in population policy. Apparently, the government has drawn lessons from the policy making of recent decades and has adopted a gradualist approach, and the family planning program is becoming less coercive (Attané 2002).[15] Hopefully, the oncoming policy modifications will be more realistic and scientific, and will be based on the involvement and participation of the commoners in policy making.

2.4 CONCLUSIONS

The 'one-child' policy was adopted by the Chinese government to control population growth and to improve the economic performance of the country in the early 1980s. However, this policy has been constantly modified, because of the changing social environment engendered by the market economy. The Chinese government has been sensitive to both external criticisms and internal resistance to the family planning program (Attané 2002). It further reoriented the family planning program towards a client centered program in the mid-1990s and promulgated the population and family planning law at the beginning of the twenty-first century.

The success of China's family planning program took root in China's unique social and administrative structures. However, increasing individualism, along with the market transition, makes it increasingly difficult for the government to call for individuals to 'sacrifice' their own interests. Individual responses, to both economic policy and population policy, have also reshaped the characteristics of family planning. Individuals are increasingly inclined to resort to law to deal with matters that affect their own concerns. At the same time, administrative power has been weakening. A bureaucratic system, which was constructed on the base of a planned economy, has become less effective in implementing family planning programs. All these factors challenge the family planning program to incorporate new contents and adopt a new approach.

China's family planning program has achieved great successes in controlling population growth and promoting reproductive health, but it has also brought about many unexpected consequences, which require urgent action to be taken. The Chinese government has been making efforts to reform its population policy within the context of a new political economy, demographic dynamics and globalization. Certainly, the Chinese state will not only continue to strengthen its wealth and power through consolidating the family planning program, but also take into consideration individual rights and welfare when the family planning policies are implemented.

3

The Politics of Numbers: Fertility Statistics in Recent Decades

Thomas Scharping

When news of the results of the country's largest fertility survey spread among China's politicians and social scientists in November 1988, there was alarm: the figures signalled that the one-child policy had run into serious trouble and that childbearing continued on a much higher level than anticipated. Even worse, they also revealed widespread underregistration in the fertility data previously published by the Chinese authorities. Instead of 15 per cent as indicated in the annual report of the State Family Planning Commission (SFPC), nearly 42 per cent of all births during that year took place without permission. Retrospective data showed that this percentage had been even higher during earlier years. This discovery led to a heated debate and ultimately contributed to a renewed tightening of birth control. Since the results of the 2000 census have become known, an unexpected finding has once again triggered concern and controversy. This time, however, the opposite situation prevails: the enumerated population total is considerably lower than most early projections, and the birth numbers are so low that they strain credulity. If they were to be taken at face value, the most populous country would rank among the five nations with the lowest fertility in the world. As this seems unlikely, a new debate over the accuracy and reliability of Chinese population statistics has erupted. It is intimately interwoven with the overall assessment of Chinese birth control policies and fertility dynamics and leads to the question of whether present policies should be continued (Scharping 2003; Chapter 2, this volume).

The analysis presented in this chapter is confined largely to national-level data and starts by reviewing the internal consistency of official birth statistics. It differentiates between data variability due to sample size and survey design on the one hand and bias caused by external problems of execution or response on the other. The chapter then examines fertility data collected in the 1990s, patterns of underreporting and the role played by birth control policies. Following that it evaluates the quality of the 2000 census with particular reference to the background of census procedures and implementation problems. Finally, it concludes with a discussion of various approaches used in adjusting China's recent fertility data and general observations on a number of related issues.

3.1 FERTILITY DATA SINCE THE START OF THE ONE-CHILD POLICY

There are three major government organs involved in the collection of fertility data: the Ministry of Public Security (MPS), which has collated birth entries from the local household registers since the 1950s but has faced increased omissions in the records due to the greater freedom of movement and the weakening of controls in the reform period (Zhang 1984; Shandong-sheng Ji'nan-shi renkou xuehui ketizu 1993; Yu 1997); the State Family Planning Commission (SFPC), which from its inauguration in 1981 to its current description of National Population and Family Planning Commission (NPFPC) has tabulated birth numbers from the regular reports of its lower echelons and has struggled with large scale birth control evasion at the grassroots (Zhang 1985; Cui 1990; Xie 1990; Shao and Li 1993; Attané and Sun 1998; Merli 1998; Merli and Raftery 2000; Scharping 2001); and the National Bureau of Statistics (NBS), which in 1982 and 1987 respectively began to conduct annual population change sample surveys and quinquennial microcensuses in order to overcome the deficiencies of the other two systems (Li 1993; Hu 1994; Jia and Sai 1995; Attané 2000; Hu 2005). The NBS also adjusts earlier reports of birth numbers on the basis of census results. During the 1980s, these sources proved the unreliability of MPS and SFPC birth records, and even the birth statistics from the annual NBS sample surveys had to be adjusted upwards by an average 11 per cent (Scharping 2003).

As can be seen from Table 3.1, the discrepancies between the data reported by the NBS, SFPC and MPS have become glaring. In the 1990s, even the NBS data became infected by the deficiencies in the birth records and the loss of control over movements, as indicated by the fact that reported births from both the 1995 microcensus and the 2000 census almost dropped to the low level of SFPC records. The NBS has therefore continued to make massive upward adjustments to its raw data (Zhang *et al.* 1997; Scharping 2003; Zhang and Cui 2003).

Table 3.1 Birth numbers (in millions) from different official sources: 1979–2003

Year	SFPC annual report	MPS registers	NBS annual survey	NBS adjustment	Census	Under-reporting in MPS or SFPC data[a] (NBS adj. = 100)	
						Millions	%
1979		17.27					
1980		17.79					
1981		18.24[b]			20.69	2.5	−11.8
1982		18.68	21.26	22.38		3.7	−16.5
1983		15.41	18.59	20.58		5.2	−25.1
1984		14.26	18.02	20.55		6.3	−30.6
1985	13.93	14.16	18.51	22.02		8.1	−36.7
1986	15.98		21.83[c]	23.84		7.9	−33.0
1987	16.55		22.40	25.22		8.7	−34.4
1988	16.15		22.47	24.57		8.4	−34.3
1989	16.71	18.07	22.88		24.07	7.4	−30.6
1990	18.95		23.91	23.91		5.0	−20.7
1991	16.97	16.81	20.49	22.58		5.6	−24.8
1992	15.96	15.10	19.40	21.19		5.2	−24.7
1993	15.70	14.52	18.45	21.26		5.6	−26.2
1994	15.75	14.28	18.05	21.04		5.3	−25.1
1995	15.21	14.40	16.89[c]	20.63		5.4	−26.3
1996	14.55	14.30	17.72	20.67		6.1	−29.6
1997	13.88	13.95	17.09	20.38		6.5	−31.9
1998	13.83	13.43	16.69	19.91/19.42		5.5	−28.8
1999	12.88	13.67	16.13	19.09/18.34		5.6	−29.8
2000	12.92			17.71	14.11[d]	4.8	−27.0
2001	12.57	16.21	14.18	17.02		4.5	−26.1
2002	12.02	12.16	13.64	16.47		4.4	−27.0
2003		12.01	13.57	15.99			

Notes: [a]For the period 1979–84, differences are between MPS and NBS figures; for the period 1985–2002, differences are between SFPC and NBS figures; [b]By interpolation from 1980 and 1982 data; [c]Computed from 1% microcensus; [d]Computed from the 2000 census short-form questionnaire for the period from 1 November 1999 to 31 October 2000. The figure computed from the 2000 census long form is 12.62 million.

Sources: Based on NBS annual survey figures for 1990–94, 1996–99, 2001–03 from published fertility rates and projection of women aged 15–49; State Family Planning Commission (SFPC) reports: (SFPC 1986–2005); Ministry of Public Security (MPS) household registers: Editorial Committee of Yearbook of Chinese Law (1992–); NBS annual survey: Department of Population Statistics of National Bureau of Statistics (1988–2005); NBS adjustments: Department of Population Statistics of National Bureau of Statistics (1988–2005); for microcensus 1995 see Zhang *et al.* (1997); for 2000 census see NBS (2002*a*).

Age-specific fertility rates, available from China's national fertility surveys of 1982, 1988, 1992, 1997, and 2001, offer some clues to the ingredients of the data confusion. (Renkou yu jingji bianjibu 1983; SFPC 1986; Chen 1991; Lin and Wang 1991; Liang and Chen 1993; Jiang 1995; Jiang 2000; Ding 2003).

Undertaken by the SFPC, their retrospective time series augments the rather summary information from other sources. They also serve as a further check of data reliability. Until 1990 each survey led to upward revisions of births reported in previous surveys. Analysis of census results showed a similar pattern. This indicated that births that had been concealed tended to be recorded once children entered school or were registered for obtaining other social services.

While intentional misreporting constitutes the major deficit of birth statistics, sampling errors are another source of discrepancies. All national fertility surveys have involved clustered sample units, using either villages and urban neighborhoods (1982 survey) or their subordinate village and neighborhood groups (all other surveys). Various techniques have at different times been employed to offset distortions resulting from the use of clustered samples. These have included various forms of stratification and one to three sampling stages. Considerably reduced sample sizes (from 1.95 per 1,000 total population in the 1988 survey, to 0.01 per 1,000 in 1997) have led to reductions in the reliability of survey results in recent years. The relative margin of error in the total fertility rate (TFR) thus changes from only plus or minus 1 per cent in 1988, to plus or minus 10 per cent in 1997 and plus or minus 6 per cent in 2001. The margins of error for age-specific rates are much larger, leading to a lack of confidence as far as recent rates for one-year cohorts or the broader age groups 15–19 and beyond 30 are concerned. In view of the small contribution of these age groups to total childbearing, this may be tolerable. But deteriorating information on individual birth orders is less so. There is insufficient detail on error rates in the five-yearly microcensus and the NBS annual population change surveys. Judging from their designs and much larger sampling ratios (roughly 10 per 1,000 population for the microcensuses; 0.5–1.6 per 1,000 for the annual surveys, with an average 1 per 1,000 since 1993), the margins should be smaller than those of the recent fertility surveys (NBS 1988; Hu 1994; Jia and Sai 1995; Hao and Gao 1997; Hu 2005).

Comparison of initial, and later retrospective, data on detailed age- and birth order-specific fertility shows an almost perfect fit in the early 1980s. Discrepancies for the late 1980s were, however, well outside the range of sampling error. The TFR calculated for 1984 from the 1988 fertility survey implies an undercount in the earlier SFPC report of more than 20 per cent. The difference is most marked for births in the cohorts 15–19 (below the legal marriage age), where fertility rates derived from later surveys double the earlier figures. More important in terms of impact on TFR, however, are undercounts of 20 per cent and 12 per cent for the age groups 20–24 and 25–29, respectively. These age groups contribute roughly 80 per cent of all births. The age group 30–34 which contributes roughly 10 per cent of births also displays significantly raised birth numbers in the later count.

Even larger discrepancies emerge in the comparison of data for 1989–90 when detailed information permits a precise analysis by birth orders and single-year cohorts. These are clearly the preferable units for analysis, as the conventional summary by five-year age groups hides important patterns. The results indicate politically induced misreporting and revealing relationships between the SFPC report and the annual NBS sample survey. While both data sets show evidence of under- and overreporting, the error margins for the SFPC report are always considerably higher. They are the main focus of this discussion; the parallel calculations from the NBS survey are given in parenthesis. A summary is presented in Figure 3.1, which graphs the absolute extent of under- or overreporting of age-specific fertility rates (ASFR) instead of the relative percentages.

When relative percentages are calculated, they reveal a considerable undercount of births among women bearing children below the officially promoted ages of 23 for late marriage and 24 for first birth: roughly 63 (35) per cent for women aged 20, 28 (19) per cent for women aged 21, and 18 (9) per cent for those 22 years old. Such differences are not negligible since the number of births among these women is far greater than that discussed above among women aged 15–19. In age groups 23–6, where first births become permissible, the undercount reduces or even reverses into a slight overcount. The undercount increases again amongst births to women aged 27, a threshold for having a second child. Underreporting of births amounts to about 20 per cent in age groups 27–34 (the NBS survey shows an overcount until age 31), and among older women underreporting is considerably higher.

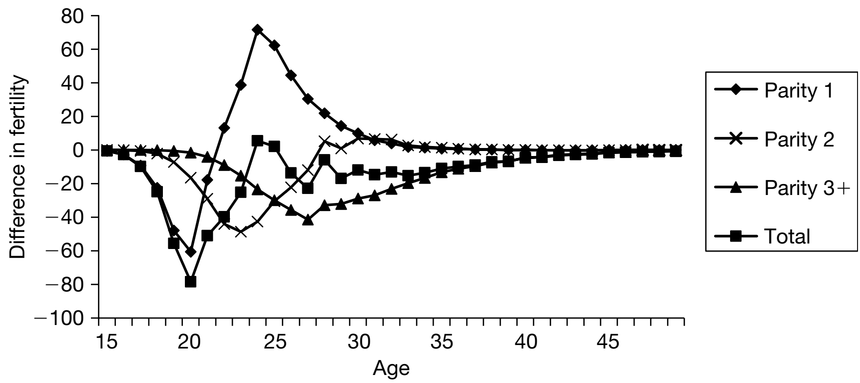

Figure 3.1 Absolute difference in fertility between SFPC birth-planning report and census results for 1989

An analysis by birth orders is equally revealing. Besides the usual extremely high undercount of first births among women aged 15–19 (90 per cent of births unreported by the SFPC, 60 per cent in the NBS survey), there is also serious overcount, beginning with births to women aged 22, where it amounts to roughly 10 (0) per cent and rises to 100 (40) per cent in the age groups 29–32. The excess of reported first births can only be explained as births to younger women reported as occurring at higher ages and second births registered as first ones. Furthermore, there is a very high undercount of second births, which made up one-third of all births in 1989. For women aged 20–27, average underreporting amounts to 65 (15) per cent. Among women aged 28 or above, for whom permits for second children may become available, overcounting of births again becomes apparent and extends until age 38. The average overcount for these age groups amounts to 16 per cent in the SFPC report and 23 per cent in the NBS survey. The greatest undercount can be detected in third and higher order births, which comprised 18 per cent of all births in 1989. The extent of underreporting is particularly large in births to women who have not yet reached 28 years. Some 90 per cent of all third and higher order births were unreported by the SFPC, 45 per cent by the NBS survey. After that age, approximately 75 (less than 15) per cent are missed. Data for 1990 largely indicate the same striking patterns.

From 1991, however, the availability of data for comparative analyses of this kind declines radically. No detailed SFPC figures have been published, and the margins for statistical error in new fertility surveys have been increased. It is noticeable that all of a sudden their results become largely uniform and move within the overlap of confidence intervals (see Chapter 4, this volume). At the same time, the discrepancies with the annual NBS surveys are reduced. The most striking phenomenon is a sudden dramatic drop in the number of births in 1991. According to the 1992 fertility survey, the TFR plummeted to 1.6 children per woman, even lower than that claimed in the former SFPC reports (Jiang 1995; Zeng 1995). The drop in TFR was recorded in all age groups. It was most pronounced for second births at ages 21–33, third births at ages 23–31 and first births at ages 19–26. After 1994 the TFR was reported to have continued to decline, to 1.3 to 1.4 children per woman. The 1997 and 2001 fertility surveys point to delayed birth of the first child and a decrease in second births as the most important reasons for this decline.

Such is the picture as conveyed by the original data. The problem is: do these figures reflect real changes, or are they mainly artefacts created by large-scale fraud? Do past patterns of misreporting continue, or are there likely to have been changes? And how do we evaluate the extraordinary drop in numbers of births shown in the 2000 census?

Various Chinese demographers insist that there has indeed been a spectacular fertility decline, and discern less than 10 per cent underreporting during the

1990s (Zhang and Yuan 2004; Zhang 2004; Guo 2004*a*; see also Chapter 4, this volume). In contrast, the NBS continues to mistrust all surveys and the 2000 census results, for it has raised the TFR obtained from them by margins implying an undercount of 25–30 per cent. For most years of the 1990s it estimated China's TFR at somewhere around 1.85 children per woman, and it continues to reject low TFRs of 1.3–1.4 (as given by recent SFPC fertility surveys) or 1.4–1.5 (as given by the NBS annual surveys) despite their apparent confirmation by retrospective calculations from the 2000 census results. Since 2001, SFPC adjusted time series for the 1990s have conformed to this assessment and calculated a TFR of 1.8 or 1.9 for 1999 (SFPC 2001; Yu 2002; Cai 2003). Even in 2005, all official pronouncements from China continue to employ the preset formula of 'a total fertility rate presently around 1.8.' A look at the reasons for the rejection of lower figures seems indicated.

3.2 THE ROLE OF BIRTH-PLANNING POLICIES

It is instructive to examine how the bureaucracies involved have assessed the quality problems of fertility data and the causes underlying these during the 1990s. Some interesting statements document the concerns of the NBS and the SFPC on the eve of the 2000 census. They were published during 1999 in two of China's major demographic journals. A cadre of the Jiangsu Family Planning Commission pinpointed the following six problem areas:

1. Concealment of births by peasants fearing high fines for unauthorized second births, or hiding a first birth so as to have another one, as well as nonreporting of births by cadres who do not want to hand over collected birth-planning fines;
2. Large omissions in the registration of migrant children, because cadres in host places are concerned about increases in their birth statistics;
3. Concern by bureaucrats that unauthorized births tarnish the annual evaluation of their birth-planning performance and lead to later sanctions;
4. Negative experiences with the supposed confidentiality of census materials, which have been misused for evaluation purposes;
5. Cadre interest in low population and high per capita figures for progress reports;
6. Peasant interest in avoiding various high fees calculated on a per capita basis.

In view of these problems, the author bracketed the birth numbers from the 1990s under the rubric 'guesses' rather than hard data (Chen 1999).

Shortly after this, a symposium on the quality of birth statistics published by another journal put similar misgivings on record (Renkou yanjiu bianjibu 1999). It documented NBS complaints about the misreporting of birth numbers and the widespread frustration of Chinese demographers about the low data quality in recent years. Four years earlier, a discussion of survey practices published by direct participants from the NBS already supplied graphic details of the problems encountered in the field. An unending series of internal directives condemned the prevalent underreporting and the manipulation of numbers. Sometimes the scandals triggering these verdicts surfaced in public. Particularly notorious cases always involve hinterland provinces with large peasant populations. Relevant examples come from Hebei, Hubei, Hunan, Shanxi, Gansu, Guizhou, Guangxi, and Hainan, where concealment of between 30 and 50 per cent of births was uncovered. In some instances, 60–75 per cent of births had been concealed. In contrast, SFPC investigations in the advanced coastal regions, and post-enumeration checks of various surveys, produced underreporting rates of 10 per cent or less (SFPC 1986–2005); Sun and Qin 1993; Wang and Wang 1995; Jia and Sai 1995; Wang 1998; Scharping 2003). It is of course difficult to generalize the overall extent of underreporting on the basis of extremes. But it is worthwhile to pay attention to the reasons cited for the widespread countrywide resistance to truthful recording of births.

Fear of heavy fines for children born out of plan always heads the list. During the 1990s, fines which could be imposed rose considerably from their former levels, which had usually involved a 10 per cent income deduction from both parents for 14 years. The exact stipulations varied from province to province, and discretionary margins were large (Scharping 2000). Overall, as the decade continued, sanctions intensified due to the widespread evasion of birth control and the knowledge that fines frequently remained uncollected in the past. Sums for third and higher order births were disproportionately increased, and many places added further penalties related to work and housing allocations. Global deductions of profits and withholding of second-child permits in areas with a high number of unauthorized births were common. Illegal sanctions such as the refusal of household registration to unauthorized children were also widespread, involving the cooperation of lower level SFPC organizations and the local MPS police stations. Under the population and family planning law of 2001, a national social compensation fee has been introduced in place of the earlier system of fines; how it is implemented, and to what extent, has not yet become clear (see Scharping 2003; Chapter 2, this volume).

Particularly challenging problems of fine collection and management are raised by the procedures for controlling migrant fertility. The birth-planning offices have been reluctant to take up this exacting and unrewarding task. Both places of origin and places of destination have tried to shift responsibilities to their respective counterpart at the other end of the migration chain. Current regulations establish the duty of home places to handle documents but make the host places responsible for implementing birth-control measures. However, this raises the question of financing. Since birth-planning budgets are always tight and calculated for the normal resident population, they do not cover the extra expenses for handling birth control among additional inhabitants. Places of destination have therefore started to raise special birth-planning fees from migrants. Since these come on top of many other fees, they have only deepened migrant antipathy to registering and consequently facing bureaucratic meddling in private affairs leading to a host of payments and legal difficulties.

Perhaps the most damaging factor affecting the quality of birth statistics, however, has been the existence of annual evaluations of cadres' birth-planning performance. After prolonged experimentation in the 1980s, relevant systems finally became mandatory across the country during 1991. Although the concrete procedures vary throughout the country, they always involve wage deductions for the nonfulfilment of precisely defined birth-planning obligations. Target figures may comprise up to twenty different items, among them upper limits for the number of births out of plan or the number of second and higher order births, prescribed norms for birth spacing, quotas for sterilizations and IUD insertions, goals for fine collection, and a precise margin for underreporting, which is not allowed to exceed 5–8 per cent of all births. Penalty sums are finely graded according to the number and degree of unattained targets. They can range as high as the complete cadre wage and are buttressed by threats of demotion, dismissal, and restitution in particularly serious cases. Cadres at higher levels are also threatened, and annual random checks in one or two villages per county may have dire implications for the whole county. All of these measures may indeed have contributed to a decline of birth figures. At the same time, they have created a solid front against truthful reporting, and ruses for the manipulation of numbers have become ever more sophisticated (Qian 1997; Short and Zhai 1998; Zhang 1999; Guo 2000; *Jiangxi shenji yu caiwu* 2000; Liu *et al.* 2000; *Zhongguo qingnian bao*, 2000; He 2001; Scharping 2003).

Glimpses of the situation may be gleaned from figures for births out of plan collected by the SFPC in the 1988 and 1992 fertility surveys and presented in Tables 3.2, 3.3, and 3.4. For good reasons no comparable data are available from more recent surveys. Figures for the countryside showed an even more serious picture, with more than one-half of all births being unauthorized second and higher order (Zhong 1993). The data for 1991 and 1992 imply a massive decline in births outside the plan and, at the end of the decade, it was claimed that these had fallen to 6 per cent of all births (SFPC 1986–2005). The decline may be due

Table 3.2 Survey data for total births and percentage of births out of plan by age group and birth order, averages for 1980–88

		Age group							
		15–49	15–19	20–24	25–29	30–34	35–39	40–44	45–49
Parity 1	All births	19,683	1,710	12,587	4,950	383	45	7	1
	% out of plan	8.4	50.1	6.1	0.8	2.0	3.6	12.7	7.8
Parity 2	All births	11,306	162	4,263	5,272	1,444	149	15	2
	% out of plan	72.4	73.1	74.0	73.6	61.0	56.5	57.5	34.1
Parity 3+	All births	8,869	7	921	3,757	2,809	991	333	51
	% out of plan	92.7	85.8	87.9	92.9	93.5	94.2	93.5	95.5
Total	All births	39,858	1,879	17,771	13,979	4,636	1,185	355	54
	% out of plan	45.5	52.5	26.5	53.5	74.6	84.9	90.2	91.4

Note: All births in a given birth order and age group = 100.
Source: Based on data from the 1988 fertility survey (Liang and Chen 1993).

Table 3.3 Total number of births and percentage of births out of plan by age group and birth order: 1990–92

		Year		
		1990	1991	1992
Parity 1	All births	3,792	3,800	2,294
	% out of plan	11.0	9.3	8.1
Parity 2	All births	2,490	1,839	1,071
	% out of plan	73.2	69.7	62.3
Parity 3+	All births	1,249	813	366
	% out of plan	95.2	94.0	87.8
Total	All births	7,351	6,452	3,731
	% out of plan	45.1	36.9	30.5

Note: All births in a given birth order and age group = 100.
Source: 1992 fertility survey (Jiang 1995).

to the great socio-economic changes of the 1990s and the renewed tightening of birth control, including strengthened late marriage policies and another shock campaign involving large numbers of abortions and sterilizations in 1990 and 1991 (Scharping 2003). Nevertheless, its speed and extent are astonishing.

One figure sums up the situation: with uncanny precision, the SFPC calculated the total fertility rate which would result from full compliance with birth-planning regulations as 1.63 in 1990 (Zeng 1997). Regulations on exemptions for second births have been both slightly relaxed and tightened during the

Table 3.4 Percentage of all births out of plan (from two national fertility surveys)

Year	1988 survey	1992 survey
1980	48.9	
1981	48.5	
1982	48.2	
1983	47.3	
1984	46.8	
1985	45.0	
1986	43.6	42.2
1987	42.8	44.0
1988	41.7	43.4
1989		46.2
1990		45.0
1991		36.9
1992		30.5

Source: Based on data from the 1988 fertility survey (Liang and Chen 1993) and the 1992 fertility survey (Jiang 1995).

decade but their net effect was restrictive. Full compliance with them would have produced an estimated TFR of 1.4–1.5 children per woman. This happens to be exactly the fertility level produced by most surveys during the 1990s.

3.3 PROCEDURES AND IMPLEMENTATION PROBLEMS IN THE 2000 CENSUS

The 2000 census provided an opportunity to test the accuracy of fertility data collected in recent years and the conflicting claims advanced on the basis of these. Extensive coverage in the Chinese media underlies the following appraisal but cannot be fully documented here. Additionally, the census evoked a spirited and continuing debate in Chinese academic circles on its achievements and shortcomings (Duan *et al.* 2001; Renkou yanjiu bianjibu 2001; Chen and Zheng 2002; Renkou yanjiu bianjibu 2002). Among the problems, questions of personnel and finances stand out. Since the central government contributed less than 13 per cent of the census funds, lower levels (which fear sanctions for newly discovered births) had to foot the lion's share of the bill (Li 2001). Until the last minute, rural townships and urban street committees scrambled for financial support. Some passed their problems on to the populace and started to collect 'census fees' in blatant violation of census rules.

These financial problems are intimately related to questions of personnel. The perennial difficulties of recruiting temporary staff were exacerbated by the gradual dissolution of grassroots organizations whose experienced volunteer force knew their community intimately. The streamlining of office and enterprise personnel, the growing lack of cooperation by private households claiming a right to privacy, and the increasing unwillingness of census workers to perform without adequate pay, were further stumbling blocks. Operating within the framework of a more and more self-assertive market economy, the census worked on a shoestring budget and was reliant upon routines left over from socialist days. It is doubtful whether such an arrangement can be continued in the future. Organizational and financial problems created a most unfavorable setting for the 2000 census, especially in regard to the two most sensitive, time consuming and unrewarding tasks: the recording of migrants and children born outside the plan. These challenges are not altogether new; they were recognized by Chinese policy makers and specialists well in advance of the census, which makes their reaction all the more interesting.

All signs point to an unresolved conflict between bureaucracies with incompatible tasks. First inklings can be gathered from the short ordinance with which the State Council appointed the Census Leading Group in 1998 (NBS 2002*b*: 458–60). The list of members included ex-officio appointments from 18 ministries, central departments, and bureaus required to cooperate for the census. Three of the organizations involved, the NBS, the MPS, and the SFPC, received elevated status, each providing one vice head of the Leading Group, with a prominent NBS cadre also acting as director of the census office set up within the NBS. The State Council's secretary general served as the head of the Leading Group, one of his deputies as another vice head. Implicit ultimate authority rested with Li Lanqing, the then Politburo Standing Committee Member directing population policy, who can be assumed to have contacted former party chief, Jiang Zemin, on questions of paramount importance. This complicated arrangement clearly indicates the power structure in census activity. While the NBS shoulders the operational duties and rules on technical matters, it cannot issue orders to other bureaucracies on questions of policy and has always to accommodate conflicting interests within the MPS and the SFPC. If compromises cannot be agreed, intervention at a higher level is required.

It seems that this structure produced deadlock over the extremely contentious and sensitive issue of how to handle births outside the plan. The NBS has long been on record as favoring anonymous and confidential reporting in order to gain trustworthy information. It also rejects existing MPS and SFPC birth records, pleading for their independent verification without the presence of SFPC personnel. There have been intensive negotiations to translate these principles into practice. Resistance against them surfaced when SFPC cadres started publicizing quite different perceptions during the preparatory phase of the census. In their view the primary value of the census was in ascertaining China's total population. Due to the existing detailed birth data from past surveys, its use as a confirmation of fertility levels would be limited. Undue stress and huge problems could be avoided if there were no insistence on personal household visits to confirm the numbers of members, if existing records were better utilized for reference, and if excessive demands for accuracy were scaled down. SFPC and MPS personnel should be present in all census offices to compare the collected data with existing records; post-enumeration checks should be the joint responsibility of all agencies rather than the exclusive domain of the NBS. Suggestions that couples with out of plan births who truthfully reported those births during the census should not be penalized would amount to a breach of law. Rather than urging priority for census accuracy, the overriding importance of other policies should be recognized (Renkou yanjiu bianjibu 1999).

Such widely differing perceptions led to a joint directive from SFPC, the NBS and the MPS in February 2000 on how to treat unregistered births outside the plan during the census. It contained the following five instructions:

1. To allow household and census registration for all children who were denied it in the past because they were 'out of plan';
2. Not to collect further fines from cadres and families for births outside the plan if they had already been fined (including those fined elsewhere) regardless of whether the births had been truthfully reported or not, provided they were registered truthfully in the census;
3. To avoid further action on the evaluation credits of units that had previously underreported or falsified birth figures, provided these were accurately registered in the census;
4. Census materials might not be used for evaluation and fine collection purposes;
5. All census information should remain confidential and should not be passed on for other purposes.

Together with the decision to stop the annual population survey and birth-planning evaluation during the census year, these internal directives were widely referred to as the Five Injunctions and Two Stops (NBS 2002*b*: 803–5; *Renmin ribao* 2000; local media).

The cited passages clearly indicate the intentions of those who drafted them. Inadvertently, the directive also offers deep insights into administrative practices that are taken for granted, even though they plainly contravene existing laws and regulations. Challenges to the implementation of the injunctions became apparent in the updating of household registers that preceded the census. Under normal circumstances, the corrected household registration entries are used in cross-checking census information on births, deaths, and change of residence. In the Chinese case, however, this procedure opens a hornet's nest of sensitive issues, among them whose is the responsibility for wrong registration, the liabilities of organizations acting in breach of law, the reasons individuals provided inaccurate information either in household registration or to the census, the consequences resulting from such discoveries, and the question of whether visits by census staff, or household entries, are finally used to complete the census questionnaire.

It is therefore not surprising that such issues produced defensive reactions, outright opposition against the census directives, and confusion. At one end of the spectrum Fujian and Liaoning provinces ordered the prompt correction of household records and the cessation of all fine collection during census-taking, 'so that there will not be a census-taker entering first and a SFPC fine-collector following after.' In Beijing, however, the local SFPC openly declared that 'households with children born out of plan can obtain their registration, if they have first paid a certain social compensation fee for them in accordance with the Beijing Birth-Planning Regulations and if they have completed the relevant formalities and documents.' A later clarification from the same authority added that 'there can be no ten-year amnesty for children out of plan.' That this stance was adopted in the capital city under the very eyes of the central leadership speaks for itself. Equally telling are the rebuke by NBS of 'some places bending the clear-cut regulations on registration without precondition'; the later, lukewarm, rectification by the national SFPC; and the final admission by the central party that 'in some places' policies were not carried out faithfully (*Beijing qingnian bao* 2000; *Xinhua* 2000; *Zhongguo renkou bao* 2000; *Zhongguo qingnian bao* 2000; Renkou yanjiu bianjibu 2002; local media).

Such controversies were repeated elsewhere and prompted the central leadership to take action. Speeches from a conference of the census office in September 2000 provide evidence of an increasing concern about the limited implementation of relevant census guidelines and a clear recognition of the problems preventing the truthful reporting of out of plan births. But apart from repetitions of the Five Injunctions and Two Stops, and a plea that all violations of policy should be reported, the Census Leading Group could offer no further advice. When the enumeration finally began, a flood of alarming reports reached the capital that the census was collecting even fewer births than the deficient numbers recorded in household registration. The State Council met in emergency and decided to prolong the overall period of census taking by five days and locally even longer. Ultimately, the top politicians were caught in a trap from which they found no real way out (*Renmin ribao*, 5, 6 and 10 November 2000; local media).

The extent of the problems they were facing can be divined from a later internal report of the Statistical Bureau of Jilin City on insurmountable difficulties in census work. Such difficulties, it claimed, were experienced everywhere in the country. It noted that numbers from the revised household registration in the preparatory phase of the census were seriously underreported and diverged from all known population trends. Census rules aiming at independent verification of births prohibited recourse to figures from civil registers or birth-planning reports. They also refrained from spelling out sanctions against persons not cooperating in census taking. But the drawback of the procedure was its total dependence on the response made by individuals with even higher underreporting than in the existing records. Births for Jilin City from the last 12 months thus notified amounted only to some 23,000, whereas the contemporary birth-planning report contained nearly 33,000. Since no reliable population totals, no dependable numbers of deaths and no trustworthy migration figures were available to balance the tables and to check logical relationships in the data, 'the people could unwittingly and irresponsibly give any response to the interviewers, just as they pleased.' Techniques used to compensate for inadequacies in the precensus statistics had increased the unreliability of the data even more (see http://tjj.jl.gov.cn/tjyj/t20051020_50638.htm).

It is therefore not surprising that cross checks of census results and other records were later undertaken in order to detect concealed births. This is clearly spelled out in a report from Henan province that describes the comparison of census questionnaires with three other data sources: monthly birth-planning reports of village and neighborhood committees over the previous three years; results from the revision of household registers in the preparatory phase of the census; and the prescribed private household books (*Xinhua* 2000). While such procedures may reveal children earlier recorded elsewhere but unreported in the census, they cannot identify births that were nowhere reported. Moreover, they imply a breach of the promised confidentiality, and the possibility of later punishment is explicitly mentioned. Once again, the census had become entangled in the irresolvable contradictions between honest reporting and adamant policy enforcement.

3.4 CENSUS DATA AND ADJUSTMENT APPROACHES

Since the publication of the census results the long hidden problems have been out in the open. Their obvious deficiencies have been commented on in a number of highly professional and semi-official Chinese analyses (Cui and Zhang 2002; Yu 2002; Zhang and Xu 2002; Zhang and Cui 2003). Among the evident inconsistencies of the figures are: discrepancies in the number of births from the short and the long census form; large disparities with the total births obtained from the updated household registers and even larger ones with the NBS adjusted birth numbers; contradictions between the number of children of young ages, previously reported births and the population total; the higher numbers of survivors in age groups 10–19 than in the corresponding cohorts ten years before; conflict between calculated births and later school enrolment figures. While, in the unanimous opinion of all Chinese observers, underreporting of numbers of births and children aged 0–9 presented the biggest problem for the census takers, some census data for the higher age groups seem to be defective, too. Unsurprisingly, all retrospective calculations of fertility rates from census cohorts in the low age brackets yield figures that conform to the earlier unadjusted survey results for the 1990s or fall within their confidence margins (Ding 2003; Zhang and Cui 2003; Guo 2004*a*, *b*).

Little help in correcting census birth data is provided by the household registers. The gap between these and the census numbers or adjusted NBS figures has been huge in the past. But because its precise extent has varied, and the previous pattern showing fewer registered births than those returned in a census has been reversed, it is not possible to derive even an approximate adjustment ratio. It is worth noting, however, that the revision of household registers prior to the census led to an upward revision in the number of MPS reported births by nearly 20 per cent. Whether this reflects the full extent of underregistration cannot be ascertained.

Nor does the post-enumeration check of census results provide sufficient clues from which to measure deficiencies in the birth data. Although it gave a rate of net underreporting of 1.81 per cent or 23 million people in regard to the total census population, no specific information has been provided on fertility. The difference between the directly recorded population total of 1,245 million and the adjusted one of 1,268 million thus may be also due to reasons other than unreported births. The most important among such additional reasons are unrecorded migrants. The picture becomes even more complicated if the possibility of simultaneous overcount is considered. This would most likely result from double entries of migrants at their home and host places. Many cohorts in the migrant age brackets were larger in 2000 than ten years before, pointing to either overcounts in the 2000 census or undercounts in the 1990 census. Unreported deaths add to the confusion. These are largely infant deaths, an estimated 15 per cent of which are missed. Together with unreported deaths of older persons, these omissions lower China's calculated life expectancy by 1–2 years (Banister and Hill 2003; Zhang and Cui 2003; Huang

2004). All these errors influence the age distribution of the population and lead to distortions in any conclusions derived from it. So too does manipulation of age reporting which reduces the number of recent births and swells the size of older cohorts.

The survival rates in Table 3.5, which were derived from comparing the size of the birth cohort recorded at a later date with that observed at an earlier date, must therefore be regarded with some caution. They indicate that concealment of births had already begun in the early 1980s, with underregistration amounting to 13 per cent for children born at the start of the one-child policy in 1980–81 and 10 per cent for those born during 1981–82. The fourth census of 1990 would have missed an average 6 per cent of the cohorts born in 1980–90. If the figures from the 1995 microcensus and the 2000 census are accepted, they would imply that underreporting of infants and young children in the microcensus continued at around 5 per cent during the first half of the 1990s. All these adjustments would add up to an overall birth underregistration of more than 20 per cent between 1980 and 1984, and more than 35 per cent between 1985 and 1989, if children who surfaced later on are compared to the

Table 3.5 Survival rates from census and microcensus for cohorts born between 1979 and 1995

Age of the cohort at the earlier count	Intercensal periods				
	1982–90	1982–2000	1990–95	1990–2000	1995–2000
0	1.09	1.10	1.15	1.14	1.05
1	1.06	1.13	1.12	1.08	1.13
2	1.06	1.05	1.07	1.05	1.05
3	0.99	0.99	1.09	1.05	1.02
4			1.09	1.05	1.01
5			1.07	1.03	1.00
6			1.05	1.07	0.97
7			1.06	1.06	0.99
8			1.03	1.01	0.96
9			1.08	1.07	0.97
10			0.98	0.99	0.97
11			0.99	0.99	1.02
12					1.01
13					0.99
14					1.00
15					1.02
16					1.01

Source: Based on census (NBS 2002*a*) and micro-census (Zhang *et al.* 1997) data, adjusted for the military, comparable reference dates, and life table mortality.

original MPS or SFPC reports. The percentages look firm for the 1980s and fall largely within the range of previous NBS adjustments or even surpass them. But because of the bad quality of 1995 and 2000 data, inferences for the 1990s must remain tentative. Using data from 1995 to 2000 for reverse surviving children born during 1991 to 1994 produces numbers that roughly conform to the original results of the annual NBS surveys but remain lower than the NBS adjustments. Stretching the calculations further into the recent past requires new data from future censuses.

Prospects for the correction of defective birth statistics by comparing parity specific figures for women of reproductive age do not look promising either. Ultimately all of these approaches employ information on children ever born, which of course can be manipulated, too. Furthermore, they presuppose more or less stable data relationships and thus fail in situations of rapid fertility change. A recent application of the more sophisticated own-child method on a sub-sample of the 2000 count has refrained from using the census form self-reports by mothers on their ever-born children by year. It has instead derived an independent estimate of the TFR in 1990 from matching the number of all 10-year-old children found within households in 2000 with mothers living in the same household. A formula is used for handling unmatched cases. This increases the original TFR for 1990 by nearly 17 per cent. Using the same margin for a correction of the 2000 census result raises the TFR for that year from 1.22 (as derived from the self-reported numbers) or 1.36 (as calculated by the own-child method) to 1.59 (Retherford *et al.* 2005).

Rival attempts at correction have worked by adjusting census figures for the young age groups in 2000 through the application of other data relationships found ten years earlier, or have tried to calculate rates of underreporting from official post-enumeration checks and undeclared births due to early death during infancy. These exercises produce different estimates for the TFR in the 1990s which, while exceeding the unadjusted survey figures, remain significantly lower than the official adjustments. The first technique produces a smaller and largely stable difference in TFRs after 1994 with that for 2000 being 1.7; the latter results in a progressively increasing discrepancy from the surveys, and an estimated TFR for 2000 of 1.5 (Wang 2003; Zhang 2004).

Another indication that birth statistics of the 1990s continue to be defective comes from school data. Numbers of primary school entrants should equal the number of births in the year relevant for reckoning school age, minus the number of deaths ever since. Unfortunately, the officially recommended school entrance age of 6 years is not universally adhered to. Many areas prefer children to begin at age 7, and still older entrants blur the statistics. A different approach therefore starts from the age distribution of primary students in 2000 and during preceding years. The age groups 7 to 11 years can be combined with intercensal survival rates and estimates for children not enrolled in school, in order to derive births for the corresponding earlier years back to 1993. No age distribution of students is available after 2000, so that weaker approximations have to be used for calculating births in the period 1994–97 from school entrance data for 2001–04. The figures confirm the need for continuing upward revisions even in regard to NBS adjusted birth numbers for the years 1987–90. For the following five years, the fit for adjusted birth numbers and fertility rates from the NBS is closer; for 1996 and 1997, however, the NBS adjustments would have to be reduced by 7 and 10 per cent respectively. The TFR for 1997 as calculated from school data amounts to around 1.6 (Scharping 2005).

3.5 CONCLUSIONS

The discussion of China's recent fertility data reveals many contradictions and open questions. Although the 2000 census has provided valuable data in other areas, it fails to clarify fertility trends in the 1990s. While at first sight it seems to confirm the results of the fertility and population surveys conducted in the 1990s, it may also be interpreted in a radically different way. It is more likely that it reflects the strong pressures of a tightened birth control regime that produces fake compliance with prescribed fertility norms. This is suggested by China's earlier experience with out of plan births and the persistent surfacing of formerly unreported births, glaring inconsistencies in current population statistics, numerous case reports on the concealment of births, as well as the overwhelming evidence of massive problems surrounding the 2000 population count.

Evidently, the Chinese leadership also holds this view. The official response to the prevalent underreporting of births, implicit in upward revisions of recorded birth data of between 25 and 50 per cent, seems though to be excessive. Instead of unadjusted census and survey results with TFRs of between 1.2 and 1.4, or official adjustments to between 1.8 and 1.9, all independent scholarly reconstructions of recent fertility trends yield rates of between 1.5 and 1.7 children per woman at the end of the 1990s. It must be admitted, however, that their methods for data verification and adjustment rest on the assumption that at least some other relevant data are reliable and that their empirical relationships in former years can be exploited for present corrections. Also, the adjustments must utilize disputed data on infant mortality, age distribution of women of reproductive age, and composition of age-specific fertility. Their results, therefore, involve a certain amount of approximation.

It seems unlikely that China's problems in enumerating its population can be solved in the prevailing conditions of extremely rapid socio-economic change, large scale migration and a tight birth-planning regime. The debate on current fertility levels and the extent of underreporting will therefore continue to rage. Nevertheless, its existence should not deter us from recognizing that China's fertility has been below replacement level for more than a decade. While the Chinese state is responsible for initiating and accelerating this development with its unprecedented birth control policies, the sweeping transformations of Chinese society have also contributed to it. This is an epochal change. It will soon confront China with an altogether new agenda in population policy and—in spite of the continuing procrastinations—impose an eventual alteration of the present birth rationing regime.

4

Below Replacement Fertility in Mainland China

Zhigang Guo and Wei Chen

China has experienced a rapid fertility decline over the last 30 years. Studies undertaken both within and outside China have documented that this extraordinary change has been driven largely by the family planning program and that below replacement fertility was reached in China in the early 1990s. China's fertility decline has taken place primarily during two periods: the first was the 1970s when the total fertility rate (TFR) dropped sharply from six births per woman in the early years of the decade to less than three at the end of the decade; the second was the 1990s during which fertility further decreased to below or far below replacement level. The fertility decline of the 1970s and subsequent fluctuations in the 1980s have been discussed extensively, but fertility changes in the 1990s remain largely unexplored because of problems of data quality, as described in the previous chapter. This chapter uses recent census data to reconstruct fertility trends, and examines their underlying causes in order to shed light on the fertility transition of the 1990s. The chapter is organized into five sections. The first section outlines fertility decline in the 1970s and 1980s, providing a context for the later sections and for discussion of the long term trends in fertility changes. Section two discusses recent fertility studies and examines fertility trends reconstructed from the 2000 census data using a child–mother match approach. The next section compares fertility statistics derived from different data sources. Following that, section four compares conventional TFR with tempo adjusted TFR (TFR'), and examines changes in both period and cohort fertility and their impact on our understanding of fertility decline. The final section summarizes the major findings of this study.

4.1 FERTILITY DECLINE BEFORE 1990

China's nationwide fertility decline did not take place until the early 1970s when the family planning program was vigorously launched as a major component of the government modernization drive. This unprecedented campaign achieved remarkable success within a decade: China's TFR declined dramatically from 5.81 children per woman in 1970 to 2.75 in 1979 (Yao 1995). Figure 4.1 presents fertility trends over the period 1964–88. This section examines only changes in TFR and the discussion of the tempo adjusted fertility measure (TFR'), which is also shown in the figure, will be presented later. It is important to note that mortality decline as well as social changes which took place before the 1970s also had some impact on the rapid reduction in fertility, although the decline has been widely seen simply as a direct outcome of the family planning program.

As previous chapters have noted, China's family planning policy in the 1970s was often described as 'later, longer, and fewer.' 'Later' meant postponing marriage for men until age 25 and for women to age 23; 'longer' spacing the first and the second child with a four-year interval; and 'fewer' promoting a family size of two or fewer than two children. Under the influence of this policy, a wide

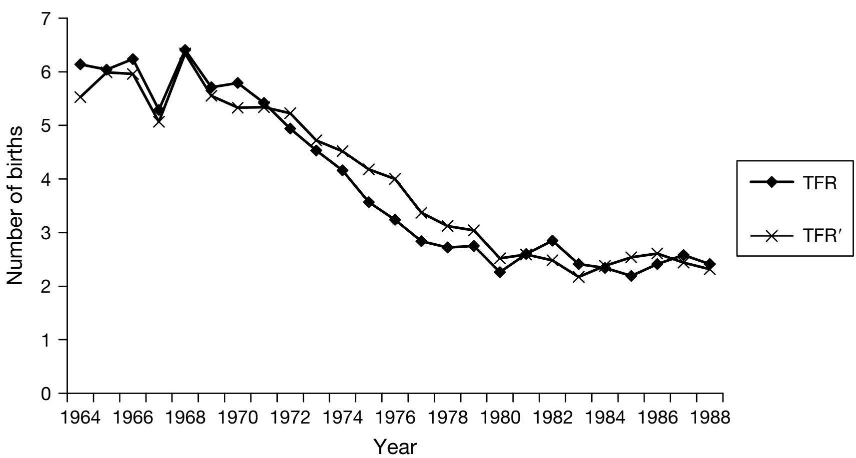

Figure 4.1 Changes in TFR and TFR': 1964–88

Note: TFR's are calculated using the method developed by Bongaarts and Feeney (1998).

Sources: TFRs for 1964–81 are calculated based upon age specific fertility rates by parity computed from the 1982 national One Per 1,000 Fertility Sample Survey, and TFRs for 1982–88 are based upon age specific fertility rates by parity from the 1988 national Two Per 1,000 Fertility Sample Survey (Yao 1995).

range of contraceptives was provided free of charge from 1974. Operations, such as IUD insertion, sterilization, and induced abortion, were not only free but also rewarded with paid leave and allowances. The extraordinary participation of 300 million women of reproductive age in the unprecedented family planning campaign reduced the national TFR by half in less than a decade.

China's fertility decline has been extraordinarily and unexpectedly rapid; indeed the decline is 'unprecedented in human history apart from periods of famine, epidemics, or wars' (Freedman 1995: 8). The decline is undoubtedly attributable to China's family planning program, but this program has not 'operated in a vacuum' (Birdsall and Jamison 1983: 651). Both China's political institutions and its socio-economic development have played important parts in assuring the success of the program. In addition, the post-1949 transformation in social structure and economic development also led to considerable changes in people's reproductive norms and behavior, in urban areas in particular, even before the national family planning campaign began in the early 1970s.

Facing continuing population pressure, the central government in 1978 proposed a policy that stipulated one child for most couples, and for others two children with at least a three year interval between births (Peng 1997). Following that, on 7 September 1980, the National People's Congress adopted the recommendation of the State Council to call upon each couple, except those from ethnic minorities, to have only one child in order to keep the national population within 1.2 billion by the end of the twentieth century. Shortly thereafter, the Central Committee of the Communist Party issued an open letter to all party and the communist youth league members requesting them to follow the government family planning policy and to have no more than one child per family.

Despite the strengthened family planning policy, the linear fertility reduction observed in the 1970s did not continue during the 1980s: instead the TFR fluctuated around 2.5. There were intensive debates on the causes of such fluctuations and overall stagnation, and a number of explanations were proposed. Some attributed the lack of further fertility decline to the new marriage law enacted in September of 1980. The legal age of marriage, 22 for men and 20 for women, stipulated by the new marriage law, was in fact lower than the recommended age of late marriage which had been strongly promoted by the government during the first decade of the family planning program. This apparent reduction might therefore have led to an increase in early marriage and early childbearing, even though the new legal marriage age represented an increase over that of the previous law. Other researchers believed that the major reason for the stagnation of fertility levels was a change of emphasis in government fertility policy in 1984, described as 'opening the small hole and closing the big hole.' The revised fertility policy allowed more rural couples to have a second child according to government birth control regulations, although second births which took place without official sanction, as well as higher order births, were strictly prohibited. This policy relaxation was related to the economic liberalization taking place in rural areas at the time. Other arguments pointed to the facts that, in the first place, those 'baby boomers' who had been the product of high fertility in the 1960s were now marrying and having children in the 1980s, and that, in addition, many of the young couples who had delayed their marriage under the 'later, longer, and fewer' policy in the 1970s had married and started childbearing in the early 1980s. All these factors may have contributed to the movements in TFR and the arrest in its pattern of dramatic decline.

Changes in age at childbearing during this period can be examined in more detail. Figure 4.2 presents the mean age at childbearing by parity for the period 1964–88. The mean age at first birth was 23.03 years in 1974, but it had increased to 24.38 years in 1980, rising by 1.35 years in just six years. This is strong evidence for the impact of the campaign for later marriage and later childbearing. The mean age recorded in 1980 was the highest over this period and even slightly above the target age for late childbearing (24 years for women) promoted by the family planning program. Similarly, mean age at childbearing for parities two and three was also delayed. In contrast, during the 1980s, mean age at childbearing for all parities leveled off or even declined.

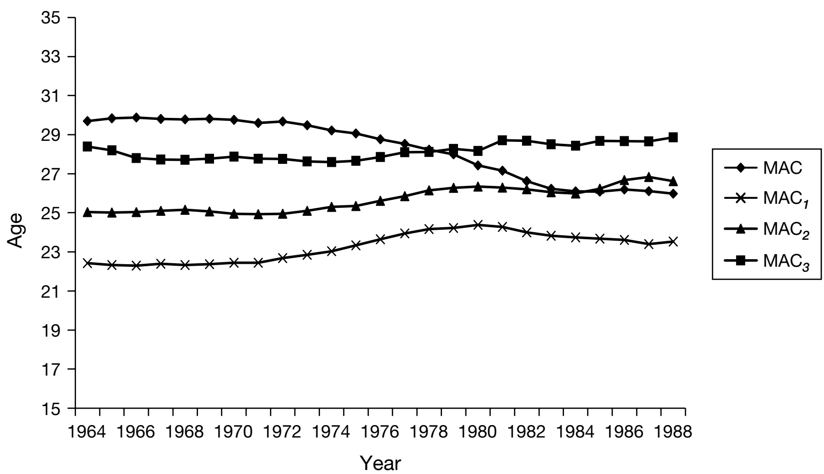

Figure 4.2 Mean age at childbearing (MAC) by parity: 1964–88

Note: MAC_1 is mean age at childbearing for first parity, and so forth.

Women's mean age at having a first child fell by more than one year. This provides support to the suggestion that the implementation of the new marriage law contributed to the decrease in age at marriage and in turn in age at birth, and that these changes were some of the underlying causes of the fertility fluctuations recorded during the decade.

4.2 FERTILITY LEVELS IN THE 1990s

There appeared to be a sudden drop in fertility to below replacement level in the early 1990s. Despite the fact that this was shown by a number of surveys, concerns over the data quality evoked considerable debates on whether Chinese fertility had indeed declined to below replacement, and what the real fertility level was. This section first comments on fertility changes as suggested by a number of surveys conducted during the period by Chinese authorities. We then examine fertility trends in the 1990s by reconstructing TFRs using the 2000 census data.

The State Family Planning Commission (SFPC) conducted a national fertility sample survey in 1992 with a sample size of 380,000 people. According to the survey results, the TFR fell to below replacement level (about 2.1 children per woman at the current mortality level) for the first time in 1991. It had declined to 1.65 from 2.24 in 1989. Such an extraordinary fall attracted wide attention and led to considerable disagreement (Feeney and Yuan 1994; Zeng 1996; Chen 1996; Yu and Yuan 1996). Many demographers thought that China's fertility could not have dropped so far so suddenly. This controversy focused upon the deterioration in the quality of demographic data (as described by Scharping in Chapter 3) and led to further speculation about the true fertility level. Some researchers believed that the TFR was still above the level of replacement, while others insisted that its true level was already below replacement, if not as low as that indicated by the survey results.

When the results of the 1992 survey were compared with those obtained from the survey of fertility and contraception conducted in 1988, researchers found that fertility data collected for the years closer to the time of the survey tend to have greater problems of underreporting. This finding was unexpected as underenumeration of births is generally caused by lapses of memory over time, and it has been interpreted as evidence of intentional concealment of 'out of plan' births.

The same trend was revealed by the Annual Population Change Sample Surveys undertaken by the National Bureau of Statistics (NBS). Despite the fact that the annual population survey has a sample of over one million, and that the numbers of women of childbearing age in that sample are larger than those included in the two fertility surveys conducted in the 1990s, the NBS surveys reported rather similar fertility levels. The TFR was below 1.6 in most years and far below replacement fertility. Partly due to their suspicions about the quality of data, the NBS mainly published crude birth rates and general fertility rates, which had been adjusted upwards before publication. Although it also published age-specific fertility rates which allow the computation of the TFR, the NBS chose not to report this fertility indicator directly as it had done before.

In 1997, a national sample survey of population and reproductive health was conducted by the SFPC, now the State Population and Family Planning Commission (SPFPC). The survey results showed the TFR as continuing its decline, to a record low of 1.35 in 1996 (Guo 2000*a*, *b*). This again led to some disbelief. Demographers now placed their hopes on the 2000 national population census for an accurate estimate of fertility in the 1990s. Unfortunately the 2000 census recorded even lower fertility and the TFR was only 1.23, indicating considerable underregistration of births (Cui and Zhang 2002; Yu 2002; Ding 2003). In the face of this extraordinarily low fertility rate, the debates about the quality of China's fertility data become more intensive. The government has usually deliberately avoided an explicit comment on the current TFR level, but uses vague expressions such as 'low fertility' or 'fertility below replacement level' on occasions when some statement is necessary.

Most demographers however believe that fertility in the 1990s did decline substantially, even after taking underreporting of births into consideration. Many factors have been suggested to explain this change such as rapid socio-economic development, massive migration flows, improved services of family planning and reproductive health, alterations in desired fertility, and delayed marriage and childbearing. The remaining part of this section presents further fertility information derived from the one per 1,000 sample drawn from the original 2000 population census data, and provides more detailed analysis of the declining fertility in the 1990s.

Chinese censuses record data on births in the 12 months prior to the census by women aged 15–50, which allow detailed fertility rates to be computed for only one year, using conventional methods. However, by identifying the birth order of each child in a household and matching the child to his or her mother, we can further determine the mother's age at each birth and estimate fertility in the population for a longer period (Guo 2001).[1] The matching is carried out according to the relationship to the head of the household. When the mother and her children have been matched, the date of birth for each child and the age at which the mother gave birth are determined accordingly. We can also determine the birth order of each child if the total number of children present in the household is the same as the number reported by the mother. These results provide all the information needed for calculating fertility rates by age and parity. A series of age- and parity-specific fertility rates and the corresponding TFRs can be worked out from these data.

The primary concern is the extent to which children are matched to their mother. In the 2000 census, all women aged 15–50 were asked about the number of children ever born and those who survived, as well as the number of sons and the number of daughters.[2] In the 1990s, as China's fertility rapidly declined, age at childbearing became increasingly concentrated in a narrow range of ages, and childbearing at age 40 and above was rare (Guo 2000*b*). Thus, we can ignore the births by the women aged 40 and over, and calculate age- and parity-specific fertility rates for each year of the 1990s. The key factor in using this approach is to achieve a high rate of successful matches between women at childbearing ages and their own children recorded in the household; otherwise the reconstructed fertility rates cannot accurately represent the real age- and parity-specific fertility patterns and the actual fertility level.

If we simply confine ourselves to age-specific fertility patterns and the TFRs without distinguishing parity, we do not have to require all mother–child pairs be successfully matched by parity: what is important is whether the children born in the 1990s can be matched to their mothers. From our experiences with the 1990 census data set, most of the children below age 10 can be easily matched with their mothers since they are more likely to have lived together in the same household. Accordingly, the fertility for the ten years preceding the population census can be confidently reconstructed.

There are 180,000 children aged 0–10 in the 2000 census data sample, representing approximately the total number of births over the decade. A complete match was achieved for 82.1 per cent of the sample and this proportion was rather stable across all ages and above 80 per cent for almost all single age groups. Here complete matching means that all the information about the birth date, parity, and mother's age at childbearing has been correctly matched and is available. A further 5.1 per cent of recorded children were partially matched. In these cases, their mothers were found in the household, but the total number of children recorded in the household differed from the number of children reported by the mother. As a result, dates of birth for the index child, and the mothers' age at childbearing, are correct and available but the birth order of these children cannot be determined. No match was found for 12.8 per cent of the sample: for these children we know their year of birth but neither their birth order nor their mother's age at childbearing.

We next assume that the unmatched and the partially matched children have the same distribution in their birth orders and mother's ages of childbearing as those completely matched children. Birth order and mother's age at childbearing are assigned to them accordingly. This procedure is similar to that described by Shryock *et al.* (1976: Appendix C). It does not change the total number of births recorded in each year, but may misrepresent the age- or parity-specific fertility pattern if the assumption is false. This in turn may affect the accuracy of the TFRs estimated for each year. However, the method can provide useful and generally reliable information about fertility changes in the 1990s. It should also be noted that the impact of infant mortality has not been considered in the procedure, and that had such an impact been taken into account, the resulting fertility rates would be slightly higher.

The TFRs and corresponding parity-specific TFRs for each year of the 1990s constructed using this procedure are presented in Figure 4.3. Women's mean age at childbearing has also been calculated by parity and is shown in Figure 4.4.[3]

The degree of consistency between these reconstructed fertility statistics and those computed using other procedures or from other data sources is generally high. The 10 per cent sample obtained from the 1990 census showed a TFR of 2.35 for the period between July 1989 and June 1990 (Ji 1993: 459). Calculations reported by Xu, based on same data, produced a slightly lower TFR of 2.30. Broken down into parity specific TFR or TFR_p, the TFR for parity one or TFR_1 was 1.05, TFR_2 was 0.73, and TFR_{3+} was 0.52 (Xu 1993: 438). Our TFR reconstruction from the 2000 census data for the year 1990 is 2.37.

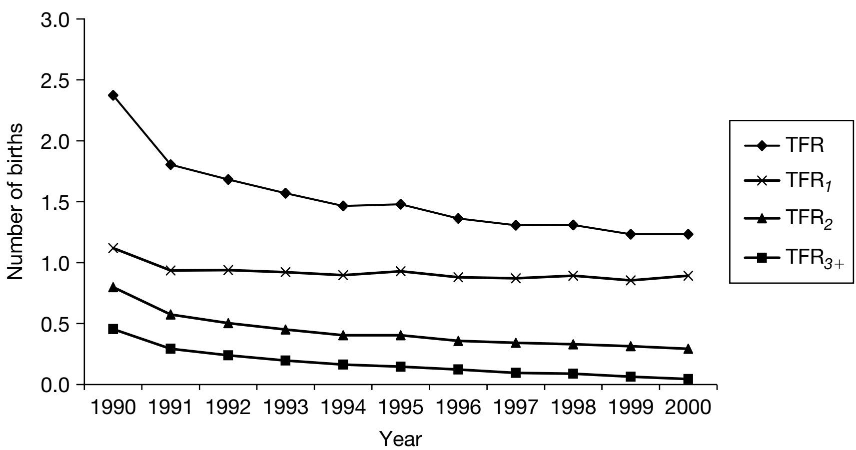

Figure 4.3 Reconstructed TFR by parity in the 1990s

Note: TFR_1 denotes the total fertility rate for first parity, and so forth.

Source: Based on the 2000 census.

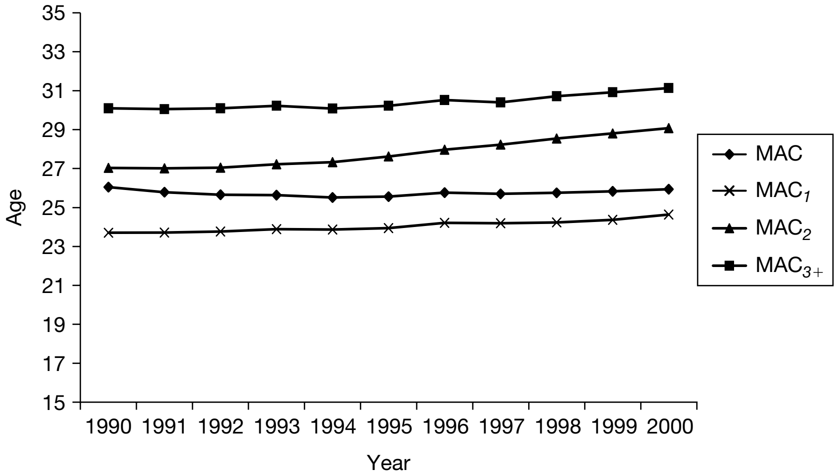

Figure 4.4 Mean age at childbearing (MAC) by parity in the 1990s

Note: MAC denotes mean age at childbearing, which is calculated with age-specific fertility rates as weights.

Source: Based on 2000 census.

The TFR_1 is 1.12, TFR_2 is 0.80, and TFR_{3+} is 0.45. All these results are very close to, if slightly higher than, those computed from the 1990 census data, except for TFR_{3+}.[4] This finding largely conforms to a general pattern observed from the fertility surveys of the 1990s: fertility at any period, when recorded by later retrospective fertility surveys, tends to be higher than that observed from earlier surveys (Yu and Yuan 1996; Zeng 1996; Guo 2000*b*). A high degree of consistency is also apparent for the period between November 1999 and October 2000, when the TFR computed using conventional methods is 1.23, and the parity specific TFRs for parity one, two, and three plus are 0.88, 0.29, and 0.06 respectively. These rates are all very close to those calculated from the reconstructed fertility data with all the differences smaller than 0.02.

The above comparisons indicate that the reconstructed fertility rates for the 1990s are generally reliable. The following observations can be made from examining these reconstructed fertility data. The TFR was relatively high, at 2.37 in 1990. This was largely attributable to the very high TFR of 1.12 for parity one, indicating birth heaping in that year. It is less clear whether the heaping reflected the lagged impact of postponed childbearing which took place in the late 1980s, or was due to the advancement of birth schedule because some people began to have children at younger ages. The reconstructed TFR declined considerably during the 1990s, particularly in the early years. It fell very dramatically from 2.37 in 1990 to 1.80 in 1991, confirming the sudden drop reported by many studies.[5] The impact of changing parity-specific TFRs to the total TFR is shown in Figure 4.3. In the early years of the 1990s, parity specific TFRs all dropped simultaneously and contributed to the remarkable reduction in the TFR. However, it is important to note that the TFR_1 fell only from above 1.0 (indicating birth heaping) to a normal level; declines thereafter were very limited. The further reduction in the TFR therefore largely depended on the fall in the TFR_2 and TFR_{3+}. In the year 2000, the TFR_{3+} declined to less than 0.05, almost reaching its lower limit. Because of this floor effect, the impact of reductions in numbers of high parity births on changes in the TFR will become increasingly small. Under the current fertility policy, one study shows that about 35.6 per cent of women are entitled to have two children and that if the policy were universally followed, the TFR for the total population would be 1.47 (Guo *et al.* 2003). By comparison the reconstructed fertility rates give the TFR_2 as only 0.29 in 2000, considerably below the level set by government fertility policy, as indeed was the total TFR of 1.23 in 2000.

That the fertility level of a single year is below that prescribed under official policy does not mean the policy itself is entirely divorced from reality. It should be noted that mean ages at childbearing computed by parity or MAC_p all continue to increase, as is shown in Figure 4.4. During the 1990s, the mean age at having a first child or MAC_1 increased by about one year, MAC_2 by about two years and MAC_{3+} by approximately one year. The mean age at completing childbearing did not change much however because of the considerable decrease in higher parity births. As Bongaarts and Feeney warned (1998), it is easy to overlook an actual increase in age at childbearing when calculations of mean age at childbearing do not take account of parity, and this may lead to neglect of the difference between period TFR and lifetime fertility. It is important to recognize that the current TFR level may be much lower than the level of lifetime fertility. This is largely due to the so-called tempo effect, which will be further discussed in section four.

4.3 COMPARING FERTILITY LEVELS FROM DIFFERENT DATA SOURCES

This section compares the reconstructed fertility statistics with those from other sources and further examines fertility patterns in the 1990s. Since 1990 both NBS and SPFPC have conducted a number of nationwide demographic surveys. Figure 4.5 shows TFRs computed from different data sources together with the reconstructed ones. Although there are discrepancies in fertility levels

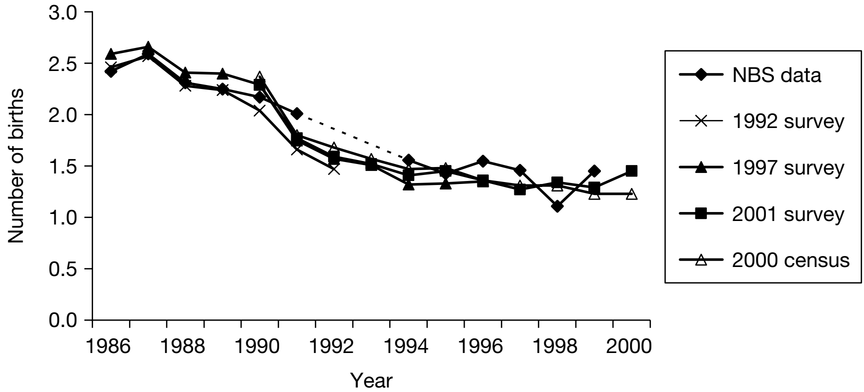

Figure 4.5 Comparison of TFR computed from different sources

Sources: NBS (1987–2000); 1992 survey from Yu and Yuan (1996); 1997 survey from Guo (2000*a*); 2001 survey from Ding (2003); 2000 data reconstructed from the 2000 population census; all others calculated by interpolation from NBS (1991, 1994) statistics.

between these results, all graphs consistently follow a similar pattern, showing declining fertility in the 1990s.

When fertility levels for the same years are compared, it is easy to see that those recorded by later retrospective surveys are always higher than fertility levels observed in the earlier surveys, except for the figures published by NBS, which are based on the Annual Population Change Sample Surveys but have been adjusted upwards. For the year of 1990, the TFR from the 1992 fertility survey is the lowest, followed by those from the 1997 reproductive health survey and the 2001 reproductive health survey. The increases in reported fertility levels of earlier years largely correspond to the year in which the data were collected, with the TFR reconstructed from the 2000 census data being the highest. Taking as another example the year 1994, the 1997 survey recorded the lowest TFR, that reported by the 2001 survey fell in the middle, and the reconstructed TFR was the highest. This further confirms that children born in the years closer to the time of the survey are most likely to have been underreported, but resurface and are generally recorded in the later retrospective surveys. Comparison between the 2000 census results and the 2001 survey suggests that the latter is an exception to that pattern. For earlier years, the figures obtained from the census are higher than those from the 2001 survey; but for the most recent years, the 2001 survey reported a higher TFR than did the census. It is not clear whether this is due to changes in sampling coverage[6] or results from more effort being put into the collection of recent births in the survey.

The discrepancies in fertility levels are not very large across results obtained from different data sources. The largest discrepancy is 0.35 of a child, observed in the fertility data for 1991 when figures from all five sources are available. If we regard this as indicating the amount of underreporting of fertility data, then 1991 would become the year with the most serious underregistration. Yet this generates an underreporting rate of only 17 per cent. In addition, it is noticeable that the discrepancy has generally become smaller in the late 1990s, reducing to less than 0.1 of a child, though the difference between the results of the 2000 census and the 2001 survey in TFR for the year 2000 is relatively large. Data from all these sources indicate that the national fertility has fallen to a very low level.

Many demographers in both government departments and research institutes believe the current TFR to be 1.8; others even believe that fertility is much higher. On the basis of these results, however, even if we added 0.3 of a child—the maximum reporting discrepancy found in this period, and which implies an underreporting rate of about 18–20 per cent—to the reported fertility rates, the TFR for the year 2000 would only increase to 1.5–1.7 which is still below 1.8. If we assume that the true TFR for 2000 was as high as 1.8, then the recorded TFR of 1.23 would suggest that some 32 per cent of the births were not recorded in that year. So far no definite evidence has emerged to suggest that underregistration of this magnitude indeed exists.

There are many critiques and much discussion of the quality of China's fertility data, such as that presented in Chapter 3 by Scharping. The relevant government departments have also conducted surveys to assess the problem, but they have rarely published detailed fertility results or survey data. For this reason, it is difficult for researchers to undertake further analyses. It is known that the NBS has adjusted fertility statistics before publishing them, but the NBS has never published details of how the adjustments were made and upon what basis. For these reasons, there is much confusion about the current fertility situation, and a considerable gap between the general assumptions about China's fertility level, and that indicated by the unadjusted statistical results.

Based on comparison and analysis of fertility statistics directly calculated from the original fertility data, it seems quite likely that China's TFR, as a measure of period fertility, was lower than 1.5 at the end of the 1990s, even after adjusting for underreporting in recorded fertility by 18 per cent. This suggests that the actual fertility level is indeed quite low and has been approaching the level aimed at under government fertility policy.

Such a judgment is not solely derived from the analysis presented above; it is supported by other evidence. Ding (2003), in an analysis of the number of children aged 0–9 recorded by the 2000 census, reckoned that the national average TFR for the period between 1991 and 2000 was 1.46, with TFRs of 1.11 and

1.35 for 1999 and 2000 respectively. Cui and Zhang (2002), using the same data also examined the number of births, birth rates, and TFRs. Their results gave TFRs of 1.09 for 1999 and 1.30 for 2000. On the other hand Yu (2002) estimated, based on the annual total population, birth rates, and death rates published by the NBS, the TFRs for the period from 1990 to 2000; these produced a much higher average of 1.94 for the 1990s. Although the published birth counts had been much inflated by the NBS, the estimated TFR for the year 2000 was only 1.55. Yu also showed that given his estimated TFRs the population under age 15 in 2000 would be around 320 million. But according to the census registration, the population of those ages was only 290 million: a gap of 32 million people.[7] Yu also used the 2000 census data on the population under age 15 to provide an alternative estimate of the annual birth rates and TFRs. This produced a TFR for the year 2000 of only 1.32 and an average TFR for the 1990s of 1.62.[8]

All the studies cited above show the considerable inconsistency between previously published statistics of annual births, and those from the 2000 census. We found the same problem in other research, where population projections reflecting different fertility policies have been undertaken. It is difficult to use the 2000 census age and sex distribution as a basis for population projections, because the officially published total population for 2000 exceeds that enumerated in the census by 22.46 million people, whose age and sex are not shown. For this reason, our projection has been based on the population recorded by the 1990 census, a census proved to be of high quality. The first step was to project the population in the year 2000. In doing so, we targeted the population total reported by the census. Then we used this population as a new base for projections with various scenarios. The projected population was 1.258 billion at the end of year 2000 under the assumption that TFR declined from 2.3 in 1990 to 1.47 in 2000, or that fertility was gradually approaching the level aimed at under government family planning policy.[9] In this scenario, while the population size is still smaller than the published population total, the proportion of those under 15 (24.29 per cent) is much larger than that obtained from the census results (22.89 per cent). When compared with the NBS published annual population figures, the projected annual population totals are very close to those reported by the government before 1996, but are noticeably lower thereafter. Similarly, in the projected population annual birth rates are higher than those published by NBS in the first half of the 1990s, but significantly lower in the second half of the decade.

Because the 2000 census population was smaller than the NBS population total, another projection was conducted assuming higher TFRs so as to produce a total population of 1.267 billion at the end of 2000, slightly above the officially published figure. In this scenario, the TFR of the projected population declines to 1.61 in 2000 and reaches the policy prescribed fertility rate of 1.47 in 2005. Because of this change, the proportion of those under age 15 amounts to 25 per cent in 2000, notably larger than the census result. If we assume that the TFR is still 1.8 in 2000, then the gap between the projected and the census recorded numbers of children becomes even larger. The results from both our population projections and the analysis based on child–mother matching indicate that fertility in China did indeed fall to a very low level in the late 1990s.

4.4 TEMPO ADJUSTED TFR VERSUS CONVENTIONAL TFR

As a summary measure of period fertility, the TFR has some limitations in reflecting lifetime fertility. It equals to complete lifetime fertility of a given birth cohort only when age specific fertility rates remain unchanged over their lifetime, otherwise it may show certain distortions. During a fertility transition, however, both the quantum of complete fertility and the fertility schedule change considerably. Bongaarts and Feeney (1998) pointed out that completed fertility is a pure quantum measure but changes in the TFR could be due to both a tempo effect, which is produced by changes in fertility schedule, and a quantum effect. They proposed a new measure of tempo adjusted TFR (denoted as TFR'), which removes the tempo effect from the conventional TFR and can be used to approximate completed fertility. This measure is very helpful in describing recent fertility changes in China.

The TFR' has been computed for, and compared with, the conventional TFR and completed fertility of 18 cohorts of women born between 1935 and 1952 (Guo 2000*a*). The results show that the TFR' is much closer to completed fertility than the conventional TFR. For the 18 birth cohorts, the mean difference between the TFR' and completed fertility is less than 0.01, but the mean difference between the conventional TFR and completed fertility is 0.16. Figure 4.1 presented in the first section, provides TFR's for 1964 to 1988. The comparison of TFR and TFR' shows that whenever there is a change in the mean age at childbearing by parity, TFR deviates from the level of TFR'; the greater the change in age at childbearing, the larger the discrepancy between the two fertility measures. When the age at childbearing increases, the TFR' is higher than the TFR and vice versa. When the age at childbearing stabilizes, the TFR' becomes similar to the TFR.

In the period of 1972–80 when China's family planning program concentrated on implementing the 'later, longer, and fewer' policy, the TFR' and TFR both declined, but the former measure was higher than the latter. This suggests that the quantum of fertility reduced while the age at childbearing was postponed. Indeed lifetime fertility fell drastically in this very short period, but the decline in TFRs was also affected by delayed childbearing. Postponed childbearing does not equate to a cessation of childbearing. The discrepancy between TFR and TFR' represents cumulated delayed fertility.

Despite the shift to the one-child policy, the 1980s witnessed marked fluctuations rather than further declines in TFRs, as shown in Figure 4.1. It is particularly noticeable that the TFR increased in 1981 and 1982. This triggered considerable concern from the government and was regarded as evidence that population growth was out of control at that time.[10] Because of that the government launched a campaign called 'propaganda month of family planning' and birth control efforts became even more intensive.[11] As a result, the TFR fell again in 1983. Fertility policy had already been very severe and the further tightening of controls met strong resistance at the grass roots. At the same time, the results from the 1982 population census indicated that the 1.2 billion population target set for the end of the twentieth century was unachievable. Recognizing this situation, the government revised its rigid one-child policy. The new and more diversified policies took into account levels of local socio-economic development and, as discussed by Zhang and Cao in Chapter 2, allowed more rural couples to have two children.

The TFR's, which remove the tempo effect, show that fertility did not in fact rebound at all in the early 1980s. The TFR' continued its downward trend and fell below the level of the TFR. Accordingly the rise in TFR did not mean an increase in lifetime fertility but merely reflected contemporary changes in the timing of births. These were mainly due to the fact that, after the introduction of the new marriage law, some people married and had children at relatively young ages; and that many people who had delayed their marriage during the 1970s also married and started to have children in the early 1980s. For this reason, the increase in TFRs at this period should not be interpreted as a sign that fertility was out of control but rather as a phase in the rapid fertility transition, during which the postponed fertility accumulated in previous years was released. Driven by the propaganda month campaign, both TFRs and TFR's fell in 1983, and fluctuated slightly above the replacement level for the rest of the 1980s.

What, then, happened to China's fertility in the 1990s? How is the sudden decrease in 1991 to be explained? And how could fertility reach such an astonishingly low level in 2000: a level not only below replacement, but also below that predicated by the current fertility policy?

Since the 1992 fertility survey, the attention of demographers and family planning workers has been largely directed to the deterioration in the quality of demographic data. Although the issue has not been entirely neglected, there is a need to further address the limitations of TFR. The TFR is used in two ways: firstly, to provide a standardized measure of period fertility for comparison with other times; and, secondly, to serve as an indication of lifetime fertility when only period data are available. In contrast, the concept of replacement fertility largely

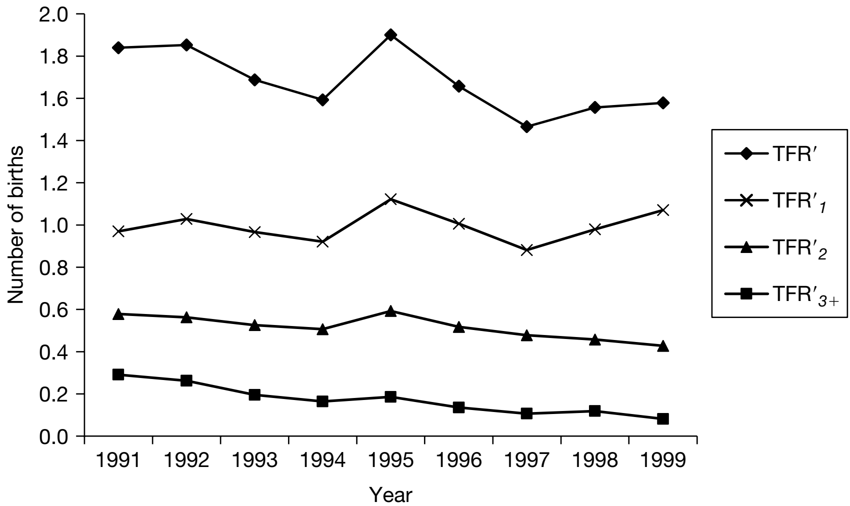

Figure 4.6 Reconstructed TFR' by parity in the 1990s

Note: TFR'_1 is tempo adjusted TFR for first parity, and so forth.

Source: Based on 2000 census.

pertains to lifetime fertility. The fertility policy implemented by Chinese government family planning regulations is also premised upon women's lifetime fertility.

Figure 4.6 provides TFR' and parity-specific TFR's for parities one, two and three plus. We need to have detailed fertility information collected in both the year prior to and the year after a given year to calculate its TFR' and for this reason, the TFR's for 1990 and 2000 have not been computed. The results shed further light on the fertility situation in China in the 1990s.

Comparing the TFR' shown in Figure 4.6 with the corresponding TFR in Figure 4.3 reveals some notable features of the changes in fertility in the 1990s. Both TFR and TFR' fell below replacement levels, suggesting that fertility in China was indeed very low. Nonetheless, it is also noteworthy that the TFR' is much higher than the TFR and there is a considerable gap between the two sets of fertility values. This gap represents the tempo effect resulting from postponed childbearing. The mean difference between the two is 0.21, computed for the entire period. Between 1995 and 1999, the mean difference is much greater, at an average of 0.29. For 1999 the TFR is 1.23 and hence much lower than the policy prescribed fertility rate of 1.47, but TFR' is 1.58. This implies that lifetime fertility in China is higher than that suggested by period fertility measures such as the TFR. During the 1990s, fertility at parities three plus was greatly reduced and both TFR_3 and TFR'_3 have fallen to very low levels.

The TFR_2 and TFR'_2 also decrease to less than 0.50, with the former being slightly lower. This indicates that the decline in fertility at parity two resulted from both quantum and tempo effects. The value of TFR'_1 stood at around 1.0 in the 1990s, showing that almost all couples still had at least one child. In contrast, the TFR_1 was only 0.9 or even lower. This suggests that the relatively low TFR_1 does not mean that many couples had no desire to have a child at all, but rather that they were simply delaying the first birth. These changes in TFR' relative to TFR imply a further accumulation of fertility potential, similar to that which occurred during the 1970s, and one which could lead to fertility rebounding when age at childbearing ceases to rise and becomes stable.

4.5 CONCLUSIONS

As a combined result of the national family planning program and socio-economic development, China's fertility has declined rapidly from a very high level to well below replacement in the past three decades. In the 1970s, fertility fell in a rapid and linear fashion, reflecting both quantum and tempo effects. Although there was a considerable reduction in women's lifetime fertility, the TFR' was consistently higher than the TFR because of changes in the timing of births. In the 1980s, China's fertility ceased its decline and instead showed considerable fluctuations. These were associated with changes in government fertility policy, the difficulty in further lowering fertility, and the lingering effect of delayed childbearing in the previous decade.

In the 1990s, fertility levels reported by the NBS were much higher than those calculated directly from national fertility or population change surveys, and they were also inconsistent with the 2000 census results. The TFRs, whether computed directly from survey and census data or estimated indirectly from aggregated survey and census results, were all around 1.3. Even if we assume that 20 per cent of births were not recorded in the year 2000 and adjust the TFRs accordingly, the estimated TFR is still notably lower than 1.8. [12] Inconsistency between the NBS published fertility data and the 2000 census results may be explained both by overadjustment to annual fertility data made by China's statistical authorities, and the underreporting of fertility shown in the census. Even if the population total recorded by the 2000 census is adjusted upward by 22.5 million, the suggestion that TFRs stood at about 1.8 in the late 1990s remains untenable. Taking into account the strong tempo effect on fertility and noticeable changes in people's reproductive behavior throughout the 1990s, there are reasons to believe that China's TFR had already, at the end of the twentieth century, reached a lower level than that officially estimated.

5

Fertility Transition in Hong Kong and Taiwan

Edward Jow-Ching Tu, Xin Yuan, and Xia Zhang

Fertility decline has been one of the most significant demographic changes taking place across the world throughout the twentieth century. In the previous chapter it was explored in the context of fertility data collected from mainland China. This chapter further examines this important transition through documenting fertility changes in Hong Kong and Taiwan. While these two Chinese societies, in comparison with mainland China, have very different social and political systems and have not been subject to the strong influence of government birth control policies, they too have experienced an extraordinary fertility decline. Their fertility transition has completed earlier than that in the mainland. The total fertility rate (TFR) has been below replacement since 1980 in Hong Kong and since 1984 in Taiwan. Both societies now have very low fertility and the trajectory of their fertility changes is broadly similar to that observed on the mainland. This chapter begins with a brief outline of fertility changes in Hong Kong and Taiwan, and the different perspectives provided by the use of period and cohort fertility measures. With the intention of shedding further light on the emergence of exceptionally low fertility and its consequences, the chapter concentrates particularly on examination of the effect of changes in the timing of births on period fertility rates, and trends in completed cohort fertility over recent decades in the two populations.

5.1 FERTILITY DECLINE IN HONG KONG AND TAIWAN

Like most populations in Asia, Hong Kong had high fertility in the past. Its crude birth rates (CBR) remained fairly stable at a level of 35 to 39 per 1,000 population between the end of World War II and the late 1950s. Hong Kong witnessed a sharp fertility decline in the 1960s and its CBR fell to 19.7 per 1,000 in 1971, a reduction of 43.7 per cent in ten years (CSD 1984). The population of Hong Kong increased from 5.18 million to 6.27 million during the period 1981–2001, but this change was mainly attributable to the high level of entrants from mainland China, rather than to natural growth (CSD 2002*a*).

Since 1906, the population of Taiwan has grown from slightly over three million to more than 22 million in 2001. As in many other societies, Taiwan's population growth stems largely from natural increase. The contribution of net immigration is rather small. Over the period from 1945–50, about a half million Japanese were repatriated to their home country, and 600,000 Chinese moved from the mainland to Taiwan in the wake of the Communist takeover; there was thus little substantial increase in the population. Since 1950, Taiwan has approximated a closed population to the extent that there has been little immigration or emigration. High fertility was a primary contributing factor to the high annual population growth rate of more than 3 per cent in the 1950s and the early 1960s. Taiwan experienced a continuous fertility decline during the 1960s and the first half of the 1970s. In the year 1976, the CBR bounced back to 26 per 1,000 because of the effect of the Dragon year, regarded as an auspicious time to give birth. After that the CBR resumed its decline and reached the low level of 12 per 1,000 in 2001. As a result, the annual population growth rate reduced from around 2.5 per cent during most of the 1960s to less than 2 per cent in the 1970s and only 0.6 per cent in 2001 (Chang 2003).

Hong Kong and Taiwan reached replacement fertility in 1979 and 1983 respectively. While traditional population transition theory assumed that fertility would stabilize at the replacement level, fertility of these two populations further declined to below, or even far below, replacement level. Thus the TFR was 0.93 in Hong Kong in 2001: considerably lower than that in most developed countries (CSD 2002*b*).

As was shown in the last chapter, postponement of childbearing and of the first birth in particular has been an important reason for, and a major characteristic of, fertility declines in recent years. The emergence of lowest low fertility in Hong Kong and Taiwan has been associated with a substantial delay in childbearing (Tu 2003). Postponement of first birth has been very apparent in both Hong Kong and Taiwan, with an increase in age of the mother of 0.12 years annually since 1976; this is discussed in the next section. Postponement produces a temporary decrease in period fertility. Such delayed fertility, however, may at a later time be released and lead to an increase in period fertility. For these reasons, it is important to ask the precise impact of postponement of childbearing and decline in the quantum of fertility on changes in TFRs. If there should be no further postponement of first births, would fertility recuperate?

To what extent might such recuperation reach? The answers to these questions might improve our understanding of the low fertility currently observed in Hong Kong, Taiwan, and many other populations. It might also help in the prediction of their fertility trends in the near future.

The TFR can be computed both for a particular period and a cohort such as women born in the same year. Cohort Total Fertility Rate (CTFR) measures the reproductive experience of an actual cohort. It is equal approximately to the average number of births that the women of the cohort have had when they reach age 49. Because of that, CTFR cannot be computed until all women involved have passed the end of their reproductive age span. For this reason conventional or period TFR, which is the average number of births a woman would have if she survives throughout her reproductive life and bears children following the age-specific fertility rates in a particular year or period, is widely used. This measure indicates the fertility level of a particular time, and is subject to ongoing changes in the timing of births. Generally, the TFR is temporarily inflated during periods when the mean age at childbearing is falling, and deflated when childbearing is delayed. Changes of this kind have been studied for at least half a century and a fertility measure designed to compensate for them was developed by Ryder decades ago (Ryder 1956). Recently this issue has been reinvigorated, and the adjustment methods have been further improved (Bongaarts and Feeney 1998; Kohler and Philipov 2001; Kohler and Ortega 2002).

Theoretically, the postponement of childbearing does not necessarily cause a decline in the level of fertility in the long run because it could have two possible outcomes. It might simply shift the mean age of childbearing upwards but produce little change in the CTFR. If the numbers born to women of older ages is sufficient to offset the decline in fertility at younger ages, the quantum of fertility will not be affected by changes in timing of births, which are due purely to postponement. Alternatively, the increased age of childbearing may be accompanied by decreased numbers of children, and empirical evidence suggests there is frequently a negative relationship between age at first birth and completed fertility. Births, once postponed, may never eventuate and hence generally fail to offset the decline in fertility at younger ages (Bumpass and Mburugu 1977; Marini and Hodsdon 1981; Morgan and Rindfuss 1999).

To eliminate the effect of changes in timing of childbearing—the tempo effect on period fertility—TFRs for Hong Kong and Taiwan have been adjusted by the methods proposed by Bongaarts and Feeny (1998) and Kohler and Philipov (2001). Because of the restrictions imposed by data availability, the tempo adjusted TFRs for Hong Kong over the period between 1976 and 2001 have been jointly measured by the two methods, while only the Kohler–Philipov method has been used to adjust the TFRs recorded in Taiwan during the same period. As in the previous chapter, the tempo adjusted or tempo free TFR will be abbreviated as TFR' in the following discussion.

5.2 TEMPO EFFECTS ON TFRs SINCE 1976

One of the most important reasons for low fertility is that in countries experiencing it, women encounter increasing hurdles in balancing their domestic roles with the demands of education, work, career, self-fulfillment, and economic security (Frejka and Calot 2001). In Hong Kong and Taiwan, the education level of females has risen continuously. Women's socio-economic status has improved since the 1970s, reflected in the areas of equal opportunity of education and employment and reduced discrimination against female workers. More women gain higher education and participate in the labor market. Despite such progress, however, women are still responsible for most domestic work. Participation in the labor market does not provide them with more leisure; it just adds to their total number of working hours, paid and unpaid, and thus minimizes free time. In the severely competitive work market, without additional social supports to compensate them for the time lost due to paid work, women postpone their childbearing and have fewer children.

As shown in Figure 5.1, mean ages of childbearing, especially of the first and second child, have been rising substantially in Hong Kong. The mean age of childbearing for parity one (MAC_1) increased from 25.45 in 1976 to 28.68 in 2001 and for parity two (MAC_2) from 27.79 to 31.39 in the same period. Changes in the mean age of childbearing for parity three and higher order births are smaller, with the MAC_{3+} only rising from 32.14 in 1976 to 33.24 in 2001. In Taiwan, as shown in Figure 5.2, MAC_1, MAC_2, and MAC_3 have all experienced considerable increases since 1976. However, women's ages at having a first and second child are still about two years less than those of their counterparts in Hong Kong.

The marked increase in mean ages of childbearing implies that at least part of the fertility decline during the last quarter of the twentieth century might merely reflect changes in timing of having children. Table 5.1 shows TFRs, TFR's and the influence of changes in timing of childbirth for Hong Kong and Taiwan in selected years. After adjustments for the tempo effect, TFR' is generally higher than the observed TFR. The magnitude of the tempo effect, however, is different over time. During the slide to lowest low fertility between 1976–87, postponement of childbearing played a major role in Hong Kong. The average contribution of the tempo effect was 0.28 of a child per woman during 1976–87. It was greater in the years 1983–87 when it stood at more than 0.4. If there had been no

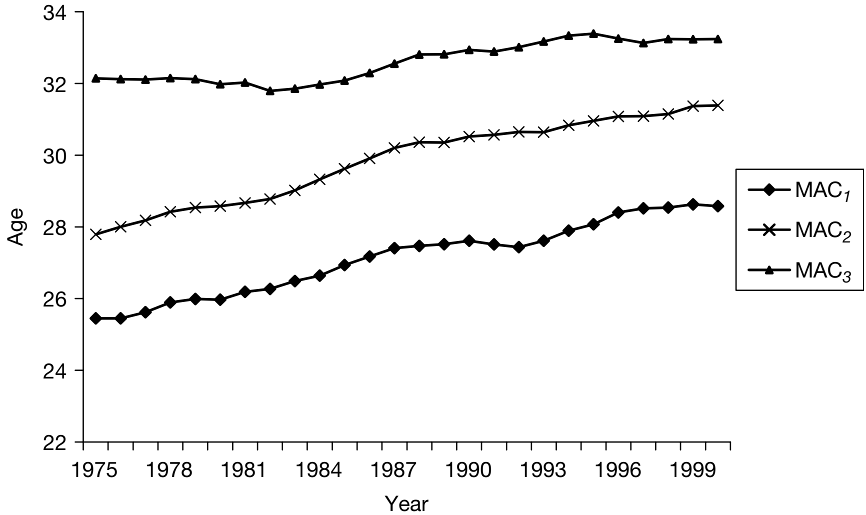

Figure 5.1 Mean age of childbearing by parity, Hong Kong: 1976–2001

Note: MAC_1 denotes mean age at childbearing for first parity, and so forth.

Sources: Data for 1976, 1981, 1986, 1991, and 1996 are calculated based on census materials provided by the Census and Statistics Department of Hong Kong. Data for the other years are calculated from the Vital Registration Data provided by the Census and Statistics Department of Hong Kong.

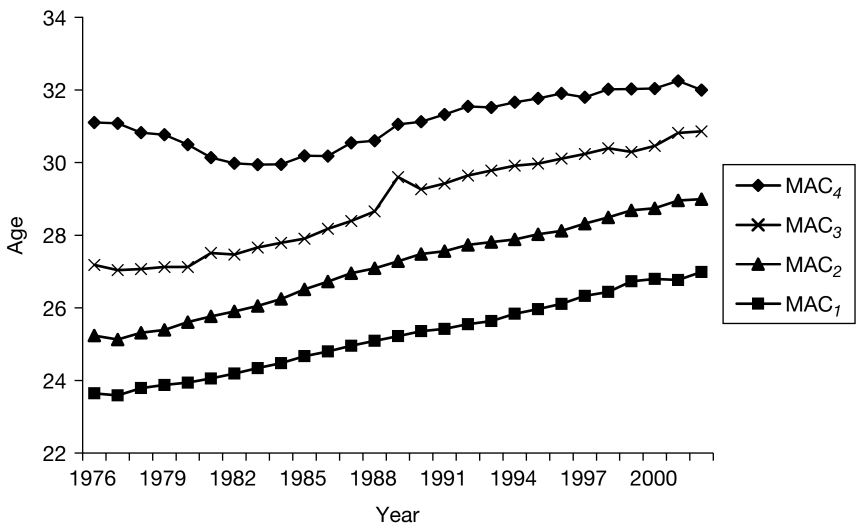

Figure 5.2 Mean age of childbearing by parity, Taiwan: 1976–2002

Note: MAC_1 denotes mean age at childbearing for first parity, and so forth.

Source: Ministry of the Interior, Taiwan: 1975–2002.

Table 5.1 TFR and tempo effects in Hong Kong and Taiwan: 1977–2000

Year	Hong Kong			Taiwan		
	TFR	TFR'	Tempo	TFR	TFR'	Tempo
1977	2.37	2.58	0.21	2.67	2.73	0.07
1980	2.03	2.09	0.06	2.47	2.75	0.28
1985	1.45	1.89	0.44	1.85	2.37	0.52
1990	1.19	1.31	0.11	1.77	1.97	0.20
1995	1.15	1.40	0.26	1.76	2.03	0.27
2000	1.02	1.09	0.06	1.67	2.09	0.42

Note: TFR' denotes tempo adjusted TFR.

Sources: The data for Hong Kong are based on data from census materials and Vital Registration Data from the Census and Statistics Department of Hong Kong. The data for Taiwan are based on data from the Ministry of the Interior, Taiwan: 1975–2002.

postponement of childbearing, Hong Kong's fertility would have been much higher than that indicated by the TFR. The TFR' from which tempo distortion has been removed fell to 1.3 in 1990, three years later than did the TFR. In other words period TFR, which cannot reflect the postponement of childbearing, gives the impression that Hong Kong reached a very low fertility regime three years earlier than was really the case. In the 1990s, the tempo effect was much smaller at an average of 0.13 and less than 0.1 since 1998. This indicates that Hong Kong's recent fertility decline has been largely the result of a decline in the quantum of fertility. After the tempo effect is removed, the average TFR' was 1.24 in the 1990s and near 1.0 during the period 1998–2000. In Taiwan, the situation has been rather different. The TFRs have fallen consistently, but are still notably higher than those in Hong Kong. While TFR's have also decreased, they are still around the level of replacement. The tempo effect, particularly in recent years, has been larger than that observed in Hong Kong. This supports the conclusion, drawn from Figure 5.2, that in Taiwan recent declines in period fertility have been primarily influenced by continuing postponements of childbearing.

Because both TFR and TFR' are summary indicators of fertility, they are unable to show the role in quantum decline and tempo effect played by each parity. To overcome this limitation we now examine fertility trends by parity.

The impact of changes in the timing of childbearing varies from parity to parity. Increases in the age at which a woman has a first child have been considerable in both Hong Kong and Taiwan since 1976. Consequently fertility rates at parity one have been greatly influenced by tempo effects. If there had been no postponement of childbearing in Hong Kong, the total fertility rate of parity one or TFR_1 would have been greater than 0.8 during 1976–86. After 1998 the tempo effect fell to a very low level; as a result TFR_1 did not change significantly but fluctuated between 0.54 and 0.50. The decline in TFR'_1 in just two decades indicates that in Hong Kong parity one fertility has experienced a considerable quantum decline. Taiwan has had higher TFR_1 and TFR'_1 than Hong Kong in the study period, with an average tempo effect of 0.13. Although the TFR_1 followed a downward trend after 1976, from about 0.90 in the early 1970s to 0.67 in 2002, the TFR'_1 remained at a relatively high level, on average 0.91 during the 1980s and 0.87 from 1990–2001. This suggests that delayed childbearing rather than the decline in the quantum of fertility has been the main contributing factor in the decrease in the TFR_1 in recent decades.

In Hong Kong, 1989 was the turning point for the role of tempo effect on decline in the TFR_2. The average tempo effect before 1989 was 0.15. After adjusting for changes in the timing of a second child, the TFR'_2 was higher than 0.7 in 1988, while the TFR_2 was 0.5 in the same year. These changes in timing made a major contribution to period fertility decline for parity two before 1989 but a much smaller one thereafter. The average tempo effect was only 0.05 in the period 1989–2000. Tempo effects were thus the predominant reason for the initial decrease in the TFR_2 during years 1976–89, while its further reduction in 1990s was caused mainly by the decline in the numbers of second births. In Taiwan, the tempo effect on the rates of second births has been fairly stable since 1976, with an average of 0.12 over the period between 1976 and 2001. Both TFR_2 and TFR'_2 experienced a downward trend, but the pace of their decline was not as large as that in Hong Kong. In the 1990s, TFR_2 was still above 0.6 and TFR'_2 was greater than 0.7. The tempo effect remains an important contributing factor to Taiwan's relatively low TFR_2.

Hong Kong and Taiwan thus have somewhat different characteristics in their fertility decline. The pattern of parity one decline in Taiwan is similar to that in Europe, which has been largely the result of postponement of first births. In European countries with very low fertility, the TFR'_1 has fallen by little over time and stood at an average of 0.83 between 1995 and 2000 (Sobotka 2003). The TFR'_1 is also high in Taiwan, 0.90 on average for 1976–2001 with only a marginal decline to 0.88 for 1995–2000. In contrast, Hong Kong's TFR'_1 was only 0.55 over the period 1998–2000, much lower than that observed in Taiwan and Europe. For parity two, the tempo effect also remains a major contributing factor to the recorded low period fertility in Taiwan but not in Hong Kong. For the birth rates at third or higher parity, fertility in Hong Kong has hardly been affected by delays in childbearing with the deviation between TFR_{3+} and the TFR'_{3+} being small, only 0.01 on average during 1977–2000, as Table 5.2 shows. Changes in fertility rates of parity three and above show a similar pattern in Taiwan, with the average tempo effects close to zero in the 1990s. Accordingly, in

Table 5.2 Parity-specific tempo effects in Hong Kong and Taiwan: 1977–2000

Year	Hong Kong			Taiwan		
	$Tempo_1$	$Tempo_2$	$Tempo_{3+}$	$Tempo_1$	$Tempo_2$	$Tempo_{3+}$
1977	0.08	0.16	−0.02	0.05	0.08	−0.06
1980	0.03	0.07	−0.04	0.05	0.13	0.10
1985	0.19	0.22	0.03	0.21	0.23	0.08
1990	0.04	0.05	0.03	0.08	0.15	−0.04
1995	0.18	0.06	0.01	0.11	0.09	0.07
2000	0.01	0.05	0.00	0.09	0.19	0.15

Note: $Tempo_1$ denotes tempo effect of first parity, and so forth.

Sources: The data for Hong Kong are based on data from census materials and Vital Registration Data from the Census and Statistics Department of Hong Kong. The data for Taiwan are based on data from the Ministry of the Interior, Taiwan: 1975–2002.

both populations, the declines in fertility rates of third and subsequent births are primarily a result of reductions in the numbers of women having larger families.

5.3 RECUPERATION EFFECTS ON PERIOD FERTILITY

With postponement of childbearing, the peak period for experiencing a first birth has shifted in Hong Kong from ages 20–29 before 1990 to 25–34 in recent years, and in Taiwan from 20–24 to 25–29 over the same period. The peak period for a second birth has also moved to a higher age. Higher age-specific fertility recorded at older ages in recent years thus largely results from the delayed births of first and second children. Since 1976, fertility rates of third and higher order births have decreased substantially at every age to 45 in both Hong Kong and Taiwan, but the shape of the fertility schedule of the third and subsequent births has not changed much, suggesting little compensation for the loss of fertility at younger ages. Therefore the following discussion focuses on the recuperation effects on parity one and two fertility rates.

To estimate the recuperation effect, or the subsequent emergence of postponed fertility, quantitatively we need a fertility schedule as reference. For Hong Kong there was little change in the shape of parity-specific fertility schedules, and hence little postponement of childbearing, before 1976 and therefore that year is chosen as the reference period. In Taiwan, the fertility schedule changed little before 1977 and that year provides the reference period.

It is often assumed that recuperation of first parity fertility rates begins at age 30 (Lesthaeghe and Willems 1999). This assumption is somewhat arbitrary because the age at which recuperation starts in fact varies across different cohorts or periods. Recuperation of parity one rates starts at ages 28–29 in Hong Kong and 25–26 in Taiwan. At ages younger than the recuperation point, age-specific fertility in the studied years is lower than that of the reference one, which indicates the postponement effect. At ages older than the recuperation point, age-specific fertility in the studied years is consistently higher than that of the reference year due to recuperation at older ages. The cumulated deviation is described as the recuperation effect. Were we to follow the age 30 assumption, part of the recuperation in both rates would be interpreted as postponement, and this would deflate both postponement and recuperation effects.

For first births, both Hong Kong and Taiwan have witnessed increasing postponement with little fluctuation. At the same time, the recuperation effect at later ages has also noticeably increased. In Hong Kong, the pace of the increase in the recuperation effect has been less than that of postponement. The postponement effect rose from 0.04 children per woman in 1978 to 0.37 in 1996, while the recuperation effect increased from 0.01 in 1978 to only 0.08 in 1996. As a consequence of increases in the postponement effect and relatively little recuperation, the decline in TFR_1 since 1976 has intensified, as shown in Figure 5.3. Only 10–30 per cent of fertility decline at younger ages, caused by delayed childbearing, has been compensated by first births to older women. The uncompensated postponement effect is a pure decline in the period fertility rate of parity one as compared with that of the reference year. Thus the greater the

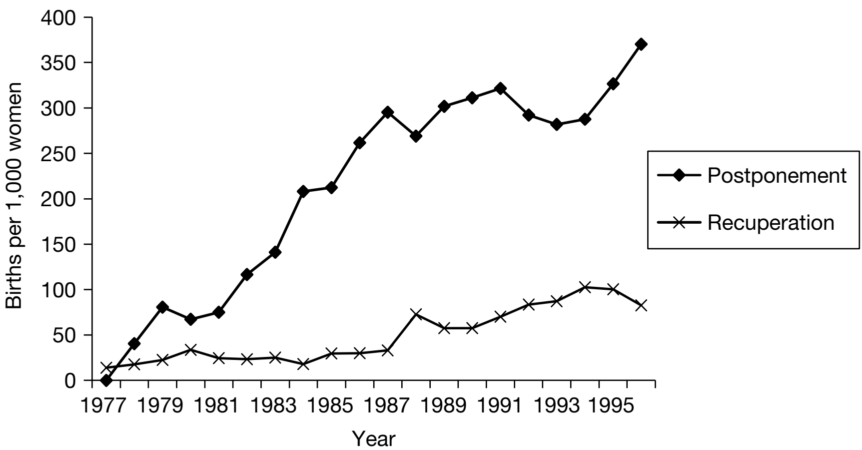

Figure 5.3 Trends of postponement and recuperation of parity one compared with 1976, Hong Kong: 1977–96

Sources: Based on data from census materials and Vital Registration Data from the Census and Statistics Department of Hong Kong.

postponement, the lower period fertility is likely to be. In Hong Kong, further postponement in having a first child may cause lower period TFR_1 and more women without children in any given year.

Compared with Hong Kong, Taiwan has recorded a similar postponement effect but, as indicated in Figure 5.4, with a higher recuperation of parity one births. The postponement effect increased from zero in 1977 to 0.29 in 1996 and rose further thereafter. The recuperation effect increased from zero to 0.20 in 1996, considerably higher than the 0.08 recorded in Hong Kong in the same year. Largely because of this difference, TFR_1 in Taiwan has been higher than that for Hong Kong. The level of TFR_1 decreased only moderately in Taiwan in the 1990s.

For second births, the recuperation point is around ages 30–31 in Hong Kong and 27–28 in Taiwan. As with first births, Taiwan recorded somewhat smaller postponement, and greater recuperation, effects for a second child than did Hong Kong. While the postponement effect increased in Hong Kong from 0.04 in 1977 to 0.39 in 1996, it rose from 0.04 in 1978 to only 0.28 in 1996 in Taiwan; 0.11 lower than that for Hong Kong. The recuperation effect in Hong Kong fluctuated between 0.02 and 0.06 and the degree of recuperation was only about 10–20 per cent. In contrast, in Taiwan the recuperation effect increased to 0.20 in 1996 and has decreased slightly since the late 1990s. With the greater recuperation effect, TFR_2 in Taiwan declined only moderately before 1997, but has fallen markedly since, as a result of the higher rates of postponement and

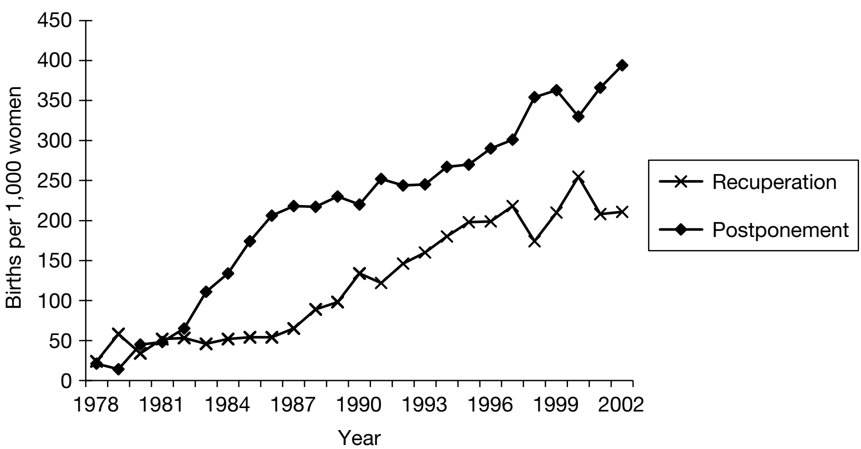

Figure 5.4 Trends of postponement and recuperation of parity one compared with 1977, Taiwan: 1978–2002

Source: Ministry of the Interior, Taiwan: 1975–2002.

lower recuperation. Second births, compared to first ones, have faced greater postponement, and smaller recuperation, effects in both Hong Kong and Taiwan.

With the decreasing proportion of third and higher order births, changes in the numbers and timing of parities one and two births have played an important role in influencing fertility trends of recent years. Since the 1990s, first and second births have accounted for nearly 90 per cent of the TFR in Hong Kong and more than 80 per cent in Taiwan. Changes in parity one and two fertility are greatly affected by the timing of childbearing. If childbearing is delayed further in Hong Kong and Taiwan, period TFRs in both countries will fall to lower levels due to imperfect recuperation.

5.4 TRENDS IN COMPLETE COHORT FERTILITY

To determine whether the tempo effect is the main cause of low fertility and to gain a complete picture of fertility trends, changes in cohort fertility must also be examined, especially fertility trends among the most recent cohorts. To examine the changes in timing of childbearing and recuperation effects, birth cohorts of 1946 in Hong Kong and 1940 in Taiwan are taken as reference cohorts because they were the most recent ones to have experienced little change in the time of starting reproduction.

Whether lowest low fertility is a temporary phenomenon is determined by changes in cohort fertility patterns. If each cohort postpones childbearing but without lowering completed cohort fertility, its period fertility is merely due to tempo effects. Thus the low fertility is a temporary phenomenon caused by postponement of childbearing. Once there is no further postponement, period fertility will rise. However, if cohort fertility experiences a true decline, in other words, if the falling fertility is caused by a reduction in quantum rather than tempo, the low fertility may continue. Analyses of cohort fertility trends therefore help to describe the changes in fertility in Hong Kong and Taiwan more clearly.

In Hong Kong, age patterns of fertility have changed greatly since the cohort of 1946. The younger cohorts have experienced much lower fertility in young adulthood, that is, before age 30. Their childbearing has been significantly postponed. However, even in their late 30s or early 40s, these younger cohorts still have markedly lower fertility than that of the 1946 cohort. Taiwan also recorded a significant postponement in childbearing among women born after 1940, and the younger cohorts have lower fertility as younger adults. Taiwan too has observed consistent declines in the quantum of fertility among the younger birth cohorts.

With significant postponement and negligible recuperation, CTFRs have decreased markedly in Hong Kong and Taiwan. In Hong Kong, the CTFR fell from more than three children for the cohort born in 1946 to 2.02, or just below the level of replacement, for the cohort born in 1953. In Taiwan, the CTFR decreased from 3.8 for the cohort born in 1940 to 2.6 for the cohort born in 1953. In comparison with the reference cohorts, women born in the early 1950s started their reproduction at later ages and their reproductive span became shorter. The fall in their CTFRs has contributed greatly to the decline in period fertility in the 1970s–80s.

Since the cohorts born after 1953 have not yet completed childbearing, their CTFRs cannot be computed directly. To estimate their CTFRs, the recuperation effect on the cohort's fertility needs to be taken into account. This helps to determine the difference between the fertility of each cohort and that of the reference one at various ages. In Figures 5.5 and 5.6, the graphs represent the deviation of cumulated fertility of all studied cohorts from that of the reference cohort. A larger distance from the top horizontal axis reflects lower cumulated fertility compared with that of reference cohort. Figure 5.5 shows

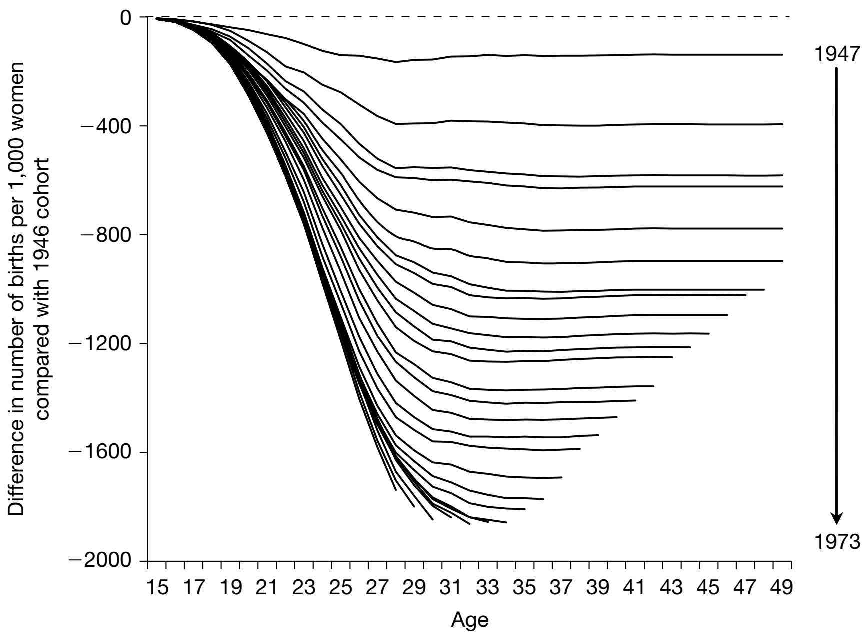

Figure 5.5 Postponement and recuperation of CTFR compared with cohort 1946, Hong Kong: 1947–73

Sources: Based on data from census materials and Vital Registration Data from the Census and Statistics Department of Hong Kong.

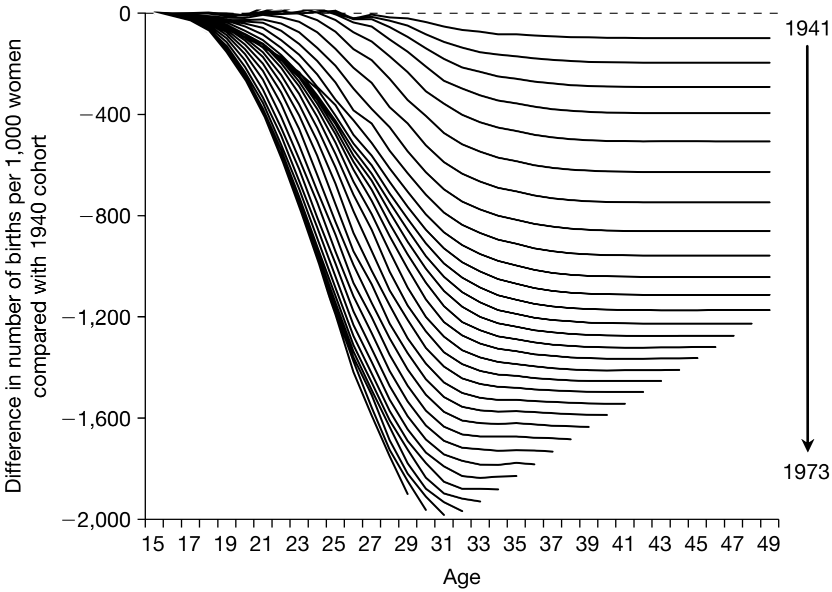

Figure 5.6 Postponement and recuperation of CTFR compared with cohort 1940, Taiwan: 1941–73

Source: Ministry of the Interior, Taiwan: 1975–2002.

that in Hong Kong the distances in cumulated fertility between the cohorts of 1947–73 and the reference cohort steadily increased, implying a consistent decrease in cohort fertility since the cohort of 1946. The deviation in cumulated fertility increases markedly from age 15 to early 30s, where first births were previously concentrated. If there is a recuperation in CTFRs, the gap between the cumulated fertility of a given cohort and the cumulated fertility of the reference cohort should become smaller at older ages. However, the data show that for all cohorts born after 1950 this gap reaches its maximum at ages in the early 30s.

In Taiwan, fertility changes among younger cohorts have been largely similar to those observed in Hong Kong. An increasing deviation from the fertility of the reference cohort has also been found among women from age 15 to early 30s. However, while in Hong Kong the difference reaches its maximum deviation by the early 30s and then levels off, in Taiwan it continued to deviate from the reference cohort at older ages (especially in some earlier birth cohorts) before levelling out, as Figure 5.6 shows. So far as the level of CTFR is concerned there has been little recuperation after the age at which the maximum difference in cohort fertility has been reached.

To further examine trends in cohort fertility, we have estimated completed fertility for women born after 1953 whose fertility data are not yet complete. Completed fertility has been estimated on the basis of average age-specific fertility rates of those born between 1946 and 1952, and on the assumption that there is little recuperation after age 37. The results are shown in Figure 5.7. According to these results, CTFRs have decreased considerably in Hong Kong, from more than 3.0 for the cohort born in 1946 to slightly above 1.2 for the cohort of 1966. This remarkable decline and the lowest low levels of CTFR achieved by those born in the late 1950s and early 1960s have contributed to the decline in period fertility in the last two decades. In Taiwan, CTFRs decreased near linearly from 3.2 for women born in 1946 to 2.0, lower than replacement level, for those born in 1966. As in Hong Kong, this change has greatly contributed to the decline in period fertility in the 1980s and 1990s. Nonetheless, by comparison with Hong Kong, the speed of decline in CTFRs is slower in Taiwan and having two children is still very popular. The low level of the CTFR observed among younger birth cohorts further confirms the finding that recent fertility reduction has been largely caused by the decline in family size.

The great reduction in CTFRs, especially the fall in the first parity fertility rate, has led to a rapid increase in the proportion of people aged 50 or over who

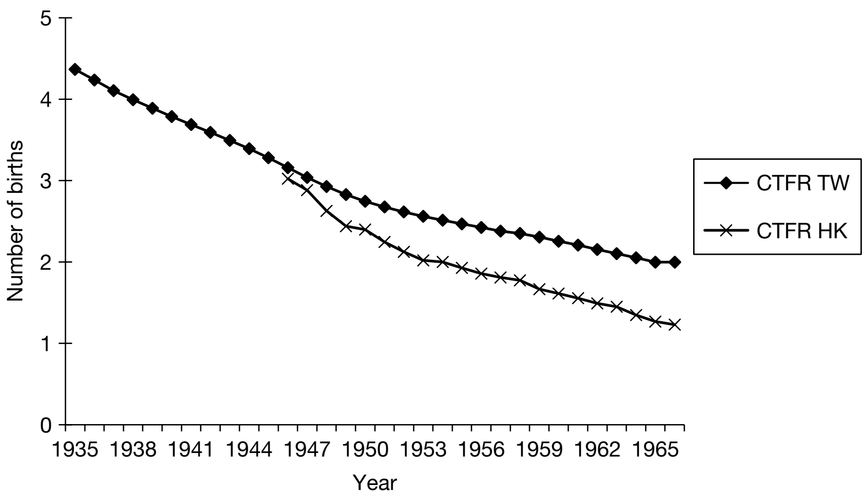

Figure 5.7 Changes in CTFRs in Hong Kong and Taiwan: 1935–66

Note: CTFRs for 1953–66 cohorts are estimated.

Sources: The data for Hong Kong are based on data from census materials and Vital Registration Data from the Census and Statistics Department of Hong Kong. The data for Taiwan are based on data from the Ministry of the Interior, Taiwan: 1975–2002.

have never had children. In Hong Kong for example, the childless rate was 2.6 per cent for women born in 1946, but it rose to 9.3 and 16.6 per cent among those born in 1951 and 1956 respectively. According to our estimates, the childless rate may reach about 20 per cent for the cohort born in 1961. In Taiwan, the proportion of women remaining childless is still lower than in Hong Kong, but it has increased in recent years.

5.5 CONCLUSIONS

Hong Kong and Taiwan completed their fertility transition around the mid-1980s. However, their fertility has not stabilized at the level of replacement but declined further to much below 2.05 children per woman. Hong Kong and Taiwan share three main characteristics in the process towards very low fertility. Firstly, low fertility is partly the result of postponement of childbearing. A considerable delay in age at having children has been recorded in both societies in recent decades. For this reason, their period fertility measures, such as TFR, have been deflated by the tempo effect. This was very notable in Hong Kong between the late 1970s and late 1980s, and in Taiwan after 1980. Without the tempo effect fertility, as indicated by the TFR', would be considerably higher. Secondly, while tempo effects have caused a large decline in period fertility, especially in TFR_1 and TFR_2, reductions in total family size are another major reason for the low and declining period fertility. Our analysis showed that the fall in parity three and higher order births has resulted in a marked reduction in the quantum of fertility in both Hong Kong and Taiwan. Thirdly, in both populations, the rates of recuperation for period fertility as measured by the TFR are limited or incomplete. Furthermore, there has been no recuperation for CTFR. Because of that, further postponement of childbearing is likely to result in both lower period and cohort fertility.

Besides these common characteristics, there are some major differences in fertility declines in the 1990s between Hong Kong and Taiwan. While completed cohort fertility of parity one was relatively stable in Taiwan, it has declined steadily in Hong Kong. Hong Kong experienced a quantum decline in all parities, including parity one, in the 1990s. The TFR'_1 was only 0.54 to 0.58 during the period between 1998 and 2000. As a result, the proportion of women remaining childless has increased significantly in younger cohorts. In Taiwan where the recuperation effect for parity one has been more apparent than in Hong Kong, changes in the TFR'_1 and the proportion of women having no children have been relatively small. In Taiwan, partly because of what has been said above, the low period fertility, especially for parity one, has been considerably influenced by the tempo effect and accordingly may be viewed as a temporary phenomenon. In Hong Kong, in contrast, declining period fertility has been largely driven by the decline in the quantum during the 1990s. This is also indicated by the very low completed cohort fertility observed among women born after 1960.

The very low fertility recorded in Hong Kong, Taiwan and many other populations has already drawn worldwide attention, because secular changes of this kind could have profound influences on long term socio-economic development or even threaten the future existence of some populations. In attempting to raise birth rates, governments in low fertility countries are seeking to address the underlying causes of low fertility and to adopt policies, programs and incentives to encourage couples, in particular women, to increase their childbearing. Increasing efforts are likely to be made to reverse such very low fertility.

6

Induced Abortion and its Demographic Consequences

Wei Chen

China has some of the least restrictive abortion laws in the world (Rahman *et al.* 1998). Abortion has increased considerably in recent decades and become a sensitive and controversial issue because of its close links with the family planning program, fertility decline, and the rising sex ratio. This chapter analyzes China's national abortion statistics and fertility survey data collected over the last quarter of a century. It starts with an overview of changes in China's abortion policies and in levels and trends of abortions in recent history. Section two examines patterns and characteristics of abortion in China and the major reasons behind these. The role of abortion in China's fertility decline is discussed in Section 3, which also investigates sex selective abortion and its impact on the sex ratio at birth (SRB). The research findings are summarized in the concluding section.

6.1 CHANGES IN GOVERNMENT ABORTION POLICIES AND LEVELS OF ABORTIONS

The Chinese government established induced abortion as a criminal offense in 1910 (Savage 1988), and continued to prohibit it throughout the first half of the twentieth century. After the founding of the People's Republic, the Ministry of Health issued a regulation in 1950 banning induced abortion, initially among female cadres and military personnel. The ban was extended to the whole country in 1952. Under this regulation, those undergoing private sterilization or induced abortion were liable to prosecution, and both the practitioner and the woman involved faced punishment by the people's court

(Sun 1990). It is worth noting, however, that protection of the interests of mother and child were the main rationale for the prohibition of contraception, sterilization and induced abortion at that time (Zhai 2000).

The 1953 population census found China's population much larger than expected. Following its results, abortion regulations were relaxed and the government also started to consider promoting birth control (Zhai 2000). In August 1953, the central government approved another regulation on contraception and abortion, which relieved some of the restrictions on induced abortion. Then, in April 1957, the Ministry of Health further relaxed its regulations and made induced abortion available to women in good health and of less than 10 weeks gestation, regardless of their age and number of children (Cui 1981; Sun 1990). In Shanghai, a woman could obtain induced abortion free of charge in any hospital (Savage 1988). A major consideration in the Ministry of Health's decision was to eliminate negative health consequences resulting from illegal abortions. Additionally, this was a response to the 1955 instruction issued by the central government, which stated that the party favored a birth control policy and that party committees at all levels should publicize this policy among cadres and the masses, except in the minority nationality areas (Hu 1999). The initiative was, however, interrupted by a political campaign directed against the 'New Population Theory' proposed by Ma Yinchu in the late 1950s.

Facing the aftermath of the Great Leap Forward and the economic difficulties brought about by famine, the Chinese government reconsidered its population policy in 1962 and family planning in urban areas was again promoted. The Ministry of Health further liberalized the access to abortion, as well as to sterilization which was made available to both males and females. It also recommended that when a pregnant woman requested an abortion, the operation should be performed as early as possible, preferably within the first three months of pregnancy. The procedures were provided free of charge, and the women were also given 10–14 days paid leave. The Chinese-invented vacuum aspiration technique was first used in Shanghai in 1958, and practiced widely in the rest of China after 1964 (Faundes and Luukkainen 1974; Scharping 2003). Unfortunately, when the Cultural Revolution began in the later 1960s, China's family planning program was once more interrupted. Because of the political upheaval, the government ceased its efforts to implement family planning policies.

Economic breakdown and rapid population growth in the second half of the 1960s finally compelled the government to adopt two nationwide demographic programs: massive population relocations from urban to rural areas, and the resumption of the family planning program. Unprecedented in scale and thrust, the birth control campaign was carried out vigorously throughout China from the early 1970s. Virtually all restrictions previously imposed on induced abortion were removed (Henshaw 1990; Rahman *et al.* 1998). It is noteworthy that before the birth control campaign, having an abortion was the outcome of a woman's or a couple's own decision to avoid an unwanted birth, but increasingly abortion has been used as a means of reducing unplanned births: those either unwanted by the individual or not permitted under family planning policy. In either event, induced abortions largely result from contraceptive failure (Wang and Wang 1991; Qiao 2001).

Since the early 1970s, with the implementation of the family planning policy, both the number of induced abortions and abortion rates have increased markedly, paralleling trends in birth control methods. Policy adjustments and changes have also produced fluctuations in the annual numbers and rates of induced abortion. Table 6.1 shows the levels and trends in induced abortion in China since 1971.

Unlike other countries whose abortion data are generally underreported, China's abortion statistics tended to be inflated in the early years of the family planning program, for the following reasons. Firstly, abortion statistics are records of operations performed by the health department, and they are used for reimbursing the cost of operations from the family planning department. Thus, although both parties were careful and conscientious about the accuracy of the records, because money was involved the health department tended to exaggerate the figures (Tuan 1988). Secondly, family planning statistics might underreport births and overreport family planning operations including abortion, in order to gain political success and monetary rewards (Freedman *et al.* 1988). In the 1990s, however, 'when illegitimate pregnancies increased and abortions came to be treated as indicators of birth planning failure instead of success, over-reporting may have given way to a tendency to under-report' (Scharping 2003: 122).

In Table 6.1, abortion levels and trends are indicated by four measures: total number of abortions, abortion ratio (AR), general abortion rate (GAR), and total abortion rate (TAR). The number of induced abortions was generally around five million between 1971 and 1978, with the AR below 30 abortions per 100 live births, GAR around or below 25 abortions per 1,000 women aged 15–44, and TAR between 0.7 and 0.9 abortions per woman. This was the period when the 'later, longer, and fewer' birth control policy was implemented (see Chapter 2, this volume), and the family size promoted by the family planning program was around two children. During this period, the nationwide family planning network was established and the use of contraceptives increased rapidly. As a result, the total fertility rate (TFR) declined rapidly by 50 per cent, from 5.4 to 2.7 while abortion levels remained fairly low.

The baby boom cohort born in the early 1960s entered their childbearing ages in the late 1970s. With the substantial increase of women of reproductive age, vast population growth became inevitable unless a stricter policy was immediately introduced. In 1979, the Chinese government launched the

Table 6.1 Levels and trends in induced abortion in China: 1971–99

Year	Number of births (millions)	Number of abortions (millions)	Abortion ratio (AR)	General abortion rate (GAR)	Total abortion rate (TAR)
1971	25.78	3.91	15.17	20.97	0.63
1972	25.66	4.81	18.76	25.26	0.76
1973	24.63	5.11	20.75	26.28	0.79
1974	22.35	4.98	22.31	25.11	0.75
1975	21.09	5.08	24.11	25.08	0.75
1976	18.53	4.74	25.60	22.88	0.69
1977	17.86	5.23	29.28	24.63	0.74
1978	17.45	5.39	30.90	24.74	0.74
1979	17.27	7.86	45.50	35.11	1.05
1980	17.87	9.53	53.32	40.99	1.23
1981	20.78	8.70	41.85	36.11	1.08
1982	22.47	12.42	55.27	49.99	1.50
1983	20.66	14.37	69.56	56.07	1.68
1984	20.63	8.89	43.09	33.69	1.01
1985	22.11	10.93	49.43	40.28	1.21
1986	23.93	11.58	48.39	41.51	1.25
1987	25.29	10.49	41.48	36.60	1.10
1988	24.64	12.68	51.44	43.11	1.29
1989	24.14	10.38	43.00	34.46	1.03
1990	23.91	13.49	56.44	43.81	1.31
1991	22.65	14.09	62.20	44.81	1.34
1992	21.25	12.58	59.22	39.33	1.18
1993	21.32	11.75	55.12	36.19	1.09
1994	21.10	9.47	44.88	28.82	0.86
1995	20.63	8.28	40.14	25.02	0.75
1996	20.67	8.83	42.73	26.35	0.79
1997	20.38	6.79	33.31	20.00	0.60
1998	19.91	7.38	37.08	21.52	0.65
1999	19.09	6.76	35.43	19.52	0.59

Notes: Abortion ratio (AR) $= \dfrac{\text{Number of abortions}}{\text{Number of births}} \times 100$;

General abortion rate (GAR) $= \dfrac{\text{Number of abortions}}{\text{Number of women aged 15–44 (not shown)}}$;

Total abortion rate (TAR) = GAR × 30 (women's reproductive span from 15–44).

Sources: Based on NBS (2000); MoH (2000); Qiao (2002).

one-child family campaign. A set of stringent regulations regarding whether and when a couple could have a child, and whether and which contraceptive method they should use was introduced. Under the regulations, women with one child were required to have an IUD inserted, women who had two or more children to undertake sterilization, and women with unauthorized pregnancies to have an abortion. The extent to which these mandatory measures were enforced reached its highest in 1983, and this was manifested by the increase in abortions, whose number doubled between 1979 and 1983 to reach more than 14 million. Other abortion indicators also peaked: AR at 70 abortions per 100 live births, GAR at 56 abortions per 1,000 women of reproductive age, and TAR at 1.7 abortions per woman (which meant that a woman would abort 1.7 children in her lifetime if the abortion pattern recorded in 1983 remained constant). Despite these changes, fertility reduction was only marginal, and fertility rates fluctuated well above replacement level throughout the 1980s.

Massive resistance within China and increasing criticism from the outside prompted modifications of the one-child policy. The central government's No. 7 Document issued in 1984 adjusted the existing family planning policy, and was summarized as 'opening up a small hole and closing a big one' (Peng 1997).[1] Greater flexibility was given in authorizing a second birth and coercive measures in the family planning program were prohibited, at least on paper. As a result, the number of abortions decreased slightly from the record level reached in 1983, though they remained relatively high over the next few years, with AR between 40 and 50 abortions per 100 live births, GAR between 30 and 40 abortions per 1,000 women of reproductive age, and TAR between 1.0 and 1.3 abortions per woman. This policy adjustment revived higher order births and in 1986, the government issued the No. 13 Document to close some of the loopholes and tighten up the family planning policy (Hardee-Cleaveland and Banister 1988).

In view of political liberalization and social disturbance in the late 1980s, the Chinese government increased its ideological and social controls. In 1991, the central government issued a directive on strengthening family planning work to strictly control population growth. This led to a second round of coercive policy implementation, producing abortion levels similar to those of the early 1980s. It is also believed to be a major factor in driving China's fertility below replacement levels in the early 1990s. The heightened efforts in population control were typically characterized by the topmost political leader within each jurisdiction taking personal responsibility for its family planning performance (*di yi ba shou fu zong ze*) and a 'one-veto' system which evaluated cadres' family planning work above other aspects of their performance (*yi piao fou jue*) (Greenhalgh and Winckler 2001; also see Chapter 2, this volume).

Beginning in 1993, the Chinese government started to rethink the nature of family planning and stressed the need to tackle family planning work not only tightly but well (Peng 1997). Family planning reorientation, emphasizing quality-of-care services, was particularly influenced by the 1994 Cairo Conference on Population and Development and the 1995 Beijing World Conference on Women, although rapid economic development also undermined traditional fertility norms. Under these circumstances, abortion rates declined in the late 1990s. GAR fell to around 20 abortions per 1,000 women aged 15–44, and TAR to 0.6 abortions per woman, at the end of the century: lower than the levels in the early 1970s when the family planning program began.

China's abortion level has ranked below the world average since the mid-1990s. Table 6.2 lists abortion rates in selected countries. While the quality of abortion data for some countries is questionable, these statistics shed some light on the level of abortions in different parts of the world. Eastern European countries had the highest level of abortion, where an 'abortion culture' prevails

Table 6.2 Levels of abortion in China and selected countries: 1996

Country	Year	Abortion ratio (AR)	General abortion rate (GAR)	Total abortion rate (TAR)
India	1995–96	2.1	2.7	0.08
South Africa	1997	2.4	2.7	0.08
Bangladesh	1995–96	3.1	3.8	0.11
Spain	1996	12.6	5.7	0.17
Netherlands	1996	10.6	6.5	0.20
Belgium	1996	11.2	6.8	0.21
Germany	1996	14.1	7.6	0.23
UK	1996	14.7	10.0	0.31
Japan	1995	22.4	13.4	0.40
Singapore	1996	22.8	15.9	0.48
Sweden	1996	25.2	18.7	0.56
Australia	1995–96	26.4	22.2	0.57
South Korea	1996	24.6	19.6	0.59
USA	1996	22.9	25.9	0.69
Mongolia	1996	18.2	25.9	0.78
China	**1996**	**42.7**	**26.4**	**0.79**
Armenia	1996	39.4	35.4	1.06
Hungary	1996	42.1	34.7	1.07
Latvia	1996	53.9	44.1	1.33
Bulgaria	1996	55.2	51.3	1.55
Yugoslavia	1993	45.8	54.6	1.64
Ukraine	1996	57.6	57.2	1.72
Cuba	1996	58.6	77.7	2.33
Romania	1996	63.0	78.0	2.34
Vietnam	1996	43.7	83.3	2.50
Russia	1996	62.6	68.4	2.56
World average	1995	n.a.	35.0	1.05

Notes: n.a. = not available. For calculation of AR, GAR and TAR see Table 6.1. Abortion statistics in India, Bangladesh and South Africa 'do not include illegal abortions, which are thought to constitute the majority of procedures' (AGI 1999: 48).

Sources: The China figures are from Table 6.1, figures for other countries are from AGI (1999): Appendix Table 4.

and women rely heavily on abortion to control their fertility (Henshaw *et al.* 1999). Despite marked declines in abortion rates in the 1990s, Eastern European abortion levels are still the highest in the world. In contrast, Western Europe has the lowest level of abortion, only about one-fifth of that in Eastern Europe. Most developing countries fall around the middle. In 1996, China's GAR was 26.4 abortions per 1,000 women aged 15–44 and TAR was 0.79 abortions per woman, both noticeably lower than the world average recorded in the same period (AGI 1999).

China recorded its highest TAR, 1.7 abortions per woman, in 1983. This level was below the current highest level recorded elsewhere and far below that observed in high abortion countries in the past. Russia, Yugoslavia, and Romania, for example, all recorded TARs of five to seven abortions per woman in the early 1960s. TAR in Japan also reached four abortions per woman in the late 1950s (Frejka 1983). Eastern European countries still experienced TARs of three to four abortions per woman in the 1970s (AGI 1999). The abortion rate was also climbing quickly in South Korea when its rapid fertility decline took place: TAR stood at nearly three abortions per woman in the early 1980s (Bongaarts and Westoff 2000). It is evident that abortion has been widely practiced worldwide as a means of fertility control. Indeed, it has played a major part in fertility decline in some countries. Nevertheless, abortion rates have fallen considerably across the world in recent years because of the increasing availability of modern contraceptive methods (Henshaw *et al.* 1999).

6.2 PATTERNS, CHARACTERISTICS OF AND REASONS FOR ABORTIONS

While abortion levels and trends vary considerably, the patterns and characteristics of abortion are broadly similar around the world. This section examines abortion patterns and characteristics in China using data from the 1997 National Demographic and Reproductive Health Survey. This survey is nationally representative with a sample of 15,213 women. The survey data, as indicated by the post-enumeration check, are of good quality (Wang 2001), although detailed examinations point to some underreporting in births and abortions (Guo 2000). Abortion patterns and characteristics found in these data are reliable. The survey has a major limitation, however, in that it did not collect information from never married women. Given the substantial increase in premarital sex and abortion in urban China in the 1990s, the exclusion of single women from the survey leads to an underestimate of fertility and abortion, at least in younger age groups and in urban areas.[2]

The 1997 survey suggests that each woman has, on average, 2.45 pregnancies, 1.86 live births and 0.46 abortions (1.43 abortions in the case of women having at least one abortion). The abortion ratio is 24.8 abortions per 100 live births. There are significant differences in the incidence of abortion across various socio-demographic groups, as shown in Table 6.3.

Data from a number of countries, largely in Europe, show two main patterns in the relationship between abortion rates and women's age. One is 'U' shaped, in which abortion rates are higher at the very beginning and the end of the reproductive ages and lower in the middle; the other a monotonic one in which the abortion rate is lowest at the beginning of women's reproductive career and rises monotonically with age (Bankole *et al.* 1999). The age pattern of abortion among China's married women conforms to the monotonic increase pattern, and aborted pregnancies rise from 7 per cent at age 15–19 to 56 per cent at age 40 and over. However, as previously noted, the 1997 survey recorded only abortions for married women and nonmarital abortions might raise the teenage abortion rate, although this is largely a concern in urban areas.

Women in urban areas are more likely to have abortions than their rural counterparts, and the urban abortion rate is more than double the rural rate. This is probably related to the following factors: by comparison with their rural counterparts, urban women tend to desire a smaller number of children and to postpone their childbearing to older ages; they are more likely to have premarital sex and pregnancies which could lead to abortions either before or soon after their marriages; they generally have better access to abortion services; in addition, women in rural areas primarily use the IUD and sterilization for contraception, while contraceptives in greater variety are available and used in urban areas. Because some of these methods, such as condoms, are less reliable than the IUD or sterilization, urban areas tend to have higher contraceptive failure rates, which contribute to the higher incidence of abortion.

Compared to the Han, China's ethnic minorities tend to have lower abortion rates. This may be explained by the facts that looser birth control policies have been applied to these ethnic groups, abortions are less acceptable to their cultural tradition, moral standards, and religious practice, and many of them live in economically less developed areas.

Education is by far the most consistent and important factor affecting fertility and abortion. As shown in the table, the abortion rate rises rapidly with the increase in level of education. Women with the highest education are four times more likely to have abortions than those with the lowest education. While educated women have better knowledge of and access to contraceptive methods, they also have a stronger motivation to regulate family size. In addition, in China's particular circumstances, educated women tend to use less

Table 6.3 Patterns of induced abortion in China (NDRHS 1997)

Characteristics	Total pregnancies	Live births	Induced abortions	Abortion ratio	Abortion proportion
Age:					
15–19	1,669	1,453	122	8.40	7.31
20–24	13,981	11,543	1,702	14.74	12.17
25–29	11,190	8,048	2,648	32.90	23.66
30–34	3,032	1,938	992	51.19	32.72
35–39	580	307	250	81.43	43.10
40+	118	40	66	165.00	55.93
Place of residence:					
Rural	24,665	19,822	3,654	18.43	14.81
Urban	5,905	3,507	2,126	60.62	36.00
Nationality:					
Han	27,372	20,748	5,353	25.80	19.56
Minority	3,198	2,581	427	16.54	13.35
Education:					
Illiterate	9,350	7,871	1,008	12.81	10.78
Primary	10,037	7,928	1,614	20.36	16.08
Junior high	7,673	5,433	1,885	34.70	24.57
Senior high	2,824	1,736	975	56.16	34.53
College+	686	361	298	82.55	43.44
Parity [a]:					
0	1,180	960	86	8.96	7.29
1	11,097	7,113	3,550	49.91	31.99
2	4,136	2,857	1,117	39.10	27.01
3+	2,145	1,468	568	38.69	26.48
Prior abortions [a]:					
0	15,111	10,793	3,585	33.22	23.72
1	2,629	1,283	1,262	98.36	48.00
2	599	248	335	135.08	55.93
3+	139	74	139	187.84	63.47
Pregnancy interval [a]:					
<12	2,621	797	1,556	195.23	59.37
12–23	6,564	4,483	1,797	40.08	27.38
24–35	4,771	3,713	918	24.72	19.24
36–47	2,037	1,586	385	24.27	18.90
48+	2,564	1,818	665	36.58	25.94
Total	30,570	23,329	5,780	24.78	18.91

Notes: [a]Calculations are based on the second or higher order pregnancy, because parity, prior abortions, and pregnancy interval are not applicable to the first pregnancy.

$$\text{Abortion ratio} = \frac{\text{Induced abortions}}{\text{Live births}} \times 100; \ \text{Abortion proportion} = \frac{\text{Induced abortions}}{\text{Total pregnancies}} \times 100.$$

Source: 1997 National Demographic and Reproductive Health Survey (NDRHS) computer record data file.

effective contraceptive methods. They therefore have more contraceptive failures and resulting abortions.[3]

Among married women in the 1997 survey, women who have already had a birth have the highest abortion rate, and the abortion rate declines markedly among those with two or more births, suggesting the strong influence of the one-child policy and the widespread use of contraception. Childless women also have a relatively high abortion rate, which mainly results from unwanted pregnancies within the first few years of marriage, or from the pregnancy violating the relevant family planning regulation.

The vast majority of abortions (70 per cent) are first abortions. Despite this, Table 6.3 shows that the higher a woman's number of prior abortions, the more likely she is to experience an additional abortion. While 24 per cent of all pregnancies are aborted by women who have had no prior abortion, this percentage doubles for women who have had one previous abortion, and further increases for those who have had more abortions previously.

An abortion study in Matlab, Bangladesh (Ahmed *et al.* 1998), the only available study documenting abortion incidence by pregnancy interval, found that the rate of induced abortion was several times higher if the preceding pregnancy interval was less than 12 months than if it was 12 months or longer. A similar pattern is recorded in China's 1997 survey, which shows that abortion rates are much higher for pregnancies with intervals of less than 12 months than those with longer intervals. Such very closely spaced pregnancies are particularly likely to result in an abortion because China's family planning regulations require a space of four to five years between the first and second births.

To further examine China's abortion patterns, reasons for abortions are grouped into four categories as shown in Table 6.4. Here 'personal reasons' consist of considerations of the women's or their children's health, and changes in work or personal life. 'Policy restriction' includes pregnancies not meeting the late childbearing age (24 years), second pregnancy in urban areas, pregnancies not meeting the required four to five year interval between the first and second child, and higher parity births which violated family regulations in rural areas.

Contraceptive failure and policy restriction are the two major reasons for married women to have abortions, and comprise 60–80 per cent of the cases. At younger ages, a higher proportion of abortions is due to policy restriction, and the proportion is larger than that caused by contraceptive failure. The opposite pattern holds for women aged 25 and above. Rural women have a much higher percentage of abortions caused by policy restriction, while in urban areas 46 per cent of the abortions resulted from contraceptive failure. The difference between the Han and other ethnic groups is small, though Han women have a higher proportion of abortions caused by contraceptive failure. The level of

Table 6.4 Percentage distribution of the stated reason for last abortion

Characteristics	Contraceptive failure	Personal reasons	Policy restriction	Others	Cases
Age:					
15–19	9.72	18.06	61.11	11.11	72
20–24	29.24	20.27	42.22	8.27	1,125
25–29	40.52	17.21	34.43	7.84	1,824
30–34	50.40	11.80	31.83	5.97	754
35–39	61.21	7.94	25.23	5.61	214
40+	47.27	14.55	32.73	5.45	55
Place of residence:					
Rural	36.24	16.07	42.03	5.67	2,558
Urban	46.10	17.36	25.84	10.70	1,486
Nationality:					
Han	40.55	16.10	35.92	7.44	3,739
Minority	31.48	21.97	38.03	8.52	305
Education:					
Illiterate	32.00	16.89	46.37	4.74	675
Primary	36.68	17.99	39.83	5.50	1,145
Junior high	38.98	15.76	36.15	9.11	1,339
Senior high	51.10	13.25	25.18	10.46	679
College+	51.94	23.30	16.99	7.77	206
Parity:					
0	7.20	41.33	40.00	11.47	375
1	46.84	11.20	33.96	8.00	2,438
2	38.05	16.59	39.15	6.22	820
3+	31.87	25.55	38.93	3.65	411
Prior abortions:					
0	34.04	18.55	39.25	8.16	2,782
1	50.27	13.38	30.31	6.04	927
2	58.37	9.39	24.90	7.35	245
3+	62.22	6.67	27.78	3.33	90
Total	39.86	16.54	36.08	7.52	4,044

Source: 1997 NDRHS computer record data file.

education is negatively related to the proportion of abortions due to policy restrictions, and positively related to abortions resulting from contraceptive failure. As already discussed, urban and more educated women are more likely to follow government fertility regulating policies, while also using a wider range of methods of contraception.

Reasons for abortion also vary from parity to parity. Slightly more than 40 per cent of women who aborted their first pregnancies did so for personal reasons, and about the same number due to policy restriction. The latter reason usually reflects the fact that these women are below the age at childbearing promoted by the government, or that their pregnancies occur before a birth permit is obtained. Among women with one or more children, the proportion of abortions resulting from contraceptive failure falls, and that attributed to personal reasons increases markedly, while the increase in the proportion of abortions resulting from policy restriction is relatively small. As for the relationship between the woman's abortion history and reason for the last abortion, the survey results reveal that the two major reasons for women having their first abortions are policy restriction (39 per cent) and contraceptive failure (34 per cent). In contrast, women who have aborted their pregnancies previously are more likely to do so again because of contraceptive failure (50–60 per cent).

The time at which the pregnancy is terminated is an important factor associated with health consequences of induced abortion. Abortions carried out in the first and second trimesters generally have a lower health risk than those taking place in late pregnancy (Tietze and Henshaw 1986).[4] Information about variations in the timing of abortions is presented in Tables 6.5 and 6.6.

Available data from other countries show that most abortions take place in the first trimester (Tietze and Henshaw 1986), and the shift towards earlier abortion is a universal trend. China's 1997 survey also shows that since 1990, around 80 per cent of abortions were first trimester procedures. Fewer than 10 per cent of abortions before 1975 were carried out in the second trimester. Between 1975 and 1979 the percentage doubled but the proportion has been relatively stable since. The two peaks recorded in the early 1980s and the early 1990s were related to the abortion campaigns carried out during these years. Differing from many other countries that witnessed major reductions in second trimester abortions, at the end of the century second trimester abortions still accounted for 18 per cent of all Chinese abortions. There are marked contrasts in the timing of abortions undergone by women in urban and rural areas. In urban areas, the proportion of second trimester abortions

Table 6.5 Changes in the time of abortion in recent decades

Period	Urban		Rural		Total	
	⩽12 weeks	⩾13 weeks	⩽12 weeks	⩾13 weeks	⩽12 weeks	⩾13 weeks
<1975	100.00	0.00	90.91	9.09	85.00	15.00
1975–79	90.83	9.17	81.82	18.18	76.38	23.62
1980–84	91.72	8.28	77.83	22.17	69.70	30.30
1985–89	95.20	4.80	81.84	18.16	72.65	27.35
1990–94	93.65	6.35	79.65	20.35	72.07	27.93
>1994	97.12	2.88	81.90	18.10	74.60	25.40

Source: 1997 NDRHS computer record data file.

Table 6.6 Percentage distribution of the last abortion by the duration of pregnancy

Characteristics	4 weeks	5–8 weeks	9–12 weeks	13+ weeks	Cases
Age:					
15–19	11.11	38.89	11.11	38.89	72
20–24	25.51	46.93	8.89	18.67	1,125
25–29	26.10	46.55	8.39	18.97	1,824
30–34	29.84	43.37	7.16	19.63	754
35–39	29.91	41.59	7.94	20.56	214
40+	23.64	49.09	9.09	18.18	55
Place of residence:					
Rural	17.36	45.54	9.81	27.29	2,558
Urban	42.33	45.96	5.79	5.92	1,486
Nationality:					
Han	27.44	45.87	8.18	18.51	3,739
Minority	15.41	43.61	10.16	30.82	305
Education:					
Illiterate	14.67	39.70	10.96	34.67	675
Primary	17.64	45.85	9.43	27.07	1,145
Junior high	29.72	48.02	7.99	14.26	1,339
Senior high	41.83	46.39	5.15	6.63	679
College+	43.69	47.09	6.31	2.91	206
Parity:					
0	24.53	42.67	12.27	20.53	375
1	30.68	46.35	7.42	15.55	2,438
2	20.24	45.85	7.32	26.59	820
3+	16.30	44.28	12.17	27.25	411
Prior abortions:					
0	25.52	44.79	8.84	20.85	2,782
1	30.31	46.71	7.01	15.97	927
2	24.90	50.20	6.94	17.96	245
3+	23.33	51.11	10.00	15.56	90
Abortion reason:					
Contraceptive failure	31.76	48.26	7.01	12.97	1,612
Personal reasons	23.77	49.18	11.81	15.25	669
Policy restriction	21.59	41.06	8.36	28.99	1,459
Others	28.62	46.71	7.57	17.11	304
Total	26.53	45.70	8.33	19.44	4,044

Source: 1997 NDRHS computer record data file.

observed in the last 20 years has been much lower than that recorded in the late 1970s and early 1980s. But in rural areas, second trimester abortions have remained fairly frequent and in the mid-1990s still made up more than a quarter of the total.

China's 1997 survey shows that a small number of women who had abortions were aged between 15 and 19 at the time. In comparison with those of older ages, they tended to have late term abortions. However, it is important to keep in mind that the survey recorded only abortions of married women. Thus this may not represent the abortion patterns among those under age 20.

The majority of abortions are first trimester procedures, and they tend to be concentrated at five to eight weeks' gestation among women aged 20 and above. The distribution of first and second trimester abortions is fairly stable across these age groups. Rural women have five times as many second trimester abortions as their urban counterparts. Women of ethnic minority groups have much higher proportions of second trimester abortions than the Han. This is less likely to be a result of government pressure because the family planning policy has been implemented more strictly in the Han population. As might be expected, higher education is associated with lower proportions of second trimester abortions. While one-third of recent abortions were second trimester procedures among illiterate women, these account for only 3 per cent among women with college-plus education.

With regard to parity, the proportion of second trimester procedures generally rose with increases in the woman's numbers of children, indicating some influence from the family planning policy. When women are divided according to the number of their previous abortions, it is interesting to note that in comparison to those with a past abortion history, women who have never had abortions before are more likely to have second trimester procedures.

Regardless of the reasons, the overwhelming majority of recent abortions are first trimester procedures. However, it is noteworthy that policy restriction was given as the reason for almost 30 per cent of second trimester procedures, which is substantially above the percentages attributed to other reasons. This was particularly the case in rural areas, where 36 per cent of second trimester abortions were ascribed to policy restriction. Thus the strong influence of policy restriction on the likelihood of having second trimester abortions is evident. As the 1997 survey provided no further detailed information regarding second trimester abortions, additional assessment of late term abortion cannot be conducted.

6.3 ABORTION, FERTILITY DECLINE, AND RISING SEX RATIOS AT BIRTH

It has been suggested that China's family planning program relies heavily on induced abortion (Wang *et al.* 1998). Estimates suggest that abortions have contributed appreciably to China's rapid fertility decline. Over 1971–99, the total number of recorded abortions reached 256.5 million. This implies that 172.0 million births or 21.6 per cent of anticipated births were averted.[5] The effect of abortion on the level of total fertility rates (TFRs) is illustrated graphically in Figure 6.1 by the gap between the two curves. If there had been no abortions, the TFRs on average would be 0.4, 0.8 and 0.6 of a birth higher than those recorded in the 1970s, 1980s, and 1990s respectively.

Information about the impact of abortion on fertility changes is not available for most countries. However, compared with South Korea and Japan, the role of abortion in fertility decline was comparatively moderate in China. In the 1970s and 1980s, fertility fell rapidly in South Korea and abortions alone led to a TFR reduction of 1.0–1.4 births. The influence of abortion on fertility was greater in Japan. Over the period from the 1950s to the 1970s fertility would have been twice as high if there had been no abortions. In contrast, in China when abortions were at their peak, the reduction in the TFR that was due to abortions was about 0.8 of a birth.

Abortion is one of the four major proximate determinants of fertility. Its impact on fertility can be estimated using the Bongaarts model of proximate determinants of fertility (Bongaarts 1978, 1982; Bongaarts and Potter 1983). The proximate determinants are a range of biological and behavioral factors that directly affect fertility, and through which socio-economic factors may operate to influence fertility. The four proximate determinants are marriage, contraception, induced abortion, and postpartum infecundability. They are primarily responsible for the levels and variations in fertility. Other factors are

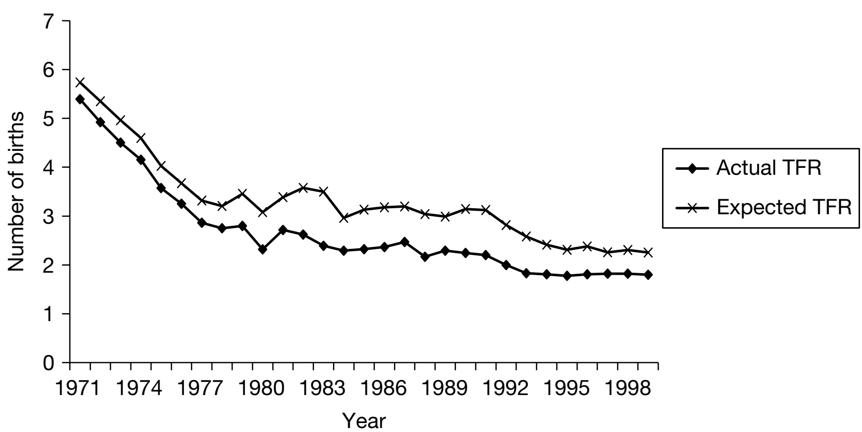

Figure 6.1 Actual TFR versus expected TFR, China: 1971–99

Note: The expected TFR is equal to the recorded TFR plus the number of births averted by induced abortions.

not, however, unimportant. In China, for example, more than 10 per cent of the national population is composed of migrants, and migration can result in prolonged spousal separations and lead to substantial fertility reduction.

Figure 6.2 displays the relative importance of the four proximate determinants in reducing the total fecundity rate to the recorded TFR in China. Before 1978, the largest fertility inhibiting factor was postpartum infecundability or other components of the residual factors represented by C_r. Delayed marriage (C_m) contributed 23 per cent of the total reduction in 1971 and this percentage gradually increased to 36 in 1979, making delayed marriage the largest fertility reducing effect in the year. During this period, the impact of using contraceptives (C_c) almost doubled whilst that of abortion (C_a) on lowering fertility was comparatively small. Since China began its one-child policy in 1979, widespread use of contraception and postponement of marriage have exerted the major influences on lowering the fecundity.

In the 1980s, the effect of postponement of marriage was slightly reduced and fluctuated as a result of the implementation of the marriage law in 1980, which actually lowered the *de facto* legal age at marriage. However, delayed marriage still accounted for about 30 per cent of the total reduction in fertility. Contraceptive use had the greatest effect, contributing 30–44 per cent of the reduction. In contrast, the effect of abortion was relatively small and its

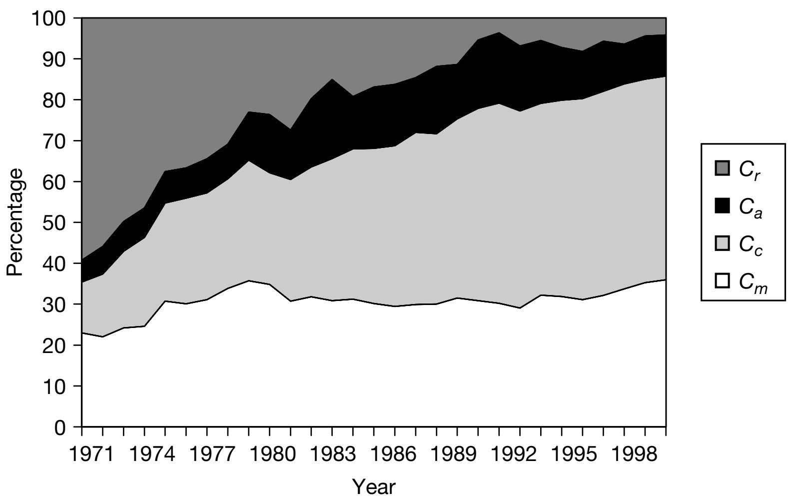

Figure 6.2 Relative contribution of the proximate determinants to reduction of fertility from total fecundity, China: 1971–99

Note: See Bongaarts (1978, 1982) and Bongaarts and Potter (1983) for calculation of C_m, C_c, C_a, and C_r.

contribution was 13–19 per cent. Effects from other residual factors were largely similar. During the 1990s, continued increase in contraceptive use constituted the greatest impact on lowering the fecundity, nearly 60 per cent. The shift to further delays in marriage accounted for 30–35 per cent. As the abortion rate declined, its effect decreased to 10 per cent in the late 1990s. Even in 1983 and 1991 when the highest abortion numbers and rates were recorded, the impact of abortion on lowering fecundity was much smaller than that of delayed marriage or contraceptive use.

China's TFR dropped from 5.4 in 1971 to 2.8 in 1979, 2.3 in 1989 and 1.8 in 1999. Table 6.7 further decomposes the roles played by the four proximate determinants in such fertility reduction. The method used in this analysis was developed by Casterline *et al.* (1984) and Singh *et al.* (1985). The table is divided into three parts. The upper panel shows proportional changes in TFRs caused by the impact of each determinant. The middle panel shows the same changes in relative terms, while the bottom panel shows changes in TFRs as measured by the number of children.

For example, the TFR declined by 48 per cent, 18 per cent, and 22 per cent in the three periods 1971–79, 1979–89 and 1989–99. Measured in absolute terms, the TFR fell by 2.6, 0.5, and 0.5 of a birth per woman respectively. Over the entire period under observation, the TFR declined by 67 per cent or 3.6 births. Detailed analysis shows that of the 48 per cent decline in the TFR taking place between 1971 and 1979, 28 per cent was due to postponing marriage (C_m),

Table 6.7 Analysis of the change in TFR in China: various periods

Period	C_m	C_c	C_a	C_r	Total
% Change in TFR:					
1971–79	−27.93	−28.61	−10.94	19.38	−48.10
1979–89	1.29	−31.42	−4.89	16.97	−18.04
1989–99	−15.75	−21.26	3.46	11.99	−21.56
1971–99	−33.02	−59.25	−9.96	35.60	−66.64
Distribution of % change in TFR:					
1971–79	58.07	59.48	22.74	−40.28	100.00
1979–89	−7.17	174.10	27.08	−94.02	100.00
1989–99	73.07	98.61	−16.07	−55.61	100.00
1971–99	49.56	88.92	14.94	−53.42	100.00
Absolute change in TFR:					
1971–79	−1.51	−1.54	−0.59	1.05	−2.60
1979–89	0.04	−0.88	−0.14	0.48	−0.51
1989–99	−0.36	−0.49	0.08	0.28	−0.49
1971–99	−1.78	−3.20	−0.54	1.92	−3.60

Source: Based on 1997 NDRHS computer record data.

29 per cent was because of the increase in contraceptive use (C_c), and 11 per cent resulted from increased induced abortion (C_a). During this period, shortening the duration of postpartum infecundability and some other factors actually led to a 19 per cent increase in the TFR. Using absolute terms, marriage postponement, increasing contraceptive use, and rising abortion reduced the TFR by 1.51 births, 1.54 births, and 0.59 births respectively. But changes in the duration of breastfeeding and other residual factors increased the TFR by 1.05 births.

The decomposition is based on a start and an end point of the periods, without taking into account changes in the intermediate years. Nevertheless, it demonstrates that during the period between 1971 and 1999, more than 70 per cent of the fertility reduction occurred in the 1970s before the one-child policy. China's fertility decline was achieved mainly through delaying age at marriage and increasing contraceptive use. The role played by abortion was only moderate. Other factors even worked in the opposite direction.

While the contribution of induced abortion to fertility decline is comparatively small, studies show that it has sometimes been used to prevent the birth of female babies. Sex selective abortion is believed to be one of the main mechanisms behind the increasing sex ratio at birth (SRB) in China in recent decades (Gu and Roy 1996; AGI 1999; Chu 2001; Chen Wei 2002). The 1997 survey found a close association between the SRB and the number of abortions. The SRB is approximately 109 among children born to women who have no, or one, previous abortion: slightly higher than the normal range. However, the SRB jumped to 121 among children born to women who already had two abortions, and it further rose to 144 and 131 among children born to women with three or four previous abortions respectively. This is a clear indication that abortion has been used to select the sex of the next child.

As indicated by Table 6.8, a strong son preference is a major factor affecting abortion. The number and sex of the children that women had already borne largely determined the subsequent incidence of conception and abortion, hence the SRB. Conception and childbearing is almost universal in China, and 97.1 per cent of the women had experienced pregnancies before the survey; most of those had already borne a child. As the first child is not much regulated by policy, very few women have their first child aborted. The AR of the first birth is only 4.2 abortions per 100 live births. People in general are less concerned about the sex of their first child, and the SRB for the first births to women who had no previous abortion stands at 103.3.

However, because of the restrictions of the one-child policy and the influence of sex preference, people tend to have a strong desire to select the sex of their next child according to the sex of the first child. Generally a balanced sex combination of children is preferred, although son preference is much stronger

Table 6.8 The impact of existing children on induced abortion of the next pregnancy

Prior pregnancies and children	Women at risk	Women conceived	Male births	Female births	Induced abortions	Per cent conceived	Per cent live-born	Abortion ratio	Sex ratio at birth
None	12,518	12,157	5,554	5,378	459	97.12	89.92	4.20	103.27
1 boy	5,554	4,191	1,398	1,372	1,264	75.46	66.09	45.63	101.90
1 girl	5,378	4,282	1,736	1,300	1,072	79.62	70.90	35.31	133.54
1 abortion	459	426	165	156	58	92.81	75.35	18.07	105.77
2 boys	1,398	667	219	243	187	47.71	69.27	40.48	90.12
1 boy + 1 girl	3,108	1,475	547	529	344	47.46	72.95	31.97	103.40
2 girls	1,300	964	494	300	124	74.15	82.37	15.62	164.67
1 boy + 1 abortion	1,429	720	115	135	446	50.38	34.72	178.40	85.19
1 girl + 1 abortion	1,228	653	184	120	322	53.18	46.55	105.92	153.33
2 abortions	58	49	18	17	10	84.48	71.43	28.57	105.88

Source: 1997 NDRHS computer record data file.

than daughter preference. Once the sex of the conceived child is known, a decision will be made about the fate of the pregnancy. As the table shows, 75.5 per cent of women who already had a male child had a second conception, while 80 per cent of women with a daughter did so. Women with one daughter are more likely to carry their second pregnancy to term, and less likely to terminate the pregnancy, than are women with one living son. The SRB is 101.9 for children born to women already having one son, but it is 133.5 for children born to women having had a previous daughter. In both cases the unbalanced sex ratios indicate sex selective abortion. It is interesting to note that the SRB is normal among the first live births to women who had aborted their first pregnancies.

A more marked pattern of sex preference can be observed among women who have two children. Women who have a son and a daughter are satisfied, while those who have two sons or two daughters still want to have a child of the opposite sex. Those having daughters alone show a particularly strong desire to have a son. Of the daughters-only women, 74 per cent conceived again and 82 per cent of their pregnancies resulted in live births, with a surprisingly high SRB of 164.7. In contrast, women with one son and one daughter had a within normal range SRB of 103.4 for their third births, while sons-only women had an abnormally low SRB of 90.1. Similar differentials were found among births to women who had already had one child and one abortion. Among women who previously had two abortions, the first live births also show a normal SRB.

6.4 CONCLUSIONS

There were great changes in government attitudes and policies towards abortions in China during the twentieth century. These changes were particularly related to China's rapid population growth and were influenced by the nationwide family planning campaigns. Changes in abortion rates in China have broadly followed the patterns recorded in the developed countries, but been less dramatic than those observed in neighboring countries that share a similar culture and have experienced a similar fertility decline. China's major fertility decline took place during the 1970s and was primarily caused by the postponement of marriage and widespread use of contraception. Although abortions have also played a considerable part in lowering fertility, and coercive abortions have often been observed, China's abortion rate is moderate by international standards. Even China's high abortion rates in the 1980s were markedly lower than those observed between the 1950s and the 1970s in the two neighbouring countries of South Korea and Japan, and in most of the other socialist or formerly socialist countries.

China's family planning program should not be seen as heavily reliant on induced abortion to control fertility. As shown by the decomposition analysis presented in this chapter, China's TFR fell from 5.4 in 1971 to 1.8 in 1999, a reduction of 3.6 births per woman. Of this reduction, 1.8 births were attributable to delayed marriage, 3.2 births to the use of contraception and 0.5 of a birth was lost to abortion. The sum of the three is greater than the total reduction of 3.6 births because postpartum infecundability, which was largely due to prolonged breastfeeding, has been reduced and this led to an increase of 1.9 births.

The likelihood of women having abortions is closely related to their social economic and demographic characteristics and is also influenced by family planning policies and regulations. Higher abortion rates are generally associated with higher education, higher income, urban residence, and Han nationality, and are often observed among women who have had one or more previous births. China has one of the highest contraceptive prevalence rates in the world, 83.8 per cent among married women in 1997. It is noteworthy that contraceptive failure has been the most frequently stated reason for having an abortion, followed by policy restriction and personal and other reasons.

China's abortions are frequently sex selective and thus partly responsible for the abnormally high SRB. Generally, the SRB among children born to women already having experienced two or three abortions is much higher than normal. The number and sex of the children that women already have also exert a strong influence on the incidence of conception, abortion and SRB. The SRB for the first live birth is generally within or close to the normal range, but later varies markedly depending on the sex composition of children that women already have. Women with sons only have a much higher abortion rate and a lower sex ratio in their next birth, but women with daughters only have a lower abortion rate and very high sex ratio in the subsequent birth. China's increasing child sex ratio has already become a serious problem and this will be further examined in the next chapter.

7

Child Sex Ratios and Their Regional Variation

Yong Cai and William Lavely

As indicated in earlier chapters of this book, the imbalanced sex ratio, in particular the increasing sex ratio at birth, has emerged as an urgent social problem in China that has captured the attention of scholars, policy makers, and the popular press both in and outside China.[1] Yet this general awareness has not been matched by a clear understanding of its causes and implications. A major impediment to understanding is the high level of generalization used to describe the problem, often at the national or, at best, provincial level. These broad characterizations obscure the connections between the phenomenon and local ecology, and mask the gravity of the problem in major subpopulations. This chapter examines the regional variation of the child sex ratio using county level data derived from the 2000 Chinese census, and discusses the implication of this variation for an understanding of the causes and consequences of elevated sex ratios.

While much of the literature on sex ratios in China is concerned with the sex ratio at birth, this chapter concentrates on the child sex ratio, defined as the ratio of the number of boys aged 0–4 to 100 girls of the same ages. This is largely based on the following considerations. Firstly, there are inherent challenges in the numerations of live births and infant deaths. When an infant dies shortly after birth, often neither the birth nor death is reported (Tu and Liang 1993). In addition to other reasons, the operation of the birth planning policy gives parents and local officials incentives to conceal both births and infant deaths. Although population counts are also subject to undercount, a live toddler is more likely to be counted than a live or deceased infant. Secondly, even if birth reporting were perfect, the sex ratio at birth takes no account of sex differentials in infant and early childhood mortality. Such mortality differentials are often related to the neglect of girls and play a major part in creating the sex imbalance (Li and Feldman 1996; Banister 2004). Thirdly, by including five annual cohorts, the child sex ratio reduces the effects of short term fluctuations and event misplacement, and is thus more robust and statistically stable. In short, the child sex ratio is a direct and essential measure of sex imbalance, reflecting the combined result of the sex ratio at birth and sex differential mortality in infancy and early childhood.

7.1 RISING SEX RATIOS IN CHINA AND THEIR MAJOR DETERMINANTS

Biological factors determine the natural sex ratio at birth. Under normal circumstances, the sex ratio at birth falls in a narrow range between 103 and 107 in most Eurasian populations.[2] In the absence of sex selective behaviors, and assuming a population closed to migration and perfectly enumerated, the child sex ratio is determined by the sex ratio at birth and sex differentials in infant and child mortality. Although no mortality schedules are truly 'gender neutral', model life tables constructed largely from European populations are a reasonable approximation (Hill and Upchurch 1995; Cai and Lavely 2003). Assuming a sex ratio at birth of 106, and taking Coale–Demeny Model West life tables as a standard (Coale and Demeny 1983), the normal sex ratio at age 0–4 in a stable population would be in the range of 97.8 to 105.5, corresponding to life expectancies of 20.0 to 80.0 years respectively. The higher the overall mortality level, the lower the sex ratio of infants and children.

While child sex ratios were high in some historical Chinese populations (Lee *et al.* 1994; Lee and Wang 1999), they were relatively low during the period between China's first modern census in 1953 and the third census in 1982 when the child sex ratio increased from 106.8 to 107.1, with a modest dip in 1964 to 105.7. As shown in Table 7.1, however, these numbers are still higher than the corresponding child sex ratios in the Coale–Demeny Model West populations with equivalent female life expectancy at birth. Sex ratios in the mortality model gradually rise, from 102.4 to 102.9 and to 104.3, as life expectancies rise. The child sex ratio in China began a rapid rise in the 1980s, diverging from three decades of relative stability. It increased to 110.2 in 1990 and to 120.2 in 2000, while that implied by Model West only rises to 104.8 and 105.1 respectively.

Three proximate determinants have been proposed to explain the elevated sex ratio (Hull 1990; Zeng *et al.* 1993):

1. Sex selective abortion that artificially increases the sex ratio of births;
2. Elevated female infant and early childhood mortality; and

Table 7.1 Child sex ratios (aged 0–4) in five censuses and corresponding model ratios

Year of census	Reported sex ratio	Expected sex ratio[a]
1953	106.8	102.4
1964	105.7	102.9
1982	107.1	104.3
1990	110.2	104.8
2000	120.2	105.1

Notes: [a]Based on Coale–Demeny Model West. The expected child sex ratio for 1953, 1954, 1982, and 1990 are from Coale and Banister (1994). The authors followed Coale and Banister (1994) to calculate the expected child sex ratio for 2000: assuming a sex ratio at birth of 1.06, 'the change in sex ratio from birth to ages 0–4 was determined by the model table at the level of mortality when the cohort was born' (Coale and Banister 1994: 478, Endnote 4).

Sources: Chinese censuses for 1953, 1964, 1982, 1990, and 2000; Coale and Banister (1994); Coale and Demeny (1983).

3. The relative underenumeration of female infants and children who are alive but hidden from the view of census enumerators.

These three proximate determinants are also advanced as competing explanations, and are sometimes referred to in shorthand as the 'ultrasound,' 'infanticide,' and 'hidden girls' hypotheses, respectively. While these three hypotheses are sometimes framed as alternatives, they are not mutually exclusive. There is evidence for all three, although it is difficult to assess the relative contribution of each.

Families traditionally could select the sex of their children using methods that manipulate infant survival—sometimes referred to as 'child control' (Greenhalgh 1988; Skinner 1997)—such as infanticide, neglect, and abandonment. A rise in abandonment and informal adoption in recent years (Johansson and Nygren 1991; Johnson 2004) has been accompanied by a sharp divergence in the survival rates of male and female infants (Li and Sun 2003). Although some evidence suggests that practitioners of traditional Chinese medicine might be able to determine the sex of the foetus early in pregnancy (Peng and Huang 1999), only with the development and spread of modern technologies of pre-natal sex determination such as ultrasound has it been generally possible to control the sex of a birth through sex selective abortion. Various data sources, including statistics on the spread of ultrasound machines, the sex ratio of aborted fetuses, and ethnographic reports, suggest that sex selective abortion is an important factor explaining sex ratio variation (Zeng *et al.* 1993; Li 1994; Chu 2001; see also Chapter 6).

Sex selective behavior is not new in China, as the historical and demographic record makes clear (Lee *et al.* 1994; Coale and Banister 1994; Lee and Campbell 1997; Lee and Wang 1999). Such behavior arises from preferences rooted in traditional family systems and associated cultural values. The family in historical China was an archetypal example of patrilineal joint family systems widely observed across East, Central, and South Asia. In such systems a son is considered a virtual necessity, although family configurations containing both sons and daughters are preferred to those containing only sons (Skinner 1997). Family systems are neither monolithic nor immutable, and thus neither are preferences. It is obvious, for example, that son preference is stronger in the mainly Han historical China Proper than in predominantly minority frontier regions. But culture does change, and the general trend over the past century has been towards the improved status of women, particularly in more urbanized areas. It thus appears plausible that family system variability—for example, across ethnic divisions or socio-economic gradients—contributes to sex ratio variation, but it seems unlikely that current trends are due to a rising preference for sons.

Fertility constraint amplifies the expression of preference (Gu and Roy 1995). In high fertility populations, a minimum complement of sons is achieved by virtually every family, but when fertility is constrained, some families must intervene to achieve the desired size and sex composition of their offspring. In general, the rising economic and psychological cost of children is the chief constraint on fertility. As the cost of children rises, parents opt to have fewer of them. The high cost, in conjunction with the exigency of having a son, imposes a difficult choice on families who conceive or bear a child of the 'less desired' sex. Sex selection is a way of escaping the cost of raising a child that is, in some sense, sub-optimal. This logic informs the view that low fertility is the common denominator of high sex ratios in China and other populations of East Asia, notably Korea (Gu and Roy 1995; Kim 2004).

Granted that rising sex ratios are not unique to China, powerful state sponsored birth control policies make China a special case. In countries with laisser faire family planning policies, parents make fertility decisions in light of numerous economic and psychological factors affecting the perceived costs and benefits of children. In contrast to these soft and diffuse constraints, China's one-child policy, initiated in 1980, alters the cost of children directly through systematic rewards and sanctions connected to a matrix of desiderata, including the number of children already born, the socio-economic characteristics of families, and the administrative locale in which they reside. Systematic measures of birth planning policy are elusive because policy implementation is highly decentralized; at the local level, policy becomes inseparable from idiosyncratic compromises and means of enforcement (Greenhalgh 1992;

Zhang 1999; Scharping 2003). But variation in the birth planning policy is substantial (Short and Zhai 1998; Guo *et al.* 2003; see also Chapter 2, this volume) and has been shown to be important for understanding sex ratio variation (Zhang 2004).

The birth planning policy also makes accurate population enumeration more difficult, as Scharping (2003) has demonstrated. Sex biased reporting in censuses and surveys, also reflective of sex preferential behavior, is yet another possible explanation for elevated sex ratios. Parents may omit a daughter from their report, particularly if she was born out of plan, was given away for adoption, or was otherwise abandoned. Administrative barriers against registration of 'out-of-plan' children could intensify an underreporting bias, as parents may be more willing to pay a fine to regularize the status of a son than a daughter. It is not only families who have incentives to conceal births. Manipulation of population statistics has been an unintended consequence of the system of evaluating cadres according to birth planning performance. Using methods that compare cohorts enumerated in two censuses, we have estimated that 7.5 per cent of females and 6.2 per cent of males aged 0–4 were underenumerated in the 1990 census. The difference between female and male underenumeration rate accounts for 28.6 per cent of the elevated sex ratio in these ages in the 1990 census (Cai and Lavely 2003).

In summary, there is considerable uncertainty about the proximate causes of high sex ratios. There is evidence for the operation of all three determinants, but as yet no systematic data that would give a strong indication of the proportional contribution of each. Influential writers claim that sex selective abortion and underreporting of girls are the major causes, with mortality differentials an insignificant contributor (Zeng *et al.* 1993; Banister 2004); however, the evidence is indirect and incomplete. Just as socio-economic status, sex preference, and birth planning administration vary by region, it is more than likely that the mix of proximate factors varies by region as well.

7.2 REGIONAL VARIATION IN CHILD SEX RATIOS

As dramatic as the rise of overall child sex ratios has been the emergence of immense regional differences. The child sex ratio rose from 107.0 in 1982 to 120.2 in 2000, while the interprovincial variance grew from 3.5 to 83.5 in the same period. As shown in Table 7.2, by 2000, provincial ratios ranged from a low of 101.4 in Tibet Autonomous Region to a high of 136.0 in Hainan Province. Few studies of rising sex ratios and 'missing girls' in China have addressed the problem of regional variation. Banister (2004) describes

Table 7.2 Sex ratios at age 0–4 by province: 1982 and 2000

Province	Census 1982		Census 2000	
	Population (0–4)	Sex ratio	Population (0–4)	Sex ratio
Beijing	667,469	107.3	442,578	110.8
Tianjin	607,798	106.5	376,002	112.6
Hebei	5,271,448	107.1	3,611,922	115.8
Shanxi	2,353,896	108.7	2,157,761	110.9
Neimeng	1,991,353	105.8	1,182,190	109.6
Liaoning	3,183,992	106.3	1,757,164	113.1
Jilin	2,153,561	105.8	1,061,361	110.8
Heilongjiang	3,272,890	104.9	1,530,908	108.8
Shanghai	780,627	105.9	489,978	110.3
Jiangsu	4,844,751	107.3	2,986,808	122.7
Zhejiang	3,204,255	108.4	2,259,449	113.8
Anhui	4,749,163	109.9	3,278,183	129.8
Fujian	2,756,149	106.2	1,623,227	123.8
Jiangxi	3,671,568	106.7	2,747,788	132.6
Shandong	6,383,914	108.0	4,579,809	114.4
Henan	7,357,828	108.3	5,276,801	132.4
Hubei	4,451,003	106.1	2,444,737	129.0
Hunan	4,905,074	106.4	3,199,237	124.5
Guangdong	6,445,286	109.2	5,532,309	129.6
Guangxi	4,404,858	108.8	2,797,864	127.9
Hainan	n.a.	n.a.	527,309	136.0
Chongqing	n.a.	n.a.	1,774,488	116.7
Sichuan	6,975,540	106.8	4,871,752	115.3
Guizhou	3,331,338	105.9	3,227,009	114.0
Yunnan	3,804,230	104.2	3,387,080	112.9
Tibet	232,753	101.9	248,463	101.4
Shaanxi	2,599,551	108.4	1,821,527	126.0
Gansu	1,794,205	105.5	1,617,252	119.3
Qinghai	463,356	103.7	371,531	108.6
Ningxia	510,286	104.2	452,495	109.0
Xinjiang	1,536,219	103.7	1,343,392	105.6
National total	94,704,361	107.1	68,978,374	120.2
Mean of provinces		106.5		117.7
Inter-provincial variance		3.5		83.5

Note: n.a. = not available.

Sources: Chinese censuses for 1982 and 2000.

variation in the sex ratio age 0–14 at the provincial level. She finds the highest sex ratios in central and south China, high ratios in the southwest, moderate sex ratios in Manchuria and the North China Plain, and low sex ratios in the far west (Banister 2004). Liu (2004) using cluster analysis examines the sex ratio at birth at the provincial level in 1990 and 2000 and argues that there are two strong culturally connected regions: the coastal regions and the central China region, with the elevated sex ratio at birth spread out from these two regions to other areas. Guilmoto (2005) examines the spatial variation of the child sex ratio in China using 1990 census county level data and makes a comparison to India. He finds that regional variation in China's child sex ratio is complex and is not readily explicable by general socioeconomic variables. In the remaining part of this chapter, variation in the child sex ratio at sub-provincial level will be further investigated using data from the 2000 census.

We rely on a county level 2000 census data set and a GIS base map provided by the University of Michigan China Data Center (ACMR 2003).[3] The data set contains 2,367 county level units (counties, cities, and merged urban districts) with no missing data. Census and population survey data from China were once praised for their remarkable accuracy (Coale 1984), both in overall coverage and age reporting. Some of the social and political conditions that favored a high quality enumeration have faded with the rise of migration and relaxation of bureaucratic control in the Reform era (Lavely 2001). Underenumeration problems undoubtedly affect the 2000 census (Zhang and Cui 2002; see also Chapter 3, this volume). However, available evidence suggests that the data quality issues of the 2000 census should not be exaggerated. The census post-enumeration survey found a net undercount of 1.81 per cent (Walfish 2001), which is low by international standards. Anderson (2004) argues that the pattern of undercount in China is neither unique nor surprising in light of the experience of other countries. Using the general growth balance method, Banister and Hill (2004) studied mortality levels and trends from the 1960s to 2000 and concluded that the quality of data from the Chinese censuses is 'quite high.' We therefore make no adjustment to the raw census data in this exercise.

The frequency of counties by the sex ratio of population aged 0–4 shows wide variation and a distribution skewed to high ratios. The sex ratio ranges from a low of 89.7 in Tibet's Zhada Xian (county) to a high of 197.3 in Hubei's Wuxue Shi (city). The mean and median of counties are both below the national level, indicating that high sex ratios tend to be concentrated in counties with larger populations.[4] Sex ratios are subject to random variability, but this could account for only a minor fraction of the large inter-county variance.[5] The explanation for the wide variation must lie elsewhere.

Figure 7.1 maps the sex ratio of children age 0–4 in 2000, with normal or low sex ratios (below 106) portrayed in white and elevated sex ratios (above 106) portrayed in shades of gray. County and provincial boundaries are shown for reference. It is evident that most counties in China have elevated sex ratios, and that sex ratios are not homogeneous in space. There are distinct clusters of high

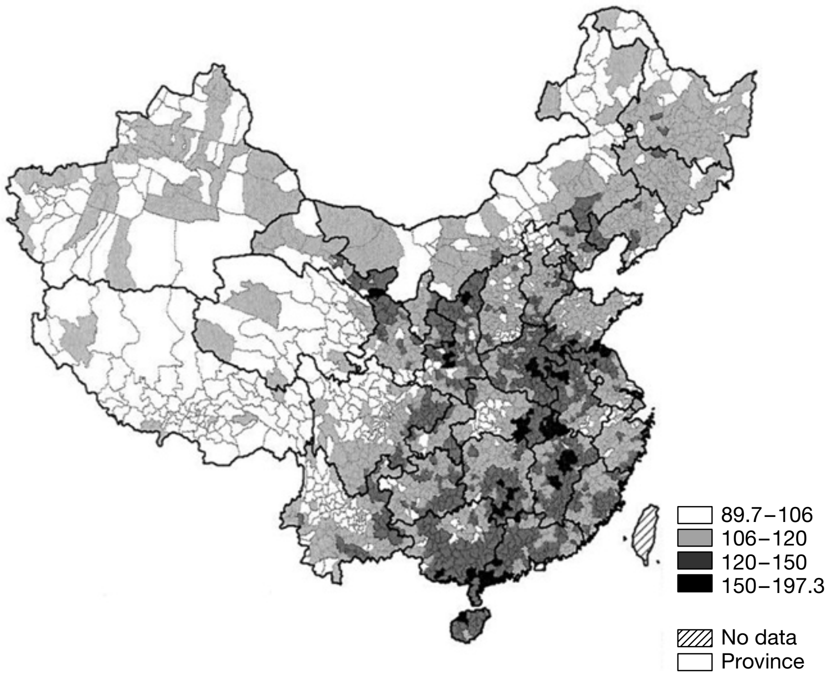

Figure 7.1 Sex ratios age 0–4, China: 2000

and low ratios that do not correspond to provincial boundaries. Clusters extend across provinces and high and low clusters sometimes occur within a single province. The map also confirms the observation that sex ratios tend to be higher in the mainly Han areas of China Proper and low in the mainly non-Han areas of the north and west.

The map in Figure 7.1 reveals some important regional features of the child sex ratio across China. However, mapping based on arbitrary categories is highly impressionistic and sensitive to the choice of break points. Spatial clusters may also occur by chance. Geographers and statisticians have developed statistical tools to provide a more objective assessment of the likelihood that characteristics are distributed randomly in space or that clustering indicates a true underlying spatial structure. Local Moran I_i, developed by Luc Anselin (1995), is one of a set of exploratory spatial analysis statistics that are together referred to as Local Indicators of Spatial Association (LISA). The idea of local spatial association is to measure the correlation between a specific unit and its neighboring units with respect to certain social, economic, or demographic characteristics. For example, Wuhan (City) has four contiguous neighboring units.[6] The Local Moran I_i is the correlation between Wuhan and its four neighboring units with a reference to the overall mean. If Wuhan is similar to its four neighbors, its Moran I_i is positive. If Wuhan is dissimilar from its four neighbors, its Moran I_i is negative. Although the distribution of local Moran I_i is unknown, a permutation test can be designed to provide a significance test. It is thus possible to identify clusters or so-called hot spots.

We utilize the specific implementation of Local Moran I_i contained in Anselin's suite of spatial analysis programs known as *GeoDa* (Anselin 2003). When two or more neighboring spatial units have significant values and share a similar tendency, a cluster is defined: counties in the high-high category are those with high observed values and a significant I_i, indicating affinity of high child sex ratio with its neighbors. Counties in the low-low category are those with low observed values and a significant I_i, indicating affinity of low child sex ratio with its neighbors. High-low or low-high clusters, indicating a value contrasting with neighbors, are rare because there is an overall tendency for neighboring units to be similar to each other.

Figure 7.2 maps counties according to the tendency of the observed child sex ratio and the statistical significance level of Moran I_i. High sex ratio clusters are portrayed in dark shades, with the darker shades indicating high significance. Low sex ratio clusters are portrayed in dot patterns, with a higher density of dots indicating high significance. Areas in white indicate that there is no statistically significant association of neighboring high or low sex ratio values.[7] It is important to note that the 'high' and 'low' are relative to the value of the mean county in China, which has a sex ratio age 0–4 of over 117 (see Figure 7.1). Thus even some counties with above normal sex ratios may qualify for membership in low sex ratio clusters. The Moran I_i mapping reveals clustering of sex ratios that are unlikely to occur by chance. The mapping also greatly simplifies the sex ratio landscape by emphasizing clusters of extreme values.

For the purpose of describing regional space we adopt the naming conventions of G. William Skinner's decomposition of China into macroregional systems (Skinner 1977; Skinner *et al.* 2000). Beginning with the low sex ratio clusters shaded in dotted gray, there is an obvious division between China Proper and the inner Asian frontiers of the west, northwest, and Manchuria. A band of low ratios describes much of China's non-Han frontier, extending from central Yunnan onto the Tibetan Plateau and through the west, but excluding all but the westernmost counties of Gansu. The band resumes in central Inner Mongolia and stretches into Manchuria, encircling a corridor that extends southward from Harbin. Low sex ratio clusters also occur in the mainly Han regions of China Proper, and we note three in particular: in the Chengdu Plain in the western Sichuan Basin of the Upper Yangzi; in central Hubei and

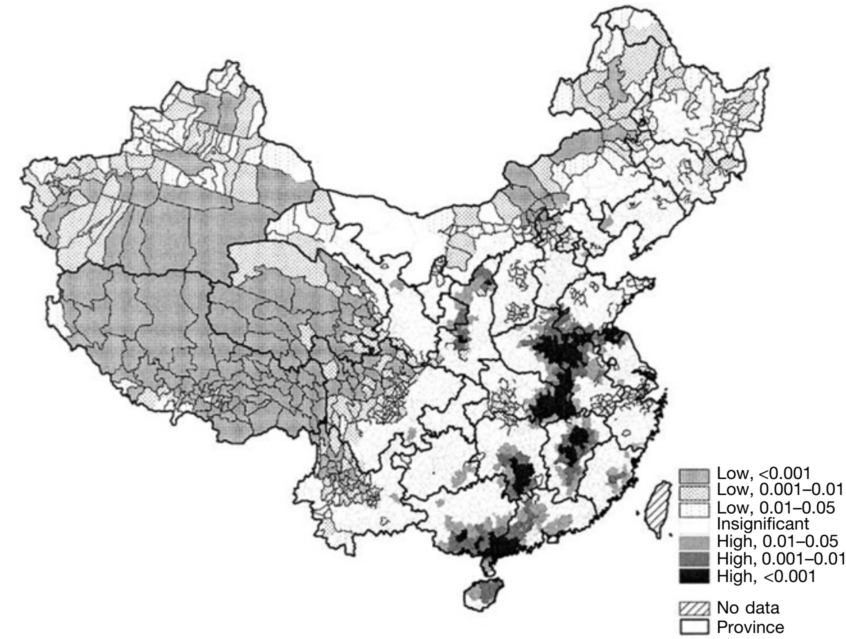

Figure 7.2 Significance of Moran I_i-defined clusters of sex ratios age 0–4

extending into northern Hunan in the Middle Yangzi; and in the northern Zhejiang–southern Jiangsu–southern Anhui border region in the Lower Yangzi.

There are six major dark shaded high sex ratio clusters, although three of these are only separated by few counties. We begin in the northwest and move clockwise:

1. High ratios follow a narrow north–south corridor running through the north Shaanxi Plateau and crossing through the Wei River Valley in Northwest China.
2. The largest single high ratio feature extends from the North China Plain into the Middle Yangzi, including parts of southern Shandong, northern Jiangsu, northern Anhui, eastern Henan, and extending into eastern Hubei centering on Wuhan.
3. Separated from the previous cluster by only a single tier of counties in the Boyang Lake area, another cluster extends southward into central Jiangxi, in what Skinner refers to as the Gan River subsystem of the Middle Yangzi.
4. There is an enclave of high ratios in the central coast of Fujian, centered on Quanzhou in the Southeast Coast Region.

5. A major southern cluster includes most of Hainan, except for its southern tier of counties, and extends into western Guangdong and southeastern Guangxi in Lingnan. It includes central Guangdong except for a coastal enclave south of Guangzhou.
6. Weakly connected to the Lingnan cluster is a northward extension into south-central Hunan in the Middle Yangzi, including the upper reaches of the Xiang River but not including the Xiang Valley north of Hengyang City.

7.3 INTERPRETING REGIONAL CLUSTERS AND VARIATION IN CHILD SEX RATIOS

With the exception of the biologically determined sex ratio at birth and sex differential mortality, which vary within a narrow range, almost all of the processes affecting the child sex ratio reflect the sex biased behavior of parents. A rational perspective would suggest that these sex biased behaviors reflect the joint operation of reproductive preferences and economic constraints. A proper analysis of the clustering of sex ratios would thus require measures of such preferences and constraints as they vary in space. Lacking these measures, we offer instead an impressionistic sketch.

Sex biased preferences for children are influenced by cultural and socioeconomic contexts, the most encompassing of which is the family system, but can include aspects of the local economy, social position, and the microdemography of the family (Skinner 1997; Lavely *et al.* 2001). Preferences reflect the value of children to their parents, while constraints consist of the costs of achieving a desired family configuration. These include the costs of childbearing (including costs imposed by fertility control policies), and the costs of sex selection which, for example, could be increased by social or legal norms against infanticide, or reduced by the availability of fetal sex determination technologies. Preferences and constraints may change or persist. In contemporary China, it is evident that constraints, in the form of fertility limitation and sex selective technologies, have been changing more rapidly than preferences.

The contingencies are complex, but it is possible to set out some broad propositions. For example, we would expect the patrilineal joint family system of the Han Chinese to be more conducive to son preference than the family systems of western and southern non-Han minorities (Skinner 1997). And we would expect tighter birth planning regulations to stimulate sex selective behavior. In the case of non-Han minorities, then, there are two powerful contingencies conducive to low sex ratios—weak son preference and more relaxed constraints on fertility. In fact, the low sex ratio clusters of the western and northern frontiers correspond fairly well to the spatial distribution of major non-Han nationalities.

In Han counties of China Proper we would expect son preference to be weaker where economies are more developed and stronger where less developed (Li and Feldman 1996). The availability of ultrasound technology, presumably higher in more developed areas, should facilitate sex selection. Among the Han Chinese, local variation in family system norms would affect the value of women and son preference. Skinner and colleagues (1994, 2000) have demonstrated that socio-economic levels and fertility change in China are patterned by an underlying urban-cum-spatial hierarchy, which they refer to as Hierarchical Regional Space (HRS). They argue plausibly that sex preferences, birth planning administration, and the availability of ultrasound also co-vary within HRS, although a lack of systematic local data on preferences, birth planning administration, or the availability of ultrasound make these propositions difficult to test directly.

The observed clusters seem to defy any obvious explanations beyond these general propositions. It cannot yet be said to what extent the clusters represent long standing regional variation in cultures, customs, and preferences, and to what extent they reflect idiosyncratic regional differences in birth planning administration or the availability of ultrasound.

The flow of clusters across provincial boundaries casts doubt on purely administrative or policy explanations. For example, Sichuan and Jiangsu have the most restrictive birth planning policies, but there are no dominant clusters of high sex ratio counties in those two provinces. In fact, the high sex ratio areas in Jiangsu appear to be part of a larger cluster of high sex ratios that extends from the North China Plain into the Middle Yangzi. In contrast, Guangdong and Hainan have less restrictive birth planning policy, but we observe large clusters of high sex ratios in those provinces.

There are also examples of high sex ratio clusters and low sex ratio clusters co-existing in the same province, as best illustrated in the case of Hubei. Although birth policy implementation is highly decentralized in China, policy variation within each province tends to be small—the total fertility implied by the local policy in Hubei general falls in a small range between 1.3 and 1.5 (Guo *et al.* 2003). It can hardly connect those clusters to administration or policy variation.

Nor do the local clusters of high/low sex ratios suggest a direct connection to well-known cultures and regions. For example, we see no correspondence between these sex ratio clusters and local dialects. The varying size and shape of those clusters highlights the challenge in understanding the sex ratio problem across China. On one hand, the existence of clusters itself suggests that there are likely to be some shared causes or proximate determinants behind the elevated sex ratios. On the other hand, the complex nature of the clusters as shown on the map indicates that it would be difficult, if not impossible, to come up with a generalized explanation for the high sex ratio across China.

There is also evidence to suggest that we cannot simply dismiss sex differential mortality's contribution to the elevated sex ratio. The female infant mortality rate (72 per 1,000) in Jiangxi is 2.5 times as high as the male infant mortality rate (29 per 1,000). In the core area of the high sex ratio cluster in Jiangxi, the female infant mortality (about 200–250 per 1,000) is about four to five times as high as the male infant mortality (about 40–50 per 1,000). Thus differential infant mortality alone could explain a large proportion of elevated sex ratio in those areas.

Large variation in the child sex ratio across China, and the obvious regional clustering demonstrate the dangers of overgeneralization. While studies based on high levels of aggregation provide important insights on the general trend in sex ratio across the country, they mask the gravity of the problem in local areas, obscure the local environment as an important contextual factor, and could lead to erroneous interpretations and policy recommendations. This analysis calls attention to the importance of local ecology to the sex ratio phenomenon.

7.4 CONSEQUENCES OF RISING SEX RATIOS

Little direct research has been done on the effects of the recent rise of sex ratios in China, mainly because the high sex ratio cohorts born since 1980 are only beginning to reach adulthood. Most treatments of the problem have involved population projections, or are based on extrapolations from other societies or eras. These studies generally focus on the effects of sex ratios on marriage markets and their broader ramifications for social order, women's status, and health.

Based on the number of males in a birth cohort and on assumptions of a normal sex ratio at birth and gender neutral survival probabilities, it is possible to estimate an 'expected' number of girls in a cohort. Using 2000 census data and reverse survival methods, we have estimated that 12.8 million females are missing from the cohorts born between 1980 and 2000 (Cai and Lavely 2003). Figure 7.3 shows the percentage of each female birth cohort that is missing from the population as enumerated in the census. Note that these estimates include girls that may be alive but hidden in the population. The figure indicates a relatively low proportion missing between 1980 and 1987, and then a rapid monotonic rise, peaking in 1999 with approximately 14 per cent of girls missing. Although the Chinese government has recently undertaken reforms aimed at reversing the trend of increased sex ratios, including bans on sex selective abortion and some relaxation of the birth planning policy, the notable

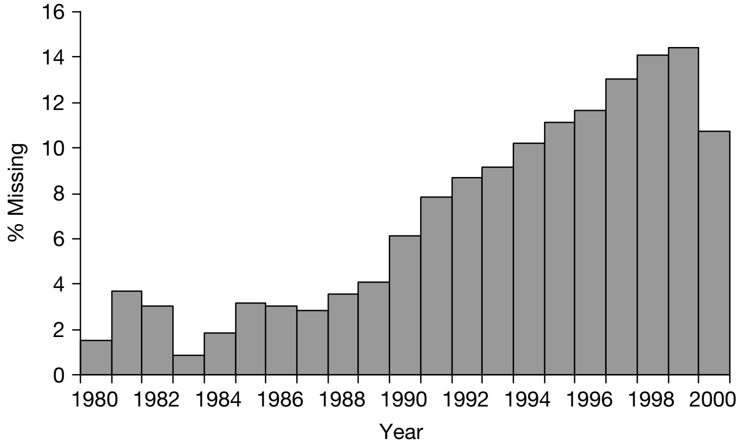

Figure 7.3 Missing girls as percentages of cohorts born: 1980–2000
Source: Cai and Lavely (2003).

decline in the proportion of missing girls in the 2000 cohort is probably an artifact of 2000 census administration. The results of recent population surveys do not indicate a decline of sex ratio in the 2000 cohort, or in subsequent cohorts.[8]

Projections have quantified the extent of the emerging marriage squeeze. For example, based on 1990 census data, Tuljapurkar and colleagues (1995) project that by 2020, about one million excess males will be in the market for marriage each year. But because child sex ratios rose dramatically after 1990, these projections do not capture the magnitude of the squeeze after 2020. Das Gupta and Li (1999: 633) estimate that at least 12 per cent of males born after 1985 will not be able to find wives. The removal of females also affects the reproductive potential of a population. Our analysis has shown that over time scales of several decades, missing girls could substantially depress population growth rates (Cai and Lavely 2003).

The general literature on marriage markets suggests some of the demographic and social effects of rising sex ratios.[9] Male marriage age will rise, and there will be downward pressure on the marriage ages of females. Bride prices or the net payment to brides' families will rise. Males will seek brides from farther afield. Rates of bachelorhood will rise. High status males, and males having an official urban residence (urban *hukou*), will be less affected because advantages or privileges of this kind are more attractive to potential brides. Lower status males and peripheral communities may adapt to the shortage in many ways, for example, by brokering marriages among neighbors or close kin, through purchase or kidnapping of females, or even by normalizing polyandrous marriage forms. Solitary males may be more likely to migrate. The bachelor underclass, already the least economically able, will not enjoy the considerable health benefits conferred by marriage and will thus experience an even greater survival disadvantage compared to the class of married males.

The most ambitious, if speculative, account of the consequences is contained in Hudson and den Boer's *Bare Branches* (2004). Drawing on historical accounts of high sex ratio societies as well as contemporary evidence about the behavior of (typically deracinated and underemployed) bachelors, they forewarn of a chaotic and vice ridden society, in which unmarried males catalyze crime, prostitution, and political unrest. But for Hudson and den Boer, whose guiding interests are in international security and interstate relations, high sex ratios ultimately influence statecraft and diplomacy because governments must placate the unruly bachelor constituency. They argue that China's high sex ratios do not bode well for a transition to full democracy because high sex ratios are conducive to authoritarianism, nationalism, and militarism.

Whatever stock we put in these assessments, they share a basic problem: they view the Chinese population as monolithic or at best as a rural–urban dichotomy. This implicit homogeneity takes little or no account of the great regional disparities in sex ratios. China's population is increasingly mobile and interconnected by transport, communication, and commercial networks; yet marriage markets remain largely local, thus the effects of market conditions are, in the first instance, local as well. A more realistic picture of the effects of rising sex ratios needs to take account of local and regional sex ratio variation.

The child sex ratio of a county is a reasonable indicator of the marriage market conditions in that county two decades later. Table 7.3 shows the distribution of population and the number of counties by the child sex ratio of children in 2000, classified as in Figure 7.1. About 10 per cent of China's population reside in counties with a normal or below normal sex ratio (here conservatively defined as below 106), whereas roughly 90 per cent reside in counties with above normal sex ratios. Fully 40 per cent reside in counties with

Table 7.3 Distribution of population and counties by child sex ratio: 2000

Sex ratio (age 0–4)	Population		Counties	
	Number	%	Number	%
89.7–105.99	131,383,664	10.6	455	19.2
106–119.99	611,993,387	49.4	1,144	48.3
120–149.99	430,197,544	34.7	687	29.0
150–197.3	65,434,828	5.3	81	3.4
Total	1,239,009,423	100.0	2,367	100.0

Source: 2000 Chinese census.

a seriously imbalanced sex ratio of 120 or above. Approximately 5 per cent reside in counties with ratios of 150 or above.

Most of rural Han China will be affected in some way by rising sex ratios. But, as we have seen in the map in Figure 7.2, many of the highest sex ratio counties comprise extensive regional clusters. Such regional concentrations impede the dilution of local conditions across larger areas. Thus, the extreme conditions emerging in, for example, eastern Hubei, northern Jiangxi, and western Guangdong, will have powerful local effects. Researchers looking for signs of the more colorful high sex ratio scenarios would be advised to seek them in these places. Serious effects may also be expected across broad interior regions, particularly the internal periphery dividing Anhui, Henan, and Shandong. Of course, the effects will not be confined to the high sex ratio areas. A generalized shortage of females will stimulate a hypergamous migration of females towards more prosperous areas. Adaptations to poor marriage prospects are also likely to include an outflow of male migrants from the most affected areas.

7.5 CONCLUSIONS

While the rising sex ratio in China has been generally a national phenomenon, it has a tremendous variation across the country. The local variation reflects the complexity of family fertility decisions constrained by restrictive birth planning policies in the context of local culture and socio-economic conditions. The regional patterns highlight the importance of local ecology in understanding the high sex ratio phenomenon in China.

The recognition of regional variation is essential for a realistic appraisal of the effects of rising sex ratios. Some areas of China, including the far west, Manchuria, the lower Yangzi region, and much of Shandong, Hebei, and Shanxi, will experience only moderate effects. But broad regions of central and south China are likely to see serious dislocations of marriage markets and emerge as the heartland of a bachelor underclass.

There are indications that child sex ratios have reached a plateau, but as yet no sign that they have begun to decline. Thus it is as yet impossible to project any amelioration of the coming marriage squeeze through the arrival of more abundant females in younger cohorts. Like population aging, the severe marriage market squeeze for males is extant in the age–sex structure and is thus a virtually inevitable feature of China's demographic future.

8

Recent Changes in Marriage Patterns[1]

Guangyu Zhang and Baochang Gu

Marriage has been one of the most important social institutions in China for thousands of years. Universal marriage has been observed among the female population until very recently (Zeng 2000). Nonetheless, China's marriage patterns have experienced some important changes during the past half-century, the last 30 years in particular. Age at marriage has generally increased, marital fertility has fallen dramatically, premarital sex and extramarital affairs have become increasingly common, and the divorce rate has risen to a record level (Coale *et al.* 1991; Zeng and Wu 2000).

This chapter starts with a review of changing patterns of, and trends in, marriage in China in recent decades with particular reference to age at marriage and proportions marrying. It then examines changes in people's attitude towards marriage, especially with regard to premarital sex and divorce. The next section investigates the impact of changing marriage patterns on China's recent fertility decline. The analysis is largely based on data collected in two recent nationwide surveys: the 1997 National Demographic and Reproductive Health Survey and the 2001 National Family Planning and Reproductive Health Survey, although data gathered from other sources are also used. Partly due to the constraints imposed by data availability, the analysis focuses primarily on changes in female marriage patterns and their impact, although male age at marriage and proportions marrying are briefly discussed in section one. The final section provides an international perspective by comparing China's marriage patterns with those in other countries.

8.1 PROPORTION OF EVER-MARRIED AND AGE AT FIRST MARRIAGE

Early and universal marriage was pervasive in the female population in traditional China. Women married shortly after their menarche and mean age at first marriage was around 18 years. Almost all women would have married by the time they reached age 30 (Tien 1983; Coale 1986). According to Lee and Wang (1999: 67), the proportion of unmarried females remained stable throughout the last three centuries. These characteristics could still be found decades after the founding of the People's Republic. For example, the 1982 census and the One-Per-Thousand Fertility Survey conducted in the same year both reported that fewer than 1 per cent of women born between the 1930s and early 1950s remained single after age 30 (Coale 1984).

Using data collected by the 2001 national fertility survey, Figure 8.1 shows the proportion ever-married by age for five cohorts of women born in 1955, 1960, 1965, 1970, and 1975. The pattern of universal marriage has remained unchanged, at least for those born before the early 1970s. Of the birth cohorts of 1955 to 1970, more than 98 per cent had married by age 30. Women born in 1975 were aged 26 when the 2001 survey was conducted, and 86.3 per cent were already married. This proportion is very close to that of most of the selected cohorts although slightly lower than that of those born in 1965. Recent censuses reveal similar patterns. For example, the proportion of women who remained single at ages 30–34 was 0.6 per cent in 1990 and 1.3 per cent in 2000 respectively. Among men of the same age groups, the proportion unmarried at similar ages was only slightly higher, at 1.4 per cent in 2000.

There are, however, some interesting differences in the timing of marriage between the five birth cohorts of women. Thus over 16 per cent of the cohort

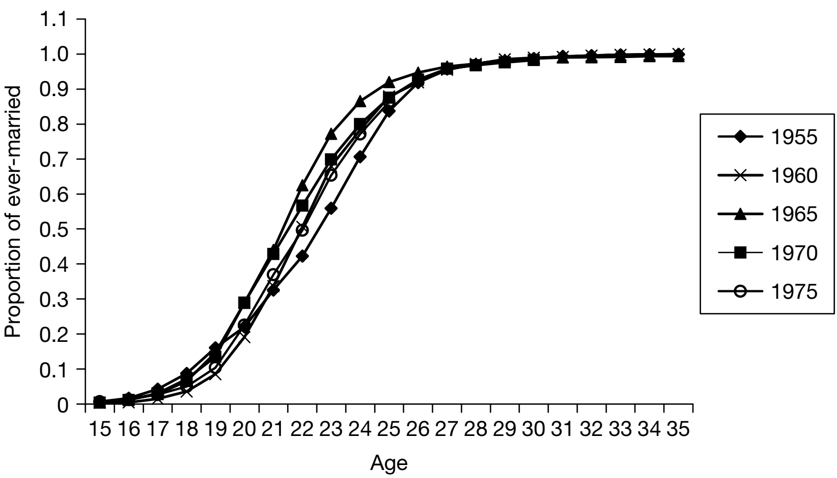

Figure 8.1 Proportion of ever-married women by age for five selected birth cohorts, China

Note: For the cohort born in 1975, the proportion ever-married is only cumulated to the age of 26.

Source: Based on the 2001 National Family Planning and Reproductive Health Survey data.

born in 1955, and around 14 per cent of those born in 1965 and 1970, were married before age 20. But the proportion marrying below age 20 was very low, at only 8 per cent, for the cohort born in 1960. It is also worth noting that the proportion ever married between ages 20 and 25 among those born in 1955 is markedly lower than that for later birth cohorts. This largely reflects the influence of the 'later, longer, and fewer' family planning campaign of the 1970s, and is further discussed later in the chapter. Such untypical postponement of marriage is still apparent in the 1960 birth cohort, although mainly at younger ages. Women born in 1965 were no longer affected. By comparison with other birth cohorts they have a consistently higher proportion marrying in their earlier 20s.

In traditional China, females married at very young ages. According to the survey conducted by Buck and Chiao among Chinese farmers in 1929–31, the average age at marriage was 17.5 for females (Barclay *et al.* 1976). Average age at marriage increased gradually to 18.6 in 1949, as shown by the 1982 One-Per-Thousand Fertility Survey. Shortly after the founding of the People's Republic, a new marriage law was promulgated in 1950, which stipulated a legal minimum age for marriage of 20 for males and 18 for females. During the following decades, as the marriage law was more widely implemented and socio-economic development increased, there was a gradual increase in the mean age at marriage (Zhao and Yu 1984).

In the early 1970s, the Chinese government launched a nationwide family planning campaign, in which late marriage was strongly promoted and used as a measure to lower fertility. Although the legal age for marriage remained the same, the government made every effort to urge urban women to marry after age 25 and rural women after 23. A series of steps were taken to ensure the implementation of these recommendations (Tien 1983). Consequently, there was a dramatic increase in the mean age at first marriage, which for females rose from 20.4 in 1971 to 22.8 in 1979, an addition of four months per year (Coale 1984). Such a policy driven rise could not continue for long once the administrative restrictions were lifted, as Figure 8.2 shows.

A new marriage law was promulgated in 1980, which increased the minimum legal marriage age from 18 to 20 for females and from 20 to 23 for males. This in effect abolished the *de facto* restriction on age at marriage imposed by the family planning program since the early 1970s (Tien 1983). Following the introduction of the new law, there was a marked decrease in age at marriage, even in the urban areas. As a result, mean age at marriage fell from 22.8 in 1979 to 21.4 in 1984 (e.g. Coale *et al.* 1991; Gu 1996; Zeng 2000). This decline ceased in the mid-1980s when age at first marriage started rising again, and slowly increased to 21.6 in 1990.

Recognizing the importance of late marriage in slowing population growth, the Chinese government took further action in the 1990s to promote late

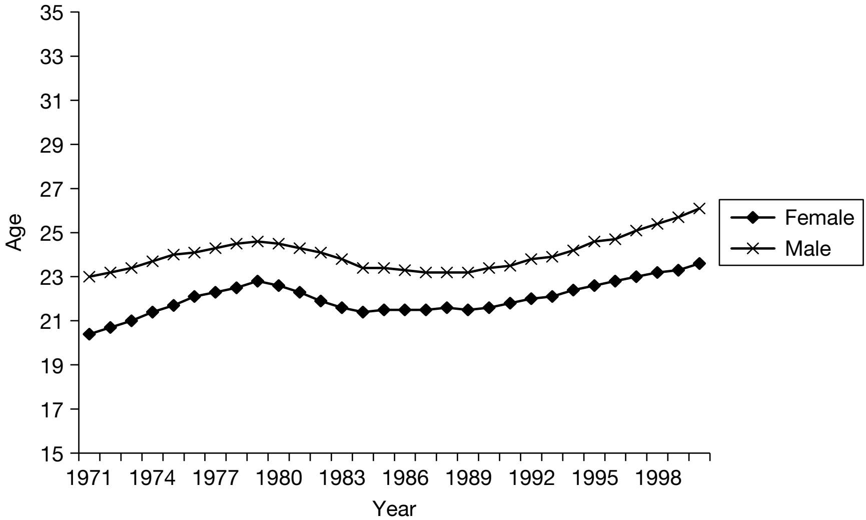

Figure 8.2 Mean age at first marriage by sex, China: 1971–2000

Source: Based on the 1 per cent sample of the 2000 census data.

marriage, primarily through the refinement of provincial family planning regulations. In most cases, recommended marriage ages were once again set at 23 for females and 25 for males (Feng and Hao 1992). In late 1992, the Ministry of Civil Affairs, the State Population and Family Planning Commission (SPFPC),[2] and other five Ministries issued a joint directive requiring all relevant government departments to strengthen the administration of marriage registration so as to curtail early marriage and early childbearing (Peng 1997). Other major changes taking place in the 1990s were China's rapid economic growth and increasing rural–urban migration, which greatly altered people's aspirations and lifestyles. Consequently, more and more young urbanites and rural migrants postponed their marriages, and this led to a further rise in age at marriage. According to the 1992, 1997, and 2001 surveys conducted by SPFPC, female mean age at marriage increased steadily, from 21.8 in 1991 to 22.6 in 1995 and further to 23.6 in the year 2000: about half a year above the record reached in 1980.

As shown in Figure 8.2, changes in mean age at first marriage for men have been very similar to those observed in the female population. Males on average have been two years older than females when marrying. But this age gap has fluctuated at different times. From 1971 to the mid-1980s, it fell from 2.6 years to about 2 years. It remained at around 1.8 years for about a decade, before rising again from the mid-1990s. At the end of the twentieth century, the age gap between male and female marriage ages was very similar to that recorded in the early 1970s.

The different roles played by the government family planning program, and socio-economic development, can be illustrated by changes in age-specific rates of first marriage of selected cohorts.[3] Figure 8.3 shows the age-specific marriage rates of women born in 1955, 1965, and 1975 respectively, who entered into marriage primarily in the 1970s, 1980s, and 1990s. Women born in 1955 started marrying after the 'later, longer, and fewer' family planning campaign had been introduced. Their marriage rate was low before they reached age 20, but peaked between age 23 and 25. In contrast, women born in 1965 and 1975 entered marriageable age after the new marriage law was implemented, with the concomitant relaxation of government control on age at marriage in the 1980s. While these two cohorts both had low proportions marrying before age 18, their marriage rates were rather high from age 20–23. After that the marriage rate fell notably, especially among those born in 1965. It is clear that the marriage experience of the 1955 birth cohort was largely affected by government intervention, while the changes in marriage patterns observed in the other two cohorts were more likely to have been affected by socio-economic factors.

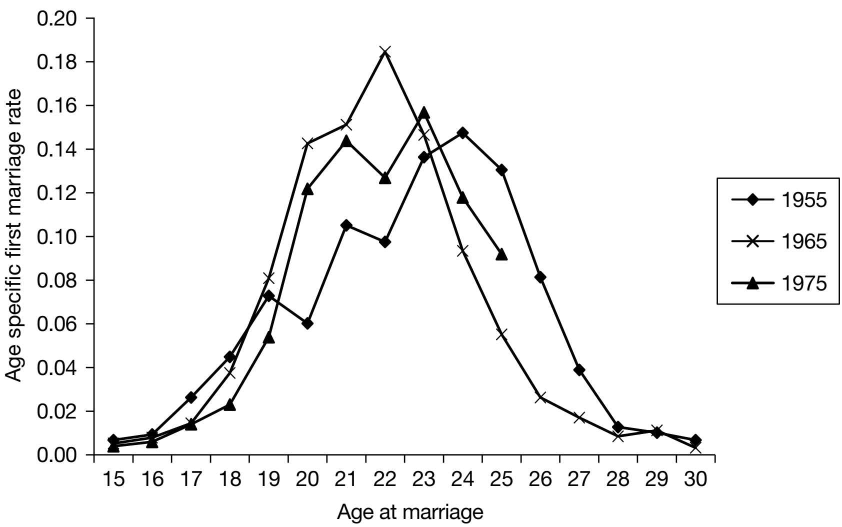

Figure 8.3 Age-specific first marriage rates for females born in China: 1955, 1965, and 1975

Source: Based on the 2001 National Family Planning and Reproductive Health Survey data.

8.2 CHANGES IN ATTITUDES TOWARDS SEXUAL RELATIONS AND THEIR IMPACT ON MARITAL BEHAVIOR

Not only in traditional China, but also in the early decades after the founding of the People's Republic, people's attitudes towards premarital and extramarital sexual relations were rather conservative. Great changes have only taken place in recent years, and especially since the early 1990s when China became more open to the outside world and people were increasingly exposed to western lifestyles through the media, the rapid expansion of the Internet, and a considerable increase in overseas visits.

There are no nationwide survey data available allowing a detailed examination of changes in attitudes towards sexual relations, marriage, and family. However, abundant information and evidence have been released in media reports, which indicate that a profound change is taking place. For example, a large number of books and magazines focusing on sexual education and related topics have been published. Shops selling contraceptives and a wide range of adult products are now found in many cities. People have become more open in discussions about sex and more tolerant towards premarital sexual relations and *de facto* relationships. Extramarital affairs, divorces, and same sex relationships have also increased considerably in recent years.

The 1997 national fertility survey interviewed 15,213 women of reproductive age randomly selected across the country. It was the first survey, if not the only one to date, to include two questions about women's attitudes towards premarital sex. One was that, 'Some people consider that it is acceptable to have sex before marriage if the two people involved plan to marry. Do you agree?' The other asked, 'Among the people you are familiar with, do you know anyone who had sex before marriage?' The number of women who did not answer these questions was less than 1 per cent. The survey reported that 12.6 per cent of respondents agreed that a man and woman could have sex before marriage if they planned to marry. More than half of respondents stated that among those they knew well there were people who had sex before marriage. There were some differences in attitudes to these questions between women living in different areas, of different age groups, and with different educational levels, as is shown in Table 8.1.

The survey results show that urban and more educated women tended to be more liberal about premarital sexual relations. Slightly higher proportions of urban and better educated women agreed with the statement, compared to their rural and less educated counterparts. Younger women seem more likely to agree with the statement, but no linear relationship was found between

Table 8.1 Percentage distribution of female respondents by attitudes towards premarital sex, China

	Agree	Disagree	No idea
Residence:			
Urban	14.4	77.5	7.2
Rural	12.1	81.1	6.2
Age group:			
20–24	13.1	79.3	6.9
25–29	15.4	76.9	7.1
30–34	16.2	78.1	5.4
35–39	12.4	81.3	5.9
40–44	11.1	83.7	4.6
45–49	10.2	83.0	6.3
Educational level:			
Primary school and below	11.9	80.5	7.0
High school and above	13.4	80.1	5.9

Source: Based on the 1997 National Demographic and Reproductive Health Survey data.

women's age and their attitude towards premarital sex: more women aged between 25 and 34 agreed with the statement than did those aged 20–24. Women aged over 35 appear to have been more conservative. Many respondents, nearly two-thirds in urban areas, and about 45 per cent of rural people, reported that they knew people who had premarital sex. Although the way this question was asked makes it difficult to compare the answers with those to the previous one, the results provide further evidence of the prevalence of premarital sexual relations, especially in cities.

Such changes in attitude inevitably have a considerable impact on people's sexual and marital behavior. However, national data on the extent of premarital sex are not available, and induced abortions taking place before marriage are often underrecorded. For these reasons, our examination concentrates on childbearing within nine months of marriage.[4] As an indicator of premarital sex or conception, this obviously represents only the minimum, but it sheds some light on the population trends in premarital sexual activity.

Studies have shown that premarital conceptions had already started to increase in the 1980s (Wang and Yang 1996), but the change was relatively slow until the mid-1990s. As shown in Table 8.2, the proportion of married women who had a first birth within nine months of marriage increased form 14.0 per cent to 18.7 per cent over this period. Since then, however, a dramatic increase has been recorded. The 2001 fertility survey shows that the proportion of married women having a first birth in less than nine months jumped to 34.3 percent in 2000: nearly double the percentage recorded in 1995. It is particularly

Table 8.2 Proportion of women having first births within 9 months of marriage, China: 1980–2000

Year of marriage	Proportion having births within 9 months of marriage
1980	14.0
1985	14.9
1990	16.8
1995	18.7
2000	34.3

Source: Based on the 2001 National Family Planning and Reproductive Health Survey data.

interesting to note that this change actually took place during a period when the overall interval between marriage and first birth increased by a few months (Ding 2003).

Another marked change in marriage patterns is the increase in divorce. Divorce was culturally discouraged in traditional China and remained so after the founding of the People's Republic. For these reasons, the level of divorce was very low before the 1980s (Zeng *et al.* 1995; Xu and Ye 2002). Because of recent changes in people's attitudes towards marriage and sexual relations, extramarital affairs and divorces have both increased rapidly in the last two decades.

Figure 8.4 shows total numbers of marriages and divorces registered from 1980 to 2004. More than ten million marriages were recorded in 1981, the highest number in recent decades. This was obviously related to the introduction of the 1980 marriage law. After that, the number of marriages first fell and then gradually increased to 9.6 million in 1992. This resulted from the fact that a large number of 'baby boomers' born in the 1960s entered marriages. Since then the number of marriages has decreased because of the reduction in cohort size resulting from fertility declines, with only a slight increase from 2003. It should be noted that these official marriage statistics include both first marriages and remarriages. Recent figures, which contain a large number of remarriages, therefore need to be interpreted with caution.

Changes in the number of divorces show a radically different pattern, increasing steadily after 1980 when the new marriage law made divorce easier than before. The number of divorces first exceeded one million in 1995 and continued to rise to reach 1.7 million in 2004, the latest available figure. Given the reduction in the number of marriages, this implies an even faster increase in the ratio of divorces to marriages, as is evident in Figure 8.4. In the early 1980s, the ratio was about 0.05, or five divorces to every 100 marriages. By the

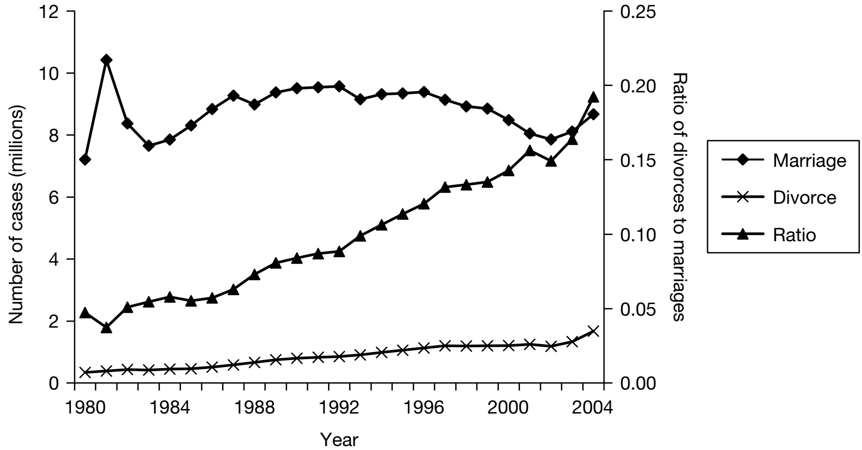

Figure 8.4 Changes in marriages and divorces, China: 1980–2004
Source: Ministry of Civil Affairs (2004).

early 1990s, this ratio rose to approximately 0.10, or ten divorces for every 100 marriages. In 2004, the ratio reached a record level of 0.19 or nearly 20 divorces for every 100 marriages. While the decline in the number of marriages is partly due to the reduction in cohort size of marriageable people, the rapid increase in divorces is obviously a result of recent changes in marriage behaviors, facilitated by the 1980 marriage law.

Since the founding of the People's Republic, there have been three marriage laws, promulgated in 1950, 1980, and 2002 respectively. Traditional marriages were dominated by arranged marriage. The 1950 marriage law was intended to promote and protect marriages formed on the basis of free choice of marriage partners, monogamy, and equal rights between both husband and wife (Arnold and Liu 1986). In 1980, a new marriage law was passed by the National People's Congress, which continued the spirit of its predecessor and outlawed arranged marriage, 'marriage by purchase,' concubinage and bigamy, among other things (Engel 1984). As already discussed, one important change was to set a new legal minimum age of marriage. Many important changes have taken place in marriage behaviors and patterns during China's recent socio-economic transformation which were not adequately accommodated by the 1980 marriage law, such as the steady increase in extramarital relationships, the fast growing number of divorces, and the surge in property disputes caused by marriage dissolution. In the mid-1990s, an amendment of the 1980 marriage law was proposed, and this was finally promulgated in 2002. The new marriage law emphasizes the importance of family and the loyalty required of each partners to a marriage. However, the newly amended law actually simplifies the procedures of divorce application and made divorce easier than before (Zhang 2001). In general, the introduction of the new marriage law reflects the profound changes that have taken place in the past two decades.

8.3 CHANGES IN MARRIAGE PATTERNS AND FERTILITY DECLINE

Changes in marriage behavior, especially age at marriage and proportion marrying, may considerably affect fertility patterns and levels (see Ryder 1956; Coale 1984; Bongaarts and Feeney 1998). This is especially the case in China where pregnancies have largely taken place within marriage and childbearing out of wedlock has been negligible. This section examines two effects of changing marriage age on fertility behavior in the 1990s: one is the change in first birth interval, and the other is its role in depressing fertility.

A relatively long interval between marriage and first birth was one of the noticeable features of China fertility patterns before 1970, but that was considerably reduced during the 1970s and 1980s. This was primarily attributed to the decline of arranged marriage, increases in female education and employment, and changing attitudes and behavior towards sex, although it was also closely related to the family planning program (Wang and Yang 1996). The change is displayed in part in Figure 8.5, which shows changes in the first birth interval from 1980 to 2000. According to the 2001 survey, the length of the first birth interval fell to approximately 16 months around 1990, and then gradually increased to about 20 months by the end of the 1990s (Zhang 2004*a*). This increase coincided with the rise in age at first marriage observed during the decade.

There are two possible explanations for the increase in first birth interval, not necessarily exclusive. One is the further strengthening of the family planning program in 1991, which through the use of contraception and abortion prevented many couples from having children soon after marriage. According to statistics published by both the Ministry of Health and SPFPC, the number of abortions did increase sharply in the early 1990s, from 10.4 million in 1989 to 14.1 million in 1991. However, statistics from the same sources also show that the number of abortions steadily declined in the later 1990s and fell to 6.7 million in 2000 (MoH 2000; SPFPC 2001). The second explanation is that more couples were postponing their marriage and childbearing. This is closely related to recent socio-economic changes, as has been pointed out both in the introduction and other chapters in this book. For example, there has been a great increase in population mobility and China's floating population reached

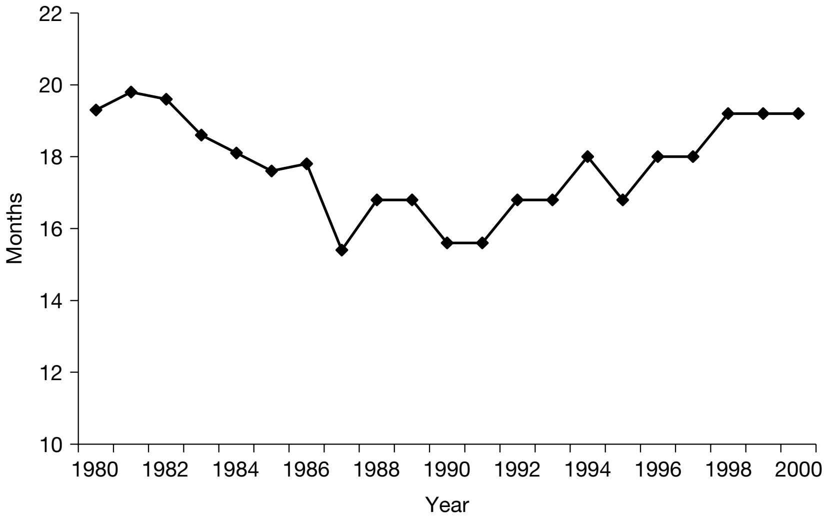

Figure 8.5 Changes in first birth intervals, China: 1980–2000

Sources: The 1980–90 series are from Zeng (2000); the 1991–2000 series are based on the 2001 National Family Planning and Reproductive Health Survey data.

144 million in 2000 (NBS 2002). That many young rural migrants moved to the city, and were subject to severe competition in the job market and to the influences of an urban and modern life style, may have played an important part in delaying marriage and first births. While in recent years many couples have begun their sexual relationships at young ages, they have effectively postponed marriage and reproduction.

Based on demographic data of the 1970s and 1980s, previous studies have suggested that rising age at first marriage had a major effect on period fertility, even if cohort fertility remained unchanged (Coale *et al.* 1991; Feeney *et al.* 1989). In a number of analyses, Coale and his colleagues showed that the total duration-specific fertility rate (TDFR)—the sum of fertility rates of ever-married women at each duration since their first marriage—was a more robust measure than the conventional TFR with respect to changes in age at first marriage (Coale 1984, 1989; Coale *et al.* 1991). This is because the TDFR shows the average number of children that would be borne by a group of newly married women, assuming that they would experience the fertility rate at each duration of marriage in a given period. Thus, changes in marriage age do not affect childbearing after marriage.[5] As virtually all Chinese women have married, Coale (1989: 839) suggested that the ratio of TFR to TDFR is 'a measure of the effect of recent changes in nuptiality on overall fertility.' If there were no changes in age at first marriage, the value of TFR would be equal to that of TDFR. However, because age at first marriage often fluctuates from year to year, the relationship between the two measures also varies. When the mean age at marriage increases but the TDFR holds, the TFR value is lower than that without such a change, and hence the ratio between the two is below 1. When the mean age at marriage decreases, the TFR will increase while the TDFR remains the same. Consequently the ratio will be above 1.

Figure 8.6 shows TFRs and TDFRs from 1990 to 2000 calculated from the 2001 survey. The TFR was lower than the TDFR throughout the entire 1990s except in the year 1990. The ratio of TFR to TDFR was below 1 during the same period, clearly suggesting the effect of rising age at marriage on fertility.

The TFR/TDFR ratio can be used to estimate the number of births that would occur if marriage age had remained constant. Multiplying the TFR/TDFR ratio by the number of annual births, Coale and his colleagues (1991: 391) estimated that from 1971 to 1980 about 19 per cent of the reduction in births, or 53 million births, resulted from the rise in marriage age. Using the same approach, Lin (1994: 19) estimated that about 3 per cent of the increase in births in the first half of the 1980s was attributable to the decline in age at marriage. According to the 2001 survey, the TFR/TDFR ratio from 1991 to 2000 was on average 0.93, implying a 7 per cent reduction in fertility resulting from delayed marriage. It was estimated that the total number of births during this period was 191.86 million (Zhang 2004*b*). If age at marriage and the duration-specific fertility rates had not changed, there would have been an additional 13.4 million children born in the

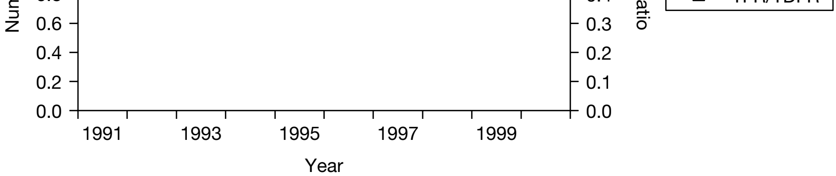

Figure 8.6 TFR, TDFR, and the TFR/TDFR ratio, China: 1991–2000

Notes: TFR: total fertility rates; TDFR: total duration-specific fertility rates.

Source: Based on the 2001 National Family Planning and Reproductive Health Survey data.

period from 1991 to 2000. The reduction is undoubtedly an important contribution to the fertility decline of the 1990s.

8.4 CHINESE MARRIAGE PATTERNS IN INTERNATIONAL PERSPECTIVE

China's marriage patterns have experienced great changes in recent years. However, these changes are not unique but are broadly similar to those observed in other countries, those of East and Southeast Asia in particular. In this region, changes in marriage patterns first appeared in Japan, subsequently in South Korea and Singapore, and spread further to other East and Southeast Asian countries including Thailand, Indonesia, and China (Tsuya 2001). However, so far as the proportion marrying is concerned, a very low proportion of women remaining single at ages 30 and above remains a major characteristic of the Chinese marriage pattern.

Table 8.3 compares changes in female singulate mean age of marriage (SMAM) from 1980 to 2000 in selected East and Southeast Asian countries with different levels of socio-economic development. All five countries have witnessed similar trends in increasing female mean age at first marriage, although the increase began at different times and with different magnitudes. Japan and Korea already had high SMAMs in 1980 and they increased further in the next two decades, from 24.1 and 25.1 in 1980 to 27.1 and 28.6 in 2000, respectively. Thailand's SMAM was similar to that for China in 1980, but increased faster and was thus a little higher than that of China in 2000.

Table 8.3 Singulate mean age of marriage (SMAM) for females in selected Asian countries: 1980–2000

Year	1980	1990	2000
Thailand	22.8	23.5	24.0
Indonesia	20.0	21.5	22.5
China	22.4	22.1	23.3
Korea	24.1	25.4	27.1
Japan	25.1	26.9	28.6

Sources: Thailand figures are from Prachuabmoh and Mithranon (2003); Indonesia, Korea, and Japan figures of 1980 and 1990 are from Tsuya (2001); Korea 2000 figure is from Choe *et al.* (2004); Indonesia and Japan figures for 2000 are from UN (2004); and Chinese figures are based on the authors' own calculations.

Table 8.4 Proportion of women who are single aged 30–34 and 35–39 in selected Asian countries: 1980–2000

Country	Age group	1980	1990	2000
Thailand	30–34	11.8	14.1	16.1
	35–39	7.3	9.6	11.6
Indonesia	30–34	3.4	4.5	6.9
	35–39	1.9	2.7	3.5
China	30–34	0.7	0.6	1.3
	35–39	0.3	0.3	0.5
Korea	30–34	2.7	5.3	10.7
	35–39	1.0	2.4	4.3
Japan	30–34	9.1	13.9	26.6
	35–39	5.5	7.5	13.8

Sources: Figures for China are based on the 1982, 1990, and 2000 censuses; others are from Jones (2005).

Indonesia's SMAM was consistently the lowest among the five, but it rose by 2.5 years during the period under observation compared to the increase of less than one year recorded in China. These results appear to suggest that age at first marriage is likely to increase further in China in the foreseeable future.

Like changes in mean age at marriage, proportions ever marrying vary considerably in these populations, as shown in Table 8.4. In the study period, Japan and Thailand consistently had high proportions of never married women. In the year 2000, among women aged 35–39 they reached 13.8 percent and 11.6 per cent respectively. Proportions never marrying were relatively low in South Korea and Indonesia where approximately 4 per cent of women aged 35–39 remained single in 2000. However, that percentage is still much higher than in China where the proportion of single women aged 35–39 was only 0.5 per cent. Changes in proportions of single women aged 30–34 show similar patterns.

Previous research has shown that increasing age at marriage, and a rising proportion of women who do not marry are often closely associated with the improvements in education and female labor force participation driven by socio-economic development and changing attitudes towards marriage and family (Tsuya 2001; Jones 2005). Thus, it may be speculated that China's slow change in the proportion ever marrying is due to the relatively low level of development in its vast rural areas. This seems not to be a sufficient explanation however. Even in China's most advanced areas, the proportion of women remaining single is rather low. Table 8.5 compares proportions single among women aged 30–34 and 35–39 in China as a whole, and in urban Beijing and Shanghai, in 1990 and 2000. As expected, both urban Beijing and Shanghai had

Table 8.5 Proportion of women who are single aged 30–34 and 35–39 in China, urban Beijing and urban Shanghai: 1990 and 2000

Age group	China		Urban Beijing		Urban Shanghai	
	1990	2000	1990	2000	1990	2000
30–34	0.6	1.3	2.3	3.9	2.9	3.4
35–39	0.3	0.5	1.6	1.4	1.9	1.4

Sources: Based on the 2000 census data (NBS 2002; Beijing Bureau of Statistics 2002; Shanghai Bureau of Statistics 2002).

higher proportions of never married females in the two age groups than the national average in both years. This is likely contributable to their difference in their levels of development. Nevertheless, it is intriguing to note that even in urban Beijing and Shanghai, the proportions never marrying were far lower than those observed in the four selected populations listed in Table 8.4. Furthermore, in both urban Beijing and Shanghai, the proportions single among women aged 35–39 actually decreased in 2000 by comparison with those recorded ten years ago. While a growing number of women in the population are delaying their age at marriage, the overwhelming majority of them have not abandoned marriage completely.

After examining changing marriage patterns in East and Southeast Asian countries, Jones (2005) reported a widely observed trend of increasing proportions of women aged between 30–34 and 45–49 remaining single in major cities of the region. As far as the levels of socio-economic development, such as educational level, female labor participation and household income, are concerned, urban Beijing and Shanghai are probably not behind some of the study cities including metro Manila, Jakarta, and Yangon. One could speculate that a shift to nonmarriage has been delayed but will take place in China, because of the relatively recent nature of its rapid socio-economic development. Given the trends observed in other Asian countries, this may not be an unreasonable speculation, although only time will tell whether this hypothesis is a valid one.

While rapid socio-economic changes are tending to make some Chinese marriage patterns similar to those existing in various other populations, there is another change that will affect marriage patterns and behavior in China in years to come. As has been detailed in the previous chapter, an increasing sex ratio at birth has been apparent in China in recent decades and there is no indication that this trend will stop soon (e.g., Hull 1990; Zeng *et al.* 1993; Banister 2004). Some demographers estimate that between 1980 and 2000 perhaps 8.5 million girls were missing (Cai and Lavely 2003), but others consider this figure could be as high as 9.5 million (Jiang *et al.* 2005). A further estimate suggests that there are perhaps 23 million surplus males among those born from 1978 to 2000, which will pose a severe challenge to the marriage market when these birth cohorts gradually enter into marriageable ages (Poston and Glover 2005). This is likely to exert a considerable impact on marriage patterns. One possible scenario is that under the situation of a marriage squeeze, age at first marriage for females will decline considerably, due to strong male competition; but on the other hand, families may become increasingly unstable with consequent further increases in divorces.

8.5 CONCLUSIONS

Early and universal marriage was prevalent among Chinese women in the past. This centuries-long institution has begun to change in recent decades, driven by China's nationwide family planning program and rapid socio-economic development. At the beginning of the twenty-first century age at first marriage for both males and females, and divorce, all reached record levels. Premarital cohabitation, extramarital affairs, and remarriages were all on the rise. Despite these changes, the proportion never marrying remains very low among Chinese men and women, even in China's most developed urban areas.

As shown by Coale and his colleagues (1991), delayed marriage played an important part in China's fertility decline in the 1970s, and falling marriage age was closely related to the fluctuations in fertility levels in most of the 1980s. This chapter further demonstrates that rising age at marriage also contributed considerably to the fertility reduction in the 1990s which resulted in China's below replacement fertility.

Changes in marriage patterns in China are broadly similar to those taking place in other East and Southeast Asian countries (East-West Centre 2002; Jones 2005). By comparison with some other countries, age at marriage in China is still relatively youthful and the proportion remaining single is extremely low. Furthermore, the rising sex ratio among children is likely soon to influence the marriage market. Thus, it can be expected that China's marriage patterns will continue to change and play a major role in affecting China's population dynamics in the near future.

9

Poverty, Progress, and Rising Life Expectancy

Judith Banister

The People's Republic of China (PRC) has achieved continuing and striking mortality decline during two very different historical periods. China is considered a model of how to bring about reduction of mortality in a poor country, based on its record during the Maoist era from the founding of the PRC in 1949 until the death of Mao Zedong in 1976. Many observers have attributed the enormous survival improvements of that era to the comparative economic and social equality of the period, to government policies directing preventive and curative medical care toward the rural and less privileged parts of China, and to highly subsidized medical insurance coverage and medical treatment in urban and rural areas. The economic reform era that followed has been characterized by rising inequality and near collapse of the subsidized medical systems, and yet the decline in mortality has continued to be impressive. This fact seems paradoxical, particularly to those who credited China's egalitarian socialist economic and health system model for mortality decline in the Maoist decades. The China of the economic reform period since 1978 has abandoned much of that model, and yet mortality rates continue to drop.

This chapter explores why mortality in China declined in the Maoist period and why that mortality decline has continued during the economic reform since the late 1970s. The discussion emphasizes the importance of China's remarkable, extended, and rapid economic development for reducing mortality in the most recent quarter century. The chapter also highlights regional and urban–rural socioeconomic differentials and shows that parallel mortality differentials remain between China's more privileged and underprivileged areas.

9.1 MORTALITY DECLINE IN THE MAOIST ERA

The PRC began with a very high traditional level of mortality from the pre-Communist decades (Barclay *et al*. 1976; Banister 1987: 50–9, 78–85). Rapid mortality decline took place in the 1950s, as in most other developing countries that benefited from the post World War II introduction of modern systems of epidemic disease control, antibiotics, immunizations, and other cheap and effective public health measures. China's success in control of mortality was heightened by the cessation of international invasion and civil war, disarming of the general population, widespread retraining of midwives in sanitary birthing techniques, land reform to give peasants access to arable land, movement of grain from surplus to deficit areas, and public health campaigns. During the intercensal period 1964–82, centered on the early 1970s, China achieved an average expectation of life at birth of 60 years (after adjustment for underreporting of deaths), double the life expectancy when the PRC was founded (Banister and Hill 2004).

China's mortality decline in the Maoist period was caused not only by the introduction of modern public health measures from abroad, but also other social and economic trends, as well as health policies. In the 1950s, China followed the Soviet model of rapid heavy industrialization and government directed urbanization; the urban population increased from 11 per cent of the total in 1949 to 20 per cent in 1960. Urbanization and industrialization are socio-economic factors that tend to cause mortality decline in the modern world. In addition, China's urban population was given privileged access to health care, housing, factory jobs, and food subsidies. The urban proportion of China's population was tightly controlled at 17–18 per cent during the 1960s and 1970s. But China's urban population has continued to receive favored treatment and has registered much lower mortality levels than the rural population throughout the five and a half PRC decades.

Certain social policies also favored mortality decline in the Maoist period, for example the Communist Party's emphasis on promoting equal treatment of girls and boys, women and men. Excess mortality of females has diminished, throughout the PRC period, at all ages except infancy (Banister 2004; Banister and Hill 2004). Also very important was the government's determination to reduce illiteracy and to universalize primary education, which has paid off in many ways, one of which is reduction of child mortality (Banister and Zhang 2005).

In the late 1960s, the PRC government introduced policies to help improve the health and survival of the rural population, including village cooperative medical systems, with highly subsidized health insurance and care. By 1975, 85 per cent of the rural population of China had medical insurance coverage, most of it provided by the rural cooperative medical system (World Bank 1997*a*: 1). The expansion of this system in the 1970s, in conjunction with maternal and child health centers at county level, may have contributed to the sharp decline in infant mortality and mortality under age 5 during that decade. Indirect estimates from China's 1982 census and 1982 retrospective fertility survey indicate that China's infant mortality rate (IMR) dropped from above 80 infant deaths per thousand live births in 1970 to about 50 in 1980, and that the under-5 mortality rate (U5MR) declined from almost 120 deaths per thousand live births in 1970 to about 60–70 in 1980 (Hill *et al.* 1999: 58–9; Banister and Hill 2004: 62–6).

China's family planning program was extended to rural areas in the 1970s and became ever more insistent as the decade progressed. The PRC total fertility rate (TFR) dropped from 5.8 births per woman in 1970 to 2.7 by 1978. Required late marriage, spacing of births, and fertility limitation concentrated childbearing in the very late teens, the 20s, and the early 30s, the healthiest ages for mother and child, and reduced young child mortality by extending the time between births. Therefore, much of the 1970s decline in death rates for the youngest children was probably caused by later marriage, family planning, and the rural collective medical system.

All the foregoing mortality declines occurred before the beginning of the economic reform period initiated by the post-Mao government of Deng Xiaoping in 1978. China had achieved a life expectancy of 60 years and infant mortality rate of about 50 in the context of a population still living in grinding poverty and enduring continuing food shortages.

9.2 ECONOMIC GROWTH, POVERTY REDUCTION, AND INCREASING INEQUALITY UNDER ECONOMIC REFORM

After the death of Mao Zedong, China's new leadership embarked upon a radical policy change to shift gradually from a command economy to a market economy. Collective agriculture in rural areas and government control of the urban economy had outlived their usefulness and could not adapt to the complexities of a modern economy. The economic reforms have released many of the former constraints on China's economic development in a step-by-step manner. As a result, the PRC has had one of the world's most rapidly growing economies for the most recent quarter century, as shown in Figure 9.1. China's real per capita gross domestic product (GDP) multiplied six times from 1978

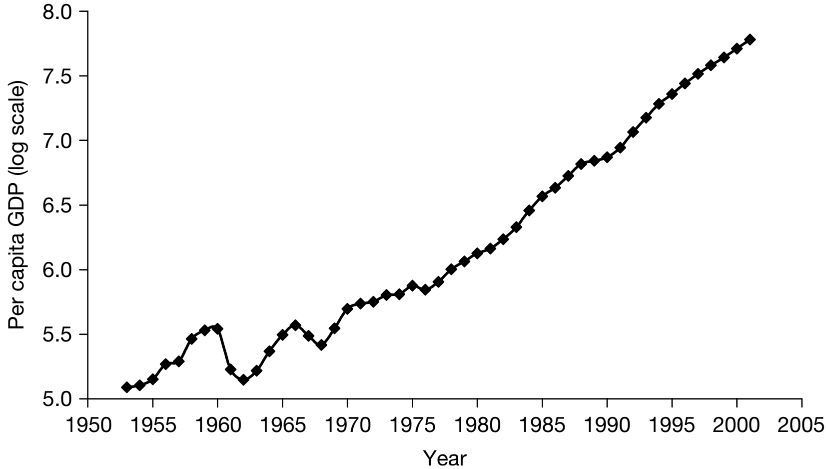

Figure 9.1 Changes in per capita GDP: 1953–2001

Note: Data based on constant 1980 prices.

Sources: Calculated by Banister and Zhang (2005) based on real per capita GDP growth rates from China NBS (1999), *Comprehensive Statistical Data and Materials on 50 Years of New China*, and 1999–2002 *China Statistical Yearbooks.*

to 2001, growing 7.8 per cent a year on average (NBS 2002: 54). By 1998, China's per capita gross national product (GNP) measured at purchasing power parity (PPP) was estimated to be US$3,220, similar to Egypt, Jordan, Kazakhstan, Morocco, and Syria, all lower middle income countries (World Bank 2000: 230–1).

There have been some negative effects of the marketization and privatization of China's economy in the most recent quarter century. The PRC government allowed the collapse of the rural collective medical systems that had provided basic medical insurance coverage and subsidized health care to most of the rural population. By 1989, only 5 per cent of villages in China continued to offer cooperative health insurance (*Jiankang Bao* (Health Daily), 23 February 1992, cited in Henderson *et al.* 1994). As of the late 1990s, close to 90 per cent of the rural population and 40–50 per cent of the urban population were without health insurance (Liu *et al.* 1998: 117; MoH 1999: 18). Meanwhile, the costs of medical care have risen. The combination of low health insurance coverage and high cost of health care leaves large proportions of China's population unable to buy medicines they require and unable to afford hospitalization when they need it. Certainly a great deal of excess mortality happens in China today because of lack of access to essential care.

Working against the above factors that tend to raise death rates has been the impressive decline in poverty during China's economic reform period, which tends to greatly reduce excess mortality. In most countries, data and estimates on poverty are seriously problematic, and China is no exception. The PRC has routinely underestimated the population living in poverty by using a very low cutoff point for the poverty line, and by estimating the poverty population only from poor rural counties, thereby excluding from the poverty estimates the poor in other counties and in urban areas. According to official PRC figures, one-third of China's *rural* population was living in 'absolute poverty' in 1978 at the beginning of economic reform. Between 1978 and the mid-1980s, almost all of China's rural people's communes were disbanded, and agricultural land was divided up and allocated to farming families to use. For the first time since agricultural collectivization in the 1950s, farmers were allowed to sell their surplus produce and keep the proceeds. Agricultural production increased dramatically. Between 1978 and 1986, China's total agricultural output more than doubled, increasing by 118 per cent in constant prices (USDA 1988: 4). Simultaneously, according to official PRC figures, the proportion of the rural population in the PRC subsisting in absolute poverty declined steeply from 33 per cent in 1978 to 12 per cent in 1985, and more gradually after that to 8 per cent in 1995, 6 per cent in 1997, and 3 per cent in 2003 (Fan *et al.* 2002: 11–12; MoF 2004). This would correspond to a drop in the number in absolute poverty in the PRC from 261 million in 1978 to 97 million in 1985 to 69 million in 1995 to 24 million in 2003.

World Bank experts have attempted to derive more internationally comparable figures for China's population in poverty. They estimated that about half of China's total population (which would have been around 480 million) was living in poverty in 1978 when the reforms began, and that by 1993, the PRC had about 350 million people in poverty, 30 per cent of the total population, based on the poverty line of a daily per capita income of an internationally comparable PPP of US$1 (World Bank 1996; 1997*a*: 36). However, apparently inconsistent with those higher estimates (possibly using a different methodology) is a more recent World Bank estimate that 22.2 per cent of China's 1995 population was living below the poverty line of US$1 PPP, which would be 269 million PRC citizens in poverty (World Bank 2000: 236).

The latest poverty figures for China are as follows. The World Bank said that 'up to 161 million people were living on less than $1 a day in 2001' (World Bank 2003). That number constituted 12.6 per cent of China's total 2001 population. But China's Minister of Commerce, Lu Fuyuan, said in a September 2003 speech: 'China still has 300 million rural people living under the poverty line' (Lu 2003). If so, the PRC's current population in poverty constitutes 38 per cent of the rural population and 24 per cent of China's total population. His speech suggests, however, that this figure is based on nominal (not PPP) exchange rates, which underestimate the true GDP per capita in China and overestimate the population with less than US$1 in income.

The foregoing data and estimates, though full of inconsistencies and problems, nevertheless all lead to the conclusions that poverty was very widespread in China as the Maoist period ended and economic reforms began, that the proportion of the population in poverty dropped sharply in the early and mid-1980s, and that genuine poverty decline has continued but has been more gradual from the late 1980s through the 1990s until today. The PRC still has a very large poverty population, using any of the internationally comparable estimates, no matter how they have been derived.

During the economic reform period, per capita GDP has multiplied manyfold, and the proportion of the population in poverty has greatly declined. At the same time, income distribution has become increasingly unequal. The World Bank estimated that China's Gini coefficient, a measure of income inequality (0 = absolute equality, 100 = absolute inequality), rose from a low 28.8 in 1981 to 38.8 in 1995, a figure that is still considered moderate inequality compared to, for example, Sub-Saharan Africa and Latin America (World Bank 1997*b*: 1–3). But inequality has worsened greatly in the early twenty-first century. Living standards have further diverged between urban and rural populations, within urban areas, and within the rural population. The key economic issue in China today is less the poverty issue and much more 'the inequality issue,' the World Bank says (Xu 2004). Given rising inequality and continuing poverty, it is important to investigate not only mortality levels and trends for the national PRC population as a whole, but also for the disadvantaged components of China's population.

9.3 FURTHER MORTALITY IMPROVEMENT AND URBAN–RURAL MORTALITY DIFFERENTIALS

Since China started its economic reform, mortality has continually declined for both sexes in all age groups, except that female infant mortality apparently increased from the 1982–90 intercensal period to the 1990–2000 intercensal period. Expectation of life at birth for China's population rose from 60 years in the 1964–82 intercensal period to 71 in 2000 (Banister and Hill 2004). Adjusted male and female life tables for China 2000 are given in Table 9.1.

These life tables are based on the highest quality data on China's mortality levels, which come from the population censuses; they are adjusted in the most sophisticated manner to account for underreporting; and they use the best available and most complete information on the levels of infant and under-5

Table 9.1 Adjusted life tables for China: 2000

x	n	${}_nM_x$	${}_na_x$	${}_nq_x$	l_x	${}_nd_x$	${}_nL_x$	${}_5P_x$	T_x	e_x
Males:										
0	1	0.02715	0.119	0.02652	100,000	2,652	97,663	0.97056	6,933,409	69.33
1	4	0.00189	1.573	0.00753	97,348	733	387,615	0.99360	6,835,746	70.22
5	5	0.00075	2.500	0.00374	96,616	362	482,174	0.99674	6,448,130	66.74
10	5	0.00055	2.500	0.00277	96,254	267	480,602	0.99652	5,965,957	61.98
15	5	0.00084	2.500	0.00420	95,987	403	478,929	0.99454	5,485,354	57.15
20	5	0.00135	2.500	0.00672	95,584	643	476,315	0.99274	5,006,426	52.38
25	5	0.00156	2.500	0.00779	94,942	740	472,859	0.99148	4,530,110	47.71
30	5	0.00186	2.500	0.00925	94,202	871	468,832	0.98965	4,057,251	43.07
35	5	0.00231	2.500	0.01147	93,331	1,071	463,978	0.98557	3,588,419	38.45
40	5	0.00352	2.500	0.01743	92,260	1,608	457,281	0.97940	3,124,441	33.87
45	5	0.00482	2.500	0.02383	90,652	2,161	447,859	0.97022	2,667,160	29.42
50	5	0.00730	2.500	0.03587	88,492	3,174	434,523	0.95379	2,219,300	25.08
55	5	0.01172	2.500	0.05693	85,318	4,857	414,445	0.92499	1,784,777	20.92
60	5	0.01976	2.500	0.09417	80,460	7,577	383,359	0.87866	1,370,333	17.03
65	5	0.03274	2.500	0.15133	72,883	11,030	336,842	0.80752	986,974	13.54
70	5	0.05479	2.500	0.24095	61,854	14,904	272,008	0.71193	650,132	10.51
75	5	0.08489	2.500	0.35015	46,950	16,440	193,649	0.58700	378,124	8.05
80	5	0.13680	2.500	0.50970	30,510	15,551	113,673	0.44492	184,474	6.05
85	5	0.19155	2.500	0.64763	14,959	9,688	50,576	0.28566	70,801	4.73
90		0.26063	3.837	1.00000	5,271	5,271	20,225		20,225	3.84
Females:										
0	1	0.04015	0.167	0.03885	100,000	3,885	96,762	0.95851	7,222,795	72.23
1	4	0.00203	1.461	0.00806	96,115	775	382,493	0.99332	7,126,032	74.14
5	5	0.00055	2.500	0.00273	95,340	260	476,052	0.99766	6,743,539	70.73
10	5	0.00039	2.500	0.00194	95,080	185	474,940	0.99765	6,267,487	65.92
15	5	0.00055	2.500	0.00276	94,896	262	473,824	0.99649	5,792,547	61.04
20	5	0.00086	2.500	0.00427	94,634	404	472,159	0.99531	5,318,723	56.20
25	5	0.00103	2.500	0.00512	94,230	482	469,943	0.99453	4,846,564	51.43
30	5	0.00117	2.500	0.00582	93,747	546	467,372	0.99373	4,376,621	46.69
35	5	0.00135	2.500	0.00673	93,201	627	464,440	0.99147	3,909,249	41.94
40	5	0.00208	2.500	0.01035	92,575	958	460,478	0.98726	3,444,809	37.21
45	5	0.00305	2.500	0.01515	91,617	1,388	454,614	0.98050	2,984,330	32.57
50	5	0.00484	2.500	0.02392	90,229	2,158	445,749	0.96903	2,529,717	28.04
55	5	0.00779	2.500	0.03820	88,071	3,365	431,943	0.94863	2,083,967	23.66
60	5	0.01345	2.500	0.06506	84,706	5,511	409,753	0.91514	1,652,025	19.50
65	5	0.02239	2.500	0.10604	79,195	8,398	374,982	0.85984	1,242,271	15.69
70	5	0.03916	2.500	0.17834	70,798	12,626	322,423	0.77810	867,290	12.25
75	5	0.06374	2.500	0.27491	58,172	15,992	250,878	0.66247	544,867	9.37
80	5	0.10758	2.500	0.42388	42,180	17,879	166,200	0.52356	293,989	6.97
85	5	0.15853	2.500	0.56768	24,300	13,795	87,015	0.31907	127,788	5.26
90		0.25766	3.881	1.00000	10,506	10,506	40,773		40,773	3.88

Notes: Death rates in all age groups first adjusted for incomplete reporting, 90% complete for males and 85% complete for females (Banister and Hill 2004). IMR and U5MR are adjusted upward to match national rates from China Child Mortality Surveillance System.

Sources: China 2000 census data from NBS (2002), 1: 570–2 and 713–15; China National Working Committee on Children and Women (2001: 28).

mortality. Therefore the mortality estimates in Table 9.1 for China 2000 are unusually solid. These life tables show that the PRC had achieved life expectancy of 71 years by the year 2000 (up from 60 years in the 1970s before the economic reform), and that female life expectancy was almost three years higher than male life expectancy (e_x column, top number). At almost all ages, male age-specific mortality rates (ASMR) were considerably higher than female ASMRs ($_nM_x$ columns), and the probability of dying in almost all age groups was much higher for males than females ($_nq_x$ columns). This is the normal situation worldwide. The only abnormal aspect of China's 2000 life tables is the much higher female than male infant mortality (first line of each life table, age '0', $_nM_x$ and $_nq_x$ values), and the slightly higher female than male child mortality at ages 1–4 (second line of each life table, same columns). This is caused by some female infanticide soon after birth and by better parental attention to the survival of young sons compared to that of young daughters.

In spite of considerable overall mortality decline during the Maoist period and the economic reform period, strong differences between mortality levels in urban and rural China have persisted. Throughout the PRC period, a major component of economic and social inequality in China has been the differences between rural and urban areas. Urban areas in any country have natural advantages for economic development, but in China the whole structure of budget preferences, ownership, and legal advantages has favored cities at the expense of the countryside. Whether using per capita income or per capita household consumption measures, city residents have had 2–3 times the income level or consumption level of rural residents in the PRC. These ratios narrowed during de-collectivization of agriculture in the 1980s, but have widened since that decade. For example, the ratio between the per capita annual disposable income of urban households and the per capita annual net income of rural households in China was 2.6 : 1 in 1978 and declined to 1.9 : 1 in 1985. In the next 20 years it first rose to 2.9 : 1 in 1994, slightly declined thereafter to 2.5 : 1 during 1996–98, then increased to 3.2 : 1 in 2003 and 2004 (NBS 2003: 344, 2005: 335). The ratio between the urban and rural per capita annual living expenditures for consumption rose from 2.1 : 1 in 1985 to 2.7 : 1 in 1995. After that, it fell slightly in 1996 and 1997, then further increased to 3.0 : 1 in 2000, and reached 3.3 : 1 in 2002–04 (NBS 1998: 326 and 344, 1999: 319 and 337, 2000: 313 and 330, 2001: 305 and 322, 2002: 321 and 342, 2003: 345 and 366, 2005: 333).

Yet the data on income and consumption differentials do not fully capture the vast differences between rural and urban living standards and opportunities in China. City families usually have housing that has been given to them or is highly subsidized for rent or purchase, while rural families have to pay almost all the cost of building their own homes. Educational opportunities are almost totally different: city children routinely get a full upper middle or high school education, while rural children usually receive only lower middle school education at best. Finally, preventive and curative medical care is more highly subsidized and more available in cities than in the countryside. The number of city hospital and clinic beds per 10,000 population is five times the county figure, and the number of medical personnel per 10,000 population in cities is also five times the number in the counties.

These and other huge differences between city life and rural life in the PRC have consistently correlated with big differences in survival chances for city and rural populations. City residents in China often remark that the dirty air and crowding in the cities, in contrast to the clean air and healthy food in the countryside, must mean that rural people in China live longer than city people; the statistics consistently show the exact opposite.

Based on unadjusted life tables from China's 2000 census (Li and Sun 2003), expectation of life at birth is still 5.9 years longer for China's city population than for its rural county population. The probability of dying for young children from exact ages 1 to 5 in rural China is reported to be three times that in the cities. Adult mortality, measured as the probability of dying from exact ages 15 to 65, in rural China is 1.5 times the adult mortality rate in China's city population. For the elderly, expectation of life at age 65 is 1.9 years longer in the cities than in the rural countryside. The Child Mortality Surveillance System recorded that in 2000, infant mortality was far higher in rural China, 37.0 infant deaths per 1,000 live births, than in the cities, 11.8 (China National Working Committee on Children and Women 2001: 28).

Urban–rural differentials in mortality have persisted in China. Yet the comparatively disadvantaged rural population has achieved real mortality decline in the last several decades. Using unadjusted mortality data from China's censuses, the rural population of China gained four years of life expectancy in the two decades from 1981 to 2000. The most stunning change for rural people was that the probability of dying for young children from exact ages 1 to 5 dropped 58 per cent. Rural adult mortality, that is the probability of dying from age 15 to age 65, reportedly declined by 20 per cent. The rural elderly reportedly gained 1.6 years of life expectancy at age 65. Therefore, in spite of continuing rural poverty and increased inequality in China since the mid-1980s, the survival chances of China's rural population have measurably improved during the economic reform period.

9.4 MORTALITY CHANGES IN POOR AREAS

As China's recent mortality decline has been partly attributable to its success in reducing poverty, this section concentrates on mortality reduction in poor counties and provinces. It has been almost impossible to document mortality changes at the level of counties and city districts in the PRC. Masses of detailed county level mortality data have been collected and still exist, but these statistics for the 1970s–1990s have never been published or released in usable form. The earliest such valuable data come from the Cancer Epidemiology Survey of 1973–75, which recorded for most of China the following details for each of 18 million deaths over three years: age and sex and geographical location of the decedent and cause of death classified into 86 different categories (Banister *et al.* 2000). These data are in electronic format for most provinces. If available for study, the Cancer Survey mortality statistics would provide a valuable baseline on mortality conditions in the PRC at the end of the Maoist period and on the eve of economic reform. Access to these files would allow analysts to study what causes of death have been largely overcome in which age groups in each type of PRC location, and which causes of death have resisted improvement or have increased over time in particular age–sex groups in rural or urban areas. The Ministry of Health (MoH) conducted a follow-up study of 10 per cent of China's counties and city districts in 1990–92, using the same methodology as in 1973–75; these data are also on file but largely inaccessible to scholars.

China's National Bureau of Statistics (NBS) gathered detailed data on all deaths in China by age, sex, and other socio-economic characteristics of each decedent in the censuses of 1982, 1990, and 2000. Some province level mortality data have been published, but until the 2000 census, electronic files of the mortality data at county level and below have not been made available. The suppression of all these precious mortality statistics for China has caused a serious shortage of good quality research on mortality levels, trends, and determinants in the world's most populous developing country (Lavely 2003). Mortality research for China's population has been largely ignored in recent decades and years, especially in comparison to research on fertility (Zheng *et al.* 2004: 1).

What follows is a snapshot of what the county level data show for mortality trends from 1973–75 to 1990–92 by economic level of the counties as of the early 1990s (for more detail, see Banister *et al.* 2000). The authors traced the same exact counties and city districts at these two points in time, the first date well before the start of economic reforms and the second date more than a decade into the economic reform period. Counties were grouped into poorer, middle income, and richer counties based on the reported per capita rural social product of each county in 1990–91.

The following figures show the data as reported, but the 1973–75 data were subject to underreporting of deaths, so the figures should not be taken at face value, even though the reported trends are meaningful. For instance, 1973–75 was at the midpoint of the 1964–82 intercensal period and should be able to

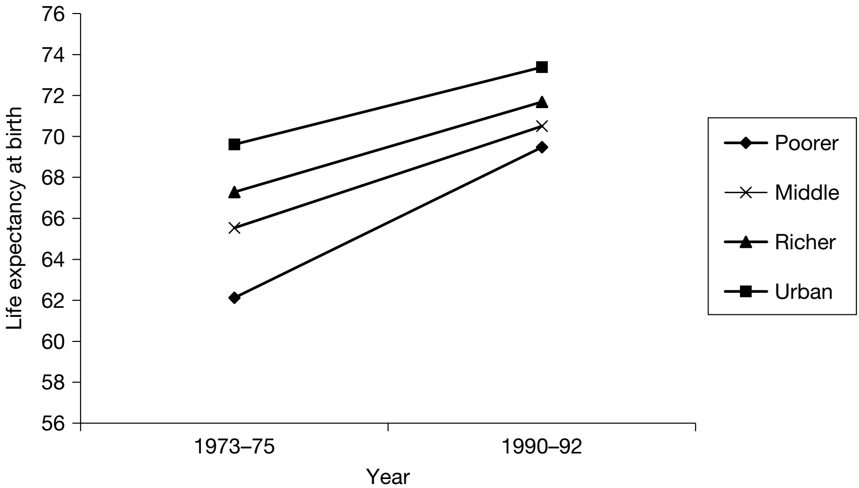

Figure 9.2 Life expectancy at birth for areas with different economic levels: 1973–75 and 1990–92

Notes: Based on unadjusted mortality data for the same whole counties and city districts in 1973–75 and 1990–92 constituting 10% of China's population but not necessarily representative of all China. Deaths are underreported at both dates.

Source: Banister *et al.* (2000).

represent the intercensal mortality level, but adult deaths in 1973–75 were recorded with only 76 per cent completeness (Banister and Hill 2004). We do not know the completeness of mortality reporting in the 1990–92 follow-up survey.

Figure 9.2 shows changes in expectation of life at birth from 1973–75 to 1990–92 in 139 counties grouped into three economic levels, in comparison to urban districts. It is clear that all categories of counties made strong gains in life expectancy in the early economic reform period. Middle income counties and richer counties gained about the same number of years of life expectancy as did urban districts: four to five years. But the poorer third of China's counties reported a greater absolute increase in life expectancy, 7.5 years, than did the other economic categories.

Levels of infant mortality were no doubt seriously underreported at both dates, but the reported trends are also telling (Figure 9.3). Urban districts showed only slight declines in IMR for both boys and girls from 1973–75 to 1990–92. The richer counties recorded somewhat stronger IMR declines for both sexes. Middle income counties had recorded much higher male than

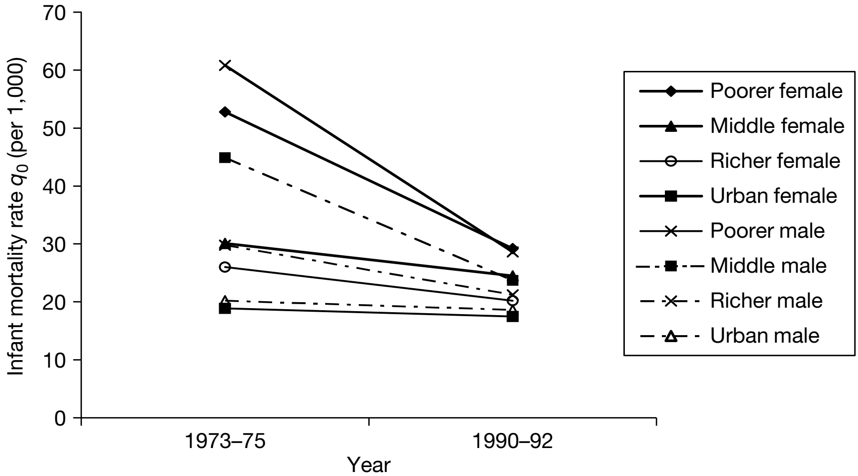

Figure 9.3 Infant mortality rates (q_0) by sex for areas with different economic levels: 1973–75 and 1990–92

Notes: Based on unadjusted mortality data for the same whole counties and city districts in 1973–75 and 1990–92 constituting 10% of China's population but not necessarily representative of all China. Deaths are underreported at both dates.

Source: Banister *et al.* (2000).

female IMR in 1973–75, and reported declines in IMR for both sexes to a similar level by 1990–92. China's poorer counties recorded that the IMR for baby boys fell by half in this 17-year period, and that the female IMR decline was almost as large. Figure 9.3 shows that there was some convergence in the recorded infant mortality rates of poorer and richer counties. All four types of place recorded even steeper mortality declines at ages 1–4, with the poorer third of China's counties reporting a 78 per cent drop in the age-specific mortality rate of young children (Banister *et al.* 2000).

Fortunately, these data sets recorded detailed mortality data for some of the poorest counties in China as of the early 1990s. For instance, Figure 9.4 graphs reported age-specific mortality rates in 1973–75 and 1990–92 for five of the poorest counties in China's poorest province of Guizhou. It is clear that in these extremely poor counties, no gains were recorded for adult mortality, but there were steep declines in mortality throughout childhood. Therefore, in order to understand why the PRC has achieved mortality declines in even the poorest places during the economic reform period, one must focus on the causes of the major decreases in child mortality. As shown by Banister and Zhang (2005),

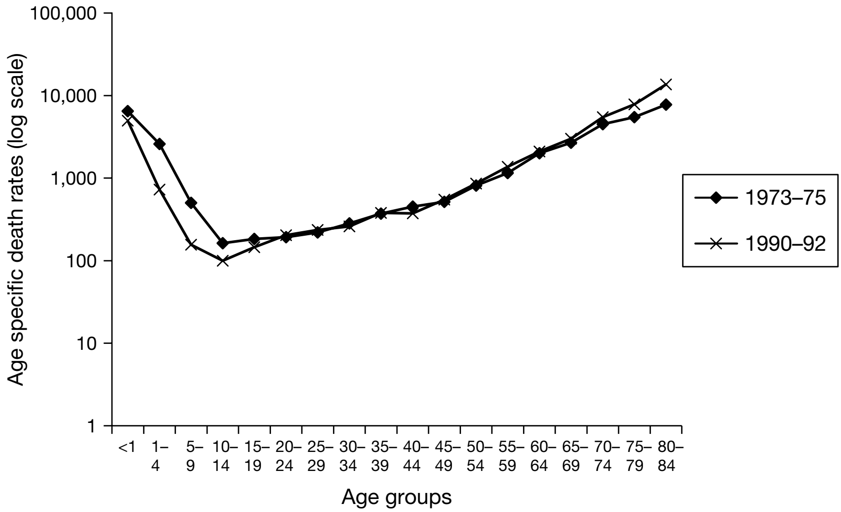

Figure 9.4 Age-specific death rates (per 100,000) in Guizhou's poorest counties: 1973–75 and 1990–92

Notes: Unadjusted mortality data are from the same five very poor whole counties in Guizhou province, China, in 1973–75 and 1990–92. Deaths are underreported at both dates.

Source: Banister *et al.* (2000).

major determinants of young child mortality in China in the reform period are levels of educational attainment and adult illiteracy, per capita consumption, and medical personnel in relation to population. If these poorest counties have experienced rising living standards, reduced illiteracy, and/or increased numbers of doctors to population, these trends would help to explain the striking decline in child mortality.

Changes in mortality over a longer period can be further examined at the provincial level. In 1982 and 2000, PRC censuses gathered data from all households on all deaths in a one-year period before the census. Using the data, analysts can see the reported mortality conditions in each province at two points in time, just after the beginning of the economic reform period and 2000. Table 9.2 shows census mortality data for China's less developed provinces, the poorest ones being nearer the bottom of the table. These mortality data are, of course, imperfect. Infant deaths are underreported at both dates, and so are adult deaths, for example. The author has not adjusted the provincial data because there is no good way of determining how completeness of death reporting varies across the different provinces.

Table 9.2 Mortality trends in China's less developed provinces: 1981–2000

Province	2000 avg. household consumption (yuan)	Year 2000 per capita GDP (yuan)	e_0 1981	e_0 2000	Abs. change	IMR 1981	IMR 2000	Abs. change	q_{1-5} 1981	q_{1-5} 2000	Abs. change	q_{15-65} 1981	q_{15-65} 2000	Abs. change	e_{65} 1981	e_{65} 2000	Abs. change
Xinjiang	3,207	7,470	61.0	73.1	12.2	115	27	−88	0.055	0.011	−0.044	0.265	0.204	−0.061	16.4	17.7	1.3
Hunan	2,723	5,639	65.5	73.0	7.4	51	23	−27	0.020	0.007	−0.013	0.266	0.184	−0.083	13.4	15.9	2.5
Anhui	2,588	4,867	69.3	73.5	4.1	30	27	−3	0.012	0.005	−0.007	0.237	0.176	−0.061	14.4	16.2	1.9
Hebei	2,534	7,663	70.5	72.9	2.4	22	18	−4	0.007	0.002	−0.004	0.221	0.184	−0.037	13.4	14.4	1.0
Yunnan	2,530	4,637	61.0	67.1	6.0	80	59	−21	0.045	0.013	−0.032	0.273	0.229	−0.044	12.9	14.6	1.7
Sichuan	2,456	4,784	64.1	72.2	8.1	57	20	−37	0.028	0.010	−0.019	0.287	0.202	−0.085	13.5	15.8	2.3
Inner Mongolia	2,425	5,872	66.8	71.1	4.3	41	28	−13	0.011	0.003	−0.008	0.269	0.206	−0.063	12.2	13.9	1.7
Jiangxi	2,396	4,851	66.1	70.9	4.8	46	42	−4	0.022	0.007	−0.015	0.260	0.191	−0.069	13.3	15.3	2.0
Ningxia	2,290	4,839	65.7	72.4	6.7	59	23	−36	0.024	0.007	−0.017	0.241	0.174	−0.067	13.3	14.9	1.6
Qinghai	2,255	5,087	61.1	69.5	8.4	88	39	−50	0.029	0.010	−0.019	0.298	0.233	−0.065	12.7	15.1	2.4
Henan	2,208	5,444	69.7	73.4	3.7	21	20	−1	0.010	0.004	−0.006	0.238	0.183	−0.055	13.6	15.5	1.9
Guangxi	2,147	4,319	70.2	74.0	3.9	32	24	−8	0.019	0.006	−0.013	0.217	0.184	−0.032	15.8	17.4	1.5
Shanxi	2,037	5,137	67.8	72.6	4.8	31	17	−15	0.010	0.004	−0.006	0.258	0.188	−0.069	12.2	14.2	2.0
Shaanxi	2,035	4,549	65.0	71.5	6.5	47	29	−19	0.014	0.004	−0.010	0.283	0.193	−0.090	11.6	14.5	3.0
Gansu	1,734	3,838	65.9	69.6	3.7	39	41	2	0.016	0.007	−0.009	0.283	0.209	−0.074	12.0	14.0	2.0
Guizhou	1,608	2,662	61.6	67.3	5.7	69	57	−12	0.052	0.018	−0.034	0.267	0.227	−0.040	13.2	15.2	2.0

Notes: Census mortality data not adjusted for underreporting of deaths. These data are important because of changes and trends in mortality. Levels are not exactly correct due to underreporting of deaths. Sichuan data here include Chongqing at both dates. Tibet data were not collected in the 1982 census.

Sources: China NBS (2001), 59 and 66; provincial volumes of data from China's 1981 census; China 2000 census data from NBS (2002).

Overall completeness of mortality reporting at the national level was not very different at the two dates. Looking at completeness of adult mortality reporting, male death reporting was 87 per cent complete and female death reporting 85 per cent complete in the 1982 and 1990 censuses combined, compared to actual deaths in the 1982–90 intercensal period, and using the 1990 and 2000 census mortality data, male death reporting was 90 per cent complete, and female, 85 per cent complete in covering deaths for the 1990–2000 intercensal period (Banister and Hill 2004).

The PRC has 31 provinces today (not including Hong Kong, Macau, or Taiwan). Table 9.2 compares provincial mortality two decades apart for 17 of the provinces—all those that are less developed except for Tibet, because no Tibet mortality data were gathered in the 1982 census. Also, Sichuan and Chongqing are combined under Sichuan in Table 9.2. Expectation of life at birth reportedly rose at least two years in each of China's poorer provinces; almost all of these provinces reported a gain of four or more years in life expectancy in the most recent two decades.

The most dramatic age specific mortality decline among all China's provinces, including the poorest ones, was in the probability of dying from exact ages 1 to 5. This measure of young child mortality (as reported) fell by more than half in poverty stricken Gansu province, and in Guizhou the rate in 2000 was only 35 per cent of the 1981 figure. Some other less developed provinces recorded even greater success in reducing mortality among young children, for example Xinjiang and Yunnan.

Many of the western provinces that had recorded unusually high mortality in the 1982 census reported the greatest gains in survival (Table 9.2). The most remarkable change appears to be in Xinjiang province, one of only two provinces in China where minority nationalities constitute the majority of the provincial population. Census mortality data for Xinjiang showed an increase of 12 years in expectation of life at birth in only two decades. Unusually high infant mortality, 115 infant deaths per 1,000 live births, had been detected in the vast, remote province of Xinjiang in the 1982 census; by 2000 Xinjiang recorded a normal IMR for the PRC. For young children, the reported probability of dying from exact ages 1 to 5 was, as of 2000, one-fifth the high level recorded for 1981. Adult mortality strongly declined as well. Years of life expectancy at age 65 also reportedly rose slightly, though Xinjiang mortality data for old age are seriously in error at all times. Most minority peoples of Xinjiang exaggerate their ages when they are old; this statistical age reporting problem is small or nonexistent in the Han provinces of China.

China's most populous province of Sichuan in 1982 reported poorer survival chances for its population than did most other provinces—higher infant and young child mortality and higher adult mortality (see Table 9.2). By 2000, however, Sichuan (including Chongqing here) reported a major turnaround—an increase of eight years in expectation of life at birth, big drops in infant and child mortality, a large decline in its excessively high adult mortality, and a gain of over two years in expectation of life at age 65. Other populous inland provinces also made major gains in survival—for example, Hunan and Shaanxi provinces.

The southwestern provinces of Yunnan and Guizhou are known for their rugged mountainous terrain and their large populations of various minority nationalities. These two provinces have also benefited from the economic reform period in terms of survival, both reportedly gaining six years of life expectancy in the last two decades in spite of their continuing poverty. Mortality rates declined throughout the range of ages. But a continuing problem in these two provinces is that infant mortality remains stubbornly high, much higher than reported in any other provinces.

Some provinces, such as Gansu, recorded higher infant mortality in 2000 than in 1981. This may be due to a genuine rise in the IMR, or to more complete infant death reporting at the latter date. Henan province reported essentially no change. Other provinces reported only slight IMR declines (Anhui, Hebei, Jiangxi). In some cases, the IMR for baby boys has declined, and the problem is really the female IMR. For example, Hebei and Guangxi provinces reported a major drop in the IMR for boys but no improvement at all for girls; Anhui recorded a minor IMR decline for boys but not for girls.

Gansu did report a modest decline in the male IMR from 41 to 35, not much improvement for a two-decade period. But the IMR for baby girls in Gansu reportedly rose from 36 to 48 at the same time. An even more extreme example is Jiangxi province. Both boys and girls experienced an IMR of 46 in 1981. The province reportedly succeeded in reducing the IMR for boys to 26 in 2000, but baby girls were subjected to an IMR of 60, a completely unnatural situation (provincial volumes from China 1982 census; NBS 2002, Vol. 1: 196 and 661).

China's poorest provinces even reported gains in survival chances among the elderly from 1981 to 2000. Both Gansu and Guizhou recorded a two-year increase in the expectation of life at age 65. Therefore, as shown in Table 9.2, census mortality statistics for 1981 and 2000 show that survival chances have improved throughout the life span in the less developed provinces of China during the economic reform decades. Another recent study, one that attempted to adjust China's 1990 and 2000 census provincial life tables for underreporting of deaths, also confirmed that in China 'the largest improvements in mortality were experienced by the most backward provinces (Qinghai, Xinjiang, Sichuan, Ningxia, and Tibet)' (Bignami-Van Assche 2005).

9.5 MORTALITY DECLINE IN CHINA: REASONS AND CHALLENGES

Today, the PRC is still a low middle income developing country. The nation experienced considerable mortality decline during the Maoist period. In the economic reform decades, mortality decline has continued everywhere, in spite of rising inequality, continuing poverty in many rural and even urban areas, and the collapse of systems of medical insurance coverage in rural areas along with reduced coverage in urban areas. Many observers have worried that the rising inequality and the loss of medical insurance would cause increased mortality in China, reversing the model mortality declines of the Maoist years. This has not happened. Why not?

There is indeed some evidence that declining government social support has tended to raise mortality, as was feared. For instance, in 23 provinces from 1981 to 1995, a small reduction in the population weighted proportion of provincial budgets devoted to health and education from 30 per cent to 28 per cent tended to reduce expectation of life at birth by half a year (Banister and Zhang 2005). Fortunately, during the same time period, the stronger influences of rising incomes, increased education, and other aspects of China's progress under economic reforms raised life expectancy by several years in spite of reduced government financial commitment to education and health as a proportion of provincial budgets.

It is important to note that many of the key factors that caused or contributed to the remarkable mortality decline in Maoist China continue to be in place, and are therefore likely to have continued to promote low mortality in the economic reform period since 1978. Some of the usual determinants of mortality decline have progressed further in the last quarter century, thus possibly contributing to further mortality decline. For example:

- Continuing equal access to agricultural land. China's rural people still have land rights and the option to grow their own food. After 1978 the land situation improved because collectives no longer took from the peasants so much of the food they produced. This has helped limit hunger, malnutrition, and starvation.
- Population still unarmed: no major civil or international warfare. This continues to limit mortality from violence.
- Continuing availability of trained midwives, rural doctors. This helps keep infant and child mortality at moderate levels.
- Industrialization. Under the economic reforms, agriculture has greatly declined as a proportion of economic output, and industry and services have

enormously expanded. China is now the manufacturing workshop of the world (Banister 2005). The increasing importance of industry in the economy improves incomes, indirectly reducing mortality, though this beneficial effect is somewhat diminished by high occupational disease and injury rates in mining and manufacturing.

- Urbanization. Under economic reforms, China's urban population increased from 18 per cent of the total population in 1978 to 42 per cent at year-end 2004 (NBS 2005: 93). This societal transformation tends to greatly improve survival.
- Improving epidemic disease control. The PRC today works more closely with the World Health Organization and with other governments to limit disease outbreaks, attack their causes, and minimize the spread of epidemics.
- Better health and medical knowledge, more modern pharmaceuticals. China's rapid economic development and improved communications during the economic reform period have brought up-to-date global health knowledge and better medicines to the population.
- Further declines in illiteracy and greatly improved educational levels of children and adults in the economic reform period. These factors are known to promote lower mortality worldwide.
- Continuing promotion of equal rights for girls and women: reduced disparities in literacy and educational attainment between males and females. These trends have helped to further reduce excess female mortality beyond the youngest ages.
- Later marriage, tighter required family planning, even lower fertility than before, and even longer birth spacing. These trends have been strong in the early 1980s, and throughout the 1990s, and into the new century. They all tend to reduce mortality of women in the childbearing ages and maternal mortality rates, as well as mortality rates for infants.

In some less developed countries, even if the country as a whole is developing, mortality might rise in poor areas because living standards are dropping and socio-economic conditions are worsening there. In China, however, even very poor areas have experienced increased income and consumption in the reform decades. For instance, the World Bank China Director pointed out: 'The incomes of the rural poor have been increasing by 4 per cent a year for 10 years. That is not actually bad by international standards. It is actually quite high' (Xu 2004). The rising tide has, at least minimally, lifted all boats (see also Banister and Zhang 2005). Most poor areas in China also have participated in the reduction of illiteracy, increased access to primary education, and improved water supplies that the PRC has reported. Therefore, China's increased inequality and the disarray in the health system have not prevented further mortality decline in poor areas.

Why has mortality not risen in China as it has in some countries of the former Soviet Union and Eastern Europe in recent decades? Those countries also have experienced powerful transformations away from command economies toward the market, and their social support systems have also weakened. Most research on mortality trends in the former communist systems suggests that rising or stagnating mortality has been caused by a chaotic transition to a market economy, real declines in living standards, social malaise expressed in rising alcoholism and violence, and declines in health and medical systems. China's economic transformation has been more controlled and the economy has grown rapidly, so that even poor areas have seen rising living standards. Though China's economic and social transformation is causing dislocations and unemployment, other factors such as visible increases in consumption and rising educational opportunities for the current generation of children seem to be giving people hope.

As shown in Table 9.1, the PRC has achieved advanced mortality conditions for a developing country or even a low middle income country. Life expectancy today is much higher than in the other populous developing countries, and infant and child mortality rates are considerably lower. Nevertheless, there remains much excess, avoidable mortality today in China. Because of continuing son preference and daughter discrimination at the youngest ages, girls in infancy and up to age 3 are dying at unnaturally high rates compared to boys (Banister 2004).

Adult men in China are dying at excessive rates compared to women at the same ages because Chinese men are engaged in more dangerous work and more risk-taking behaviors than women, have much higher rates of cigarette smoking and more transport accidents, engage in more alcohol consumption, and experience other lifestyle and occupational factors that are riskier than those of women. Though it is a worldwide phenomenon that male death rates are almost always higher than female death rates at almost every age, it is nevertheless possible today for men to minimize their excess mortality risks by controlling or, to the extent possible, eliminating their own self-destructive and reckless behavior patterns.

There remain large geographical differentials in mortality in China today, particularly between poor places and richer places. The rural population is seriously disadvantaged compared to the city population, and the economic and social disparities are reflected in big differences in survival between the cities and the countryside. Finally, while survival gains may have been greatest in China's least developed counties and provinces during the economic reform period, mortality levels are still much higher in poor places than in richer rural, as well as urban, places in the PRC. With regard to survival, China's main goals today should be to greatly narrow the mortality gaps between poorer and richer areas, between countryside and city, between little girls and little boys, and between men and women.

It is not only length of life that needs attention, but also healthy life. China is still far behind in comparison with advanced countries in systematically collecting information on disability, morbidity (illness), and chronic disease, but the fragmentary available information suggests that people might now be living longer but sicker lives. It is also true that a healthy and well educated labor force is a key asset for ensuring China's economic and business success in the long run. The PRC could and should promote extending the *healthy* life expectancy of its population. This will require gathering and analyzing more accurate and comprehensive information on causes of ill health and of death, as well as widely publicizing what behaviors and lifestyle changes would help citizens avoid disease, disability, and premature death. Future research on quality of life in China should focus on finding out what is now limiting healthy life expectancy, broader educational attainment, and further poverty reduction, and target policies to overcome those barriers in this enormous and important population that constitutes one-fifth of the global total.

10

Changing Mortality Patterns and Causes of Death

Zhongwei Zhao

China has experienced an extraordinary mortality decline in recent history, as has been documented in the introduction as well as in the previous chapter of this book. This change has more than doubled life expectancy at birth for the Chinese, and made a major contribution to the world mortality reduction in the second half of the twentieth century. While living standards in China are still rather low, life expectancy reached 71 years at the beginning of the twenty-first century: well above the average for Asia and for the world as a whole. This chapter examines recent changes in age patterns of mortality, their sex differentials and major causes of deaths. It offers further detail on China's mortality transition and its consequences, and provides additional evidence for recent debates on some related theoretical issues.

Data used in this chapter are drawn from two major sources. The first consists of government publications, namely census and survey results, data collected through national disease surveillance networks, and official statistical yearbooks. In publishing these materials, the authorities involved usually examine the quality of the data, but they may not adjust the results even when problems, such as underregistration, have been identified. Sometimes, certain published results, for example crude death rates, have been adjusted, but others such as age- or disease-specific death rates have not.[1] This creates some difficulties in analyses. The second type of data includes those compiled and adjusted by independent researchers on the basis of their evaluation of data quality. In comparison with unadjusted data, these results are generally expected to be closer to reality. However, since the adjustments are often made on the basis of different assumptions, especially those about patterns or levels of mortality, using these data may also pose certain difficulties or lead to inconsistent presentations. For these reasons, officially published data are used in this analysis when they are available, although data adjusted by some researchers are also presented as important references. The problems found in these data and their potential impact on the conclusions will be noted in the course of discussion.

10.1 AGE PATTERNS OF MORTALITY

China witnessed a great mortality decline in the second half of the twentieth century—when the crude death rate fell from more than 30 per 1,000 to less than seven per 1,000 and life expectancy at birth rose from less than 35 years to more than 70 years. Mortality reduction of the same magnitude did not take place simultaneously in all age groups however. Available evidence shows that a rapid mortality decline was first recorded among children and young adults, just as in many other populations. The fall in mortality among the mid-aged population started slightly late, but it was already observable in the early 1950s and became more remarkable after the great famine of 1959–61. The trend of mortality change among people aged over 60 was, from available data, less clear before the early 1970s. Since then, however, noticeable mortality reduction has also taken place in the elderly population. These variations have not only confirmed some widely noted characteristics of mortality transition, but also resulted in considerable changes in age patterns of mortality in the population.

Demographers have long been interested in examining age patterns of mortality, which provide an effective way of studying mortality differentials and their underlying causes across populations. One of the major outcomes of such investigations is the construction of a number of mortality models (UN 1955, 1982; Coale and Demeny 1983). These mortality models have been widely used, especially in the indirect estimation of mortality, population projections and demographic simulations. The far eastern pattern of mortality is one such model and is particularly relevant to the issues to be discussed in this section. Goldman (1980) first suggested the existence of a far eastern mortality pattern on the basis of her investigation of mortality in a number of Asian populations. According to her, this mortality pattern is 'characterised by excessively high death rates among older men relative to death rates among younger men and among women.' It occurs 'nowhere else, at least among countries with reliable mortality statistics' (Goldman 1980). Following that, the United Nations Population Division further examined the data used by Goldman and those collected from other populations, and constructed a set of model life tables. One of them was named the 'far eastern' pattern of mortality (UN 1982, 1983). This mortality pattern has been widely accepted as a regional mortality model ever since. The author of this chapter has recently challenged that notion by showing that the far eastern mortality pattern is not region specific and has been found in other areas (Zhao 2003, 2004).[2] This section further demonstrates that mortality patterns in China, as in many other populations, do not conform to a single mortality model and have undergone considerable changes in recent history.

For the purpose of this analysis, mortality patterns observed in China in recent years have been compared with nine mortality models—five from the United Nations and four from Coale–Demeny model life table systems. The degree of resemblance between the observed mortality patterns and a particular mortality model is measured by the index of similarity (UN 1988; Zhao 2003). A smaller index, by comparison with a larger one, indicates a closer resemblance between the observed mortality pattern and the mortality model to which it has been compared. Theoretically, observed mortality patterns can be compared with all mortality models regardless of whether they are labeled 'males' or 'females.' However, in this study observed male mortality patterns are compared only with mortality models labeled 'males' and the same approach is applied in comparing female mortality patterns.

For the period prior to 1950, the comparison results show a mixed picture. While mortality patterns in some historical Chinese populations, the population of Taiwan in particular, were similar to the far eastern mortality model, those observed in other populations conformed to different mortality models. For example, the age pattern of male mortality in the population studied by Chen (1946) in Yunnan in the 1940s closely resembles that of Coale–Demeny Model Life Tables Region North. In the Chinese peasant population surveyed around 1930, the male mortality pattern was also less similar to the far eastern mortality model, whether the data used are those published by the Chinese government, or the life table constructed by Barclay and his colleagues (SDNG 1971; Barclay *et al.* 1976).

During the second half of the twentieth century, the Chinese government conducted five censuses and a number of large sample surveys, which provide useful mortality data. For the period from 1945 to 1974, mortality changes in the national population can be examined using the life tables compiled by Yan and Chen (1991) on the basis of the 1988 fertility survey data. Recent life tables can be constructed directly from the mortality data obtained from the 1982, 1990, and 2000 censuses. The indices of similarity calculated by comparing these life tables and various mortality models are listed in Table 10.1. There are nine indices listed for each period, with each index under an abbreviation of the name of a mortality model against which the observed mortality patterns have been compared. It is possible that some of these results may be affected by the assumptions used by Yan and Chen in constructing their life tables, or by

Table 10.1 Indices of similarity computed through comparing observed mortality patterns and various mortality models

Year	United Nations model life tables					Coale–Demeny model life tables			
	LA	CH	SA	FE	GE	West	North	East	South
Males:									
1945–49	14.5	14.5	10.0	12.9	14.2	14.8	16.0	14.0	13.0
1950–54	13.9	12.7	9.1	8.4	11.9	12.3	13.5	12.4	10.8
1960–64	9.3	7.6	4.9	4.4	6.1	7.5	10.1	7.2	7.0
1970–74	5.1	4.1	2.9	2.5	2.5	3.0	7.0	2.6	4.1
1981	4.1	3.7	2.6	2.6	2.0	1.9	5.4	1.8	2.9
1989–90	3.8	3.0	3.2	2.0	1.7	1.0	4.8	1.2	2.5
1999–2000	2.1	2.2	3.4	2.5	1.4	1.2	2.9	1.7	1.7
Females:									
1945–49	14.2	13.6	10.5	14.4	14.1	14.5	15.2	12.9	12.5
1950–54	12.2	10.9	7.5	9.8	10.5	11.5	11.9	9.8	9.7
1960–64	6.4	6.4	3.1	5.7	5.1	6.9	8.6	5.5	6.5
1970–74	4.6	4.0	2.7	2.9	2.8	3.7	6.3	3.6	5.3
1981	1.9	2.3	2.4	2.4	1.1	1.2	2.6	1.4	2.4
1989–90	2.2	2.1	2.7	2.1	1.2	1.2	1.7	1.4	2.3
1999–2000	1.4	1.7	2.3	2.2	1.1	1.7	1.2	1.5	1.3

Notes: LA: Latin American model; CH: Chilean model; SA: South Asian model; FE: Far Eastern model; and GE: General model.
Sources: Yan and Chen (1991); Huang and Liu (1995); and NBS (2002).

the underregistration of deaths.[3] Nevertheless, they are sufficiently robust to demonstrate changes in age patterns of mortality in recent years.

A number of observations can be made from examining these results. Indices computed for earlier periods when mortality was high tend to be greater than those for later periods when mortality was low. For example, most of the indices computed for the late 1940s are greater than 10, while those for 1999–2000 are largely smaller than 3. Similar findings have been observed in other populations, and are likely to have been related to the following factors. When the model life tables were constructed, those with high mortality levels were largely derived from extrapolation rather than being based on empirical mortality data. This might lead to large discrepancies between these mortality models and mortality patterns actually recorded in populations with high mortality. The large index values could also be a result of data quality, which might have been relatively poor during the early period but improved in more recent years. If the death records of certain age groups, say those who were very old or very young, suffered disproportionately from underrecording, it would increase the disparity between observed mortality patterns and the mortality models. Furthermore, the large value of the index recorded for the early period could also be due to variations in the speed of mortality decline among different age groups. During the time when mortality started to fall, especially when this happened dramatically, mortality changes of the same magnitude did not take place simultaneously in all age groups: this would lead to a large index. In contrast, when mortality reaches a low level, slow but steady mortality improvement is often observed in most of the age groups. This tends to reduce the value of the index.

The listed indices also show that age patterns of mortality have gone through significant changes over the period of observation. The indices obtained from all nine comparisons are rather large for the late 1940s and early 1950s. In these circumstances, it may not be very meaningful to say the observed mortality patterns conform to a particular mortality model. In the 1960s and 1970s, the mortality patterns in the male population, according to the life tables constructed by Yan and Chen (1991), were closer to the United Nations far eastern mortality model. It is important to be aware of the fact that Yan and Chen's life tables were constructed on the basis of some assumptions and limited mortality data. They therefore may not accurately reflect actual mortality patterns in the population. For this reason, mortality data collected in other surveys and censuses have been examined. Indices of similarity derived from these unadjusted results show that the observed mortality patterns were mostly close to the United Nations Latin American mortality model, and the United Nations South Asian model, in 1957 and 1963 respectively. During the period between 1973 and 1975, the recorded mortality patterns conformed to the United Nations Far Eastern mortality model (CPIC 1987). But they were closer to the United Nations South Asian mortality model if instead the adjusted results produced by Banister were used (Banister 1987). Further changes in age patterns of mortality were observed in the last two decades of the twentieth century. According to the 1982 census, China's male mortality patterns were closer to the Coale–Demeny east mortality model, but since the early 1990s they have increasingly become similar to the Coale–Demeny west mortality model. These results are largely consistent with the observations made in many other populations: mortality patterns do not conform to a single mortality model, but have gone through considerable changes in recent history.

The results of comparing female mortality patterns, which are presented in the lower panel of Table 10.1, provide further support to the observations made above. The only major difference between male and female mortality patterns is that they tend to conform to different mortality models. In the early period, according to the life table constructed by Yan and Chen (1991), the observed female mortality patterns were closer to the United Nations South Asian mortality model. Since the early 1980s, the census results show that age patterns of female mortality have increasingly conformed to the United Nations General mortality model.

10.2 SEX DIFFERENTIALS IN MORTALITY

Sex differentials in mortality are another important issue in demographic research. While females generally live longer than their male counterparts in most contemporary populations, this has not been always the case. There have been noticeable changes in sex differentials in mortality in China and many other parts of the world in recent history.

Studies have revealed that in many historical Chinese populations, mortality recorded among females was either close to or even higher than that among males. Generally, mortality for girls was noticeably higher than that for boys. Female infanticide and unfavorable treatment given to girls clearly took their toll. For example, even in the Qing imperial lineage where the social status and the living standards of the population were much higher than the average in society, female infant mortality was markedly higher than male infant mortality. Female neonatal mortality was as high as 224 per 1,000 among those born between 1751 and 1820 (Lee *et al.* 1994). Sex differentials in mortality were also present in the adult and elderly populations. Generally, female death rates compared with those for males were higher at younger ages and lower at older ages. In mainland China, the mortality crossover often took place when people were in their late 30s or early 40s, but in early twentieth century Taiwan, it occurred somewhat earlier. Sex ratios of death at older ages (40–64) were rather high in the Qing imperial lineage and the population of Taiwan (Zhao 1997).

Such sex differentials in mortality are broadly similar to those of the far eastern mortality model as characterized by Goldman (1980), but they are insufficient to support the claim of a unique far eastern mortality model. The difference between male and female mortality was not very large in most historical Chinese populations so far investigated, and it conformed in the main to a widespread mortality pattern. According the studies conducted by Preston (1976), for example, excess female mortality in adolescence and young adulthood had been found in some high mortality populations. The noticeable gap between male and female mortality at older ages has also been observed in some western countries. The differential found in some of these countries is even greater than that recorded in many parts of China. Besides, it is also noteworthy that in some historical Chinese populations, sex differentials in mortality differed considerably from those described above. For example, in the population of the Beijing First Health Demonstration District studied by

Campbell (2001), the sex ratio of mortality was close to one for those under age 10. But among those aged 10 and over, higher female death rates were recorded in all groups during the period between 1929 and 1933. In the population of Chengkung studied by Chen (1946) in the 1940s, higher male death rates were observed from birth to age 64.

Noticeable mortality decline has taken place since 1950, but the speed of this change has not been the same in male and female populations. According to the life tables compiled by Yan and Chen (1991) and those constructed directly from recent census results, female life expectancies at birth increased from 49.2 years in 1950–54 to 74.4 years in 1999–2000. Male life expectancies increased from 46.7 years to 70.7 years.[4] The gap between female and male life expectancies increased from less than 2.5 years before the mid-1970s to 3.7 years at the end of the twentieth century.

Figure 10.1 plots sex ratios of probability of death by age, which are obtained by dividing male probability of death into female probability of death. Male mortality is higher than female mortality if the ratio is greater than one; otherwise male mortality is the same or lower than female mortality. A number of observations can be made from examining these results.

There were great changes in sex ratios of mortality in the second half of the twentieth century, and the most apparent one is their increase across all age groups except among those under age 5. This trend is broadly similar to that found in other countries. It directly contributes to the faster increase in life

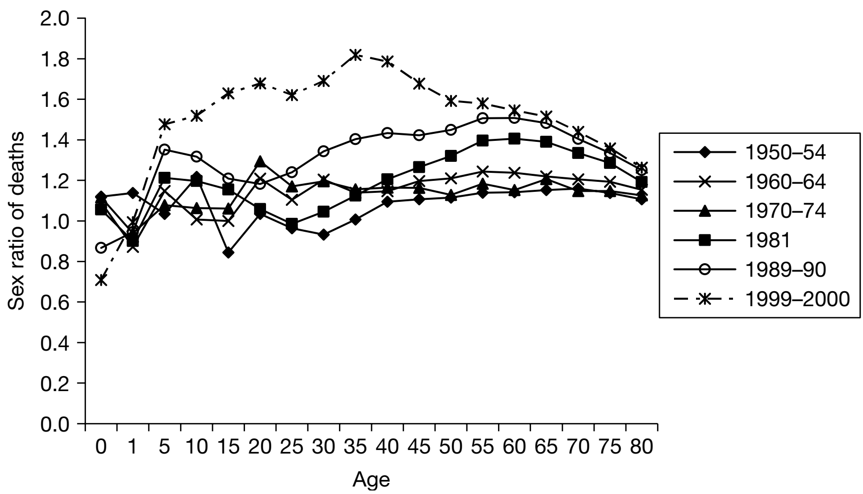

Figure 10.1 Sex ratios of probability of death by ages in selected periods

Sources: Yan and Chen (1991); Huang and Liu (1995); and NBS (2002).

expectancy in the female population than that of males. In the early 1950s, although mortality had already started to fall, China's sex differentials in mortality still had some similarities to those recorded before and in the early twentieth century. This is indicated by the relative disadvantage in female survivorship between ages 15 and 34. During the next 25 years, the difference between males and females in mortality generally increased. The results of the 1982 census showed a high sex ratio of mortality among people between ages 50 and 74. This pattern is similar to the far eastern pattern of mortality described by Goldman and the United Nations Population Division. But the sex ratio of death in this age group is only around 1.4 and noticeably lower than that recorded in other populations including some western populations (Zhao 2003). This characteristic was soon replaced by an even higher sex ratio of mortality among children aged 5 and over, and young adults. During the last two decades of the twentieth century, sex ratios of death further increased and reached 1.5 or higher in most of the age groups, indicating the greater gains that females have achieved in improving mortality. A similar analysis has been conducted using mortality data obtained from other sources, and the results confirm the conclusions reached above.

Sex differentials in mortality in China have a very clear aberration when compared with those in many other countries. Figure 10.1 indicates that the sex ratio of infant mortality was around 1.1 between the early 1950s and early 1970s, but has decreased markedly since. According to the latest census records, it was only 0.7 for the period 1999–2000. In other words, female infant mortality was more than 40 per cent higher than male infant mortality. Probability of death for female children aged 1 to 4 years has also been consistently higher than that for their male counterparts since the early 1960s. This is a notable characteristic of China's current mortality patterns and differs radically from that recorded in most populations with a similar level of mortality, where male children often experience considerably higher mortality than their female counterparts. It is clearly related to strong son preference, which often results in discrimination against daughters. Such discrimination has a long history in China. It has once again become readily observable in recent years when the number of children that a couple may have has been strictly restricted by government birth control policy. In this particular situation, neglect of female children, and occasionally female infanticide, have been used by some families to increase the possibility of having a son, as Chen and other researchers in this volume and elsewhere have demonstrated (Li *et al.* 2004).

Like changes in age patterns of mortality, changes in sex ratios of death are also broadly related to the process of mortality decline. An increase in sex ratios of death, first among people of older ages and then among children and young adults, has been observed in many populations of the world (Zhao 2003).

The evidence indicates that higher or lower sex ratios of death recorded in certain age groups of the population may not indicate the existence of a region specific mortality pattern, but rather that the population may be in a particular stage of its mortality transition.

10.3 CHANGES IN MAJOR CAUSES OF DEATH

During the last 50 years, dramatic changes have taken place not only in levels and patterns of mortality, but also in causes of death. Alterations in causes of death are one of the major reasons for mortality decline, while being also regarded as an important feature of the epidemiological transition. The Chinese government began to collect health statistics in urban areas in the early 1950s and the practice has gradually expanded into rural areas. China now has a nationwide disease surveillance system and a well established network for gathering detailed health information. Since the early 1990s, ICD-9 has been adopted in the classification of diseases and causes of death, and international standards have been increasingly used in data collection.

Having acknowledged these achievements, it is also important to point out that in comparison with most developed countries, China needs to further improve its health data collection in at least the following areas. Currently, detailed data about causes of death are gathered from only parts of the country. They may not accurately represent mortality and disease patterns across the entire population. Underregistration is another problem often found in these data. For example, death rates computed directly from the data collected from nearly 150 national disease surveillance points are noticeably lower than those calculated from other data sources. They tend to underrepresent actual mortality levels and death rates from certain diseases. In some official publications, aggregate rates, such as crude or standardized death rates, have been adjusted for underrecording, but age- and disease-specific mortality rates have not been adjusted adequately. Furthermore, the quality of health services is still relatively low and access to hospitals and other health facilities remains rather difficult in some rural and remote areas. According to the data collected from the disease surveillance points, in 1997 only 55 per cent of recorded causes of death were certified by doctors working in county or above county level hospitals. Eleven per cent of those who died were not seen by doctors before their death (MoH and CAPM 1997: 14). This inevitably affects the reliability of causes of death attributed in the death registration.

Although China's health statistics are subject to the influence of these deficiencies, they are the major data source for the study of epidemiological transition in the population. If used with caution, they provide vital information about the origin and causes of the mortality decline. The alteration in causes of death mapped by these data can generally be relied upon. Table 10.2 shows the proportions of deaths by causes observed in the second half of the twentieth century. It is clear that the causal structure of deaths changed considerably during this period. In 1957 in urban areas, the five major causes of death were respiratory diseases, infectious diseases, pulmonary tuberculosis, digestive diseases and heart diseases. These diseases caused about half of the deaths, with respiratory diseases alone responsible for nearly 20 per cent of loss of life. Given that precise causes were not available for a large number of the deceased, the actual proportions of deaths caused by these diseases were very likely to be higher. Before the mid-1950s, the proportions of deaths due to respiratory diseases, infectious diseases and digestive diseases were even greater. In Beijing, for example, these three types of diseases accounted for nearly two-thirds of recorded deaths in 1949, which probably reflected the general characteristics of causes of death existing in the first half of the century (Li *et al*. 1987: 131).

In the year 2000, the five leading causes of death in urban areas had shifted to malignant tumors, cerebrovascular diseases, heart diseases, respiratory

Table 10.2 Proportions of deaths by five major causes in selected years

Causes of death	1957	1963	1975	1980	1985	1990	1995	2000
Urban:								
Malignant tumor		8.6	18.8	19.6	20.3	21.9	21.9	24.4
Cerebrovascular diseases		6.9	21.6	23.4	21.0	20.8	22.2	21.3
Heart diseases	6.6	6.7	19.5	22.9	23.4	15.8	15.3	17.7
Respiratory diseases	16.9	12.0	10.8	9.0	9.1	15.8	15.7	13.3
Injury and toxicosis				5.0	5.8	6.9	6.9	5.9
Digestive diseases	7.3		4.9					
Pulmonary tuberculosis	7.5	6.8						
Infectious diseases[a]	7.9							
Sub-total	46.2	41.0	75.6	79.9	79.6	81.2	82.0	82.6
Rural:								
Malignant tumor			17.5	14.7	15.2	17.5	17.3	18.4
Cerebrovascular diseases			13.5	17.1	15.6	16.2	16.7	18.4
Heart diseases			18.0	25.8	25.5	10.8	9.6	12.4
Respiratory diseases			12.9	12.0	12.3	24.8	26.2	23.1
Injury and toxicosis					7.2	10.7	11.3	11.0
Digestive diseases			6.8	5.3				
Total			68.7	74.9	75.8	80.0	81.1	83.3

Note: [a]Excluding TB.

Sources: MoH and CAPM (1991–98); NBS (1985–2001); *China Health Statistical Yearbook* Editorial Committee (1985–2001).

diseases, and injuries and toxicosis, which between them led to more than 80 per cent of deaths. Deaths caused by infectious diseases, pulmonary tuberculosis and digestive diseases fell significantly. Information on causes of death in rural areas is not available for the 1950s and 1960s. From data recorded during the last quarter of the twentieth century, changes similar to those observed in urban areas have been taking place in the vast rural areas. At the end of the century, the five major causes of death in the rural population were the same as those in the urban population, although the magnitude of their influence and their ranking were different. In rural areas, the proportion of deaths caused by malignant tumors, cerebrovascular diseases, and heart diseases was lower, and that due to respiratory diseases, injuries, and toxicosis was higher. Respiratory diseases remained the number one killer in the 1990s. However, the latest statistics show that a dramatic change has taken place in rural areas, where deaths caused by malignant tumors and cerebrovascular diseases have increased and those caused by respiratory diseases fallen considerably in the last few years. As a result, the causal structure of deaths in urban and rural areas has become very similar (NBS 2004).

As Table 10.2 shows, respiratory diseases were a major cause of death prior to the mid-1960s. The proportion of deaths caused by these diseases fell slightly during the period up to 1985. In the early 1990s, there was a sudden increase in the proportion of deaths due to respiratory diseases, which rose from 9 to 16 per cent in urban areas and from 12 to 25 per cent in rural areas. These unexpected increases, however, were largely the result of changes in the way that certain diseases were classified rather than a sharp rise in the proportion of deaths caused by respiratory diseases. In the early 1990s, a large number of deaths were reportedly caused by chronic pulmonary heart diseases. But China's health authorities decided that those who had been reported as dying of these diseases should more accurately be classified as having died of chronic obstructive pulmonary diseases (MoH and CAPM 1991). The reclassification was accordingly undertaken, and the same practice is most likely to have been followed thereafter. Since a similar adjustment was not made to the statistics of earlier years, this resulted in an apparent sudden increase in the proportion of those who died of respiratory diseases, and reduction in the proportion of those who died of heart diseases, during the early 1990s.

Changes in causes of death link directly to the fact that death rates of some diseases have fallen markedly in the past 50 years, which is shown in Table 10.3. In urban areas, deaths due to infectious diseases fell from 57 per 100,000 in 1957 to four per 100,000 in 2000. During the same period, deaths caused by pulmonary tuberculosis fell from 55 to three per 100,000 and those by digestive diseases decreased from 52 to 18 per 100,000. Similar changes have been taking place in rural areas, though they seem to have lagged behind.

Because of the constraints of data availability, it is not possible to give a detailed account of the situation before the mid-1950s. But evidence suggests that a more dramatic fall in deaths caused by these diseases had already occurred by that time. In Beijing, for example, death rates from these diseases were very high in the early twentieth century, when the recorded death rate of pulmonary tuberculosis was sometimes higher than 500 per 100,000 (Hou 2001: 402). By 1949, the situation had become less severe. Death rates from infectious diseases, digestive diseases, respiratory diseases and pulmonary tuberculosis were 235, 255, 234, and 173 per 100,000 respectively. By 1953, death rates from these diseases had already dropped to 85, 62, 178, and 103 per 100,000 (Li *et al.* 1987: 133).

While the decline in these disease-specific death rates is dramatic, the increase in death rates of some other diseases is equally noticeable. As shown in Table 10.3, death rates from malignant tumors, cerebrovascular diseases, injury, trauma, and toxicosis have all risen considerably in urban areas. For instance, deaths caused by malignant tumors increased from 37 to 147 per 100,000 and those caused by cerebrovascular diseases increased from 39 to 128 per 100,000 over the period from 1957 to 2000. Recorded death rates from

Table 10.3 Disease-specific death rates (per 100,000) in urban and rural areas

Causes of death	1957	1963	1975	1980	1985	1990	1995	2000
Urban:								
Malignant tumor	36.9	46.1	111.5	111.3	113.9	128.0	128.6	146.6
Cerebrovascular diseases	39.0	36.9	127.9	135.4	117.5	121.8	130.5	128.0
Heart diseases	47.2	36.1	115.3	132.5	131.0	92.5	90.1	106.7
Respiratory diseases	120.3	64.6	63.6	52.0	50.9	92.2	92.5	79.9
Injury and toxicosis	19.0	16.2	23.1	29.2	32.5	40.4	40.6	35.6
Digestive diseases	52.1	31.4	28.8	22.7	23.3	23.5	19.5	18.4
Pulmonary tuberculosis	54.6	36.3	21.2	12.2	10.2	7.0	n.a.	2.9
Infectious diseases[a]	56.6	21.2	13.2	8.4	7.9	n.a.	n.a.	4.0
Rural:								
Malignant tumor			119.6	96.9	98.8	112.4	111.4	112.6
Cerebrovascular diseases			92.3	113.1	101.3	103.9	108.1	115.2
Heart diseases			123.2	170.6	165.8	69.6	62.0	73.4
Respiratory diseases			88.2	79.1	79.7	159.7	169.4	142.2
Injury and toxicosis			24.3	27.7	46.8	68.5	72.7	64.9
Digestive diseases			46.3	34.8	35.5	32.2	30.2	23.9
Pulmonary tuberculosis			32.6	21.4	24.2	11.9	10.2	7.3
Infectious diseases[a]			23.8	18.2	14.0	11.3	8.2	5.1

Note: [a]Excluding TB; n.a. = not available.

Sources: MoH and CAPM (1991–98); NBS (1985–2001); *China Health Statistical Yearbook* Editorial Committee (1985–2001).

heart diseases were relatively high between the mid-1970s and mid-1980s. This was related to the problem of classifying those who reportedly died of chronic pulmonary heart diseases. When this is taken into account, the death rate from heart diseases may have also risen slightly during the studied period. In rural areas, death rates from malignant tumors, injury, trauma, and toxicosis also increased in the 1990s, but the trend in deaths caused by cerebrovascular diseases, heart diseases, and respiratory diseases was less clear.

The increase in the crude or nonstandardized death rates is, in many cases, not the result of a rising age-disease-specific death rate, but rather an outcome of the changing age structure of the population and of those who died. Nonetheless, available data show that age-specific death rates from some diseases, malignant tumors, and diabetes, for example, were on the rise during the 1990s. This trend was particularly noticeable among those aged 40 and above. Some of those who would have died from other causes if there were no epidemiological transition have become the victims of these diseases (MoH and CAPM 1991 to 1998).

A further noticeable change is the increasing trend in deaths caused by injury, trauma and toxicosis. In urban areas, the reported death rate increased from 19 to 36 per 100,000 between 1957 and 2000. The rise was even faster in rural areas where the death rate rose from 24 to 65 per 100,000 in the last quarter of the twentieth century. This was also reflected in the proportion of patients hospitalized for similar causes. In urban areas, 6 per cent of patients were hospitalized due to injury, trauma, and toxicosis in 1955, but the proportion rose to 15 per cent in 2000. In rural areas, the relevant figures were 6 per cent in 1965 and 21 per cent in 2000. The proportion of deaths due to transport accidents, and that caused by suicides and self-inflicted injuries reached very high levels. In urban areas between 1991 and 1995, the number of deaths resulting from transport accidents was 12 per 100,000, and those caused by suicide and self-inflicted injuries were seven per 100,000. The figures for rural areas were 14 per 100,000 and 23 per 100,000 respectively (*China Health Statistical Yearbook* Editorial Committee 2000; MoH and CAPM 1995). China's suicide rates, particularly among women and old people, are among the highest in the world.

10.4 CAUSES OF DEATH, MORTALITY PATTERNS, AND THEIR SEX DIFFERENTIALS

Having summarized the major changes in causes of death, this section briefly examines their impact on age patterns of mortality and their sex differentials.

China's crude death rates have fluctuated around 6.5 per 1000 in the past two decades. This corresponds to roughly eight million deaths per year. Most of the eight million deaths were caused by cardiovascular diseases, cancers, respiratory diseases, and injuries and poisoning. The first major killer was cardiovascular diseases, responsible for nearly three million deaths a year, according to estimates made on the basis of officially published disease-specific death rates and population data (*China Health Statistics Yearbook* Editorial Committee 1999; Zhuang and Zhang 2003). This was followed by cancers and respiratory diseases, with cancers causing more than one and a half million, and respiratory diseases causing more than 1.2 million, deaths. Injuries and poisoning led to more than half a million deaths. It should be noted that since the number of deaths and disease-specific death rates reported by various government departments are often obtained through different data collection procedures from different areas and subject to different types of registration problems, using data from different sources could lead to estimates differing from these results, as well as to those discussed below.

Assuming the age structure of deaths recorded by the 1998 Annual Population Change Survey (NBS 1999) has remained largely constant in recent years, the eight million deaths would consist of some 620,000 deaths (or 8 per cent) before age 5 and 860,000 deaths (11 per cent) between ages 5 and 39. The overwhelming majority of the deaths take place after age 40, with nearly three million (36 per cent) between ages 40 and 69, and 3.6 million (45 per cent) at ages 70 and above.[5] The population and the deaths have been divided into these four broad age groups because the major causes of death in these groups differ considerably.

The analysis of major causes of death in each age group and their sex differentials has been conducted on the basis of statistics published by MoH and CAPM in 1998, the last year for which officially published detailed data are available. These data underrecord the number of deaths, particularly at very young and old ages. However, if the underregistration in each group is largely random, its effect on the relative distribution of causes of death and sex composition of deaths in each age group will be small.

As shown in Figure 10.2, more than half of the deaths of infants and small children were due to respiratory diseases and diseases originating in the perinatal period. In the second group, major causes of deaths were injuries and poisoning, and half of the deaths were due to these reasons. The principal causes of death for people aged 40–69 were cardiovascular diseases and cancers, which between them were responsible for 65 per cent of deaths. Among those aged 70 and above, primary causes of death were cardiovascular and respiratory diseases. These accounted for nearly 70 per cent of deaths in that age group, with cardiovascular diseases alone responsible for about

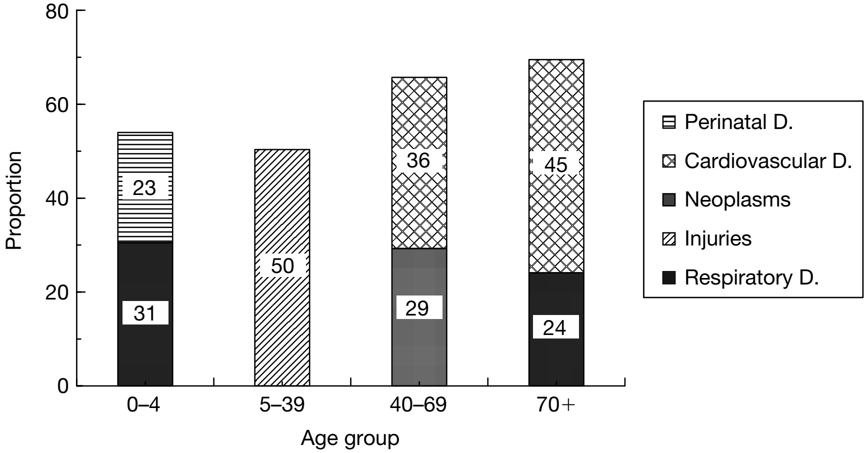

Figure 10.2 Proportions of deaths by major causes in different age groups: 1998
Source: MoH and CAPM (1998).

45 per cent of deaths. Further analysis shows that the most important cause of death among those aged 40–54 was cancer. At ages 55 and above cardiovascular diseases killed more people than any other disease, in every five year age group. Lowering the number of deaths from these causes is clearly the main focus for further reducing mortality. Any major change in death rates from these diseases will inevitably have a marked influence on the age pattern of mortality in the population.

There are considerable variations in sex ratios of mortality by causes of death, which are computed by dividing the male mortality rate of a given type of disease into the female mortality rate of the same type of disease. High sex ratios, all around 1.7, are found in deaths caused by injuries and poisoning, cancers, and digestive diseases. They have played an important part in creating the mortality differentials between males and females. In contrast, sex ratios of deaths caused by cardiovascular diseases and respiratory diseases are relatively low: both are approximately 1.1. However, if we further divide the population into five year age groups, the sex ratios of deaths caused by these diseases are, for most age groups, also notably higher. The relatively low overall sex ratios mentioned above are largely due to the fact that death rates of these two types of diseases are fairly similar among very old males and females, and that most of the deaths, female deaths in particular, take place in these age groups.

There are some noticeable differences in sex ratios of death by causes between rural and urban areas. In urban areas, sex ratios of major causes of death tend to be slightly higher than those in rural areas. However, the following observations are noteworthy. Firstly, in rural areas the sex ratio of infant deaths from diseases originating in the perinatal period is under 1.1, but it is 1.5 or 36 per cent higher in urban areas. The relatively low sex ratio recorded in rural areas may be an indication of some kind of human intervention such as neglect of female children, as discussed earlier. Secondly, in urban areas the sex ratio of deaths caused by diseases of the urinary and reproductive systems is less than 1.1, but in rural areas it is close to 1.3. While the number of deaths caused by these diseases has been fairly small in recent years, this difference is interesting and worth further investigation.

The underlying causes of the differences between male and female mortality are very complex. They are not only related to biological and genetic factors, but also reflect different roles played by males and females in a society and in families. In addition to the differences in their physiological makeup, the differences in their working environment, life styles and behavioral risks all contribute to the considerable disparities in patterns and causes of deaths between male and female populations.

10.5 CONCLUSIONS

China made great progress in reducing mortality in the second half of the twentieth century. While its socio-economic development level was rather low by international standards, life expectancy at birth increased dramatically during the period between 1950 and the late 1970s. This achievement and China's successful experiences of lowering mortality, along with those observed in Sri Lanka, Costa Rica, and some other populations, have been widely regarded as 'routes to low mortality in poor countries' (Caldwell 1986). Since the late 1970s, China has witnessed radical socio-economic reform and social changes. Unlike some Eastern European countries where mortality either stagnated or even increased during the period of their reconstruction, China has achieved further reductions in mortality, and its life expectancy has now reached 72 years.

During this great transition, considerable changes have also taken place in the age patterns of mortality and their sex differentials. This, however, is by no means a special feature of China's mortality pattern. Mortality decline, in its early stages in particular, does not usually take place with the same magnitude across all age groups and in both male and female populations; hence noticeable shifts in age patterns of mortality and their sex differentials have been recorded in many parts of the world. The causal structure of deaths has also altered radically in China in the last 50 years. It has become increasingly similar to that found in developed countries, with most of the deaths now caused by cardiovascular diseases and various types of cancers. The impact of infectious diseases has decreased significantly.

Despite the progress, however, it is important to note that China now faces many serious challenges in further lowering mortality. The proportion of people dying of respiratory diseases, injuries and poisoning remains high. Immunization and vaccination rates have fallen in recent years. Since the early 1980s, reductions in infant mortality have been moderate and the increase in life expectancy has been relatively slow. China's mortality advantage over countries with similar levels of development, which greatly impressed the world in the 1970s and 1980s, has largely disappeared. In addition, inequality in health care has grown at an alarming speed and created further challenges to future mortality decline. Urgent and effective actions need to be taken to improve the situation and to halt the negative trends in the improvement of public health.

11

Population Ageing: Challenges, Opportunities, and Institutions

Feng Wang and Andrew Mason

Following drastic fertility and mortality declines in the second half of the twentieth century, China is now joining the ranks of ageing societies elsewhere in the world at a rapid pace. Two and half decades ago, when China began its one-child policy in an attempt at further slowing down its population growth, concerns were raised about the serious social and economic consequences of this most extreme form of state engineered fertility reduction. Many critics argued that this policy would not only accelerate an ageing process that was already going to be rapid due to the drastic fertility decline then achieved, it would also artificially alter the Chinese kinship and family networks, the primary traditional sources of elderly support in Chinese society.

After more than two decades of speculation and anticipation, population ageing has finally arrived as a demographic and social reality. Two and a half decades ago, when the concerns of population ageing were first aired, China's population was growing at about 1.5 per cent annually, and the share of the population aged 60 and above was only 7.6 per cent, while those aged 65 and above constituted only 4.9 per cent of the total population.[1] Today, China's population growth rate stands at roughly half of the level two decades ago, and the 2000 census revealed that the proportion of the elderly population had risen to 10.5 and 7.1 per cent for those aged 60 plus and 65 plus, respectively. By 2005, more than 140 million people in China were 60 years or older, a population size that exceeds the total population of Japan, and is approximately the same as the total population of Bangladesh or Russia. If ranked as a separate country, China's elderly population alone would make the seventh largest population in the world. While its population ageing level—in terms of the elderly population as a proportion of the total population—is only half of that in western industrialized and ageing societies today, China's per capita income level is only one-quarter to one-sixth of these other countries. Rapid ageing in the absence of a standard of living and a social safety net comparable to other ageing societies has earned China the title of a country that has become old before it has become rich.

Moreover, given the rapid pace of fertility decline and also an unusually rapid mortality decline earlier, there is little doubt that China's ageing process will accelerate. What we have seen, in other words, is only the beginning of a new historical era for China. If the current demographic parameters—fertility level and mortality decline—persist, China's total population size will peak in less than two decades, and the share of its population aged 65 and over will exceed 20 per cent by the year 2050. Such population ageing is not only unprecedented in Chinese history and will affect every aspect of Chinese society; it will also exert a profound impact on the rest of the world because of China's increasingly important role in the global economy.

Rapid population ageing in the context of government enforced low fertility and an economic transition from a socialist planned to a market based economy is a complex and challenging process. This chapter examines the complexity of this process and the consequences of China's rapid population ageing. Firstly, we highlight how sub-national demographic dynamics in China imply a far more serious ageing scenario in some segments of society than others: namely that urban China will soon be as old as the oldest populations in the world. Secondly, we illustrate how population ageing in China may be affected by another recent important social and demographic change: increasing population migration. Thirdly, we examine the economic consequences of ageing by introducing the concept of the second demographic dividend that may result from an ageing population, and thus suggest that population ageing is not only a challenge, but also an opportunity. We provide our estimates of the potential positive economic consequences that China may achieve during its process of population ageing. Finally, we emphasize how such a potential positive economic gain will not come naturally but relies heavily on the institutional context, a challenge China also faces.

11.1 POPULATION AGEING: NATIONAL AND SUB-NATIONAL TRENDS

With a few exceptions (Zeng and Vaupel 1989; Poston *et al.* 2005), earlier literature examining the trends in and consequences of population ageing in China mostly treats China as a whole, and leaves out important sub-regional differences (Liang *et al.* 1986; Banister 1992; Poston and Duan 2000). One of the most salient features of China's society prior to its recent economic reforms, however, was the creation and maintenance of a dual society within one country (Whyte 1996; Knight and Song 1999). Urban and rural China followed different economic and social systems, with the population residing in urban areas receiving state guaranteed employment, housing, education, health care and other benefits, while those living in the countryside relied mostly on themselves and their local communities under the People's Commune system. Fertility as well as mortality decline that laid the foundation for population ageing closely mirrored this dualistic nature of society. Both mortality and fertility declined earlier and to a much lower level in urban than in rural areas. The one-child policy, which serves to accelerate population ageing, has mostly been implemented among the urban population, who had few alternatives to compliance (Wang 1996). Treating China as a whole, as we show below in this chapter, grossly understates the seriousness of population ageing in China.

Over the past four decades, China has evolved into a country with several sub-national demographic regimes. Such sub-national demographic differences exhibit themselves in both mortality and fertility, across provinces, and in particular between urban and rural areas. In 2000, just as in 1980, the mortality difference between China's richest provinces in the coast areas and the poor ones located inland, and between urban and rural populations, resembles that between developed and developing countries in the world. Measured by life expectancy at birth in 2000, populations in China's three major cities, Beijing, Shanghai, and Tianjin, all enjoyed a level of 75 years or more, about ten years longer than those in China's poorest provinces. In the same year, urban residents generally enjoyed a level of life expectancy that was 5.6 years higher for males and 6.3 years higher for females than those residing in rural areas (Wang and Mason 2004). These differences result largely from the diversity in standard of living and access to health care, a legacy of the uneven socialist development which has been only amplified following China's reforms in the last two and half decades.

Fertility, a more important demographic force than mortality affecting the population age structure, shows an even greater gap between urban and rural areas. Such a difference is both long standing and profound. Figure 11.1 provides a comparison of fertility trends between urban and rural China between 1963 and 1987. The urban fertility level started to diverge from the rural level in the early 1960s, immediately following the fertility rebound after China's Great Leap Forward famine of 1959–61. As early as the mid-1960s, the urban fertility level was only half of that for the rural population. Fertility decline accelerated after the late 1960s, when the Chinese government started to impose a more restrictive birth control policy among its urban population than among the rural population. The urban total fertility rate declined to

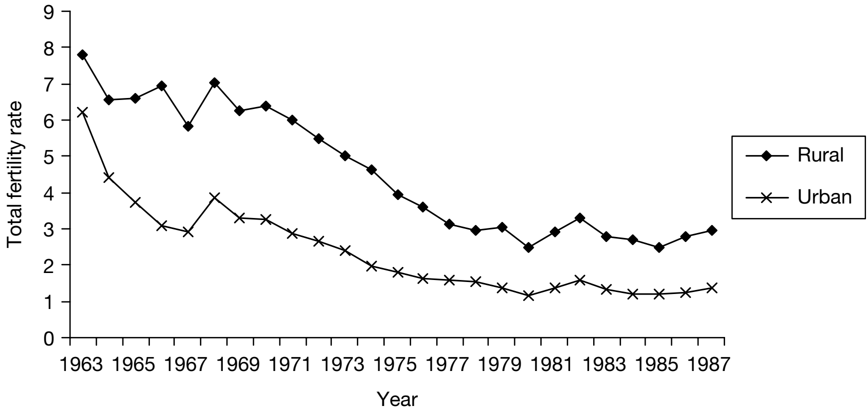

Figure 11.1 Fertility decline in urban and rural populations, China: 1963–87
Source: Yao (1995: 3).

around three by the beginning of the 1970s, a level not achieved in rural China until a full decade later. Moreover, the fertility level in urban areas dropped below replacement as early as three decades ago, in 1974, years before the implementation of the one-child policy in 1980. Throughout the 1980s (and in fact the 1990s though not shown in the figure) the urban fertility level remained barely above the one-child requirement, while rural fertility level continued well above replacement level.

What defines urban versus rural population in China is a complex and controversial subject. Firstly, there is the question of what is considered urban. In China, the definition has been an evolving one, from administrative based to residential based (Chan 1994). For over two decades from the late 1950s, China's urban and rural sectors were segregated into two worlds, with little migration without government approval. The divide between the two was largely administrative or political. Urban Chinese received preferential treatment by the state, from free education and guaranteed employment, to free medical care and other social welfare provisions, whereas rural Chinese who labored under the commune system did not. The chief mechanism used by the government to enforce this two-tier system was a strictly controlled household registration system (Cheng and Selden 1994). Urban Chinese were entitled to hold nonagricultural household registration, while rural Chinese were registered under the agricultural household status. Urban and rural Chinese, in other words, were differentiated by their household registration status. Since the late 1970s, however, this household registration system has undergone major changes and is being phased out. Increasingly, urban and rural Chinese are no longer differentiated based on their political, or household, registration status alone, but on residential criteria, or where they work and live. One example is China's 2000 census, which classified urban status based on population density and distance to a local government (Chan and Hu 2003). With this new definition, the urban population constituted 36 per cent of China's total population in that year.

Secondly, and in addition to the issue of what constitutes 'urban,' there is the question of how to determine a person's type of residence. With the increasing migration of the last two decades in China, it is also increasingly more challenging to decide whether a person's residential status should be the place of household registration, or current residence. If temporary rural to urban migrants are counted as a part of the urban population, in some migrant concentrated cities population size could easily be inflated by 20 per cent or more.

In our study of divergent ageing trends in China, we adopt a rather restrictive urban and rural definition. Specifically, we follow populations as they were classified at the time of the 1982 census: a differentiation largely following a household registration type. We recognize that using such a definition does not allow a realistic portrayal of China's population distribution by residence category over time, as both migration and urbanization have been redefining the geographic distribution of the Chinese population. For our purposes, however, such an approach is appropriate, because we are following the real life course experiences of two segments of the population that have been under differential treatment by the state and that have followed vastly different demographic trajectories especially in terms of fertility levels.

The sharply divergent paths of fertility and mortality decline imply that the population ageing process also started much earlier in urban than in rural China. With the extremely low fertility in urban areas for the past two and half decades, future population ageing will also be more severe in this segment of the population. In the remaining part of this section, we examine differential ageing trends in urban and rural China without considering the impact of migration between the two sectors of the society. We intend to answer the question that, given past differences in demographic profiles, what would future ageing trends look like for the two segments of the Chinese population?

To do so, we use the cohort component population projection method to project changes in urban and rural populations for the period 1982–2050. We use 1982 as our starting point as that was the year of China's first national census after its fertility decline began and when the controversial one-child policy was just launched. To project the future population of China, we use an assumption of a total fertility rate of 1.6 throughout the time period of 2000–50, and of a mortality level that will increase female life expectancy at birth from 74.7 years in 2000 to 79 in 2050, and male life expectancy from 71 to 75 years. Our fertility

Table 11.1 Assumptions used for projecting ageing trends in China

	Urban China		Rural China, without migration		Rural China, with migration			
	1982	2050	1982	2050	1982	2000	2014	2050
Fertility (TFR)	1.6	1.29	2.6	1.8	2.6	1.8		1.8
Mortality (e_0) Male	70	78	66.2	75	66.2			75
Mortality (e_0) Female	72	82	69.4	79	69.4			79
Annual migration ('000,000)					−6	−14	−21	0

assumption is higher than the fertility level dictated by Chinese birth control policy and higher than that reported in the official Chinese news media, but consistent with what is believed to be the current fertility level in China (Retherford *et al.* 2005). Projections of urban and rural population involve more assumptions, and the assumptions we used are given in Table 11.1.

China's population ageing process will soon accelerate, and the trend is unlikely to be reversed during the first half of the twenty first century. Table 11.2 presents projected old (65 years and above) populations for China in selected years, between 1982 and 2050. Figure 11.2 plots trends in population ageing for China as a whole, and by urban and rural population for the period 2000–50. As shown by these results, roughly a decade from now, i.e., by 2017, 10 per cent of China's total population will be 65 or over. In 30 years' time, by the late 2030s, one in five persons in China will be an elderly person. In just ten years, there will be 200 and 125 million Chinese aged 60 and above, and 65 and over, respectively; within 25 years, the numbers will further increase to 300 and 200 million. Whereas it takes 35 years for China's elderly to double from 5 per cent to 10 per cent of the total population, the next doubling, from 10 to 20 per cent, would only take 20 years or less. Meanwhile, China will also see its number of oldest old, those aged 85 and higher, quadruple between now and the year 2050.

Due to past differences in fertility and mortality levels, ageing trends also differ drastically between China's urban and rural areas. The urban population will experience a much more rapid ageing process than its rural counterpart. Ten per cent of China's urban population is already aged 65 and over today. In slightly over a decade from now, 15 per cent of China's population who were classified urban at the start of China's one-child policy will be 65 years and older, a level of ageing that is comparable to that in the more developed world today. In 20 years, by 2025, the proportion of aged among urban Chinese will reach 20 per cent, a level found currently only in the two

Table 11.2 Projected old age population (millions), China: 1985–2050

Year	60+	65+	85+
1985	84.8	55.3	1.7
1990	99.4	65.4	2.6
1995	115.9	76.5	3.4
2000	130.4	89.4	4.4
2005	143.5	100.6	5.2
2010	163.9	109.5	6.2
2015	200.0	125.2	7.2
2020	219.8	154.8	8.4
2025	256.8	169.8	9.1
2030	313.3	200.2	9.8
2035	349.2	247.7	12.3
2040	359.4	275.2	17.1
2045	362.4	279.7	18.0
2050	368.6	278.0	24.0

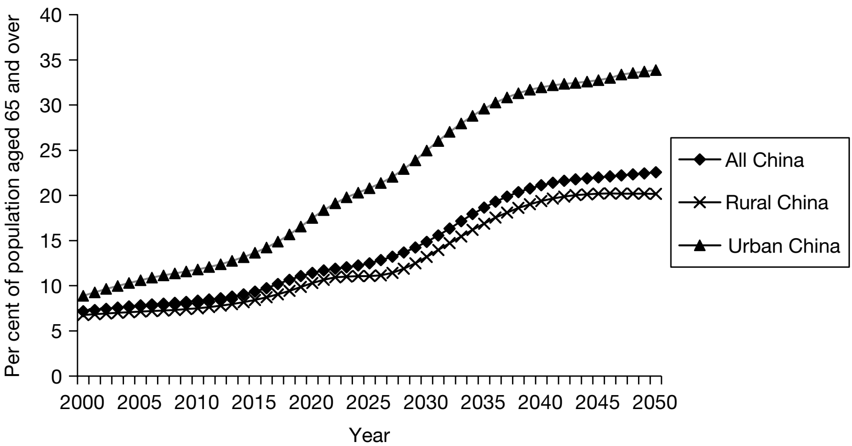

Figure 11.2 Projected ageing trends, China: 2000–50

oldest major populations of today, Japan and Italy. Moreover, due to the one-child policy of the last two and a half decades, this ageing trend will continue well into the twenty-first century. Assuming fertility stays at its current level among urban Chinese, at about 1.3 children per couple, 35 per cent of China's urban population will be aged 65 and older by 2050. While that percentage represents only a small proportion of China's total population, the sheer number of elderly urban Chinese will be by no means small. That number was 20.6 million in the year 2000, and will be 34.1 million by 2015, 45.6 million by 2025, and 55.9 million by 2050.

In rural China, the level of population ageing will lag behind that in urban China by more than a decade, as shown in Figure 11.2. It will be not until 2033 that 15 per cent of the population is aged 65 and over. If fertility and mortality levels stay as assumed, population ageing for the majority of China's population will level off at about 20 per cent by the middle of the twenty-first century. The number of the elderly in rural China, nevertheless, will still be staggering. It was 67.9 million in 2000, and will be 93.3 million by 2015, 128.2 million by 2025, and 229.1 million by 2050.

11.2 MIGRATION AND ITS POTENTIAL IMPACT ON AGEING IN RURAL CHINA

Population ageing in both urban and rural areas is likely to be affected by another important demographic change in Chinese society that began two decades ago, namely rural to urban migration (see also the next three chapters). China's economic growth and policy changes that removed control over migration across administrative boundaries have resulted in an unprecedented increase in migration, most of which is from rural to urban areas. The Chinese 2000 census counted 80 million people as migrants who had been away from the county where their household registration was held for more than six months. At the aggregate or the population level, migration redefines the ratio between the working population and the elderly in urban and rural China. For urban China, the large inflow of young rural labor not only helps to drive the urban centered economic growth but also helps to pay taxes and fees that could be used towards supporting the urban elderly. For the rural elderly, the picture may well be different.

To assess the potential impact of rural to urban migration on population ageing for the rural elderly, we carry out another set of population projection with assumptions of rural to urban migration. For the volume of rural–urban migration, we assume a net out migration from rural China of six million per year at the start of our projection period, 1982 (shown in Table 11.1). This number is slightly below the 7.7 million estimated by Chan and Hu for 1990 (2003). We increase the number of out migrants to eight million by 1990, to 14 million by 2000, and to 21 million by 2014. The assumed increase in migration is based on the past trajectory of rural to urban migration. By 2015, we assume such out migration will cease. We use age pattern of labor related migration from the 2000 Census as the age pattern of assumed rural to urban migration. This age pattern, by sex, is plotted in Figure 11.3.

Out migration of young people from rural areas alters the ageing trend in rural China considerably. In Figure 11.4, we present results comparing future population ageing trends in rural China with consideration of out migration. As

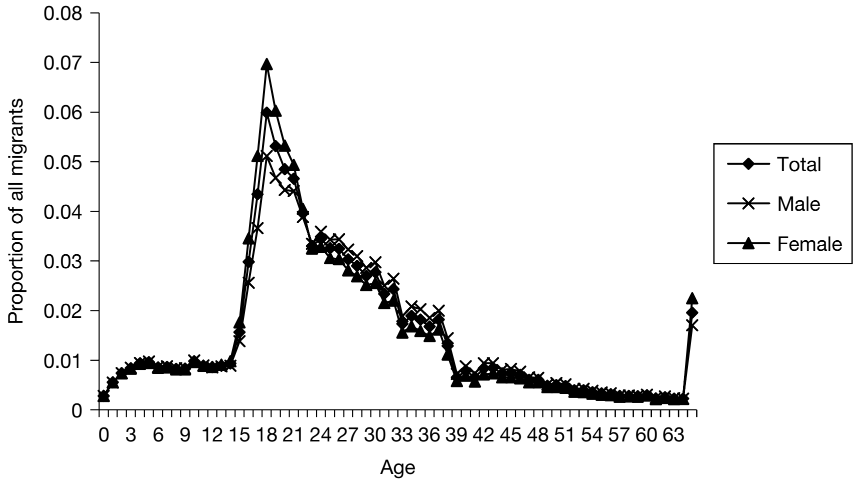

Figure 11.3 Age pattern of nonmarriage/nonhousing related migration, China: 2000
Source: Based on China's 2000 census (NBS 2002: Table 7-5).

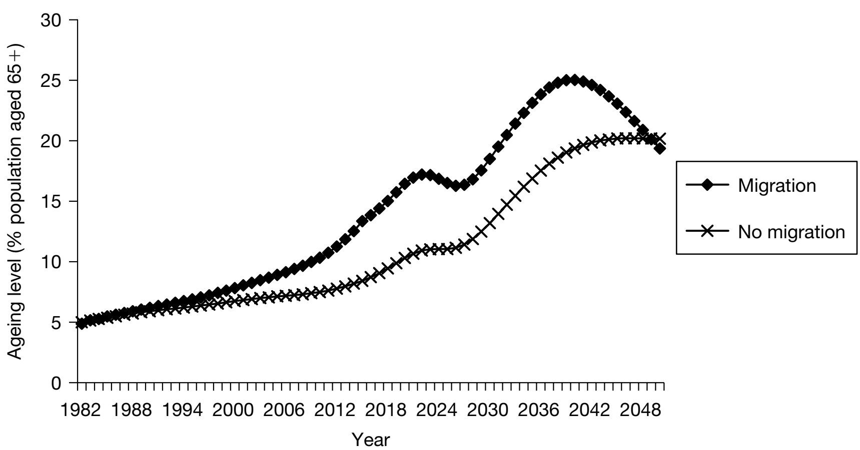

Figure 11.4 Potential impact of out migration on ageing in rural China

shown in this figure, ageing in rural China will be much more serious with out migration than with no out migration. In only five years, by 2009, the share of rural population aged 65 and above would reach 10 per cent; in less than 15 years, by 2018, the share would reach 15 per cent. With migration, the peak of ageing would come earlier, by 2040 instead of 2044, and at a higher level, 25 per cent instead of 20 per cent. Taking migration into consideration, we find that ageing in rural China will be much closer to that in urban China than when migration is not accounted for.

The comparisons above based on population projections illustrate future population ageing trends at the societal level. Urban and rural China will face different ageing prospects due to past and future demographic profiles. Rapid ageing at the societal or the aggregate level raises new challenges for social support, such as an increased burden of pension payments and increased contribution among the working population.[2] They also pose new challenges for family support. The two forms of support are not affected in the same way by the same ageing trends delineated above. Rural migrants can make up for the labor shortage in urban areas, but they cannot be expected to make up for the shortage of family caregivers for urban elderly in the future. A large number of rural migrants in urban China also contributes to decreased family support to the elderly in rural China.

In both urban and rural China, demographic and social changes have resulted in changes in living arrangements and in a noticeable shrinkage in the average household size. Average household size for China as a whole dropped from 4.36 persons in 1982 to 3.45 in 2000. In urban areas, the average household size in 2000 was only 3.16. At the same time, the share of elderly Chinese living alone or with only a spouse increased substantially. In 1982, among elderly males aged 65 and above, 27.6 per cent lived either alone or with only a spouse. In 2000, the proportion increased to 37.2 per cent. For females, the proportion increased from 24.3 to 29.8 per cent. The percentage of elderly people living alone or just with a spouse is higher in urban than in rural areas, at 41.4 per cent for males and 33.7 for females in the year 2000 (Zeng and Wang 2003). While rural to urban migration can help to solve China's ageing problem in urban areas at the aggregate level, it cannot alleviate the pressure of lack of family support. For most urban elderly people, the scenario of two single children supporting four parents will soon be a social reality. In 2000, 5.3 per cent of all households in China were composed of a single elderly person or an elderly couple alone. The proportion is projected to double by 2030, and may rise to 15 per cent of all Chinese households by 2040 (Zeng *et al.* forthcoming).

For rural elderly people, increased ageing levels due to fertility decline and out migration may not affect family support in the same way as in urban China. This in part is due to the higher number of children the rural couples have in comparison with urban counterparts under the one-child policy rule, and in part due to the particular migration pattern currently observed in China (Roberts 1997). Rural to urban migration so far has largely followed a circular pattern, with most rural migrants returning or at least planning to return to their home villages when they reach old age. Migrants also send a large share of their income back to their rural families, supporting those left behind. If the majority of rural young migrants do not return to their natal villages, however, rural out migration could result in a scenario where population ageing and lack of family support make life more precarious for rural than for urban elderly Chinese in the future (Zeng and Vaupel 1989; Zeng *et al.* forthcoming).

11.3 ECONOMIC CONSEQUENCES OF AGEING

Population ageing not only poses new challenges, it also presents new opportunities. Most discussions of population ageing tend to focus only on the negative consequences of this new human experience at the societal level, and ignore the possibilities that new opportunities may well be ushered in by this new demographic reality. An ageing population, just like a young population, also brings with it resources and new opportunities. The extent to which such opportunity can be seized, however, depends on the institutional arrangements of a given society.

To quantify and to assess the potential economic opportunities associated with population ageing, we need to introduce the concept of demographic dividend, and especially the second demographic dividend. Recent demographic literature has focused largely on the demographic dividend brought about by fertility decline and the decline in support ratios (Bloom and Williamson 1998; Mason 2001; Bloom *et al.* 2002). Such a dividend is only the first dividend of a demographic transition, resulting from a faster increase in the number of producers than of consumers. Along with population ageing, however, there is also a second demographic dividend (Mason and Lee 2006).

The second dividend arises because changes in age structure influence the processes that lead to the creation of wealth. A possibility—one that has occurred in other East Asian economies—is that population ageing will lead to rapid accumulation of capital. Should this occur, the capital intensity of the economy and, hence, output per worker will rise. Traditionally, the effect of population on capital deepening is considered in the standard neo-classical model that assumes a constant saving rate (Solow 1956). The approach taken here, however, builds on elaborations of the neo-classical model that treat saving and wealth as endogenous (Tobin 1967; Mason 1987; Willis 1988; Lee 1994). Population ageing, as we demonstrate below, may lead to increased saving and possibly increased capital accumulation.

The concept of lifecycle wealth and its relationship to population age structure is central to understanding the second demographic dividend. The lifetime budget constraint implies that the current lifecycle wealth of an individual, a cohort, or a population must equal the present value of the future stream of consumption less the present value of the future stream of labor income.[3] In the absence of intergenerational transfers (familial support, PAYGO pension systems, bequests, etc.), lifecycle wealth consists entirely of capital, i.e., real assets held by each individual, a cohort, or the population. Capital represents one form of lifecycle wealth.

Lifecycle wealth is closely related to the direction of resource flows. The lifecycle wealth associated with upward flows—from younger age groups to older age groups—is positive. Current members of the population can expect to receive more in benefits than they pay in costs in present value terms. This is possible because the current population is receiving net transfers from generations that are not yet born. The flip side of transfer wealth is the implicit debt imposed on future generations.

The lifecycle wealth associated with downward flows—from older age groups to younger age groups—is negative. Many members of the population have already received benefits but they have not yet incurred the costs associated with downward transfers. A newly married couple, for example, faces childrearing costs but may anticipate few additional transfers from their parents. Hence, their childrearing lifecycle wealth is strongly negative.

The relationship between lifecycle wealth and age structure can be readily summarized given sufficiently strong assumptions. Lee (1994) has shown that given steady state golden rule growth, the ratio of lifecycle wealth to labor income (or consumption) is equal to the difference between the mean age of producing and the mean age of consuming.[4] The mean ages are 'dollar weighted' average ages. The difference between the two measures the lag in years between the age at which a dollar is earned and the age at which it is consumed. The greater this lag the greater is lifecycle wealth. If the population consumes before it produces, on average, its lifecycle wealth is negative.

With increases in life expectancy the expected duration of retirement rises. Individuals must accumulate additional wealth or face substantial reductions in standards of living during old age. The wealth can come in several forms, however. One possibility is the accumulation of additional capital. The other is the accumulation of transfer wealth—increases in the obligations of future generations to provide old age support either through public pension plans or as part of familial support systems. Either form of wealth can meet the retirement needs of a growing elderly population, but increases in capital influence the level of output and economic growth, while increases in transfer wealth do not (Lee 1994). A third possibility is that neither transfer wealth nor capital is accumulated. In this case, favorable effects on productivity are not achieved and standards of living among the elderly deteriorate. Which of the three possibilities, or a combination of them, materializes depends largely on the institutional arrangements, which we shall return to discuss in a later section of this chapter.

To illustrate the potential demographic dividend associated with population ageing in China, we carry out a set of analyses with available data. Our production and consumption profiles are based on data for urban China for the year 2000, and our population age structures are based on those projected using 1982 as the basis and with assumptions similar to those in Table 11.1. The calculations are for China as a whole. The analysis presented below relies on a highly stylized model of the economy. Suppose that the cross-sectional age profiles of production and consumption—the shape but not the level—are held constant. The profile of production reflects persistent effects of experience and obsolescence. We abstract from changes in labor force behavior, e.g., changes in retirement behavior and changes in returns to experience related to increases in educational attainment or other forces. The profile of consumption reflects preferences about own consumption and preferences about the consumption of others reflecting altruism or political processes.

China's ageing population structure leads to a substantial decline in the resources that must be reallocated from working generations to children and a substantial increase in the resources that must be shifted from workers to the elderly. The shift is quite evident in Figures 11.5 to 11.7, which show the distributions of aggregate consumption and labor income by age for 1982, 2000, and 2050 and the associated age reallocations.[5]

Two interage flows, from workers to children and from workers to the elderly, are summarized by the arrows shown in the figures. The foot of the arrow is located at the mean age of the outflow from workers and the head of the arrow is at the mean age of the inflow to recipients. The width of the arrow is the per capita reallocation. Given golden rule, steady state growth the area of each arrow is equal to aggregate lifecycle wealth that must be maintained to support each age reallocation (Lee 1994, 2000). In the case of downward flows, flows from older to younger age groups, the lifecycle wealth is negative. It is negative because those who are alive are obligated to make transfers to those who have not yet been born.

The effects of age structure on lifecycle wealth are quite pronounced (Table 11.3). In 1982, transfers are strongly downward from workers to children and total lifecycle wealth is more than nine times total labor income and negative—dominated by the downward flow to children. As population ageing proceeds, flows to children decline and are dominated by flows to the elderly.

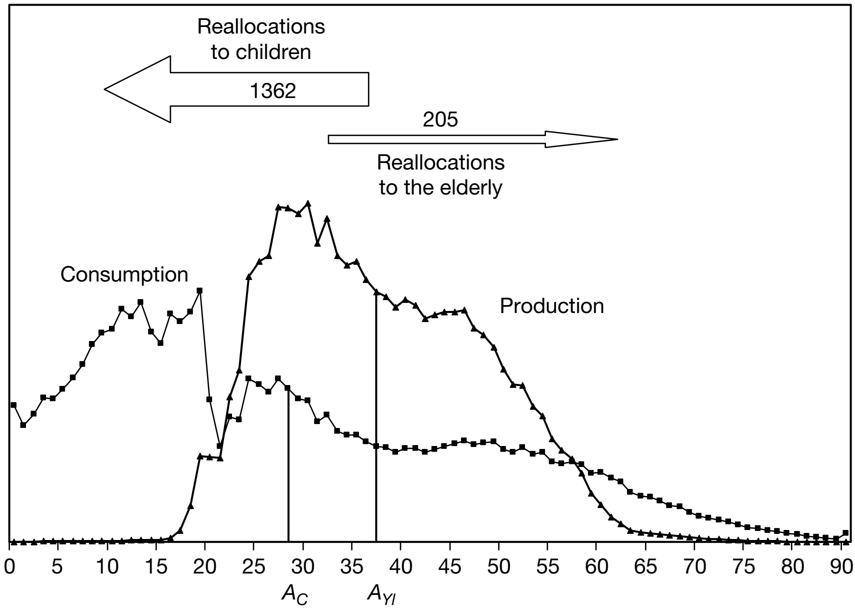

Figure 11.5 Consumption and income profiles, China: 1982

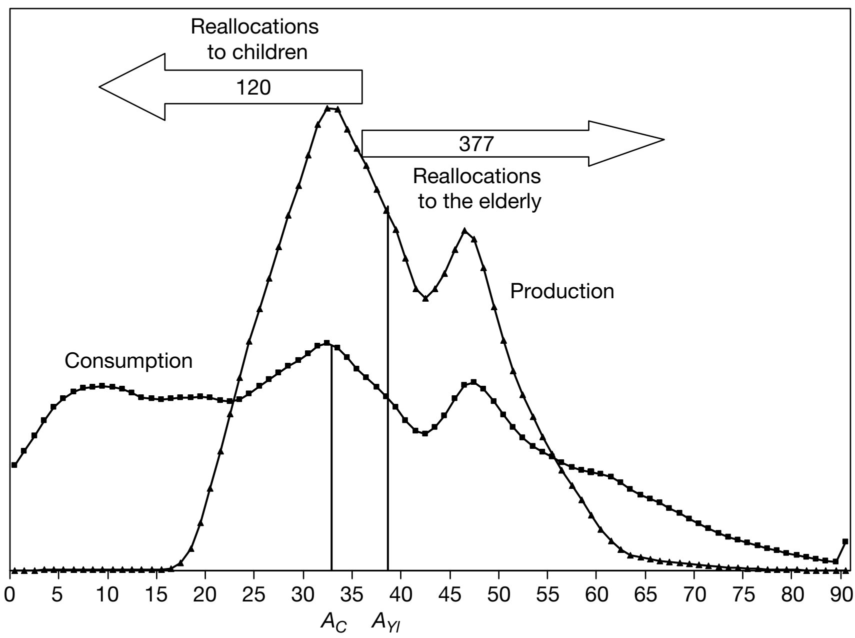

Figure 11.6 Consumption and income profiles, China: 2000

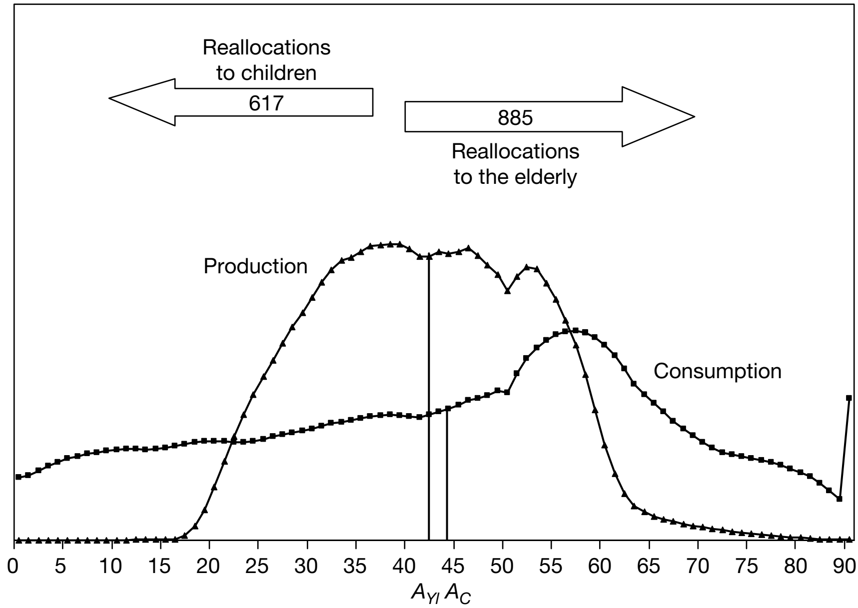

Figure 11.7 Consumption and income profiles, China: 2050

Table 11.3 Mean ages and lifecycle wealth variables

	1982	2000	2050
Mean age of consumption	28.0	32.5	44.4
Mean age of production	37.3	37.8	41.8
Ratio of lifecycle wealth to labor income			
Total	−9.2	−5.3	2.6
Support of child dependents	−11.2	−7.8	−4.5
Support of elderly dependents	2.0	2.5	7.1

Notes: Estimates of lifecycle wealth for the support of child dependents is based on the mean age at childbearing in 2000 from the population projection for China. Lifecycle wealth calculations assume golden rule, steady state growth.

Source: Based on age profiles of household consumption and labor income estimated from the 2000 Urban Income and Expenditure Survey.

By 2050, steady state lifecycle wealth will be 2.6 times labor income. Steady state lifecycle wealth required to support consumption by the elderly will rise to 7.1 times labor income. The important implication of Table 11.3 is that population ageing in China must lead to rapid growth in the capital stock, to an enormous expansion of public or familial based transfer programs, or to a significant decline in living standards among the elderly.

Suppose that the reallocation system for the elderly relied entirely on capital throughout the entire history under consideration. Prior to reform this would assume that the state was implicitly funding pensions by investing in state enterprise. After reform capital accumulation became a combined responsibility of the family, the market, and the state. Demographic conditions in 1982, under steady state golden rule assumptions, would imply a capital output ratio of 2.6. Demographic conditions in 2050, again under steady state golden rule assumptions, imply a capital output ratio of 7.1. Given simple assumptions, an increase in the capital output ratio of this magnitude would lead to a doubling of output per worker.[6] The impact on the rate of growth of output per worker depends on the time frame over which the capital deepening occurs. Evenly spread over a century, output per worker would have to grow at 0.7 per cent per year. Spread over 50 years, output per worker would grow at 1.4 per cent per year as a result of capital deepening.[7] Such a growth in output per worker is what can be considered the second demographic dividend in the Chinese case.

11.4 INSTITUTIONS AND THE SECOND DEMOGRAPHIC DIVIDEND

The extent to which the second demographic dividend can be realized, however, depends on the mechanisms or institutions used to reallocate resources. Resources can be reallocated from surplus ages to deficit ages in different forms and relying on different institutions, as listed in Table 11.4.

Table 11.4 Reallocation system

Form	Institution		
	Family	Market	State
Capital	Housing Consumer durables Education	Factories Inventories Farms	Public infrastructure State owned enterprise Funded pension plans
Transfers	Childrearing costs Support of elderly Bequests	Public debt	Public education Public health care Unfunded pension plans
Credit	Familial loans	Consumer credit	Student loans

Source: Adapted from Lee (1994).

Three forms are available in complete economies: capital, transfers, and credit. Firstly, capital can be accumulated at surplus ages; later, at deficit ages it yields capital income and can be liquidated. An important point to note is that capital can only be used to reallocate resources from younger to older ages. Secondly, those in deficit ages can rely on current transfers from those in surplus ages. Thirdly, individuals can rely on credit markets. Those at surplus ages can lend to children relying on loan repayments later in life when they are at deficit ages. Credit markets play a small role in interage reallocation systems, however, because of constraints on indebtedness.[8]

Economic reform complicates the picture in China because the institutions and mechanisms used to achieve reallocations are themselves under drastic transformation. In a market economy, three institutions are involved in reallocations. In many societies, the family is the principal institution responsible for reallocating resources across age groups, and in virtually all societies, families dominate reallocations to children. Two other institutions, the market and the state, vary in their importance depending on the economic system. In pre-reform China, market institutions played little or no role and the state played a dominant role. In post-reform China, the emergence of a market economy and the recognition of private property have expanded the mechanisms available for resource reallocations with important economic implications.

Our calculations of the second demographic dividend for China are thus suggestive because there are many complexities not addressed. One is that in pre-reform China a large portion of lifecycle wealth, perhaps all, was held as transfer wealth rather than as capital. Lifecycle wealth represented the pension obligations or the implicit debt of future generations as embodied in the state and its organs, e.g., state owned enterprise (SOE). To an unknown extent economic reform destroyed that lifecycle wealth. A continuing issue in China will be through what mechanisms and to what extent lifecycle wealth should be replenished. Transfer wealth will necessarily play a major role, because the greatest obligations are to those who are near or who have already reached retirement. For them, accumulating capital is not an option; only creating transfer wealth is. The question then is the extent to which pension obligations are absorbed by the state (taxpayers), shifted to private firms (including state owned enterprises that are privatized), or shifted to families.

A second complication for China is separating the transitional issues associated with economic reform from the ongoing issues that arise with population ageing. Establishing a large scale PAYGO pension system would most readily meet the short term objective of fulfilling obligations to current pensioners. Such a strategy, however, would commit China to a path that foregoes the second demographic dividend.

Direct econometric support for the existence of a second demographic dividend comes in the form of studies of the effect of demographic factors on aggregate saving. Saving rates must rise above their equilibrium level to produce an increase in the capital output ratio. There is no doubt in East Asia that aggregate saving rates are well above equilibrium, but there are many competing hypotheses about why saving rates are so high in East Asian economies. A number of studies have found evidence to support the view that saving rates have been influenced by changes in age structure (Mason 1987, 1988; Kelley and Schmidt 1996; Higgins and Williamson 1997; Deaton and Paxson 2000) and life expectancy (Bloom and Graham 2003; Kinugasa 2004). The magnitudes of estimated effects are sensitive to the methods and data employed.

The available evidence supports the conclusion that the demographic transition has led to more rapid growth in output per capita in many East Asian countries where the demographic transition has been especially rapid. China has clearly enjoyed significant gains in output per effective consumer as a result of the first dividend. Whether or not China will enjoy a second dividend remains to be seen. Demographic change offers an opportunity for significantly more rapid economic growth, but only if the policy environment is supportive. It would be a serious error, however, to reach any welfare conclusions about demographic change, in general, and fertility decline, in particular. Two reasons for this seem particularly important to emphasize. The first is that capital deepening is achieved by reduced consumption. The resulting growth in output per worker is not a free lunch but comes at the expense of reduced material standards of living among those who are saving at such high levels. The second point is that rapid fertility decline in China may have involved an enormous sacrifice on the part of parents forced to have a single child. We do not know how many children would have been born in the absence of the one-child policy. Nor do we know how to value the costs imposed by the loss of reproductive freedom.

11.5 CONCLUSIONS

Following rapid mortality and especially fertility declines in the second half of the twentieth century, China's ageing process is well under way and is unfolding not only on a massive scale and at a rapid pace, but also with enormous complexities. It is complex due to its demographic and institutional legacies that have created multiple sub-national demographic regimes, and due to drastic changes in its economic and social institutions.

This chapter highlights some of these complexities. Firstly, when examined at a sub-national level, such as by urban and rural areas separately, we witness and anticipate a vastly different picture of population ageing in China to that treating China as a whole. Due to an earlier onset of fertility decline and a more stringent government birth control policy, urban China has become old not only earlier but also much faster than rural China. By 2023, when the proportion of those aged 65 and above reaches 12 per cent in the national population, it will reach 20 per cent in China's urban population. In other words, in less than 20 years, this segment of the Chinese population will be as old as those of Japan and Italy, the two oldest large populations in the world today. Moreover, unless fertility increases substantially in the near future, in about 40 years there will be one out of every three persons in China's urban areas who is an elderly person.

Secondly, a massive migration process further complicates ageing trajectories in urban and rural China. Constant out flows of rural young workers, while helping to pay for urban infrastructure and therefore supporting urban elderly in some ways, will also lead to an increase in ageing levels in rural areas. In the peak years, around 2020, out migration of young people could result in an increase in the proportion of rural aged by as much as 70 per cent compared with the trajectory in the absence of out migration. The impact of migration on ageing, however, is most likely to be restricted to the macro or the societal level, and temporary. At the aggregate level, rural migrants in urban China can make up for the labor shortages in urban areas resulting from a more severely aged population, and can help pay for taxes that are needed for urban pensions. At the micro or the familial level, however, rural migrants cannot substitute for children to provide daily support to urban elderly parents. At the same time, given that most rural migrants are likely to resettle back to the countryside, and taking into account their remittances home while away, the negative impact of rural out migration may not be as serious as it appears.

Thirdly, population ageing in China not only poses new challenges but also presents new opportunities. One such opportunity is an increased level of saving and capital accumulation. With the right institutional setting and incentives, China's ageing demographic profile can lead to increased capital accumulation and in turn, increased output per worker due to capital deepening. This increase is what is known as the second demographic dividend. Based on urban China's consumption and production profiles of 2000 and the projected population age structures, we estimate that this second demographic dividend could amount to as much as a 1.4 per cent increase in output per worker annually for the 50-year period between 2000 and 2050.

To realize this second demographic dividend, however, it is crucial to have the appropriate institutional arrangements that allow or even enforce current surplus to be saved in the form of capital, rather than spent as transfer to pay for an ongoing pension scheme or as credit. China's economic reforms of the last two decades have included a component of establishing a capital market and have allowed private ownership of capital and property. Institutional changes of such type facilitate the realization of the second demographic dividend. At the same time, however, increasing pressure for transfer payments to the rapidly increasing retirees also puts a strong constraint on both the individual and the state to accumulate capital. Turning the demographic challenge of ageing into an economic opportunity depends largely on the institutional context, a factor far more complex and unpredictable than future demographic trajectories.

12

Internal Migration: Policy Changes, Recent Trends, and New Challenges[1]

Zai Liang

China's internal migration was negligible during most of the 1960s and 1970s because of strict government control of rural–urban migration through the implementation of the *hukou* (household registration) system. Since the late 1970s however, there have been major changes in the size and patterns of migration (Eckholm 2003). In fact, it would be difficult to spend a day in a Chinese city without encountering any migrants. The magnitude of migration has been accompanied by a growing literature dealing with different aspects of this process. According to Princeton University's Population Index, for example, there were 34 English publications on the topic of migration in China in the 1980s, and the number increased to 131 in the 1990s. More research findings have been published in Chinese, and the number of research papers published in 1985, 1988, and 1995 were 22, 41, and 65 respectively (Yang 2003). The increase in migration studies is also reflected in the number of books published on the topic. According to the author's own incomplete account, there were eight books published in English and 26 books in Chinese by the early 2000s.[2]

This chapter reviews recent patterns of China's internal migration, discusses relevant policy changes, and identifies challenging issues facing policy makers and students of migration. It cannot provide an exhaustive review of the existing literature because of the large volume. Instead, it tries to draw broad patterns in big strokes, with a particular focus on definitions, data sources, and major patterns of migration (including spatial patterns, remittances, and return migration). This is followed by some discussion of China's migration policies and changes. The final part of this chapter presents major challenging issues for migration in China.

12.1 DIFFICULTIES IN DEFINING MIGRATION AND COUNTING MIGRANTS

It has become an annual ritual now that each year in the months and days leading to and following the Spring Festival (*chunjie*), there are numerous reports about China's migrant laborers going home for the holidays. In fact, a typical image of a migrant as portrayed by the media is someone waiting in a long line at a railway station, with a big bag carried on the back. Data from the Railway Ministry suggest that during the Spring Festival of 1994, the railway system transported over 180 million passengers, and 74 per cent of them were migrants (Wu *et al.* 1995: 60). Ten years later the number had somewhat declined, with 140 million passengers being transported by railway in 2004 (*World Journal* 2004). The decline probably reflects the fact that some migrants chose to travel home by long distance buses with more flexible schedules and convenient stops. Clearly, even with a slightly reduced number of rail passengers, China's transportation system feels the burden of a large number of migrants and has had to develop strategies to deal with it.

The exact size of this population is difficult to obtain for two reasons. One is the nature of the population. Migrants are constantly on the move from one location to another. Migrants who are without *hukou* in the place they are living are not particularly eager to be counted in any survey or census. Obtaining accurate numbers is further complicated by the fact that surveys or censuses do not always use the same or 'standard' definition of migrants.

Table 12.1 shows how migration was handled in six major national surveys or censuses. There are three criteria in defining the migrant population in China. One is space (geographical or administrative boundary). For migration to occur, an individual has to cross two administratively defined regions. The region could be county, city, or province.[3] The second criterion is time. A definition of migration has to involve a time dimension. The question of consideration is whether to include in the definition of the migrant population people who have resided at the place of destination for three months, six months, or a year. These two criteria generally apply to measures of migration in other countries as well. However, in the Chinese context, there is a need to include a third criterion which is the status of a person's household registration (*hukou*). '*Hukou*' defines one's legal location of residence. The use of *hukou* status is important for at least two reasons. Firstly, *hukou* indicates access to benefits or lack of them (Chan 1996; Solinger 1999; Wu and Treiman 2004). For example, an urban *hukou* was for a long time associated with provision of housing, employment, medical care, pension, and so on, though these benefits are now much less guaranteed than previously. In contrast, a

Table 12.1 Definitions of migration in major surveys or censuses in China: 1986–2000

	Space	Time	*Hukou*
1987 China 1% Population Survey	Cross-county, town	6 months	*Hukou* and non-*hukou*
1986 Survey of 74 Cities/Towns	Cross-city/town	1 year+	*Hukou* and non-*hukou*
1988 China 2/1000 Fertility and Birth Control Survey	Cross-county	1 day+	*Hukou* and non-*hukou*
1990 China Population Census	Cross-county	1 year+	*Hukou* and non-*hukou*
1995 China 1% Population Sample Survey	Cross-county	6 months+	*Hukou* and non-*hukou*
2000 Chinese Census	Cross-county, intra-county	6 months+	*Hukou* and non-*hukou*

Notes: The 1986 survey of 74 cities/towns has a special module for individuals who have resided in location for less than one year. The 2000 census has a module for people who have resided in the current location for less than six months.

rural *hukou* does not contain these benefits. Secondly, in the eyes of the government, no migrant is allowed to live in a place permanently unless he or she obtains the local *hukou*. In the current literature, migrants with *hukou* are considered as permanent migrants and migrants without local *hukou* are often described as temporary migrants (or the so-called floating population). Depending on one's definition of migrants (along the three aspects of time, space, and *hukou* status), the estimated size of the migrant population can differ significantly.

Aside from regional surveys such as the Shanghai Floating Population Survey and the Beijing Floating Population Census, all national surveys or censuses cover both permanent and temporary migrants. The main difference between them in defining migrants lies in the other two criteria: space and time (duration). For example, the 1987 Chinese 1 per cent Population Sample Survey used six months as the duration for migrants to be counted at their places of destination. When the 1990 Census was conducted, however, only migrants who had been resident at their places of destination for a year or more were defined as the migrant population.[4] When China's National Bureau of Statistics (NBS) conducted the 1995 1 per cent Population Sample Survey, it reverted to six months as the time/duration criterion for being recorded as a migrant (NBS 1997). Since then, six-month residence duration seems to have become the standard and was used in the 2000 census (NBS 2002).

Given the different definitions of migrant population contained in different national surveys and censuses, it is no wonder that different estimates of China's migrant population exist. For example, a popular book that portrays different aspects of the migrant population cited '80 million floating population' in China in the 1990s (Hao 1996). From newspaper reports or academic sources, Cai Fang and colleagues derived estimates of the floating population as 80 million to 120 million in the mid-1990s (Cai *et al.* 2001). Although not always made explicit, these estimates often refer to the size of China's floating population (migrants without local *hukou*). However, when these estimates are cited, it is difficult to figure out how the population is defined in terms of space and time. It is often unclear whether the estimates include migrants moving between counties as well as within counties. Even less clear methodologically is how they are derived, whether from national surveys or by extrapolation from local surveys. As a result, these estimates may offer little more than confirmation that the size of China's migrant population is huge.

The approach taken in this chapter is to use data from national surveys or censuses. The main advantage of doing so is that we have a clear definition of the population being discussed so that the degree of change over time can be assessed. The main focus of the study is China's floating population because it has experienced the largest increase since the late 1970s. The data sources include China's recent censuses along with annual population change surveys, all conducted by the NBS (1997, 1998, 1999, and 2000).[5]

When the first census since the beginning of economic reform was conducted in 1982, the floating population was around 11 million. By the time of the 1990 census, it had increased to about 30 million. The early 1990s saw another big jump in the size of the floating population which, according to the Population Sample Survey undertaken in 1995, reached 56 million in that year.[6]

To see whether the estimates of the total floating population in the mid-1990s, commonly cited in the literature as being 80–120 million, make sense the following simple exercise can be conducted. The 1994 Beijing Floating Population Survey reported that 36.7 per cent of the floating population had duration of residence of less than six months (Zhou 1996). Assuming the distribution of duration of residence among the floating population in Beijing was the same as that throughout China, the total floating population in China in 1995 may be calculated as 88.46 million (56 million + 22.46 million). This figure is close to the lower cited estimates. Data from the 2000 Census reveal nearly 80 million intercounty temporary migrants with duration of residence of no less than six months (Liang and Ma 2004). If the same methodology is applied to the census data, it suggests that the total size of China's floating population might have reached 126 million by the end of the twentieth century.

12.2 PATTERNS OF RECENT INTERNAL MIGRATION

The 2000 census shows that the province that sent the largest number of interprovincial migrants is Sichuan (excluding Chongqing) with 6.9 million out migrants, followed by Anhui (4.33 million), Hunan (4.30 million), Jiangxi (3.68 million), and Henan (3.07 million). These provinces are among the most populous in China (Liang and Ma 2004). Data collected in the mid-1990s suggest that migrants chose coastal region destinations (Liang 2001). This pattern seems to have further intensified in the late 1990s and early twenty-first century. The province receiving the largest number of floating population was Guangdong, which had 21 million in-migrants in 2000, accounting for more than a quarter of China's total floating population in that year. The dominance of Guangdong's position in attracting the floating population shows no signs of abating in the new century, and the number of migrants in the province reached 21.3 million in 2004 (*People's Daily* 2004*b*). Two other coastal provinces Zhejiang (5.4 million) and Jiangsu (5 million) are in distant second and third places. Shanghai ranks fourth with a floating population of 4.3 million in 2000 (Liang and Ma 2004). The size of Shanghai's floating population is much more significant than it initially appears, when considered in the context of the city's total population of 16.4 million. It is also noteworthy that Shanghai had only 1.7 million migrants in 1995 according to the Population Sample Survey of that year, which used the same definition of migrant as the 2000 census (Liang 2001). Five years later, the size of the floating population had more than doubled, largely as a result of Pudong's development.

The major interprovincial population movements and the origin–destination linked patterns are revealed by examination of China's two main migration streams: one is the Guangdong centered migration stream (Pearl River Delta region) and the other the Shanghai centered (Yangtze River Delta region) migration stream. Within the Guangdong centered migration stream, three adjacent provinces, Hunan, Guangxi, and Jiangxi, sent the largest numbers of interprovincial migrants. In fact, Hunan to Guangdong migration represents the largest migration stream in China: 3.3 million floating population from Hunan were residing in Guangdong province in 2000. Among six provinces that contribute more than one million migrants to Guangdong, three are the neighboring provinces mentioned earlier and the other three are the populous provinces of Sichuan (2.8 million), Henan (1.5 million), and Hubei (1 million). The migration streams in the Yangtze River Delta region are characterized by the dominance of Anhui, which sent over one million migrants to Shanghai and Jiangsu (Liang and Ma 2004).

Students of migration have long realized that migration is demographically a highly selective process. Migration theory suggests that migration is a developmental process and the selectivity of migration changes over time (Massey *et al.* 1987). Migration often begins with young and single males. When migrants secure stable employment and find affordable housing, they gradually bring spouses and children to the places of destination to settle. Thus it is expected that family migration will increase over time and the number of migrant children should follow the same trend. In Shanghai, six surveys of floating population have been conducted since the early 1980s (1984, 1985, 1986, 1987, 1993, and 1997). Data from the two most recent surveys are used to document the increase in the duration of migrants staying in Shanghai, and the increase in family migration and migrant children. It should be noted that all six surveys used an identical definition of floating population, i.e., those who had stayed in Shanghai for at least one day. This allows researchers to analyze changes in migration patterns over time.

A major finding from the 1993 and 1997 Shanghai Floating Population Surveys is that migrants have increased their duration of residence in Shanghai. In 1993, 22.6 per cent of the floating population had resided in Shanghai for one to five years, and this proportion increased to 37.1 per cent in 1997. During the same period, the percentage of migrants with duration of residence in Shanghai of five to ten years more than doubled, from 5.7 to 13.6 per cent (Zhang *et al.* 1998). These results indicate that a substantial portion of migrants was settling in Shanghai.

The increasing duration of residence for the floating population in Shanghai is, not surprisingly, accompanied by another trend: an increase in migrant children of school age. Overall, the size of floating population in Shanghai did not experience significant change from 1993 to 1997; indeed numbers actually declined slightly from 2.81 million to 2.76 million.[7] However, during the same period, the number of migrant children of school age grew from 280,000 to 340,000, an increase of 21 per cent. This phenomenon is not unique to Shanghai: a similar pattern also shows up in Beijing. Like Shanghai, Beijing has also conducted several surveys of its floating population, most recently in 1997 (OBFPC 1998). The 1997 survey data show migrants resided in three types of households: Beijing local resident households (households heads with Beijing *hukou*), migrant households (households headed by migrants), and institutional households. Changes in the proportion of various types of household where migrants lived can be clearly identified on the basis of the 1997 Beijing Floating Population Census and the 2000 census, as shown in Figure 12.1. In 1997, 32.84 per cent of migrants lived in migrant households. By 2000, the proportion of the floating population who lived in migrant households had risen to 45 per cent, an increase of 12.2 percentage points in a matter of only three years (Zhang 2003).

These trends—increasing proportions of migrants staying longer and bringing their families to the cities—have been further confirmed by recent surveys, and could have many important implications. For example, results

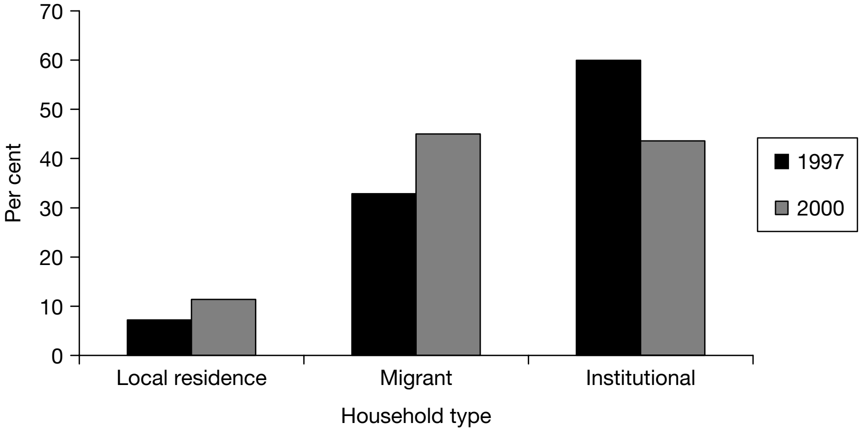

Figure 12.1 Percentage distribution of migrants by type of household, Beijing: 1997 and 2000

Source: 1997 Beijing floating population census and the 2000 population census.

from a survey of the floating population in Beijing conducted in 2004 reveal that 54 per cent prefer to remain in Beijing if possible (*World Journal* 2005*a*). Thus a mentality which sees the floating population as people who come, make money, and then leave does not reflect this new demographic reality. In addition, as more migrant family members move to cities, they increase the demand for services, such as schools and heath care, as well as services for reproductive health. The presence of a large number of school children helps create a new urban social phenomenon: the mushrooming of *dagong zidi xuexiao* (migrant children's schools) in urban China. In Beijing alone, there are over 200 such schools in existence (Han 2003). These schools are often located in areas with inadequate sanitary conditions. Usually owners of these schools are migrants themselves who may not always have experience in teaching or school management. Teachers and classrooms are rarely up to the standard of urban public schools (Liang and Chen forthcoming). This poses a major challenge to China's law of mandatory education.

12.3 MIGRATION, HOUSEHOLD INCOME, AND RETURN MIGRATION

The impact of migration on destination areas can easily be detected in, for example, the erection of high-rise buildings that have become so dominant in

Chinese cities over the past two decades. Some even go so far as to claim that those cities that have more migrants will be most prosperous (Lu 2004). In more concrete economic terms, China's trade surplus with other countries is also to some extent attributable to the hard work of those migrant workers who often make toys, shoes, clothes and electronics. The two main locations where these goods are produced (the Pearl River Delta region and the Yangtze River Delta Region) happen to be most attractive to migrant labor. In the context of destination areas, migration is often discussed both for its positive contributions and allegedly negative consequences such as crime and over crowding (Zhang *et al.* 1998). However, migration has a major impact on migrant sending areas as well. A recent popular term highlights this phenomenon: *dagong jingji* (migrant economy), referring to the migrants who return home to open new businesses and employ local workers (Bai and Song 2002). In China's largest migrant sending province, Sichuan, 340,000 returned migrants had reportedly opened new factories and businesses by 1997. These businesses included electronics, clothes, textiles, furniture, chemical engineering, construction, home decoration, food processing, and manufacturing. The same report indicated that over 750,000 people were employed in these new businesses (Chen 1997). Li Yining, a well known economist at Peking University, is enthusiastic about this trend, pointing out that China's 80 million rural migrants are self-supporting: the state does not spend any money on them. If one-third or a quarter of these 80 million migrants returns home, he argues, they will surely generate significant changes in the countryside (cited in Chen 1997: 56).

Evaluation of the economic consequences of migration for the sending communities is admittedly a formidable task. Here we draw upon recent work on migrants' remittances by scholars at Rural Development Center of China's State Council (RDCCSC) to supplement discussion of this issue. Du Ying and Bai Nansheng of RDCCSC conducted their research on the impact of remittances on migrant sending communities in Sichuan and Anhui (Du and Bai 1997). They divided rural communities into three groups according to the level of economic/agricultural development, with groupings I, II or III standing for high, medium, or low levels of development, respectively. Two measures were used in their study: migrant contribution to household income (using migrant's gross income divided by the total household income) and migrant contribution to net household income (using migrant's net income divided by total net household income). The results of their study are shown in Figures 12.2 and 12.3, which indicate that migrant income contributes significantly to both the total household income and net household income. For example, in the more developed regions of Sichuan, migrant net income contributed nearly 20 per cent of net household income. Another finding is that

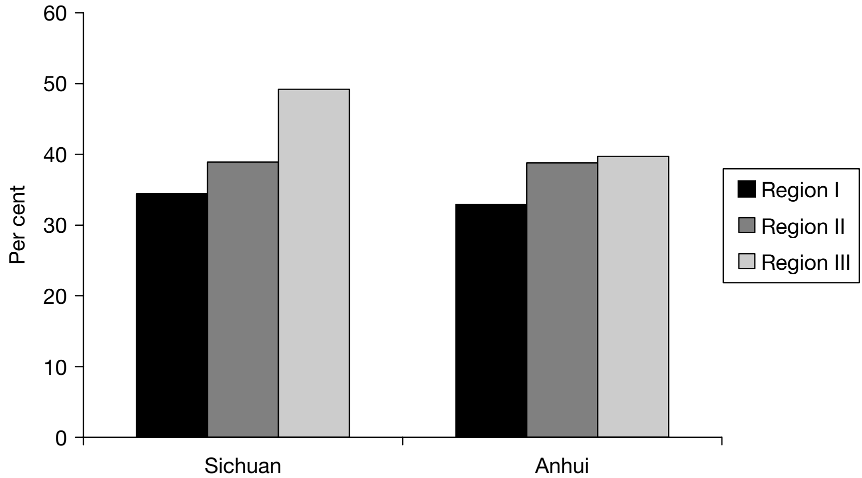

Figure 12.2 Migrant contribution to total household income by region: Sichuan and Anhui

Source: Du and Bai (1997).

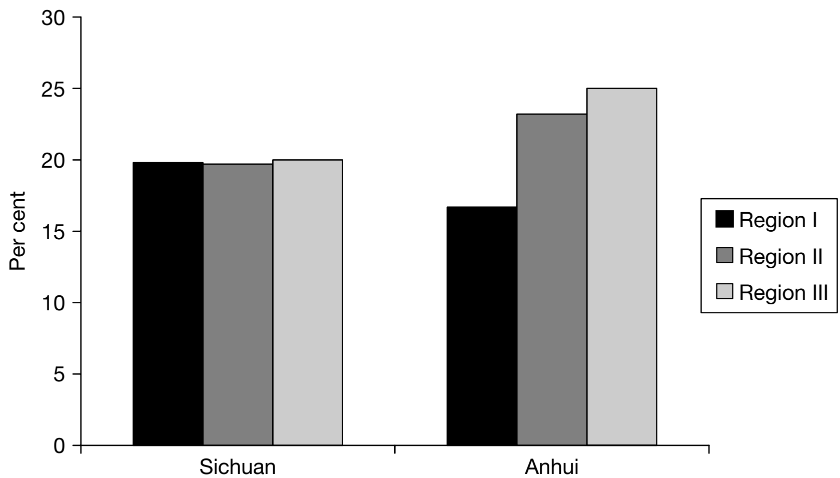

Figure 12.3 Migrant contribution to net household income by region: Sichuan and Anhui

Source: Du and Bai (1997).

migrant income contributes more to the total or net household income in less developed regions than in more developed regions. That finding is consistent with another study of the role of migration on alleviation of poverty using more recent data (Ma *et al.* 2004). This suggests that efforts should be made to provide migration opportunities for people from less developed regions, perhaps as a way to alleviate poverty.

On an aggregate level, Chen (1997) reported that in 1997 migrant workers from Sichuan sent remittances of 20 billion *yuan* (RMB) back to their home villages. This sum is equal to the revenue of Sichuan province in that year. Cai's (2000) calculation suggests that on average migrants sent home 2,000 *yuan* per year. Assuming the floating population numbered 80 million, remittances per year may be as high as 160 billion *yuan*. The infusion of such huge amounts of money to migrant sending villages has perhaps unforeseen implications for reducing rural/urban inequality and interregional inequality (Liang 2001).

While the issue of return migration is of great importance, not many data sources are available allowing its examination. If, however, the experiences of other countries are any guide, return migration can be as high as one-third of the original migration flow (Warren and Kraly 1985). Recent work by Liang and Wu (2003) has established some groundwork in this area. Capitalizing on the information collected by the Population Sample Survey of 1995, they measured return migration among interprovincial migrants, using Sichuan province as an example. Since Sichuan–Guangdong migration is one of China's major migration streams, return migrants from Guangdong to Sichuan and those from other provinces were measured separately. The results show that return migration from Guangdong to Sichuan was about 23 per cent and return migration from other provinces to Sichuan was 10 per cent. Assuming the average rate of return migration in Sichuan is somewhere between 10 and 23 per cent (for example 16 per cent), and applying this estimate to the total floating population in 2000, the possible number of return migrants would be around 13 million for China as a whole. These return migrants bring back new ideas, capital, and skills. Their potential contribution to the migrant sending communities is enormous.[8]

12.4 RECENT CHANGES IN MIGRATION POLICIES

A major difference in internal migration between China and other countries is the government controls on population movement, which are largely reflected in government migration policies. The most important element underlying China's migration related policies is the household registration or *hukou* system. Like migration itself, policies governing migration have changed significantly in the past two decades. This section provides a succinct discussion of these changes and the distinction between polices made by the central government and those by local governments. A fuller treatment of changes in government policies on migration is beyond the scope of this chapter.

China's economic reform started in 1978, but it was not accompanied by a similar reform policy governing migration. In fact in December 1982, after three years of reform, the State Council issued a document calling for 'strict control of rural to urban migration and the change of status from agricultural to nonagricultural *hukou* (*nong zhuanfei*)' (cited in Bai and Song 2002). The most important policy change governing migration in the 1980s was announced in 1984, essentially allowing peasants to enter towns to do business as long as they could take care of their own grain. The document even permitted some peasants, but not all, to obtain local *hukou* in towns. According to Bai and Song (2002), the following major factors led to this change. Agricultural productivity had increased in rural areas and as a result there was enough food for peasants who wanted to go to cities. Also, during this time, China's urban reform created a demand for additional workers. The late 1980s and early 1990s saw major tightening of government policies on migration. In documents issued in 1989 and 1991, the State Council explicitly stated that out migration from rural areas must be strictly controlled and officials and government agencies at all levels were to discourage migrants from migrating blindly to Guangdong. However, the policy seemed to have little effect because, as was shown earlier, migration clearly increased by 1990 and continued to accelerate through the 1990s.

By the mid-1990s, China had already undergone dramatic changes; so much so that migration became a realistic option for millions of people. Between 1984 and 1994, many documents had been issued with the aim of slowing down, if not stopping, the flow of migrants, but this has been in vain. The government finally realized that it was no longer realistic to issue another order to control the flow of migrants. A more pragmatic approach was to facilitate the flow and help migrants adapt in the host communities. In a document entitled 'Provisional Regulations regarding Interprovincial Migration', the Ministry of Labor for the first time set the tone for the institutionalization and management of migrant labor. This document called for the issue of migrant employment registration cards (*waichu renyuan jiuye dengji ka*) by the province of origin (Bai and Song 2002). With that card, a migrant could apply for a migrant employment certificate at the province of destination. Migrants were required to show potential employers the registration card and certificate when applying for a job. The author's own field research in Sichuan province found that obtaining a migrant employment registration card and employment certificate is a routine procedure, rather than a difficult task.

Perhaps the reform that migrants most desire is a reform in the *hukou* system. The Chinese government has so far taken a gradual approach, with the most dramatic changes in small cities and small adjustments in big cities. For example, the 1997 document from the State Council authorized small cities/towns to issue local *hukou* status for migrants who meet certain requirements. In particular, the document stated that once migrants receive local *hukou* status, they should enjoy equal benefits to other local residents in terms of school enrollment of children, employment, and social welfare support. By 2000, this new policy was extended to county level cities. The most dramatic reform in *hukou* took place in Shijiazhuang, capital of Hebei. As one of several experimental places for *hukou* reform, the city implemented a radical new policy that allows migrant workers who have been living in Shijiazhuang for two years with stable employment and stable place of residence to apply for local urban *hukou*. The biggest fear among some policy makers had been that the city of Shijiazhuang would lose control over the number of permanent urban residents, a fear that did not in the event materialize. Among the floating population of 290,000 counted in the 2000 census, only a third took advantage of this opportunity during the period between August 2001 and October 2004 (Duan 2004).

In sum, government migration policies are clearly moving in the right direction albeit at a slow pace. The basic idea is to begin with the towns/small cities, then move to the provincial capital cities, and eventually to major cities such as Beijing, Shanghai, and Guangzhou. Given the large concentration of migrants in coastal regions, reform must cover these most desirable destinations as well. There are two major policy concerns at the moment. One is job discrimination against migrants. In Beijing, for example, migrant jobs are restricted to certain occupations, and migrants are not allowed employment in occupations such as finance, insurance, accounting, star-level hotels, or as telephone operators, etc. (Bai and Song 2002). Another major policy concern is with school enrollment of migrant children. Although a policy document issued in 1998 by the State Council called for local governments to accommodate the educational needs of migrant children, the reality is that few have actually implemented the policy (Liang and Chen forthcoming). This is in direct contradiction to China's effort to implement nine-year compulsory education, and is further discussed in the next section. Before giving migrants fully fledged urban *hukou* status, these two issues should be addressed with high priority.

Recent reforms on migration related policies address specific targets. In September 2004, a joint document from the Ministry of Education, the National Development and Reform Commission, and Treasury, calls for abolition of the policy of charging extra fees for migrant children. Beijing began to implement this policy in autumn 2004 (Liu *et al.* 2005). Another major change in Beijing was announced in March 2005 when, at a meeting of the Beijing People's Congress, a policy on equal treatment of migrant workers was adopted. At least on paper, migrants and their children are now treated the same as local Beijing residents. However, the implementation of these policies often takes a long time. It is also not clear whether other cities will follow suit. We await the outcome of these policy initiatives.

12.5 MAJOR CHALLENGES AHEAD

Research on internal migration in China is today a growing and exciting field, which has attracted scholars from demography, sociology, geography, economics, anthropology, and other disciplines. The number of articles published on migration continues to increase. These efforts have deepened our understanding of migration issues and provided an important foundation, and fundamental facts, which are likely to inform any policy decision making concerning migration issues. It is always difficult to predict the future for a fast changing society such as China. However, one thing is certain: China's floating population is likely to increase further. Given this reality, the following challenges that face migration researchers and policy makers need to be addressed.

12.5.1 Second Generation Migrants: The Long Term Consequences of Migration

As shown in earlier sections, the number of migrant children in Chinese cities has increased significantly in recent years. The main problem facing migrant children who do not have local *hukou* is the lack of equal educational opportunities. Migrants often face the choice of leaving their children behind or taking them to cities. As migrants decide to make a living in cities on a long term basis, they ultimately need to bring their children. However, the door to schools in cities is not always open to migrant children, especially children without local *hukou*.

In most Chinese cities today, migrant children without local *hukou* cannot enjoy the same opportunities to attend local public schools as other children. The typical story is that these schools require some level of 'endorsement fees' for the enrollment of children without *hukou* and those fees for middle schools are significantly higher than for elementary schools. Cao (1997) reported that in the 1990s some middle schools in Beijing charged as high as 50,000 yuan for migrant children to be enrolled. Except for a very few rich entrepreneurs, most migrants cannot afford the high endorsement fees. If children cannot go to local public schools, they have the choice of going to migrant sponsored schools, which have increased significantly, or simply dropping out of school. Most migrant children do enroll in schools, but more often than not in the migrant sponsored schools where tuition is affordable.[9] The quality of these schools is questionable to say the least.

In a paper on school enrollment for migrant children, Liang and Chen (forthcoming) show that migrant children who do not have local *hukou* at their destination not only have a lower enrollment rate compared to local children, but also have a lower enrollment rate as compared to nonmigrant children in migrant sending communities. The irony is that most people migrate because they want to make more money for the family and want their children to have a better life in the future, yet their children's education actually suffers as a result of migration to cities.

This lack of opportunity should be a major concern for policy makers in cities. As China continues to move to a market economy, educational credentials will become more and more important as a screening device for occupational attainment and career advancement. The current generation of China's migrants is characterized by a heavy concentration in lower level occupations. Whether this will be reproduced in the next generation to a large extent depends on their children's access to a good educational system and receipt of adequate education.

Results from the 2000 census suggest that there are 14 million migrant children in destination areas and 23 million migrant children are left behind (*liushou ertong*) in migrant sending communities (Duan and Zhou 2005). In the study conducted by Duan and Zhou, children left behind are defined as children who are below 14 years of age and are not residing with at least one of the parents. It was not until recently that the issue of children left behind came to the attention of mainstream media and researchers (*China Daily* 2004; Duan and Zhou 2005; *World Journal* 2005*b*) The issue needs immediate attention because co-residing with two parents is an important measure of children's well-being, and has been used in many migration studies (Tolnay 2003). It is also noteworthy that nearly 87 per cent of the 23 million children who are left behind live in rural areas. Providing compulsory education in rural areas is already a challenge, and the issue of children left behind by migrants adds salt to the injury. At present, policy makers seem at a loss regarding policy options. When asked by a reporter, an official in charge of women's affairs from the State Council stated vaguely that 'the government is not certain of what to do, perhaps the community can provide training for parents and better services for these children' (*World Journal* 2005*b*). Clearly more needs to be done, sooner rather than later.

12.5.2 Migration, Health, and STDs/HIV

Another area that needs attention is the relationship between migration and health. The link between the two has long been recognized (Curtin 1969; McDaniel 1994; Prothero 1977). There are two issues in regard to migrant health that are particularly important. The first is reproductive related health care for women and their children. For married migrants, the official policy of the State Family Planning Commission is that migrant women's reproductive health care should be provided mainly by local agencies at destination (SFPC 1998). In reality, however, the existing urban health care system often has problems meeting the needs of married migrant women, due to financial constraints. In addition, the current policy is also out of touch with reality in so far as it is only concerned with married women. Anyone who travels to the Pearl River Delta region these days knows immediately that there are many unmarried female migrant workers (Fan 2000; Roberts *et al.* 2004). According to a report from Dongguan, a major city where joint venture or foreign owned enterprises concentrate, more than 50 per cent of female migrant workers have had pre-marital sex (*World Journal* 2004*c*). Thus unmarried women too should be provided with reproductive related services. Like migrant women, migrant children also face health care problems. One study, of migrant children in nine cities, uncovered major health problems. For example, compared to local children, migrant children are much less likely to access immunization and physical check-ups and are more likely to suffer malnutrition (Zhang and Zhao 2003).

The second major health concern is the potential spread of STDs/HIV (Smith and Yang 2005). Issues of migration, sexual behavior, STDs, and HIV/AIDS have been extensively documented in developing countries especially in Africa (Anarfi 1993; Brokerhoff and Biddlecom 1999; Prothero 1977). It has been argued that migrants are particularly prone to risky sexual behavior because of the following characteristics: predisposing individual characteristics; changes in individual attributes due to migration, especially separation from a spouse/partner; exposure to a new social environment featuring different sexual norms; and the lack of social control for migrants in the new environment (Brokerhoff and Biddlecom 1999). Thus, for example, based on data from 11 villages in northern Senegal, Kane and colleagues reported that 27 per cent of returned male international labor migrants were infected with HIV/AIDS as compared to less than 1 per cent of nonmigrant males (Kane *et al.* 1993). This concern is clearly echoed by scholars who study STDs and HIV/AIDS in China (Gill *et al.* 2002; Yang 2002; Li *et al.* 2004; Parish *et al.* 2003). As Gill *et al.* predicted 'these large numbers of roaming workers [i.e., migrants] will become one of the most significant sources of new HIV infection in China over the coming years' (2002: 98). In a study of migration, drug use, and HIV in China's Yunnan province, Yang (2002) further suggested that migration is more than a transporter of HIV: it breeds social and behavioral changes that make migrants vulnerable to socially deviant and epidemiologically risky behavior. Among the specific factors that Yang stressed are economic marginalization, social isolation, and residential segregation.

Yang's concern regarding residential segregation is well supported by evidence from Beijing. While there has been a major increase in family migration and numbers of migrant children, the proportion of migrants living in institutional households is still substantial. Data from the 2000 census show that as many as 44 per cent of migrants in Beijing, which translates into 1.35 million migrants, resided in institutional households. Such 'institutional households' are usually dormitories for their workers provided by factories, construction companies, or in some cases work units. Migrants living in institutional households generally do not bring their spouses, and have little interaction with local residents in urban areas.

The vulnerability of the migrant population to risky sexual behavior is exacerbated by the fact that China is on the verge of a sexual revolution, which is most apparent in cities and coastal regions where migrants are heavily concentrated (Liang 2001; Gill *et al.* 2002; Parish *et al.* 2003; Yang 2004). A recent report suggests that there are as many as 6 million prostitutes in different parts of China (*World Journal* 2003*c*). Parish *et al.* (2003) found that migrants are more likely than local residents to engage in unprotected sex with commercial sex workers, and that people in coastal regions are twice as likely to have unprotected sex with commercial sex workers as are individuals in other regions.[10] The authors also suggested that 'This unregistered unlocatable population [migrants] could be engaging in more risky behavior than our data suggest. Thus our results could understate the degree among young migrants and in southern coastal locales . . .' (2003: 1272). Despite the important implications for public health there have been insufficient studies on this topic, and research and policy making in this area are urgently needed for the health of China's huge migrant population and their families.

12.5.3 Shortage of Rural Migrant Workers (*Mingong Huang*) or Shortage of Fair Wages?

Beginning in mid-2004, there have been reports of shortages of workers along China's coastal regions (Huang 2004; *People's Daily* 2004*a*; Wang 2004; Zhu and Wang 2005). First appearing in the Chinese media, these reports have recently captured the attention of the foreign press, such as the *New York Times* (Yardley and Barboza 2005). The news caused considerable surprise because for a long time people took it for granted that there was an unlimited supply of cheap labor in China. Although one can still debate the extent and magnitude of this problem in migrant destination areas, the issue reflects the reality of migrant workers' plight: low wages, routine overtime work, lack of labor rights for many workers, and frequent occurrences of unpaid wages.

For the last ten years or so, the Chinese economy has enjoyed a growth rate of about 9 per cent each year. However, this broad economic growth has not trickled down to the average migrant workers in coastal areas. A report, cited by Li Deshui, the Commissioner of NBS, shows that during the last ten years, the average wage for migrant workers in the Pearl River Delta region has remained about 600 *yuan* per month (Zhu and Wang 2005). In addition, the issue of unpaid wages has drawn national and international attention. In Shenzhen, for example, among 653 factories surveyed, 40 per cent owed wages, which added up to an astonishing total of 100 million *yuan*, to migrant workers.

Migrant workers used to be docile and easy to manage, but not any more. With help from NGOs and a variety of channels of information, an increasing number of such workers are aware of their labor rights. The year of 2004 saw three million migrant workers joining a total of 57,000 protests (Roberts 2005). Perhaps one of the most well known strikes happened on 6 June 2004 in Shenzhen, when over 3,000 migrant workers blocked a major highway by lying on the road, which delayed traffic for as long as four hours (*World Journal* 2004*a*). According to the same report, workers in this factory (a ten thousand worker joint enterprise owned by Hong Kong and Chinese business people) had a base salary of 200 *yuan* and normally earn about 500–600 *yuan* per month with overtime pay. In Dongguan, protestors even became violent. They set a shoe-making factory on fire, destroyed computers, and beat the management personnel (*World Journal* 2004*b*).

From the perspective of the Chinese government, although it is important to keep foreign investment flowing and orders coming, it is equally important to ensure fair wages for migrant workers and protection of their labor rights. There are reports that sometimes local government is so eager to attract investors that basic labor rights are ignored and enforcement of labor laws overlooked. While increasing wages for migrant workers may lead to loss of some investors, in the long run it will reduce the inequality and instability of Chinese society.

12.5.4 Migration and Old Age Support

A further issue relevant to migration is how migration affects the support of the elderly, which has been examined in the previous chapter. Due to improved health and medical conditions, China's elderly population has increased steadily. By the end of 2003, those aged 65 and older increased to 96.92 million and accounted for 7.5 per cent of the total population (Zhuo and Liang 2005). It should be noted that much of this elderly population resides in rural areas where pensions to support the old are largely unavailable.

Researchers have long argued that one of the main motivations to have children is for old age security. Traditionally security depended upon co-residence with children who provided financial support as well as daily help. However, in the age of migration, such an arrangement clearly faces some major uncertainties. Using the 2000 Survey of the Elderly (aged 60 and above), Zhuo and Liang (2005) revealed that 38 per cent of rural respondents had at least one child (including son- or daughter-in-law) who migrated. Depending on how far the children travel, migration may have different impacts. When people migrate to other provinces, the frequency of returning home is generally limited by the cost of transportation. Liang and Ma (2004) report that there has been an increase in long distance migration, with the proportion of interprovincial migrants increasing from 27.7 per cent in 1990 to 53 per cent in 2000. Clearly the rural elderly must feel the impact of migration. Some of the consequences of migration for the elderly are positive, such as remittances and new things brought from cities. Given the fact that one of the high priorities for migrants is to improve housing conditions, elderly people with migrant children in cities are likely to live in better houses than those elderly who are without such migrant children (Zhuo and Liang 2005).

However, the author's recent fieldwork in rural Sichuan finds that a different story is emerging. It is a sad one, where rural elderly people are overburdened by care of grandchildren and in some cases cultivating and harvesting the farmland. Data from the 2000 census indicate that nearly 21 per cent of the children left behind by their migrant parents are residing with grandparents. In rural Guizhou, one old couple was found to be caring for 7 grandchildren while the childrens' parents were away working in cities (Duan and Zhou 2005). Some preliminary evidence suggests that rural elderly people are under stress. As migration continues to rise and migrant waves originate from more places, traditional patterns of old age support in rural areas are likely to be challenged. While young people pursue their opportunities and dreams elsewhere, there may be a potential crisis in support for the rural elderly in coming years.

12.6 CONCLUSIONS

One of the most significant social demographic changes in recent years is the rapid increase in internal migration, which has made enormous contributions to China's economic growth. The fact that both the migrant population and the economy have grown over the last two decades is not a coincidence. Some researchers suggested that migration has contributed as much as 10 to 16 per cent of China's economic growth in recent years. At the household level, migration has also lifted many families out of poverty and in some cases created opportunities that earlier generations could only dream of.

Migrants are agents of social changes. This is reflected in the information channels established between places of migration origin and destination, and return migrant entrepreneurship. Furthermore, issues facing migrants often become the trigger for policy changes, such as the recent policy change over school enrollment of migrant children. The increase of minimum wages in coastal regions is also a response to many protests migrants initiated.

The rapid increase in migration creates many new challenges for scholars and policy makers. This chapter has addressed the issues of education of migrant children, provision of health care to migrants, protection of migrants' labor rights, and support for the elderly in rural areas. However, that list of issues concerning migration is far from complete. Further discussion of some of the issues can be found in the next two chapters of this book. These new challenges also create unique opportunities for students of migration and allow many migration related questions to be explored on a very large scale. Researchers on Chinese migration are poised to make major contributions to the field of migration studies.

13

The Impact of Temporary Migration on Migrant Communities

Fei Guo

The previous chapter showed that as a result of economic reforms and the relaxation in the household registration or *hukou* system, an increasing number of migrants has moved from the countryside to cities in the past three decades. Although these migrants have become an important part of the labor force in cities, the majority of them are temporary in nature: working as temporary workers and living in temporary shabby housing. They are generally not regarded as 'urban citizens' by urban authorities and the general public. Studies have suggested that most migrants move from rural areas to cities or coastal areas seeking employment opportunities. Many migrants are in their prime working age and move to cities in search of a better life, but a large number of them are only able to take up '3 D' (dirty, dangerous, and demanding) jobs that are not attractive to urban residents (Goldstein and Goldstein 1991; Guo 1996; Yang 1996; Yang and Guo 1996; Solinger 1999; Wang *et al.* 2002).

Although there is an increasing body of literature on migration in China, few studies have looked at unemployment problems among the migrant population. The common perception about migrants in general and temporary migrants in particular, is that they are economically active and that the unemployment rate among them is low. With massive industrial restructuring in recent years, attention has focused largely on unemployment among those urban residents who had previously worked but who were laid off by state or collective enterprises. Unemployment among the migrant population in cities has not attracted adequate attention from either researchers or policy makers.

Although many temporary migrants have improved their living standards, many others live in shantytown communities or 'migrant villages' with limited opportunities of access to urban facilities and services. Such communities frequently face the fate of being dispersed or 'cleaned up' by the authorities.

A new urban underclass that includes a significant proportion of temporary migrants has been gradually developing in many Chinese cities.

This chapter examines a range of impacts that migration has brought upon migrants themselves. It focuses particularly on the impact of migration on migrants' employment status, and on migrant communities in the cities. The occupational structure of migrants and determinants of unemployment of migrants will be examined in detail. The analyses are based on the results of two surveys: the 1997 Beijing Migrant Census (also known as Beijing Floating Population Census) and a recent five-city study of migration and urban poverty.

13.1 IMPACTS OF GOVERNMENT CONTROL ON RURAL–URBAN MIGRATION

The divide between urban and rural societies is considered one of the most fundamental social divisions in China, and the term Great Wall has been used to emphasize its importance (Chan 1994; Wang 1997). The mechanism which divides the entire population into the two categories of agricultural and nonagricultural residents is the household registration or *hukou* system established in the late 1950s. The importance of the type of household registration goes far beyond determining type of residence. It also determines eligibility for, and access to, government provision of social services and benefits. Nonagricultural status, for most of the past four decades, conferred access to a wider variety of goods as well as to nonagricultural employment, public housing, free medical services, and retirement benefits (Kirkby 1985; Yang 1993). Although such entitlements have been much reduced in recent years, urban residence still provides a much better quality of life than that of rural residents who are at the bottom of the hierarchy of residential status.

The labor administration or labor recruitment system was another long lasting social control mechanism, which was also introduced in the 1950s to supplement the household registration system. Every employed person was issued with a booklet containing his or her personal files, including personal history, work experience, work performance, and political performance. The employed person could not transfer to another job without transferring these personal files, and permission for a job transfer was tightly controlled at several levels in the government's labor administration.

The state run sectors recruited employees according to annual quotas established by their national level ministries, and allocated new job opportunities to subordinate offices and factories within each bureaucratic chain of command (Davis 1992). In practice, new posts were filled mainly by recruits from the local region of the work units, which were primarily in urban areas. Therefore local urban residents were largely recruited into the industrial sectors. Under this labor administration system, individual migration, whether to transfer jobs or to seek work, was tightly controlled. Rural residents were only allowed to migrate to urban areas when they were admitted to institutions of higher education or approved by the urban authorities (Kirkby 1985; Hsu 1986; Davis 1992; Day and Ma 1994).

In past decades, especially in the pre-reform era, urban planning in China was undertaken mainly to meet the needs of locally registered residents. For the majority of urban residents, employment was almost guaranteed once they graduated from high school. The city governments, at the levels of city, district, street, or even neighborhood committee, were responsible for the creation of employment opportunities for residents in their administrative territories. Sometimes work units, whether state or collective enterprises and organizations, were additionally responsible for the employment of children of their employees. Although there have been some changes in recent years, the labor recruitment system for employees in the formal sector remains largely intact. More importantly, the legacy of the previous system has continued to influence urban planning policies and community management that tends to exclude nonlocally registered residents. Whenever the problem of unemployment among urban residents became critical, the authorities attempted to solve the problem by dispersing migrants, particularly those who came from the countryside. Local officials regarded the floating population as a burden on the city (Solinger 1995, 1999; Ma and Xiang 1998; Xiang 1998, 2000; Jeong 2000). A number of migrant villages in Beijing experienced 'cleaning-up' or demolition at various stages of their development. Jeong (2000) reported that Zhejiang village, one of the most developed migrant communities in the capital city, had experienced 'cleaning-up' and demolition a number of times regardless of strong and organized resistance from the community. Residents in these migrant communities have been unable to live a stable life and to achieve secure employment, even though in some cases they were highly organized. Urban planning authorities have always made the employment of urban residents a priority in their policies; unemployment among the migrant population has not been an issue on their agenda.

13.2 OCCUPATIONAL CONCENTRATION OF TEMPORARY MIGRANTS[1]

The market oriented economic system developed over the last 20 years has provided job opportunities for millions of people who have moved to cities without changing their official household registration status (Yang and Guo 1996; Wang

1997). Based on data from the 1990 census, which collected information on the occupational patterns of migrants in the late 1980s, Yang and Guo (1996) found that rural migrants who moved to cities for economic reasons tended to work in marginal sectors or in occupations that were not wanted by local residents.

Table 13.1 Basic characteristics of all migrants by employment status

Characteristics	Total		*Wu Gong*[a]	*Jing Shang*[b]	Other jobs	Unemployed
	Number	%				
Total	1,424,926		1,143,517	260,703	7,743	12,963
%		100.00	80.25	18.30	0.54	0.91
Age:						
15–19	164,187	11.52	93.84	5.74	0.05	0.37
20–24	413,111	28.99	88.56	10.40	0.38	0.66
25–29	342,488	24.04	75.80	22.46	0.55	1.19
30–34	224,371	15.75	70.48	28.02	0.50	1.00
35–39	105,571	7.41	71.10	27.42	0.69	0.79
40–44	76,140	5.34	73.77	24.64	0.81	0.78
45–49	47,808	3.36	74.32	23.49	0.99	1.20
50–54	25,097	1.76	76.46	20.17	1.75	1.63
55–59	14,057	0.99	76.63	17.95	2.84	2.58
60–64	8,155	0.57	77.20	15.94	3.57	3.29
65–69	2,885	0.20	74.04	16.47	4.12	5.37
70+	1,056	0.07	66.67	19.70	3.98	9.66
Sex:						
Male	995,256	69.85	82.25	16.97	0.51	0.27
Female	429,670	30.15	75.63	21.37	0.62	2.38
Hukou type:						
Nonagricultural	136,657	9.59	75.74	18.12	4.18	1.96
Agricultural	1,287,176	90.33	80.74	18.32	0.16	0.79
Undecided	1,093	0.08	64.50	17.57	1.56	16.38
Education:						
Illiterate	34,113	2.39	68.58	28.51	0.00	2.90
Primary school	217,995	15.30	74.96	23.62	0.09	1.32
Secondary school	948,899	66.59	82.21	16.94	0.14	0.71
High school	186,961	13.12	80.30	17.71	0.98	1.01
Vocational school	26,815	1.88	74.54	15.12	8.93	1.40
University	10,143	0.71	63.90	15.44	19.31	1.35
Length of residence:						
3–6 months	215,188	15.10	86.26	12.68	0.35	0.71
6–12 months	466,609	32.75	87.91	11.33	0.26	0.50
1–3 years	392,393	27.54	77.25	21.18	0.65	0.92
3–5 years	165,247	11.60	71.69	26.27	0.82	1.22
5+ years	185,489	13.02	68.00	29.13	1.00	1.87

Notes: [a]*Wu Gong*: Manual labor or temporary workers; [b]*Jing Shang*: Engaging in petty trading business, street vendors, etc.

Source: Beijing Migrant Census (1997).

Data from the Beijing Migrant Census conducted by the Beijing Statistical Bureau in November 1997 also reveal a clear pattern of occupational concentration among employed migrants, especially temporary migrants.[2] As Table 13.1 shows, among 1.42 million migrants who had moved to Beijing for employment reasons and lived there for at least six months at the time of the census, 80 per cent were engaged in *Wu Gong* (manual labor or temporary work), 18 per cent were *Jing Shang* (engaged in petty trading businesses, street vending, etc.) and less than 1 per cent were employed in other jobs. The unemployment rate was very low with less than 1 per cent of migrants reporting that they were out of a job at the time of survey.

Migrants to Beijing were predominantly (80 per cent) young people aged 15 to 34 years. One-third of migrants were female, a similar proportion to that of females among migrants in the late 1980s reported in the 1990 census (NBS 1991: 485). However, the 1990 census data included all migrants in Beijing, including those who had come for reasons unrelated to employment. The proportion of females who migrate for nonemployment related reasons is normally greater than is that of women who come for work. When these facts are taken into account, it is reasonable to suggest that the proportion of females among employment seeking migrants in the late 1990s was slightly higher than that of one decade previously.

More than 90 per cent of migrants in Beijing had agricultural *hukou* registration and came from rural areas. Fewer than 10 per cent had a nonagricultural background and moved from other cities or towns. More than 80 per cent of migrants had received primary or secondary school education. Only 13 per cent had received high school education; a very small (2.5 per cent) proportion had vocational school training or university education.

Table 13.2 shows that around one-third of male migrants work in construction industries. Some large construction companies are owned and run by state or collective entities but many of their employees are recruited as temporary workers. The harsh nature of the work means that these jobs are not attractive to local residents. The other three popular occupations for male migrants are trading and small businesses, and restaurant and other service workers. Women are more concentrated in service related occupations, including trading and small businesses, restaurant, and other types of services. The last group includes domestic workers, in what are regarded as 'migrant-only' jobs. A noticeable proportion of migrant women are also industrial workers. Only a very small proportion of migrants work as professionals and technicians, government officials and office clerks, as these jobs are normally only available for local residents.

Migrant workers' occupational structure is very different from that of Beijing's local residents. Table 13.3 shows the occupational structure of Beijing usual residents by gender in 1990 and 1995. It should be noted that the term

Table 13.2 Percentage distribution by occupation and sex of migrants, Beijing: 1997

	Male	Female
Professional/technicians	1.57	1.80
Official/managers	0.34	0.23
Clerk	3.29	2.43
Trading/business	14.05	21.97
Recycling	1.06	0.72
Restaurant service	9.40	21.86
Repair service	2.84	1.15
Other services	10.19	24.20
Agricultural workers	3.65	5.13
Industrial workers	12.95	16.13
Construction workers	37.26	2.92
Transportation workers	2.49	0.43
Others	0.89	1.03
Total	100.00	100.00

Source: Beijing Migrant Census (1997).

Table 13.3 Occupational structure of Beijing residents by sex: 1990 and 1995

	1990		1995	
	Males	Females	Males	Females
Professional/technicians	13.01	21.77	13.38	24.38
Official/managers	9.26	3.35	11.49	5.07
Clerk	6.76	5.16	6.49	7.31
Trading/Business	5.30	7.48	6.99	10.24
Service worker	6.91	10.85	7.34	11.07
Agricultural workers	15.04	21.91	14.48	18.76
Industrial workers	43.69	29.42	39.82	23.14
Others	0.05	0.04	0.01	0.03
Total	100.00	100.00	100.00	100.00

Sources: 1990 figures from *Tabulation on the 1990 Population Census of the People's Republic of China*, Vol. 2. Population Census Office, Beijing: China Statistical Publishing House. 1995 figures from *1995 Quanguo 1% Renkou Chouyang Diaocha Ziliao (Tabulations of the 1% National Demographic Sampling Survey, 1995)*, Quanguo Renkou Chouyang Diaocha Bangongshi (The National Office for Demographic Sampling Survey), Beijing, Zhongguo Tongji Chubanshe (China Statistical Publishing House).

'usual residents,' as defined in both the census and the sample survey, includes both residents with local household registration, and migrants who had been living in Beijing for at least six months at time of the survey. Their occupational structure is here used to proximately represent that of local Beijing residents, as the majority of 'usual residents' have local household registration. Of all female usual residents aged 15 and above, about 25 per cent were professionals or technicians, 23 per cent were industrial workers, 11 per cent were workers in the service sector, and 10 per cent were personnel in the trading and business sectors. The occupational structure of the usual residents in Beijing remained largely unchanged between 1990 and 1995, except for a considerable decrease in the category of industrial workers, which may reflect the injection of significant numbers of migrant workers into this sector.

One considerable difference between Beijing usual residents and migrant workers is in the proportion of people working as service providers. Table 13.3 shows that the proportion of the usual residents working in services was small compared with those in other occupations. The proportion of migrants working as service providers, on the other hand, was significantly greater than that of all other occupations. More than 40 per cent of migrant women were engaged in jobs in the service sector, as were more than 20 per cent of migrant men. Among the usual residents, the proportion of people working in service occupations remained unchanged from 1990 to 1995 despite the large numbers of migrant workers in this sector. This may suggest that jobs taken by migrant workers in the service sector were not replacing those of the usual residents, and that many such jobs may have been created by migrant workers themselves upon their migration into the city.

The comparison of occupational structures of Beijing usual residents and of migrants suggests that migrant workers in the city are disadvantaged in the job market. Overall, only a very small proportion of migrants was able to advance into professional or technical occupations. Few migrants have access to employment as office workers and clerical personnel. Many found themselves jobs as industrial workers, service workers, or street vendors.

The above analysis shows that although to a certain extent the fates of temporary migrants in Chinese cities are affected by their individual characteristics (for example, male, younger, and better educated migrants have more chance of finding a job in the formal sector), the overall determining factor is the status of people's residence: migrants versus locally registered residents. The migrants' penetration into low end occupational categories may imply the upward mobility of local residents in the labor markets in the cities.

13.3 UNEMPLOYMENT AMONG TEMPORARY MIGRANTS

Studies have shown that many rural migrants, often on a short term contract or no contract at all, are not entitled to the full benefits provided by employers such as an employer sponsored housing program, health care or health insurance, and pension or other insurance programs. In many cities, migrant workers are not entitled to the minimal living allowance which is available to many unemployed local workers. As a result, unemployed migrants have to take care of themselves or simply return to their places of origin where they may still have land or kinship networks that may provide some help. In recent years, some cities in more developed regions have started to adopt polices that encourage employers to provide certain benefits to migrant workers through commercially operated medical and pension insurance programs. Due to the temporary nature of migrant work and the immature stage of the insurance programs, such medical and pension insurance programs cannot be easily transferred once migrants change their jobs.

Some studies have directly or indirectly addressed the issues of unemployment in the urban labor force and the impact of rural–urban migration on urban unemployment. Zhai and Wang (2002) pointed out that reduced controls over rural–urban migration may significantly worsen the employment situation in urban areas. To avoid the problems of overcrowding and unemployment in large cities, some scholars have proposed policies that encourage the development of industrial enterprises or other nonfarming jobs in towns or small cities. Other scholars, on the other hand, have reservations about the impact of such rural industrialization on the probability of either inter- or intra-provincial migration (Johnson 2002; Liang *et al.* 2002). However, the issue of unemployment among migrants, especially rural to urban migrants, has not been adequately investigated.

Results from the 1997 Beijing Migrant Census show that the majority of migrant workers were employed at the time of survey and unemployment rates among migrant workers were generally low. As shown in the Table 13.1, less than 1 per cent of temporary migrants who moved to Beijing for employment reasons were out of work in 1997. This is consistent with the general perception that few migrant workers are jobless in cities.

Table 13.4 suggests that among all unemployed migrants in Beijing, more than half were in the age range 20–29 years and 79 per cent were females. Although females were not the majority of the migrant population, they were certainly the majority of unemployed migrants. More than 80 per cent of unemployed migrants had only secondary or less schooling, around 14 per cent had high school education, and 4 per cent had received vocational training or university education. The proportion of unemployed females with university education was similar to that of males, which indicates that better education indeed has a positive impact on female migrants' competitiveness in job markets.

Results from logistic regression on migrants' likelihood of being unemployed are presented in Table 13.5. They show that while individuals' demographic

Table 13.4 Age and education of unemployed migrants by sex

Characteristics	Total		Sex	
	Number	%	Male	Female
Total	12,963		2,732	10,231
%		100.00	21.08	78.92
Age				
15–19	612	4.72	38.07	61.93
20–24	2,727	21.04	16.94	83.06
25–29	4,091	31.56	12.34	87.66
30–34	2,239	17.27	17.24	82.76
35–39	834	6.43	26.74	73.26
40–44	591	4.56	28.60	71.40
45–49	572	4.41	31.64	68.36
50–54	409	3.16	30.81	69.19
55–59	363	2.80	43.25	56.75
60–64	268	2.07	53.73	46.27
65–69	155	1.20	53.55	46.45
70+	102	0.79	61.76	38.24
Education:				
Illiterate	990	7.64	10.61	89.39
Primary school	2,883	22.24	17.48	82.52
Secondary school	6,694	51.64	21.56	78.44
High school	1,883	14.53	24.96	75.04
Vocational school	376	2.90	38.03	61.97
University	137	1.06	48.91	51.09

Source: Beijing Migrant Census (1997).

characteristics are important determinants in affecting migrants' likelihood of being unemployed, other variables such as the length of residence and the types of *hukou* also had strong impacts on such likelihood. The first model shows that all demographic variables included in the analysis are significant. When all other demographic characteristics are controlled, age is significant in explaining the variance of being unemployed. Compared with people in the age group 55 years and above, people in younger groups seem to be less likely to be unemployed. The chance of not having a job is lowest among those aged 35–44. Compared with females, male migrants are much less likely to be unemployed. Compared with their married counterparts, single migrants are less likely to be unemployed.

Effects of education on employment status suggest that compared with people with higher education (vocational school and above), people with a low level of education (illiterate and primary school only) are more likely to be unemployed, and the level of education has positive effects on the likelihood of being employed.

Table 13.5 Parameter estimates of being an unemployed migrant in Beijing

Parameters	Model 1	Model 2	Model 3
Intercept	−2.5294	−2.1511	−2.8498
Age (reference = 55 and above):			
15–24	−0.2814**	−0.1809**	−0.1155**
25–34	−0.3919**	−0.3762**	−0.3320**
35–44	−0.7282**	−0.7423**	−0.7605**
45–54	−0.1784**	−0.1980**	−0.2685**
Sex (ref. = female):			
Male	−2.2822**	−2.2339**	−2.1840**
Marital status (ref. = married):			
Single	−1.5622**	−1.4948**	−1.5135**
Education:			
(ref. = vocational school & above)			
Illiterate & primary school	−0.2225**	−0.1998**	0.4277**
Secondary & high school	−0.4065**	−0.3946**	0.1152*
Length of residence in Beijing:			
(ref. = 5+ years)			
Less than one year		−0.6988**	−0.6647**
1 to 3 years		−0.5178**	−0.5035**
3 to 5 years		−0.3642**	−0.3472**
Hukou type (ref. = agricultural *hukou*):			
Nonagricultural *hukou*			0.7488**

Notes: *Significant at $p < 0.01$; ** Significant at $p < 0.001$.
Source: Beijing Migrant Census (1997).

The unemployment of migrant workers is also related to the length of residence. Compared with people who have been in Beijing for five or more years, people who have been in the city for a shorter period tend to have a lower likelihood of being unemployed. This seemingly contradictory result may suggest that, for migrant workers, staying in Beijing for a longer period of time does not enhance one's chance of being employed; indeed it somehow reduces employability to a certain extent.

Household registration is one of the important determining factors affecting migrants' employment status. It was hypothesized that being a nonagricultural *hukou* holder would decrease one's chance of being unemployed. The results in the third model strongly suggest that compared with migrants with agricultural *hukou* status, people with nonagricultural *hukou* are much more likely to report being unemployed at the time of survey. This unexpected finding may suggest that compared with migrants with agricultural *hukou*, those with nonagricultural *hukou* status may have more support in the city once they are unemployed. The support could come from employers as a part of unemployment benefits, or from relatives and family members. In contrast, migrants with agricultural *hukou* status would not have such assistance, and therefore cannot afford to remain in Beijing once they are unemployed. In such cases, the survey is unable to capture them. Observations from fieldwork also suggest that compared to urban migrants, many rural migrants tend to take any jobs available to them in cities, as these are in short supply. However, urban migrants tend to be more selective when taking up jobs. These observations have been supported by a recent study conducted in another big city Shanghai (Wang *et al.* 2002).

A large proportion of migrants work in the construction industry and in service sectors such as restaurants and retail outlets. Migrants have also taken over the entire sector of street vendors. Almost all these occupations are temporary in nature. Sometimes the employment is based on random selection by potential employers at the spontaneous job markets. Solinger (1999) noted that the construction industry relied heavily on sub-contractors or agents who signed contracts with employers or construction entrepreneurs for the projects. Workers who were employed for such projects did not normally have formal contracts. Their employment relationship depended on a verbal commitment from an agent or sub-contractor. Sometimes one single construction project was sub-contracted many times. With each sub-contract, workers became more distant from the employer, or from formal employment. Their employment status became more and more informal with each level of sub-contract, and less and less protection was available for them. Solinger (1999: 266) cited a typical story about what would happen if a migrant worker became sick: 'If a little sick, they don't go to the hospital or take medicine. If they are very sick, they just go home.'

If someone lost a job or was unable to work, the most common solution would be to go home, because rural migrants are less likely to be able to claim unemployment benefits than migrants from other urban areas. Observations among street vendors in a migrant community from Henan confirmed that many people could not afford to stay in Beijing without a job. Rent and daily consumption in the city would be impossible for many people without a regular income. The temporary nature of their employment and lack of legal protections force many unemployed migrants out of the city once the employment perspective is no longer promising.

From available studies, some regional variations in patterns of unemployment among temporary migrants can be observed. As indicated in an unpublished work by Nielson *et al.* (2005) on unemployment among the floating population in China's Jiangsu province, more than half (51.3 per cent) of the respondents surveyed reported never being unemployed, while 28 per cent reported a past unemployment period of at least three months, 15 per cent three to six months, and 5 per cent a period between six months and one year.

Another study, of the floating population in Shanghai, conducted by the Ministry of Labor and Social Security in 2001 found that 25 per cent of respondents reported having been out of work in the six months prior to the survey (cited in Nielson *et al.* 2005). However, the Jiangsu study did not specify whether respondents were out of work at the time of the survey, and the Shanghai study did not specify the duration of the unemployment. It should also be pointed out that the measurements of unemployment used in the two studies were different from that used in the 1997 Beijing Migrant Census, which only measured current employment status at the time of survey.

13.4 MIGRANT COMMUNITIES IN CITIES

In many cities, the housing system is not able to accommodate a massive number of migrants. While some better off migrants are able to rent dwellings in apartment buildings in cities or in suburban villages, many others can only afford to live in a variety of temporary dwellings which have mushroomed in many Chinese cities. The most common forms of such temporary dwellings include self-built houses, huts, shelters, or tents that together make up communities without basic access to urban facilities and services. Wang and Zuo's study (1999) in Shanghai suggested a clear pattern of residential segregation between migrant communities and local residents. Migrants tended to experience much smaller and poorer living conditions compared with local residents and few had access to basic urban facilities and services. Wang *et al.*'s (2002) more recent study in Shanghai further pointed out that rural migrants were far from being integrated into urban society. Although most were able to find employment in the city, which increased their income level considerably, they were not able to settle down as a part of an urban community. 'Urban village' is a term frequently used in the literature of migration studies in China, and often implies the segregated nature of the migrant community and its relatively disadvantaged social status.

A recent study of five Chinese cities[3] has indicated that one of the important consequences of temporary migration is the formation and transformation of shantytown communities in many cities, including major cities like Beijing and Shanghai as well as provincial and small cities. The major features of the shantytown communities include poor living conditions, lack of access to basic urban services, such as running water and sanitation facilities, and an insecure and unstable community environment. Temporary migrants, especially those from rural areas, are more likely to live in these disadvantaged communities, although in some regions an increasing number of petty business people and unemployed urban residents live there as well. Managing those migrant concentrated communities has become a challenging administrative task for planning authorities in many cities.

The preliminary results from this study[4] imply that the household registration system is still effective in determining people's life chance in the cities. In all the selected cities, it is clear that migrants with agricultural *hukou* backgrounds are more likely to live in the migrant concentrated communities while migrants with nonagricultural background are less likely to be found there.

Fieldwork in the selected communities strongly suggests that the type of housing ownership was one of the important factors shaping the structures of the migrant communities in Chinese cities. During the era of the planned economy, urban work units—businesses, enterprises or government organizations—played a major role in shaping urban communities by providing housing to their employees. In recent decades, controls over collective ownership of urban housing have been weakened, and ownership of housing in cities has been gradually transferred to individual households. Consequently, residential housing rental markets have grown substantially in many cities.

Migrant concentrated communities are more likely to be formed or transformed from two major types of urban settlements. The first type includes the communities located on the urban periphery, in which houses or apartments were privately owned even before the economic reform. Such private ownership of the houses or apartments was the necessary condition for the formation of migrant communities. Most of the migrant concentrated communities in Beijing, Shenyang, and Shijiazhuang are among this type. Because they were located on the urban periphery and were more likely to be re-zoned with the expansion of urban boundaries, local governments might not have particular interest in maintaining sanitation and other community services. Living conditions gradually worsened and eventually these communities became shantytowns in the eyes of other residents and local authorities.

The second type of migrant community includes those in which houses or apartments are owned by employers or work units, such as textile factories or transport companies, which have not yet been transferred to private ownership. Some inner city communities in Beijing and Shijiazhuang were among this type. Apartments and houses in these communities were old, sometimes without running water and toilets. A number of neighborhoods, for example Nankazimen and Ertaizi in Shenyang, faced being demolished at any time due to new urban planning projects. Most long term residents had been employees of the previously state or collective run enterprises, and many had been laid off in recent years. Rental income became an important source of income for many. Although residents benefited economically from receiving migrants into their communities, they also suffered from the gradually deteriorating living conditions as a result of the influx of migrants.

The study communities in Beijing, Shijiazhuang, and Shenyang shared some similarities in terms of their attributes and locations. Most were informally regarded as migrant or outsider communities by local residents, regardless of the proportion of migrants within that population. Most of these communities have suffered increasingly worsening living conditions and environment. Many houses, especially those rented by the migrants, were poorly constructed and did not have construction approval. Migrant residents in these communities often faced the possibility of being expelled (*qing cha)*, and their houses being demolished (*chai qian*) by the urban planning authority.

Two migrant communities that were considered shanty towns in Shenyang were not serviced by the urban sewage system. Open sewers ran through the residential areas. A recently built public toilet, the 'white house,' in one was regarded the best building in the entire community. Similar observations have been made in Beijing, especially in small migrant communities, where the majority of migrants did not have access to services provided by the urban authorities. Such migrant communities did not have a positive image in the eyes of local residents, migrants themselves, or the local authorities. Garbage filled streets and crowded living quarters were commonly seen in almost all communities in the study.

The migrant communities in Wuxi and Dongguan differ considerably from those in the other three cities. Both cities have experienced rapid economic development in the past two decades. While Wuxi's development has been largely based on the legacy of the collective economy, Dongguan's development has been based primarily on recent investments in industries by capitalists from Hong Kong and Taiwan. Migrants in Wuxi and Dongguan have become an important and permanent part of the local labor force. Migrants in Dongguan have even become a majority in the total population. Although disadvantageous compared with local communities, living conditions in the migrant communities in Wuxi and Dongguan are much better than those in the other three cities. Local governments in these two cities have played an important role in establishing these communities and providing them with some services.

However, fieldwork and intensive interviews reveal that migrant workers who live in the dormitories in the science parks in Dongguan do not have personal freedom. Most migrant workers were not allowed to leave the parks from Monday to Friday without permission from their employers. At weekends they were sometimes harassed by the local community's public security personnel outside the science parks, because they were not locally registered and were subject to all sorts of fees. Although many migrant workers claimed that they were able to make a better income in Dongguan than they earned at home, they were treated as second class, or underclass, citizens.

Among all migrant respondents in the selected communities of the five cities, a large proportion (41.4 per cent) lived in rented single storey houses, one-third (33.8 per cent) in rented apartment units, and 20.9 per cent lived in other types of dwelling. Single storey houses are common in many migrant communities, especially in Beijing, Shenyang, and Shijiazhuang, and people who lived in these houses were considered the most disadvantaged in these cities. The one-fifth of migrants in 'other types of dwelling' lived mainly in sheds on construction sites or dormitories provided by employers. Some of these places, such as construction site sheds or restaurant storage rooms, were in an unliveable condition and without basic facilities such as toilets and running water.

One of the most common problems faced by migrants was crowded living space. It was quite common that three or four adults, sometimes two married couples, shared a small room in a rented place. Results from the study showed that more than 78 per cent of migrants lived in a one-room house/unit, while only 16.6 per cent had a two-room dwelling, and a very small proportion lived in a place with more than three rooms. However, only 16.4 per cent of all migrants lived in one-person households, 29 per cent lived in two-person households, and more than half (54.6 per cent) lived in a household with three or more people. Compared with migrants, local residents in the same neighborhoods enjoyed more living space, and a large proportion of them (45 per cent) lived in a house/unit with more than three rooms.

Access to tap water and toilet facilities are important indicators of people's living conditions. Among all migrants in the selected communities, less than half had access to their own indoor tap water and about 42 per cent had access to a public, shared, tap. In contrast, 87 per cent of local residents had their own indoor tap water. Similarly, only a small proportion of migrants had their own toilet facility, and the majority of them had to use a public toilet. Local residents tended to be much better off, with more than 71 per cent having their own toilet. If the respondents from Dongguan were excluded, the proportion of migrants without access to indoor tap water and toilets would be even greater. It is clear from the five-city study that the majority of the migrants in the selected communities did not enjoy basic living standards of adequate living space and necessary facilities.

13.5 CONCLUSIONS

This chapter has examined various impacts of migration on migrants themselves and on the communities in which they live. The analysis of migrants' occupational structure suggested that migrant workers in Chinese cities are disadvantaged in the job market. Overall, a very small proportion of migrants are able to advance into professional or technical jobs. Few have access to jobs as office workers and clerical personnel. The great proportion of migrants found jobs as industrial workers, service workers, or street vendors: jobs that few local residents are willing to take. While China has been experiencing rapid economic development and has become 'the factory of the world,' changes in migrant occupational structure have been insignificant. Social integration between migrants and local residents in many Chinese cities has been inadequate. The prevalent usage of the term 'floating population' when describing the migrant population in official documents, research work, and popular cultural media reflects the social status of migrants and the perceived temporary nature of migration.

Although the unemployment rate was low among migrants, that does not imply that migrant workers were at an advantage in the competitive job market in Chinese cities. Migrant workers were less able to afford to be out of a job for long periods, because they are not entitled to the unemployment benefits that most local urban residents have enjoyed. The economics of migration to the city cannot be understood merely in terms of migrants' direct contribution to the economic activities of the cities, but must also take into account the lack of any attendant costs, as migrants are unable to claim any support and the costs of unemployment are transferred to families or rural areas. The data on migrant employment used in this chapter were collected in 1997. With further industrial restructuring in a number of sectors, and more urban workers being laid off in recent years, one would not expect any considerable improvement in the employment conditions of migrants, rural migrants in particular, in the near future.

This chapter does not focus on the impacts of migration on migrants' places of origin. However, other studies have suggested that such impacts were a mixture of positive and negative aspects. The previous chapter shows, for example, that rural migrants have contributed to the economic development of their native places by sending remittances to their family members and by returning home with skills and knowledge obtained outside. The governments of a number of labor exporting provinces, such as Sichuan and Guizhou, have actively promoted out migration programs to more advanced regions such as Zhujiang Delta and Yangtze Delta. In one county alone in Sichuan province, migrants remitted 138 million *yuan* a year in the mid-1990s, more than the total economic output of the county, which was 115 million *yuan*. Another study calculated that rural migrants in early 1990s remitted 862 million *yuan* to Anhui, which exceeded the provincial government's annual revenue by 230 million *yuan* (*New York Times* 1994). Migrants have also contributed to their communities of origins by investing directly in their home towns, or nearby market towns, upon returning. A number of studies have documented that return migrants have set up private enterprises that are able to absorb a considerable amount of rural surplus labor (Guo 1996; Bai and Song 2002; Zhou 2003). For example in Fuyang city of Anhui province, the number of rural enterprises established by return migrants was one-fourth of the total number of rural enterprises, and they contributed to one-fourth of the total revenue of the city's economy in late 1990s (Bai and He 2003).

However, some studies have also pointed out some negative impacts of rural–urban migration on sending communities, such as abandoned agricultural land in some areas as the result of high levels of out migration by those in the prime working ages; difficulties in monitoring family planning among female migrants; and problems in providing care to migrants' elderly parents left back home (MoA 1996).

While many temporary migrants, especially those from the countryside, have enjoyed their opportunities of working and living in the cities and earning a regular (or not so regular) cash income, many have lived in the most disadvantaged communities in the cities. Many have become a new class of urban poor, while many migrant concentrated communities have been gradually transformed into shanty towns. Local residents have often opted to move out of these communities if they have the chance. Even in cities such as Wuxi and Dongguan where sometimes the migrant population has outnumbered local residents, migrants have been likely to become second class citizens. The majority of temporary migrants have very slim opportunities of advancing themselves by climbing the ladder of occupational mobility in the cities. The freedom to migrate that opened the door of opportunities to millions has, to a certain extent, brought them relative economic benefits. Most were able to earn a higher, if not always secure, income compared with their rural counterparts. However, migration has not brought significant social transformation to millions of rural migrants, who are largely unable to settle down to become urban citizens. Temporary migrants are floating in and out of the city, but have hardly become an integrated part of it.

Questions arise from this chapter, some of which are addressed elsewhere in this book. Given the fact that the fertility level in urban areas has been much lower than in rural areas, Chinese cities will experience more rapid population ageing in the near future. Without labor migration from rural areas the cities, large cities in particular, would not be able to overcome their impending demographic difficulties and hence maintain sustainable development. Although admitting that migrants, temporary or otherwise, have become an important part of urban economic development, urban planning authorities in many places have not adopted an approach that would facilitate the integration of migrants into urban communities. It is hoped that further studies will address this pressing issue, and that some policy adjustments can be made which consider rural–urban migration as a necessary process in the future development.

14

The Changing Profile of Labor Migration[1]

Kenneth Roberts

Migration is a dynamic demographic process, responding to economic, socio-cultural, demographic, and political conditions at origin and destination. Moreover, through the cumulative experience of the actors involved, it takes on a life of its own as it transforms the economic and social landscape of both areas. Nowhere is the task of understanding the dynamics of a migration system more urgent than in contemporary China, which is experiencing the largest migration in human history and faces hard policy choices regarding labor market integration, urbanization, and rural poverty. Scholars attempting to understand Chinese labor migration have made analogies to a number of migration systems and theoretical models, each formulated to explain a particular system of migration.[2]

This chapter aims to explore the potential dynamics of Chinese labor migration. The analogy that will be its foundation is that of international migration, especially the case of Mexico–US labor migration. The chapter starts with an examination of the relevance of this comparison. If it is accepted, it can focus our attention on potential changes in the profile of Chinese labor migration, for the long duration of Mexico–US labor migration—over four decades in its current, most intense phase—makes it 'the largest sustained flow of migrant workers in the contemporary world' (Massey *et al.* 1994: 705), and has generated an enormous multidisciplinary literature.

The chapter then identifies major changes in the profile of labor migration and examines their relationship to changes in factors affecting the origin, destination, and migration process in the context of both China's internal migration and Mexico–US migration. It argues not that factors found in Mexico operate in the same way in China, but rather that the penetration of capitalist relations, interacting with uniquely Chinese institutions and conditions, will create parallel, though perhaps different, outcomes. Examination of these factors and their outcomes in one context will create 'markers' that can be anticipated in another. The third section uses these markers to generate hypotheses concerning potential changes in the profile of Chinese labor migration.

14.1 LABOR MIGRATION IN CHINA AND MEXICO

As shown in the last two chapters, a unique dimension of Chinese migration is the influence of the household registration (*hukou*) system. 'Official' migration (*qianyi*), involves a permanent change in place of household registration, while the major type happening today is temporary labor migration, in which workers leave their homes for a period for wages in low skill jobs (*liudong renkou*). Such a system rests both on limited economic opportunities in the place of origin, and short term opportunities at the destination that are temporary either because of the nature of the job or because of official restrictions on permanent stay (Roberts *et al.* 1999).

Both of these conditions are in place in contemporary China. Rural labor was bottled up on the communes until the economic reforms in agriculture of the early 1980s. China's employment and output structures became grossly out of balance: 73 per cent of the labor force worked in agriculture in 1992 to produce 27 per cent of GDP, while agriculture in other countries at China's level of development produced 16 per cent of GDP with only 44 per cent of the labor force (UNDP 1995).

The structure of opportunities for rural laborers in Chinese cities is conditioned by the *hukou* system which still restricts permanent legal residence in the cities, together with its remaining perquisites in what Solinger (1999) calls the 'urban public goods regime' in education, health, social security and housing (Wu and Treiman 2004). The high cost of urban housing pushes migrants into low quality rentals on the fringes of large cities, or makeshift accommodation at shops, construction sites, and restaurants, as shown in the previous chapter. Migrants are frequently in violation of a complex and costly system of permits, their 'illegality' forming the basis for labor exploitation and periodic 'cleanups' (Chan 1996). These constraints are reinforced by a long standing prejudice of urbanites toward peasant workers (*mingong*), a prejudice as strong and effective as ethnicity in other places (Honig 1992). The Chinese peasant, with a comparatively low level of education and a regional dialect, 'is as visible and identifiable to the local resident of a city like Beijing as an Afro-American is to the Caucasian in the cities of America . . . ' (Dutton 1998: 9).

Thus internal migrants in China are ‘like immigrant labor in other settings . . . eager to earn money at any price, grateful for the chance to live in the city, vulnerable to threats of deportation, subject to enormous competition, and powerless because of the state’s unwillingness to offer them rights, welfare, or security’ (Solinger 1993: 98). This comparison to international migration has been endorsed by other leading scholars of Chinese migration (Davin 1999; Skelton and Hugo 1999; Mallee 2000; Cai 2001; Fan 2004; Xiang 2005).[3]

Of all the contemporary examples of international migration, the Mexico–US case is particularly relevant to the study of migration in China because of two further factors (Roberts 1997). The first is the relative proximity of sending and receiving areas with wide disparities in earnings. Migrants to both the cities of China and of the US earn a multiple of several times what they would earn at home. This proximity also permits regular visits home and the maintenance of strong village based networks. The second is that both countries share a land policy based in revolutionary history that gave farmers a plot that could not be sold or mortgaged, but had to be cultivated or forfeited. This system of land tenure, combined with surplus labor and limited access to the inputs required for commercial production, changed the function of the land from that of an economic unit to a base for a variety of household activities, including farming, raising children, agricultural sideline activities, local wage labor, and (because of proximity) circular migration. An added similarity is the imposition of free trade in agriculture upon inefficient peasant farming by the North American Free Trade Association (NAFTA) in Mexico and the World Trade Organization (WTO) in China, which have profound impacts on their economic development.

Mexico–US migration is more than a century old. Its most intense period began in the 1960s at the end of the *bracero* (guestworker) program, and accelerated rapidly during the 1970s. Currently, almost one in ten of the total Mexican born population, or 9.8 million people, live in the US, and of these 5.3 million are undocumented (Passell 2004). From 1965 to 1986, Mexican migration to the United States consisted mainly of ‘a circular flow of mostly undocumented, mostly young adult males who left their immediate relatives behind in a rural Mexican community to work in seasonal US agriculture for several months (normally six months or less), and then returned to their community of origin’ (Cornelius 1992). Most migrants had low levels of educational attainment, came from a few states concentrated in the central area of Mexico, and worked in only a few states in the US, especially California and Texas (Massey *et al.* 2002).

But in a few short years that system was transformed into an urbanized and substantially female population of permanent settlers who were increasingly dispersed throughout the United States (Durand *et al.* 1999). Four changes occurred in the profile of the migration stream:

1. Increasing education and skills among migrants;
2. Increasing diversification of sending areas (and, as shown in subsequent research, receiving areas);
3. An increasing proportion of women and children; and
4. Increasing settlement in the destination (Cornelius 1992).

14.2 CHANGES IN FACTORS AFFECTING ORIGIN, DESTINATION, AND THE MIGRATION PROCESS

Changes in Mexico–US migration outlined in the previous section were explained by the economic crisis in Mexico that affected the whole country and so generated new sending areas; by a shift in the composition of US demand for migrant labor to year round jobs requiring more skills; by legislation that legalized many migrants; and by the maturation of migration networks (Cornelius 1992). These changes can be categorized into factors affecting the origin, factors affecting the destination, and factors affecting the migration process linking the two. This section discusses similarities and differences in these factors between the Mexico–US and Chinese labor migration systems.

14.2.1 Factors Affecting the Origin

The first stage of Mexico–US migration began when the proportion of the population dependent on agriculture was still high, as it is in China today. Fertility remained high in Mexico until the mid-1970s, ensuring rapid growth of the labor supply for several decades. But where China had relatively equal landholdings, Mexico had created a bipolar farm structure consisting of large capitalist farms with mechanized production of commercial crops, and small subsistence units that provided only a portion of household subsistence. Many of these small farms were on *ejidal* land which, as in China today, was owned communally but farmed individually. By the early 1990s, among the 27 per cent of the labor force still in agriculture, half of their work was spent in the cultivation of low profit corn and beans, so that the sector generated only 9 per cent of GDP but contained two-thirds of Mexico's poor. The elimination of input subsidies and price guarantees imposed by NAFTA and the dismantling of the *ejido* system have had the effect of compressing into a decade or less what would otherwise have been a slower shrinking of employment in agriculture (Latapí *et al.* 1998).

The consequence of these changes in agriculture was to increase migration. A major review of Mexico–US migration found that the highest probabilities of out migration were observed in rural communities undergoing rapid economic growth and development (Massey and Espinosa 1997). Thus while it is possible that agricultural development may cause wage convergence and reduce migration in the long run, in the short to medium run the positive relationship between the two creates a 'migration hump' (Martin 1993).

The factors producing large numbers of migrants in China are very different from those in Mexico during the early years of migration. Farms in China are small, with the average household cultivating only one-sixth hectare, and there is little consolidation of farm plots into larger units that facilitate mechanization. Fertility fell rapidly through the last three decades of the twentieth century and resulted in a notable reduction in the proportion of young people. China's surplus rural labor is a legacy of the pre-reform period, when the rural population was contained on the communes.

In 1978, before economic reforms, agriculture employed 74 per cent of the labor force. Rawski and Mead (1998) estimate that labor requirements fell by 31 per cent between 1979 and 1993. But large cohorts born before the fertility decline continued to enter the workforce, so that until 1991 the number of agricultural workers grew even as the proportion fell (Johnson 2000). During the 1980s, 71 per cent of that increase was absorbed, largely in township and village enterprises (TVEs). Rural industrialization seemed an alternative to urban migration—the *li tu bu li xiang* policy (leave the land but not the countryside). But the early success of TVEs was due to the unique circumstances of that period (Jefferson and Rawski 1994); during the 1990s, 86 per cent of the increase in the labor force was employed in urban areas (Knight and Song 2005).

By 2000 there were 328 million agricultural workers, 46 per cent of the total labor force. Many were redundant: 152 million were estimated by the Ministry of Agriculture (MoA) to be surplus to agricultural needs (Aubert and Li 2002). Most rural households have substantial labor available for much of the year, employed in a variety of nonagricultural pursuits (Cook 1999). A 1995 survey of 4,000 households in eight provinces found that daily income from farming was 9.4 *yuan*, while it was 12.7 *yuan* from working in TVEs and 17.4 *yuan* from migration (Knight and Song 2003). Income from migration contributed 16 to 25 per cent of rural net income in Anhui, Sichuan, Hunan, and Jiangxi, while the share of wages in total rural net income increased from 20 per cent to 31 per cent from 1990 to 2000 (Ma 2004).

In addition, despite efforts at the national level to limit the burden to 5 per cent, taxes and arbitrary fees imposed by cash strapped local governments increased to unbearable levels in some locales—19 per cent of net farming income in one township in Hubei province—and this has led to protests and rural violence (X. Li 2003; Pomfret 2001).

Yet most rural Chinese do not want to give up their farm because of the security it offers: 86 per cent of migrants surveyed in Guangdong wanted to keep their land (Woon 1993). An important security function for migrants with unstable employment is that they can return home when sick or unemployed (Nielsen *et al.* 2004). A similar situation exists for Mexicans: as marginalized workers in the US they must retain links with their agrarian roots, including their right to *ejidal* property (Fletcher 1999).

Given the constraint of retaining land rights, the key to further reductions in agricultural labor in China would be the development of rural markets for labor, machinery, and especially land rental. This happened not only in Mexico, where it led to consolidation and large scale farming, but also in Taiwan, where there emerged instead part-time farming on small plots, facilitated by mechanization, government subsidies, and a dispersed industrial base providing employment in rural areas.

Rural markets for labor and agricultural equipment are undeveloped in China and surveys have found that many migrants return once or twice a year to work on their own farms (Song 2000). The lack of adequate labor has been a significant constraint on migration (Knight and Song 2005). But land rental is becoming more common: while in 1995 only 3 per cent of land was rented, a 1999 survey by the MoA found 14 per cent of land in six provinces was rented, two-thirds requiring no payment but only an obligation to meet the grain quota (Kung 2002). The proportion rented rose to 25 per cent in highly developed rural areas in Zhejiang province in 2003 (Rozelle *et al.* 2005).

If China follows the path of Mexico, social and cultural change in rural areas may have as profound an effect on migration as economic change. For young people in rural areas, migration offers potential for escape from the drudgery of farm work and the constraints of village life. A 1989 Mexican survey found the younger generation in high emigration communities reluctant to take home town agricultural jobs, even at higher than the prevailing local wage, and even if such jobs could be available year round (Cornelius and Martin 1993: 503).

In China there is a distinct young peasant group referred to as *dagong zu* who have no experience in farming and for whom migration is the accepted path to a better life. During the 1990s the participation rate in off-farm employment doubled for those aged 20–30 and tripled for those aged 16–20 (Zhang *et al.* 2004). In high migration areas there is 'a sense of the village being abandoned . . . the centre of activities is no longer located in the village and the aspirations and expectations of the whole village lie thousands of miles away' (Gao 1999: 219). A survey of young migrant workers in three coastal cities found that 72 per cent would choose to stay even if their earnings in agriculture were equivalent to what they earned in the city (Wang 2003). Farming is perceived to be a dead end for the young; migration offers opportunity, however remote the probability of success.

A final issue affecting origin areas is whether the transfer of money and skills from migrants back to rural areas will lead to rural development, reducing poverty and inequality in the countryside. The 'new economics of migration' literature argues that remittances from migration can alleviate constraints on rural credit and thus facilitate investment (Taylor *et al.* 2003). While there is qualified support for this hypothesis in Mexico (where the primary uses of remittances are, as in China, housing and consumption), remittances there were most likely to be invested in dynamic rural communities, exacerbating regional inequality (Lindstrom 1996). In China the evidence is mixed: a recent study conducted in four provinces reveals that the wages of migrants decreased income inequality among households in the same village but contributed to inequality between villages through the differential development of village based migrant networks (Benjamin *et al.* 2005). Murphy (2002) finds an increase in entrepreneurial activity in some areas of Jiangxi, especially when facilitated by local government, while de Brauw and Rozelle (2002) find very little investment of remittances in productive activities. A 1999 survey in Anhui and Sichuan found so little investment in nonfarm businesses that the authors called the hypothesis 'the myth of entrepreneurship' (Bai and He 2003). However, if a migrant acquires skills in the city, it does facilitate change to a nonfarming occupation upon return to the countryside (Ma 2001).

Factors affecting the origin areas—demography, agrarian structure, agricultural technology, rural development, cultural change—all worked in the same direction in Mexico: to decrease the amount of labor used in agriculture. There are several important differences in these factors in China, but what seems certain is that China's labor requirements in agriculture, still very high in relation to those of more developed neighbors, will fall. China has just begun the process of substituting crops and technologies and developing rural factor markets that will give farmers flexibility in their allocation of labor to agriculture; the potential for the release of that labor is immense.

14.2.2 Factors Affecting the Destination

The second set of factors affecting Mexico–US migration involved economic and political changes at the destination. This chapter cannot describe the effects of the availability of migrant workers upon the development of secondary labor markets in the US; it is enough to recognize that certain sectors of the economy, particularly in the booming southwest, became dominated by Mexican migrant labor during the 1980s. Mexican workers are now the majority in occupations such as janitors and maids, food preparation, household workers, gardeners, farm and nursery workers, garment workers, construction workers, and vehicle washers (Latapí *et al.* 1998).

The increasing dependence of the US economy on migrant labor and its perceived social costs led in 1986 to a major change in immigration policy: the Immigration Reform and Control Act. A compromise between the interests of employers, organized labor, migrant interest groups, and those who felt the country had 'lost control of its borders,' its intention was to legalize long term residents while shutting the door on future entrants. Most experts agree that not only did it not reduce illegal entries, but made those already in the country illegally less likely to return home (Donato *et al.* 1992). Its passage heralded a new era of Mexican migration to the US (Durand *et al.* 1999).

The economic impact of Mexican migration on the US labor market, particularly during times of high unemployment, continues to be debated today (Borjas and Katz 2005). It seems to be less of an issue in contemporary China, despite the restructuring of urban enterprises which resulted in 34 million redundancies in the last half of the 1990s (Knight and Song 2005) and a true unemployment rate in urban China which rose from 6.1 to 11.1 per cent between 1996 and 2002 (Giles *et al.* 2005). While 41 per cent of surveyed employees of urban enterprises agreed that 'state owned enterprises are laying off workers because there are too many migrants working in urban areas,' among high school graduates that percentage halved, reflecting the fact that education was the major factor protecting state workers from being laid off.[4] Cities like Beijing and Shanghai responded to residents' concerns with detailed regulations on the types of jobs permitted to migrants, but these were widely ignored and recently dropped altogether.

The fact is that most Chinese migrants, such as those working in construction, other types of manual labor, petty retailing, and services are not in direct competition with urban residents: migrant and nonmigrant workers seem to be highly imperfect substitutes or even complements, for migrants do the jobs that nonmigrants shun (Knight and Song 2005). Education has been a major factor segmenting the labor market, but this might change as rural educational levels rise: between 1990 and 2000 the completion rate of middle school for 18-year-old rural youth rose from 48 to 77 per cent for boys and 33 to 72 per cent for girls (Connelly and Zheng 2005). But for now, with China's economy booming, urban unemployment is not a major issue. Instead, labor shortages are emerging in the export manufacturing areas of Guangdong and Fujian provinces (*People's Daily* 2005). Generally, migrants are seen as major contributors to economic modernization at the national level and to the material lives of urbanites at the local level.

But the social position of migrants in urban China is as difficult as that of Mexican migrants in the US, and the balancing of economic and social concerns reflected in policy and enforcement is the major factor affecting migrants in the destination. The rest of this sub-section reviews Chinese attitudes and policies toward migrants, and their reflection in the evolution of the *hukou* policy and enforcement.

Permitted since 1984, migration was initially not a major issue, but after recovery from the economic downturn of 1989–90 the growing numbers became a cause of increasing concern. The Chinese press generally portrayed a homogeneous and rather threatening image of large masses, pushed by overwhelming poverty, pouring blindly into the cities and disturbing social stability, and called for control or expulsion to restore social order (Florence 2004). The reception given migrants by urbanites was generally hostile, reflecting perceptions about their contribution to a variety of problems accompanying the transition (Davin 2000).

China has what Xiang (2005) calls a 'place-embedded social control paradigm' that reflects a view of 'rootedness to place' as the norm. Historically, peasants forced from their land by flood or famine 'floated aimlessly' through the land, and because they might turn to banditry were regarded as a source of instability (Zhang 2002*b*). Such fears were the basis for regulations and campaigns during the 1990s, when the Ministry of Public Security developed an almost crisis-like mentality, believing that in the move to the city, peasants not only lost their social connections, but also any restraints upon their actions (Dutton 1998).

Within this context, the state tried to gain control with an interlinked web of work and residence permits; both costly and confusing, the vast majority of migrants did not possess them (S. Zhao 2000). In Beijing, five different certificates were issued by five different agencies: 'in ordinary times nobody regarded them as violating legal provisions, but with the advent of special occasions, such as important celebrations, those migrants without a complete set of the five certificates would be regarded as "law or regulation breakers" and would be harshly treated and expelled' (Q. Li 2003: 135). Periodic 'cleanups' of migrant housing and sweeps of undocumented migrants have occurred. Undocumented migrants were taken to Custody and Repatriation Centres, of which there were 728 by the end of 1997, affecting two million people (HRIC 1999).

These draconian measures were increasingly at odds with the interests of other agencies of the government: there existed competition and intergovernmental conflict over the collection of fees and taxes (He 2003). Rather than working together, those charged with regulating migrants were often at cross purposes. Landlords, who were major beneficiaries, were unwilling to check the birth control certificates of migrant women as required by family planning authorities (Zhang 2002*b*). The MoA, local governments and labor export companies all benefited from and promoted migration in rural areas such as Huzhou county in Sichuan province, which sent out 37 construction teams and 120,000 migrant workers in 2000 (Mobrand 2004). In addition, social scientists argued that migration was not 'blind' but organized (S. Zhao 2000), that migration controls hindered the development of an efficient labor market (Cai and Wang 2003), and that they prevented China from utilizing its comparative advantage in labor (Y. Zhao 2000).

Since the late 1990s, modified regulations make it easier to migrate to towns and small cities; allow children to inherit *hukou* status from their father; give investors and those who buy housing permanent residence; and even reform major categories of *hukou* status (Wang 2005). The commonality of these reforms is that none threatens the system that excludes most rural migrants from permanent settlement in the cities.

Research and media interest increasingly highlighted migrants' experiences and problems (Xiang and Shen 2005). Zhang (2002*a*: 281) cites a story in the *Beijing Evening Daily* about a migrant from Anhui:

> Every time I try to squeeze onto a crowded bus, I hear city people complaining that there are too many *waidiren* [outsiders] . . . But when you move into a brand-new apartment building, when you eat fresh vegetables, when you walk on clean streets, when your trash disappears, when your elderly and children are well taken care of, have you ever though about us—migrant working brothers and sisters?

The film, *Beijing Bicycle* (2001), brought the plight of a migrant worker in Beijing to young urbanites, much as had *El Norte* (1983) to a generation of young *norteamericanos*.[5] Public outcry at the beating and subsequent death in 2003 of a university graduate from Wuhan arrested in Guangzhou for having no temporary resident certificate (Wang 2005) led to the regulation on Internment and Deportation of Urban Vagrants and Beggars being changed to one for Aid to Vagrants and Beggars in Urban Areas (Jiang 2004).

By the time of the 16th Party Congress in 2002, President Jiang Zemin urged the removal of all institutional and policy barriers to urbanization, and oversight of a rational and orderly flow of rural labor (Jacka 2006). The same year the State Council ruled that migration of rural surplus labor into urban areas was not a social problem but a normal consequence of economic development; that migrants were part of the working class (*gongren jieji*) and not peasants (*nongmin*); and that policies towards them should be fair, with formal contracts, no delayed wages, no arbitrary fees, and safe working conditions (Huang and Pieke 2003). In 2004 local governments in migrant receiving areas required companies to establish wage funds before beginning construction (Kuhn 2004). The same year, the National Labor Medal was awarded to a migrant worker for the first time (*Xinhua* 2004), and according to the Spring

Breeze action of 2005, only ID cards are required for migrants to work in a city (Liu and Cai 2005).

While legal obstacles to migrants working in cities are being removed, housing and children's education remain major barriers to integration and settlement, as has been shown in previous chapters of this volume. Buying a house is prohibitive for all but the richest migrants, and most migrants live in poor quality rented rooms on the fringes of cities (Wu 2004). Chinese migrants are even more disadvantaged than their Mexican counterparts regarding the education of their children, for Mexican children born in the US are entitled to citizenship, and are guaranteed an education even if born in Mexico. In China, it was not until 1998 that cities were required to educate the children of people not registered there, and they have charged prohibitively high fees for doing so. Many of the estimated seven million migrant children attend migrant schools, which are cheaper but of poor quality (Kwong 2004). The suicide of a fifth grade girl forced to care for five other children recently focused attention on the children of migrants who are left behind in the countryside, and a survey in Anhui province found 74 per cent of students were without one parent at home and 31 per cent without either (Shi *et al.* 2005).

14.2.3 Factors Affecting the Migration Process

The dynamics of migration also involve changes in the migration process linking origin and destination. In Mexico–US migration, these changes included better information about employment opportunities and life in the US, easier contact between people in Mexico and the US and, most importantly, the maturation of migration networks. Migration networks reduce the costs and risks of migration, providing members with 'social capital' that reinforces migration from particular sending areas and concentrates it in particular destinations (Massey *et al.* 1994).

As migrant networks mature, they may concentrate migration between regions and channel it into particular occupations, but they can also expand occupations and regions as the contacts provided through the network allows members to explore new opportunities (Roberts and Morris 2003). They can draw more skilled and educated migrants into particular occupations, and they can endow people without education or skills with social capital and increase their migration. While there is debate about the net effect of these factors, what is not at issue is that the maturation of migrant networks has led to the formation of transnational communities, the feminization of the migration stream, and settlement (Roberts *et al.* 1999; Durand *et al.* 2001; Marcelli and Cornelius 2001).

The importance of networks for Chinese migrants has been emphasized by a number of scholars (Ma and Xiang 1998; Solinger 1999; S. Zhao 2000;

Cai 2001; Zhao 2001; Zhang 2002*b*). Liang in Chapter 12 of this book identified some major interprovincial flows between origin and destination. Informal networks between these areas have been institutionalized in formal linkages, such as through setting up migrant centers representing county and provincial governments in major destinations.

Nevertheless, compared to Mexico, the formation of migrant networks is just beginning, and there are many parts of rural China from which few people migrate to work elsewhere (Ma 2004). More than one-third of the 4,000 households in a 1995 survey in eight provinces wanted to increase migration, but had not done so because of lack of contacts (36 per cent) or information (25 per cent). Of those who did not want to continue with the migration option, 17 per cent said it was too insecure and 9 per cent listed the costs and hardships of travel. Most had not even considered migration as a possibility, suggesting lack of information was the single biggest constraint (Knight and Song 2003). As networks mature, these constraints will ease significantly.

One remarkable continuity affecting the Mexico–US migration process is the large differential in wages over the long run (Massey *et al.* 2002); were this differential to close as predicted by economic theory, the primary incentive for migration would cease. Regional income inequality between inland and coastal areas in China grew during the 1980s and 1990s, and in response the proportion of migration from inland to coastal provinces grew from one-third to three-fifths of all non-*hukou* migration from 1995 to 2000 (Lin *et al.* 2004).

14.3 POTENTIAL CHANGES IN THE PROFILE OF CHINESE MIGRATION

If migration in China were to respond to changes in the factors identified above in a fashion similar to that in Mexico–US migration, the following changes in the profile of Chinese migration would be expected in the near future: more migration to the coastal cities, greater occupational diversification within destination areas leading to higher skills and education of migrants, more women and families in the migrant stream, and more settlement. These potential changes will be briefly explored in this section.

14.3.1 The Magnitude and Regional Specificity of Migration Flows

The magnitude of Chinese migration is large and growing, with the most rapid upsurge beginning in the early to mid-1990s and increasing since, as shown in

Chapter 12, this volume. The examination of factors affecting the origin, destination, and migration process presented above points overwhelmingly to increased migration in China over the next two decades. While the relative size of the cohorts entering the labor force is declining, they are still numerically very large, and the vast majority of their members will not become farmers. In the destination areas there is increased tolerance and sometimes grudging respect, if not the type of acceptance that would lead to integration. It is clear to most policy makers that the solution to rural problems does not lie in the countryside, and that '*li tu bu li xiang*' will have to change to '*li tu you li xiang, jin chang you jin cheng*' ('leave the land and the countryside, enter the factories and the cities').[6] Lastly, the maturation of migration networks will lead to more migration through a process of cumulative causation.

More migration is now interprovincial rather than local, as documented in Chapter 12. During the early stage of Mexico–US migration, most migrants came from just a few states in central Mexico and went mainly to Texas and California, similar to the 'spatial focusing occurring in China between major sending provinces and destinations' (Fan 2005). But as the entire country went into crisis during the 1980s, migration spread from the central states to the periphery. Even indigenous people from the southern state of Oaxaca who did not speak Spanish began joining the migration stream. In China, the process of cumulative causation in high migration provinces might see their relative contribution to migrant numbers continue to rise in the short run. But if China follows the path of Mexico, whether due to crisis or simply the steady deterioration of rural conditions, we can expect the spread of migration to other origin areas.

Mexico–US migration also spread to nontraditional receiving areas. Between 1990 and 2002, the number of Mexican migrants outside the four traditional receiving states of Texas, California, Illinois, and Arizona increased five times, compared to just 87 per cent within those states (Passel 2004). While this spatial diversification requires a level of prosperity in nontraditional receiving areas that China is still far from achieving, there is increasing rural to rural migration to fill the void left by farmers turning to migration (Lohmar *et al.* 2000), and already one of the earliest migration streams, that from Wenzhou in Zhejiang province, has begun a 'diffusion path' of migration to small cities after having been concentrated initially in big cities like Beijing (Xiang 2005).

14.3.2 Occupational Diversification and Education

Mexican migrants to the US during the 1960s worked predominantly in agriculture. They diversified into restaurants and construction during the 1970s and 1980s and were working in every sector of the US economy by the end of the 1990s (Borjas and Katz 2005). A similar occupational diversification is being witnessed in China. Migrants have long provided goods and services in the cities, and the variety and sophistication is increasing yearly. Service jobs are especially important for women migrants, with 40 per cent of the women migrants in Beijing working in this sector in 1997 (Guo and Iredale 2004).

Factory work is likely to become more skill intensive as China produces more high technology goods: factories already demand at least a middle school education. The message is travelling back to the villages as 'migrants write home exhorting their siblings to stay in school' (Murphy 2002: 100). The contribution of education to migrants' income in the vibrant Dongguan region was found to be three times that in Jinan, Shandong province, portending the rise in qualifications necessary for success (Meng 2000).

14.3.3 Women and Families

The third and fourth changes in the Mexico–US migration system—more women and children and more settlement—are of critical importance and are closely related. There had been a gradual feminization of the Mexican migrant flow, which accelerated sharply in the 1990s as more women and children joined their husbands (Marcelli and Cornelius 2001). Important reasons were better secondary education for children and a desire for the additional earnings of wives (Latapí *et al.* 1998).

During the early stage of Chinese migration women were much less likely to engage in interprovincial migration than men (Yang 2000). That began to change during the 1990s, not only because Guangdong attracted an increasing proportion of female migrants, but because of rising numbers of women migrants in major destinations such as Beijing and Shanghai. A six-province survey found the probability of women's migration relative to men doubled between 1995 and 2000; for the youngest cohort of migrants it was equal (Zhang *et al.* 2004).

Women's reasons for migration differ from those of men.[7] Female migrants in Tianjin were described as breaking through the limitations put upon them by men, tradition, and the state (Zhang 1999: 38). Those in Shenzhen came not only for an income but for the no less important goals of escaping from parental control and various familial responsibilities (Lee 1998). Young women working near Shanghai actually preferred to work in a factory there rather than do similar work in their villages (Xu 2000). In the rural economy, many young women felt marginalized, bored, and of little worth (Jacka 2006).

A common stereotype of female migrants—that they work briefly in the city, return home, marry, bear children, and never migrate again—is no longer true. By 1995, one-third of the migrant workers in Beijing, Wuhan, Suzhou, and

Shenzhen were accompanied by a spouse (Knight *et al.* 1999); similar findings were shown for Shanghai two years earlier (Roberts 2002).

A survey of rural women conducted in 2000 in Anhui and Sichuan provinces illustrates the diverse patterns of female labor migration (Roberts *et al.* 2004). Both a cohort and a period effect were causing more women to migrate in recent years: women in younger age cohorts were consistently migrating more than those in older cohorts, and women in all age cohorts were migrating more in recent periods. The survey also showed that 62 per cent of female migrants did not engage in their first migration until after the average age of marriage of 21.7, and by this age more than half were married when they migrated for the first time. The proportion of women migrants who were married on subsequent migrations was even higher: of the total of first through third trips engaged in by women, two-thirds were accomplished while they were married. Among married female migrants, about half migrated alone and half were accompanied by their husbands (Roberts *et al.* 2004). These results are supported by surveys of the floating population conducted in Shanghai in 1993 and 1997, which shows a particularly noticeable change in the 20–24 age cohort, where the proportion of female rural labor migrants who were married almost doubled, from 18 to 34 per cent.[8]

The biggest potential constraint on migration of married women is their responsibility as mothers, for in rural China children soon follow marriage. Yet as in Mexico (Donato and Kanaiaupuni 2000), children do not appear to constitute an insurmountable barrier to migration. Four out of five married migrants in the Anhui/Sichuan sample had children by the time they took their first trip. The care provided by grandparents was the critical factor, with three-fourths of those women leaving them with grandparents, most commonly paternal grandparents. About one-fourth of the women migrated with their husbands and children, contributing to the issue of schooling for migrant children discussed in earlier chapters.

Gender and marital status interact strongly with occupation in the destination. Over half of the single women migrants from Anhui and Sichuan were enterprise employees, usually factory workers. Married women on later trips or migrating with their husbands worked in a variety of occupations. This is partly because factories frequently provide same-sex dormitories for workers, but also because some types of jobs, such as home repairs, vending, and food preparation permit couples to work together efficiently and earn more money (Roberts *et al.* 2004).

A significant shift in occupations among female labor migrants was observed in Shanghai between 1993 and 1997. By 1997 the proportion working in manual labor or handicrafts fell from 64 to 44 per cent; the proportion working in construction, farming, and commerce, or as maids was constant; while those working in any other occupation rose from 2 to 21 per cent. The proportion working in the private sector rose from 15 to 23 per cent, and the self-employed rose from 27 to 39 per cent. Since the majority of self-employed workers and those in occupations other than factory work were married, this occupational shift was accompanied by an increase in the proportion of married female labor migrants (Roberts 2002). The causality could, of course, run in the other direction, with married women creating occupations for themselves in the city. The diversity of Chinese women's migration patterns is in sharp contrast with that of Mexican women, whose migration to the US is mainly linked to that of their husbands and other male family members.

14.3.4 Settlement

While the majority of migrants in both Mexico and China do not express an intention to stay, an important trend in Mexican migration is increasing settlement. Marcelli and Cornelius (2001) estimate the proportion of migrants who returned to Mexico fell 28 per cent from 1980 to 1992. Mexican women enjoy more autonomy in the US than in their rural villages, and are more likely than men to express a preference for staying permanently (Pessar 2003).

Chinese migrant women tend to see a future in the city as holding greater potential for development than life in the countryside, so that 'significant, and possibly growing, numbers of migrant women wish to stay away from their "home" in the countryside for as long as possible' (Jacka 2006). Data allowing the examination of settlement in Chinese cities are difficult to find. However, successive floating population surveys collected in Shanghai show that the proportion of rural labor migrants staying less than a year fell from 73 to 51 per cent between 1993 and 1997, while those staying from one to five years rose from 24 to 39 per cent, and more than five years from 4 to 10 per cent (see Roberts 2002).

14.4 CONCLUSIONS

This chapter has identified major factors at the origin, the destination, and the migration process that have affected the migration from Mexico to the US in recent history and might influence the dynamics of migration in China. Understanding these dynamics is critical to the development of appropriate policies which will have significant impacts upon some of the most important issues facing China today, including rural poverty, the pace and character of urbanization, the evolution of the labor market, and human rights.

Is the analogy to international migration generally and the Mexico–US example in particular appropriate? The relevance of comparing internal migration in an economy transitional from socialism to market with a cross-border migration involving two market economies was addressed in the early sections of the chapter, and it is evident that it can help our understanding of the nature of migration in China. But even though labor migration across international boundaries may provide an appropriate theoretical model, the factors operating in the two systems are so different that it would be inappropriate to apply the results of one to the other. The goal of the analysis was to identify particular *types* of factors that will play major roles, even if with opposite effects in the two cases.

There have been four major changes in the evolution of the Mexico–US migration system: more migration from more origins to more destinations, occupational diversification and intensification of education and skills, more women and children, and more settlement. Although there are some important differences between Mexico and China regarding the factors at the origin that have influenced theses changes, the overall outcome will probably be the same—less labor needed in agriculture, large cohorts entering the labor market, and dissatisfaction with farming as an occupation and the village as the locus of one's future plans. Likewise, the migration process is likely to develop in a similar manner, with networks both deepening and widening. This too will increase the intensity of migration, and can cause spatial and occupational focusing followed by diversification. Networks can have paradoxical effects, so again it is not the specific prediction that is important, but the necessity of paying close attention to their evolution, and the roles of local and national governments and private recruiters in facilitating or hindering the operation these networks.

Factors at the destination offer the potential for the greatest divergence between the two migration systems. The comparison drew attention to the interplay of economic and social factors which are very different in the two countries. The United States is a 'country of immigrants,' so that anti-immigrant groups must find other grounds for opposition, while China has a long tradition of a 'place-embedded social control paradigm' that makes possible abrupt changes in government policy in reaction to perceived problems. In China's booming economy there is little competition between migrants and locals, but that could change rapidly with economic conditions and with longer run increases in migrants' human capital. Settlement is easy in the US once the border has been crossed, and every child once there is entitled to an education. In China housing and education are the two biggest obstacles to settlement. *Hukou* policy is central to these issues, with recent changes favoring relaxation, the integration of migrants, and efficient labor markets.

In one regard, the process in China is moving much faster than it did in Mexico: more women are coming at an earlier stage in the process, more single women are coming to work in industry, and more married women are coming without their husbands. This is partly due to differences in the labor markets in the two destinations: if the US–Mexico border area is considered part of the destination, the difference narrows, and the service sector in urban China was largely nonexistent before migrants moved in. But Chinese women seem to have seized the opportunity to change their lives in ways that Mexican women never did. Their desires for themselves and their families will have a major impact upon the future of Chinese migration.

15

Minorities: Cultural Integration, Family Planning, and Population Changes

Isabelle Attané

The 55 national ethnic minorities officially recognized in China today represent a total of 105.2 million people, 8.5 per cent of the national population. These minorities are identified by ethnic, cultural, and religious criteria. They are defined as population groups who share 'a language, an area, an economic life, a culture,' and 'an awareness of belonging to the same group' (Gladney 1996).

Within this diversity, some groups stand out by their numerical size, geographical territory, or strong ethnic identity. This chapter focuses on the eight major groups with a population of five million and above: the Zhuang, Man, Hui, Miao, Uighurs, Yi, Mongols, and Tibetans. Together they accounted for 69 per cent of the total ethnic minority population in 2000. This chapter first describes the major characteristics of these ethnic populations with respect to their integration with the Han Chinese and their levels of development. It then discusses family planning and fertility decline in these minority groups. Following that the chapter examines their recent population growth and changes in mortality, age structure and sex composition.

15.1 CULTURAL INTEGRATION AND DEVELOPMENT

In addition to the Han majority, the eight ethnic groups with a population exceeding five million in 2000 are, in order of size: Zhuang, Man (or Manchu), Hui, Miao, Uighurs, Yi, Mongols, and Tibetans. Their population size is shown in Table 15.1, with the Zhuang, the largest among the eight, having 16.2 million people and the Tibetans the smallest with 5.4 million people. Three of these

Table 15.1 Population of main ethnic groups and their mean annual growth rates: 1953–2000

	Population at each census (in 1,000s)					Mean annual growth rate (per cent)			
	1953	1964	1982	1990	2000	1953–64	1964–82	1982–90	1990–2000
Han	542,824	651,296	936,675	1,039,188	1,137,386	1.7	2.8	1.3	0.9
Zhuang	6,752	8,386	13,383	15,556	16,179	2.0	3.6	1.9	0.4
Man	2,399	2,695	4,304	9,847	10,682	1.1	3.6	10.3	0.8
Hui	3,530	4,473	7,228	8,612	9,817	2.2	3.7	2.2	1.3
Miao	2,490	2,782	5,021	7,383	8,940	1.0	4.5	4.8	1.9
Uighurs	3,610	3,996	5,963	7,207	8,399	0.9	3.1	2.4	1.5
Yi	3,228	3,381	5,454	6,579	7,762	0.4	3.7	2.3	1.7
Mongols	1,451	1,966	3,411	4,802	5,814	2.8	4.2	4.3	1.9
Tibetans	2,753	2,501	3,847	4,593	5,416	−0.9	3.3	2.2	1.6
Other ethnic groups	8,818	9,722	18,623	26,744	32,217	0.9	5.0	4.5	1.9
All ethnic minorities	35,031	39,902	67,234	91,323	105,226	1.2	4.0	3.8	1.4
China	577,856	691,220	1,003,914	1,130,511	1,242,612	1.6	2.9	1.5	0.9

Sources: China's censuses for 1953, 1964, 1982, 1990, and 2000.

ethnic groups are found only in China: the Zhuang located mainly in Guangxi (87.8 per cent); the Man concentrated primarily in Liaoning (50.4 per cent); Hebei (19.8 per cent) and Heilongjiang (9.7 per cent); the Hui living largely in Ningxia (19.0 per cent), Gansu (12.0 per cent) and Henan (9.7 per cent). The other five ethnic groups are generally found in cross-border areas: the main Turkic speaking Muslim group, the Uighurs, is concentrated in Xinjiang (99.4 per cent); the Mongols mainly live in Inner Mongolia (68.7 per cent); the Miao in Guizhou (48.1 per cent), Hunan (21.5 per cent) and Yunnan (11.7 per cent); the Yi in Yunnan (60.6 per cent) and Sichuan (27.3 per cent); and the Tibetans in Tibet (44.8 per cent), Sichuan (23.4 per cent) and Qinghai (20.1 per cent).

These ethnic groups display various levels of integration to the Han majority. Their degree of sinicization is measured through an 'index of sinicization,' which can be calculated by using several cultural and environmental variables and is ranged from 0 to 100.[1] The computed indices are presented in Table 15.2. Next to the Han, the highest scores of sinicization are shown for the Hui and Man. The Uighurs have the lowest degree of sinicization among the selected ethnic groups, with an index of 6.

The Hui is China's oldest and largest Muslim community. It is totally separate from the Muslim Uighurs of the Xinjiang region and has for a long time intermingled with the Han population. The Hui are geographically diffuse and distributed throughout the country, although with higher concentrations in the Ningxia Hui Autonomous Region and neighboring Gansu. Descended

Table 15.2 Sinicization index for selected ethnic groups

Ethnic group	Sinicization index	Ethnic group	Sinicization index
Han	100	Mongols	29
Hui	62	Yi	25
Man	61	Tibetans	10
Miao	32	Uighurs	6
Zhuang	30		

Source: Based on the 1990 census.

from Arab and Persian merchants who settled in China in their thousands from the seventh century onwards, and central and western Asian Muslims brought by the Mongol army in the thirteenth century, the Hui assured their population growth through intermarriage with Han women, with children traditionally taking the father's nationality. This exogamy also favored the rapid cultural, physical and linguistic sinicization of the Hui. Nothing—not customs, habits, traditions, or language—now distinguishes them from the Han, other than their religion and the constraints it imposes, such as dietary prohibitions, particularly on pork. The Man also have a long history and a high level of integration with the Han. While still forming the ruling class of China in the nineteenth century but in the early days of their decline,[2] the Man were already beginning to adopt the Han language, culture and lifestyle (Fang 1993). Today, the community speaks only Chinese (Wang 1994).

The Zhuang, Mongols, Miao, and Yi are in what might be described as an intermediate stage of sinicization, with indices between 25 and 32, partly because of their greater geographical integration into Han territory compared to the Uighurs and Tibetans. Zhuang culture has growing similarities with that of the Han. Gradually, the use of the Yue dialect became increasingly common among the Zhuang, and Mandarin slowly became their written language. The Zhuang economy today is all but indistinguishable from that of the Han (Olson 1998). The Mongols retain a kind of original identity, mainly through the preservation of Mongolian language and dialects, but also through an economic life characterized by nomadic pastoralism. Despite gradually becoming more sedentary, they have preserved rich cultural traditions. Buddhism, practiced by the majority of Mongols, is a point of contact with the Han. Mongols are increasingly culturally akin to the Han who vastly outnumber them (with 79 per cent of the total population) in the Inner Mongolia Autonomous Region, according to the 2000 census.

The Miao are related to the Hmong of Laos, Vietnam, and Thailand (who are in fact Chinese Miao who emigrated south from the thirteenth century onwards), and are culturally and linguistically mixed (Yuan 1991). While some groups of the Miao display an acute ethnic consciousness others, like the Monsua to whom the Chinese refer as 'cooked' Miao, are highly sinicized. The Yi people, even if they retain a strong cultural identity primarily through the preservation of their traditional social structure, live widely scattered among the Miao, Zhuang and Han, and the intermarriage with those ethnic groups favored their integration (Olson 1998).

The Uighurs and the Tibetans also have in common the upholding of a strong cultural identity, largely through the preservation of their language, educational systems, and press. The Uighurs, overwhelmingly concentrated in the Xinjiang Uighur Autonomous Region, comprise China's most visible Islamic community (the Hanafite school of Sunni Islam). They speak Turkic languages and regard Chinese as a foreign language. They share rich cultural traditions with the Muslims of the former Soviet Republics in Central Asia, and have little in common with the Han (Mackerras 1994). At least half of the Tibetans live in the Tibet Autonomous Region, and most of the rest in the traditional Tibetan areas in Qinghai and Sichuan provinces. The Tibetans are largely farmers, nomadic herdsmen, and monks. They display a high degree of cultural homogeneity which is mainly religious based (Tibetan Buddhism) but also linguistic, with fewer than one in three Tibetans able to write Chinese. Their cultural traditions are more akin to those of neighboring Nepal than to the Han.

The variation in level of development among these selected ethnic groups is indicated by their differences in levels of urbanization and education. China as a whole is among the least urbanized countries in the developing world, with 26 per cent of the population urban in 1990 and 37 per cent in 2000. Nevertheless, as those two figures suggest, an urbanization process is on the way, with a rapid growth in the population of cities and towns of 3.4 per cent per year recorded between the last two censuses, as Table 15.3 shows. However, huge differences in the proportion urban are observed among selected ethnic groups. While the proportions urban in the Han, Man, and Mongols were close to the national average, varying between 32.7 and 38.2 per cent in the year 2000, those proportions among the Miao, Uighurs, Yi, and Tibetans were each below 20 per cent. Among all selected ethnic groups, the Hui are the most urbanized, with almost half the population (45 per cent) urban.

As already indicated, China's workforce remains essentially agricultural, with 72.2 per cent in 1990, and 64.5 per cent in 2000, being rural dwellers. The Han, Hui, and Man are the only ethnic groups in which less than two-thirds of their populations work in the agriculture sector. In contrast, the Miao, Yi, and Tibetans have the highest percentage of agricultural workforce (here the agricultural workforce includes people working in farming, forestry, husbandry, and fishery sectors), each above 85 per cent in the year 2000.

Table 15.3 Proportion of urban population and agricultural workforce by ethnic group

	Urban population		Agricultural workforce[a]	
	1990	2000	1990	2000
Han	27.1	38.2	71.3	63.1
Zhuang	9.9	22.4	88.9	80.0
Man	28.1	35.2	68.0	65.9
Hui	39.1	45.3	62.3	59.6
Miao	8.0	14.1	93.0	86.9
Uighurs	15.5	19.4	85.2	80.4
Yi	8.2	10.4	93.7	90.6
Mongols	24.4	32.7	71.9	70.7
Tibetans	7.1	12.8	86.7	86.7
China	26.2	36.7	72.2	64.5

Note: [a]Agricultural workforce includes persons working in farming, forestry, husbandry, and fishery sectors.

Sources: Based on China's 1990 and 2000 censuses.

In spite of great differences in age structures (to be discussed in later sections), which inevitably bias the comparison between ethnic groups, some striking differences appear in their access to education. Table 15.4 shows the proportions of individuals with various levels of education in selected ethnic groups. The proportion of people aged 6 and over who have never been to school is below 10 per cent among the Man, Zhuang, Han, and Mongols, while it exceeds 20 per cent among the Miao, Yi, and Tibetans. The Man, Hui, and Mongols have the highest percentage of people who have undertaken university education, while among the Miao, Yi, and Tibetans only 1.1 to 1.4 per cent of the population have done so.

Inequalities are more striking when comparing male and female access to education. Among all selected ethnic groups, females are generally disadvantaged in getting adequate education. Among people aged 6 and over who have never been to school, there is a salient female majority in all the ethnic groups. The proportions of females who have never been to school are double or even triple those for males in some of the groups. The Uighurs form a noticeable exception, with the number of females who have never been to school very close to that of males.

The sex differential in education exists at all levels except primary school education, and males are systematically overrepresented. The proportion of females, compared to that of males having secondary schooling and above is relatively low among the Han, Zhuang, Yi, and Miao, but is relatively high in the

Table 15.4 Percentage distribution of population by level of education and proportion of females with given education, by ethnic group: 2000[a]

	Total	Never went to school/ IEC[b]	Primary	Secondary (1st level)	Secondary (2nd level)	University
Both sexes:						
Han	100.0	9.0	37.6	37.3	12.2	3.9
Zhuang	100.0	7.7	46.4	34.7	9.0	2.1
Man	100.0	5.1	37.5	40.4	12.1	4.8
Hui	100.0	18.3	36.8	29.0	11.8	4.1
Miao	100.0	20.6	50.9	21.5	5.6	1.4
Uighurs	100.0	11.7	53.1	24.6	7.9	2.7
Yi	100.0	26.1	51.6	16.4	4.8	1.1
Mongols	100.0	7.9	37.3	34.7	14.8	5.2
Tibetans	100.0	51.6	35.2	7.7	4.2	1.4
% of females[c]:						
Han	48.7	72.0	51.1	43.8	42.5	38.2
Zhuang	48.5	78.1	51.7	41.4	38.0	32.2
Man	48.1	67.0	50.5	44.9	45.1	44.3
Hui	49.2	65.9	46.7	43.4	47.4	44.0
Miao	48.1	71.4	46.0	35.8	34.6	30.6
Uighurs	49.1	51.2	50.0	46.7	48.7	47.0
Yi	48.8	65.7	45.4	36.3	39.6	32.8
Mongols	50.8	66.5	51.6	47.6	48.9	47.1
Tibetans	50.3	60.0	40.1	37.8	43.2	37.6

Notes: [a]Computed for population aged 6 and over; [b]IEC = Illiteracy eradication course; [c]Proportion of females out of the total population with a given education level.

Source: China's 2000 census.

populations of the Man, Mongols, Hui, and Uighurs. In that second group, more than 44 per cent of those with university education are women.

15.2 FAMILY PLANNING AND FERTILITY DECLINE

In 1971, China launched its third family planning campaign which, unlike its two forerunners of 1956–57 and 1962–66 that were interrupted by the great famine and the Cultural Revolution, has been pursued vigorously ever since. As discussed in Chapter 2 and elsewhere in this book, the 'later, longer, and fewer' birth control policy was implemented from 1973. However, because these measures could not ensure that the official target of holding the population within 1.2 billion by 2000 would be reached, the Chinese government revised its birth control policy in 1979 and began its one-child family campaign in both urban and rural areas, with some relaxations in 1984 when most rural couples were allowed a second child (Attané 2002).

Partly from considerations of political stability, ethnic minorities were largely left out of efforts to strengthen birth control policy in the 1970s. Gradually, and especially from the mid- to the late 1980s, fertility control was encouraged in regions with dense concentrations of non-Han populations. Even so, a distinction was drawn between small ethnic groups for whom sufficient population growth had to be assured and larger, often more sinicized, ethnic groups. The latter could be treated on the same footing as the Han,[3] especially those with a population of 10 million and above.[4] Two children were permitted for those in ethnic groups with a population of less than ten million, and some might have three. Theoretically none should have four of more children (Peng 1991). In Guangxi, for instance, birth control policies were implemented in 26 localities with a high percentage of Han in the early 1980s. These measures were then extended to some 60 cities and counties, and gradually to areas with higher percentages of ethnic minority populations. While Han and Zhuang (the most numerous ethnic group in Guangxi) were encouraged to have one child, smaller ethnic groups such as Yi were only encouraged to delay marriage and their people could have two or three children (Huang and Mo 1988).

As far as birth control policies and regulations are concerned, there are complex rules dividing provinces, rural and urban populations, and ethnic groups (Attané 2002). The hierarchy that generally operates irrespective of province is: the strictest measures affect the urban Han, and these are relaxed progressively for the rural Han, for urban minority groups, and rural minority groups who face the least strict measures. In practice, the one-child policy is now only strictly enforced among the urban Han (and officially among urban Zhuang and urban Manchu), and ethnic minorities in rural Tibet can still have an unlimited number of children while in rural Xinjiang the number of children is limited to three or four (Attané and Courbage 2000).

Today, there are birth limitation measures in all regions with high concentrations of ethnic minorities, but these measures remain less strict than those for the Han, and people of ethnic minorities may generally have two or three children. Only the two most populous ethnic minority groups, the Zhuang and Man, no longer receive favorable treatment. The two Autonomous Regions with the highest percentage of ethnic minorities, the Xinjiang Uighur Autonomous Region and Tibet Autonomous Region, are officially subject to the most permissive rules. Tibetan regulations of 1992 stipulate, for instance, that the approved late childbearing age for Tibetan women is 22 years and above compared to 24 for Han women. Nonagricultural (*fei nong ye*) Tibetans living in townships (*xiang*) can have two children. In nomadic or rural areas family planning is promoted largely by education and propaganda so as to persuade people not to have more than three children. In Xinjiang, according to 1984 provisional regulations, urban ethnic minorities were authorized to have two or three children, while rural ones might have three or four.

The Population and Family Planning Law implemented in 2002 introduced no major change. It stipulates only that family planning must also be enforced among ethnic minorities according to provincial family planning regulations. From the late 1980s there have been no nationally unified measures governing family planning in all ethnic minority groups. Each province is allowed to decide how many births can be authorized among different ethnic groups with consideration of their specific circumstances.

While the 1990 and 2000 censuses provide total fertility rates (TFRs) for each ethnic group for the years in which the censuses were conducted, such information is not available for the two intercensal periods 1982–90 and 1990–2000. Thus TFRs for the selected ethnic groups over these periods have to be constructed indirectly. This exercise was greatly facilitated by the NBS publication of detailed population data by age and sex, which allows the backward projection of population size, number of births, and women of reproductive age (15–49) for these periods.[5] On that basis, the general fertility rate was calculated and the TFR was then estimated using the general fertility rate divided by 35 (years of potential reproductive life).[6] The results are presented in Table 15.5.

The family planning program launched by the Chinese government in the early 1970s helped to accelerate fertility decline at the national level, and especially in the Han population. However, the trend and magnitude of that fertility decline in different ethnic minority groups varies considerably, due in part to the fact that they were largely ignored in the early stage of the national program.

As Table 15.5 shows, TFRs in the selected ethnic populations differed significantly in 1975, when they ranged from 3.6 and 3.7 for the Han and Man to 6.0 and 6.4 for the Yi and Miao. The divergences in fertility in small ethnic groups have been measured by an index, or the ratio of their TFRs to that of the Han population. In 1975, as shown in Figure 15.1, these indices ranged from 103 for the Man, whose fertility was at that time very close to that of the Han, to 178 for the Miao. In comparison with the Han, Uighurs, and, to a lesser extent, Tibetans display the sharpest divergences in their fertility behavior. The fertility index for the Uighurs, for instance, reached 235 in 1984. In 1999 the Uighurs and Tibetans, along with the Yi and the Miao, had the highest fertility levels: 2.6 children per woman, well above the number for the Han population.

By the end of the century, in 1999, the indices ranged from about 100 for the Man to nearly 200 for the Yi and the Tibetans. Over the period 1975–2000, there appear to be three broad patterns of fertility change among the

Table 15.5 Estimated TFRs for selected ethnic groups: 1975–2000

	Han	Zhuang	Man	Hui	Miao	Uighurs	Yi	Mongols	Tibetans
1975	3.6	5.4	3.7	4.4	6.4	5.6	6.0	4.9	5.2
1976	3.3	5.3	3.6	4.1	5.7	5.1	6.3	4.4	5.0
1977	3.1	4.9	3.7	4.0	5.3	5.3	5.8	4.2	5.0
1978	3.1	4.8	4.2	3.8	4.9	4.3	5.3	4.5	4.8
1979	2.9	4.9	3.9	3.8	4.7	5.4	4.8	4.5	4.9
1980	2.7	4.3	3.3	3.5	4.4	4.9	4.5	5.0	4.9
1981	3.2	4.5	4.1	4.0	5.2	5.6	5.1	4.8	5.2
1982	2.8	4.0	3.2	3.7	4.6	5.5	4.4	4.6	4.7
1983	2.6	4.0	2.8	3.3	4.1	5.8	4.0	4.6	4.4
1984	2.6	4.3	2.9	3.2	4.0	6.1	3.9	4.2	4.2
1985	2.7	3.9	3.5	3.3	4.0	5.8	3.9	4.2	4.3
1986	3.0	3.8	3.9	3.6	4.2	5.5	4.0	4.2	4.2
1987	3.0	3.2	3.5	3.5	4.1	4.9	3.8	4.0	3.9
1988	2.8	2.9	3.0	3.3	3.7	4.3	3.6	3.7	3.4
1989	2.7	2.8	3.0	3.2	3.7	4.6	3.6	3.6	3.7
1990	2.3	2.5	2.2	2.9	3.1	4.2	3.1	2.7	3.6
1991	2.1	2.6	2.1	2.8	3.1	4.4	3.0	2.6	3.6
1992	1.9	2.3	2.0	2.6	3.1	3.7	3.1	2.4	3.5
1993	1.8	2.1	1.9	2.4	2.9	3.3	3.0	2.2	3.4
1994	1.8	2.0	1.8	2.4	3.0	3.2	3.2	2.3	3.5
1995	1.6	1.8	1.6	2.2	2.8	3.0	3.0	2.0	3.2
1996	1.5	1.8	1.5	2.1	2.7	2.9	3.0	1.8	3.1
1997	1.4	1.7	1.4	2.0	2.7	2.6	2.9	1.7	2.7
1998	1.1	1.5	1.2	1.6	2.0	1.7	2.2	1.4	1.9
1999	1.4	1.7	1.4	1.9	2.5	2.6	2.8	1.6	2.6
1999–2000 (census data)	1.2	1.4	1.1	1.5	2.1	2.0	2.0	1.1	1.9

Source: See text.

minorities as compared to the Han. The Hui had TFRs which were broadly parallel to, but consistently higher than, those of the Han. The TFRs of the Man, Zhuang, and Mongols all declined, bringing them closer to those of the Han. Among the Miao, Uighurs, Yi, and Tibetans, TFRs show continuing large excesses over those of the Han.

Among all eight minority groups, fertility most closely approached that of the Han during the second half of the 1980s, and indeed in two instances—Man and Zhuang—was about as low. The following factors contributed to this change. There was a relaxation in birth control policies for the Han population who, since 1979, had been subject to the strict one child policy. From 1984, the rural Han in most provinces were allowed a second child. Also, the economic reforms which started in 1978 led to great social changes: de-collectivization of agriculture, dismantling of the people's communes, and the return to individual farms

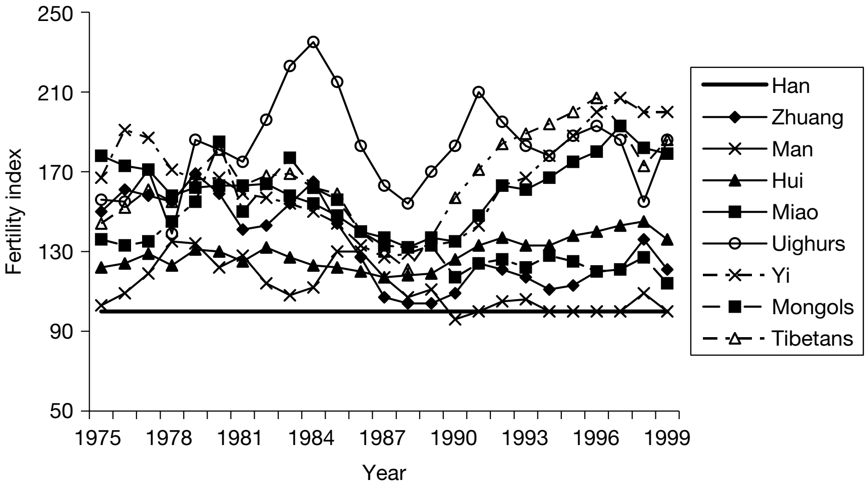

Figure 15.1 Fertility index by ethnic group compared to the Han (= 100): 1975–99

that restored the family's function as an independent production unit. This newly restored economic independence brought with it a *de facto* social liberalization: renewed family solidarity; increased influence of the family on its individual members; and an open resurgence of hitherto suppressed traditional religious and cultural observances. In this context, growing resistance to the birth control policy was manifested in a slight resurgence in fertility (Attané 2002). From 1985, the convergence of policy measures, with an extension of family planning policy to minority populations of over one million, also encouraged convergent fertility behaviors. Notwithstanding this slow homogenization, however, wide disparities remained at the end of the 1980s, with the highest fertility, 4.6 children per woman, among Uighurs in 1989.

In spite of rapid declines in fertility among all the ethnic groups, the 1990s saw the fertility gap widen again, except among the Man and the Mongols: chiefly as a result of the sharp decline in fertility in the Han population. In 1999, fertility levels varied considerably, from 1.4 children per woman for the Han to 2.8 for the Yi.[7]

Current disparities in fertility levels are undoubtedly partly related to the social and economic characteristics of the various minorities. For instance, the Man, who live in the most industrialized parts of the country, are among the wealthiest, most urban and generally most highly educated of the minorities, and have already reached an advanced stage in their fertility transition; while the highly rural, agricultural, generally poorly educated Miao, Yi, and

Tibetan populations who live in some of the poorest provinces (Yunnan, Guizhou, Tibet) had a later onset in their fertility decline.

But socio-economic characteristics alone cannot fully explain recent fertility trends. On the one hand, with three out of five women who never went to school, almost nine out of ten workers engaged in agriculture, and 87 per cent of the population living in rural areas, conditions in the Tibetan population appear to be unfavorable to fertility decline. However, with an average of 3.5 children per woman in the 1990s, the Tibetans' fertility rate is much lower than that of other populations which have a comparable environmental and cultural context: the TFR for Nepalese women was 4.8 in 1995–2000 and 5.5 for women in Bhutan (UN 2001).

The TFR of the Uighurs fell by two to three children per woman on average during the 1990s, but their fertility remains 40 per cent higher than that for the Hui, in spite of better general socio-economic conditions. While fertility decline among some of the selected ethnic minority groups took place at a time when most of them were still not subject to the national birth control policy, from the 1980s official promotion of family planning accentuated the spontaneous trend. During the last two decades, varying family planning policies and regulations inevitably affected people's fertility behavior, and current differences in fertility levels and trends result, to a great extent, from the differences in local family planning regulations and program efforts.

15.3 RECENT CHANGES IN MORTALITY, AGE AND SEX COMPOSITION, AND POPULATION GROWTH

This section examines other major demographic trends in the selected ethnic minority groups. Population growth, reduction in mortality, and recent changes in the age and sex composition of these groups is discussed on the basis of data collected by recent censuses.

15.3.1 Population Growth

During the period 1953–64, the growth of China's ethnic minority populations as a whole was slower than that of the Han, as indicated by the average annual population growth rate shown in Table 15.1. But when population growth in each ethnic group is considered separately, different trends are observed. This highly turbulent period saw population decline, at least statistically, among the Tibetans. This was at least in part related to the fact that many Tibetans followed the Dalai Lama into exile in 1959 (Olson 1998). The lower overall growth of the minority population recorded in this period was also in some cases a matter of political opportunism, as avowed membership of the majority ethnic group was used as a strategy to avoid certain forms of discrimination. The annual population growth rate was relatively low for the Yi, Man, Miao, and Uighurs, varying between 0.4 and 1.1 per cent. In contrast, the Zhuang, Hui, and Mongol populations increased rapidly during that time, with average population growth rates above 2 per cent annually.

Since 1964, the average annual population growth rate of all ethnic minorities has outstripped that of the Han. During the intercensal period between 1964 and 1982, the annual population growth rate for the Han was 2.8 per cent, and between 1982 and 1990 it was 1.3 per cent, but for the ethnic minorities, the growth rates were 4.0 per cent and 3.8 per cent respectively. This growth differential is related to both the later onset of the demographic transition, especially the later initiation of the family planning program, among China's ethnic minority populations, and a rise in the population who reported themselves as belonging to certain minorities. The latter phenomenon is particularly striking in some ethnic groups and reflected in their intercensal population growth rates. For example, the average annual growth was 4.3 per cent for the Mongols and 4.8 per cent for the Miao between 1982 and 1990. The recorded growth rate was even higher for the Man where it reached 10.9 per cent. Such a growth rate, in the absence of bias in self-reported ethnicity, would bespeak exceptionally high fertility, which—as shown in the last section—is clearly not the case for the Man.

Between 1990 and 2000, China's overall population growth slowed to less than 1 per cent annually, compared to 1.5 per cent during the previous intercensal period. Ethnic minorities also experienced a drastic decline in their population growth: from 3.8 per cent annually in 1982–90 to 1.4 per cent in 1990–2000. Nevertheless, this growth rate still considerably outstrips that of the Han. Among all selected minority groups, the Yi, Miao, Mongols, Uighurs, and Tibetans have high growth rates, exceeding 1.5 per cent per annum in this most recent period, while the Man and Zhuang have experienced low growth with their population increasing by 0.8 and 0.4 per cent a year respectively.

15.3.2 Age Structure

The age structure of these ethnic minority populations further illustrates their differential growth. Table 15.6 presents the age distribution of the selected populations, and three broad groups stand out. The first consists of the Man and Zhuang, who are in the most advanced stage of their demographic transition.

Table 15.6 Percentage distribution of population by age and ethnic group

	Under 15			15–64			65 and over		
	1982	1990	2000	1982	1990	2000	1982	1990	2000
Han	33.2	27.1	22.5	61.9	67.2	70.3	4.9	5.7	7.2
Zhuang	38.9	33.6	24.4	56.2	61.2	68.8	4.9	5.2	6.8
Man	33.9	30.8	24.0	61.5	65.1	70.4	4.6	4.1	5.6
Hui	36.7	32.0	27.3	59.1	63.5	67.0	4.2	4.5	5.7
Miao	42.4	34.8	29.8	53.4	61.1	64.8	4.2	4.1	5.4
Uighurs	40.3	39.4	33.0	54.5	55.8	62.3	5.2	4.8	4.8
Yi	42.2	35.4	30.3	53.9	60.6	64.9	3.9	4.1	4.8
Mongols	39.4	35.8	27.0	57.2	61.1	69.0	3.4	3.1	4.0
Tibetans	39.7	35.9	31.0	55.6	59.3	63.9	4.8	4.9	5.1

Sources: China's censuses for 1982, 1990, and 2000.

While the age structure of their populations is still young, the proportion of those below 15 years was about 24 per cent in 2000, much lower than other minority groups. These two peoples also display high percentages of elderly people, with 5.6 per cent and 6.8 per cent respectively of people aged 65 and over, reflecting an earlier onset of fertility and mortality decline.

The second group includes the Hui and Mongols, who are in an intermediate situation. They commenced their demographic transition earlier and have a much younger age structure compared to the Man and Zhuang. Children under age 15 account for 27.3 per cent and 27.0 per cent, and proportions of elderly consist of 5.7 per cent and 4.0 per cent respectively.

The third group comprises the Miao, the Uighurs, the Yi, and the Tibetans. These four ethnic groups all have high proportions of children, close to or exceeding 30 per cent; and low proportion of people aged 65 and above, ranging from 4.8 to 5.4 per cent. In 1990, the Yi, Tibetans, and Uighurs all displayed pretransitional age structures. During the 1990s, the Uighurs experienced a sharp decrease in the proportion of those below age 10, because of fertility decline. The change remains slow for the Yi and the Tibetans.

15.3.3 Mortality Decline

The changing age structure over the last decade results in part from recent mortality decline. As demonstrated in Chapters 9 and 10, mortality has continuously declined in China since the economic reforms began in the late 1970s. Life expectancy at birth for the national population was around 60 years in the period between 1964 and 1982 and further increased to 71 years in 2000 (Banister and Hill 2004).

Based on unadjusted mortality data collected from recent censuses, life expectancies at birth have been computed for all selected ethnic groups and are presented in Table 15.7. Noticeable improvement has been observed during the intercensal period in all these populations, with life expectation having increased by 1.5 years for the Miao and 3.4 years and 3.6 years for the Uighurs and Tibetans respectively.

The 2000 census shows that great disparities in life expectancies remain between the selected ethnic groups, with a ten year gap between life expectancy for the Yi (63.9 years) and that for the Man (74.2 years). While life expectancy for the Man has reached a level not far from that observed in the United States (where it was 73.6 years for males and 79.4 for females in 1995–2000) or in some rich countries in Asia (for example, life expectancy was 70.6 years for males and 78.1 for females in South Korea), the Yi still have a life expectancy two years below that of Moroccans and one year below that of Indonesians (UN 2001). It is also notable that in these ethnic populations, the sex differential in mortality is not necessarily related to the level of life expectancy. Such mortality differential is partly the reflection of women's status in these groups, and of their unequal access to medical care compared to men.

Changes in infant mortality rates (IMRs) based on unadjusted census data also indicate marked mortality decline. As shown in Table 15.7, during the period between 1990 and 2000, the sharpest decline took place among the Uighurs and Tibetans, with their IMRs falling by half. However, the Miao had

Table 15.7 Life expectancies at birth and infant mortality rates: 1990 and 2000

	Life expectancy at birth				Infant mortality rate (per thousand)			
	1990		2000		1990		2000	
	Male	Female	Male	Female	Male	Female	Male	Female
Han	68.7	72.3	71.1	74.3	22.9	27.0	18.3	26.3
Zhuang	67.0	70.0	68.8	72.6	36.4	60.1	26.8	42.1
Man	70.7	73.6	72.6	76.0	15.0	14.5	10.2	10.6
Hui	69.0	72.4	70.6	73.9	33.0	30.5	25.0	27.7
Miao	63.6	65.2	64.7	67.0	55.7	58.7	50.9	66.6
Uighurs	63.2	63.7	66.0	67.7	82.6	68.7	40.5	36.2
Yi	60.3	63.2	62.2	65.8	69.3	61.7	48.6	58.3
Mongols	64.9	68.2	66.1	72.0	27.3	25.8	23.8	21.7
Tibetans	59.6	63.6	63.7	66.6	86.7	73.4	40.9	41.0

Sources: Attané and Courbage (2000), based on China's 1990 and 2000 censuses.

the slowest reduction in male IMR and that of females even increased. Huge differences in IMRs remain in the year 2000: the IMRs for the Miao and Yi are five to six times higher than that for the Man.

There is an excessive female IMR in all selected ethnic groups except for the Uighurs and Mongols. In societies where women do not face discrimination, especially in the health care and nutrition provided to them, mortality is higher for males than for females at all stages of life (Coale 1991). That is the case for China's adult population, but not among infants. China's infant mortality has improved considerably because the implementation of government health policies since the 1950s, the success of hygiene and vaccination campaigns, and the eradication of some fatal infant diseases. However, as infant and child survival gradually improved, the sex differential in infant mortality has widened, and reversed to favor male children. For instance, the IMR was 38.7 per 1,000 for males and 36.7 per 1,000 for females in 1982 (Huang and Liu 1995). In 2000, it had fallen to 26.5 per 1,000 for males while rising to 38.9 per 1,000 for females.

In studying sex differentials in IMRs, Hill and Upchurch (1995) estimated the observed normal female mortality advantage, or the ratio of female to male infant mortality, is 0.767 when the male probability of dying in the first five years of life is 0.025, and 0.778 when the male probability of dying is 0.05, and so on. For China as a whole, this advantage had already been lost by 1973–75, with a female to male infant mortality ratio of 0.875. This ratio continues to increase, and had reached 1.465 in 2000 (Attané 2004).

There is excess female infant mortality in most of the selected ethnic groups, but huge variations exist in the magnitude of such excess. The Zhuang minority displays the most striking mortality differential, with a female to male IMR ratio of 1.65 in 1990, and 1.57 in 2000. It is followed by the Han and Miao, whose IMR ratios were 1.44 and 1.31 respectively in 2000. In contrast, the female to male IMR ratios for the Man, Mongols, Hui, Yi, Uighurs, and Tibetans were only slightly higher than those estimated using Hill and Upchurch's procedure, although noticeable increases in the ratios were observed in some of these groups in 2000. These results suggest great variations in levels of son preference and in its effects on female infant mortality among the selected ethnic groups.

15.3.4 Population Ageing and Changes in Dependency Ratios

As a result of mortality and fertility decline, all the selected ethnic populations are undergoing an ageing process. Nevertheless, the speed of ageing differs greatly among these populations. As shown in Table 15.6, between 1982 and 1990 all these populations witnessed a decrease in the percentage of children under age 15. The decline was very marked among the Han, Miao, and Yi, ranging from 2.2 to 2.5 per cent annually, although it was rather slow among the Uighurs where only 0.3 per cent of decrease was recorded each year. During this period, the ageing process had only just begun: the average increase of the elderly population (aged 65 and above) was small among most of the selected groups, and the increase exceeded one per cent only in the Han. In fact, the proportion of the elderly decreased among the Man, Miao, Uighurs, and Mongols.

During the 1990s, the Han, Zhuang, Man, Hui, Miao, and Mongols all recorded high annual growth rates in their elderly population: from 2.3 per cent for the Han to 3.1 per cent for the Man. In spite of a later introduction of fertility and mortality decline, the ageing process was rapid for the Miao, with a 2.8 per cent annual increase in the population aged 65 and over. The Yi are in an intermediate situation, while the increase in the proportion of the elderly remains slow among the Uighurs and Tibetans, where the population change is largely caused by the reduction in number of children.

The dependency ratio compares the economically inactive population to the economically active one. As conventionally defined, the economic inactive population consists of people under the age of 15 and those aged 65 and over, with the economically active population assumed to be all those aged between 15 and 64. The lower the dependency ratio, the more economically dynamic the population is supposed to be. Under this assumption, an ageing population could present a heavy burden to society.

As in many countries, the ageing process in China is initially accompanied by a substantial decrease in the dependency ratio. This is caused by fertility falling before there is an increase in the population of old ages. During this stage, the rapid and significant fall in fertility together with the modest increase in the number of elderly modifies the age structure in favor of young adults, and produces a 'demographic window' of opportunity. The working age population has a relatively low social burden to support, as discussed in Chapter 11. Accordingly, China as a whole is now in a favorable situation, with the overall dependency ratios continuing to decrease. At the national level, this situation will reverse in the 2030s, with the elderly dependency ratio increasing faster than the decline in the youth dependency ratio (Mo 2002).

As Table 15.8 shows, there are considerable variations in dependency ratios in the selected ethnic populations because of the differences in their ageing process. Following the reduction in the percentage of children, and consequently the increase in the group aged 15–64, these populations all saw a sharp decline in the youth dependency ratio; for example, from 0.691 in 1982 to 0.355 in 2000 for the Zhuang, or from 0.783 to 0.460 over the same period for the Miao. Between 1982 and 1990, as more children moved into the productive years, the declining youth dependency ratio was paralleled by a decrease in the elderly dependency ratio in all small ethnic groups; this led to a sharp decrease

Table 15.8 Dependency ratios by ethnic group: 1982–2000

	Youth dependency ratio (0–14/15–64 years)			Elderly dependency ratio (65+/15–64 years)			Overall dependency ratio (0–14 and 65+/15–64 years)		
	1982	1990	2000	1982	1990	2000	1982	1990	2000
Han	0.537	0.403	0.319	0.080	0.085	0.103	0.616	0.488	0.423
Zhuang	0.691	0.549	0.355	0.088	0.085	0.099	0.779	0.634	0.454
Man	0.552	0.473	0.341	0.074	0.063	0.080	0.626	0.536	0.421
Hui	0.620	0.504	0.408	0.071	0.071	0.085	0.691	0.575	0.493
Miao	0.793	0.570	0.460	0.078	0.067	0.084	0.871	0.637	0.544
Uighurs	0.741	0.706	0.529	0.096	0.086	0.074	0.837	0.792	0.606
Yi	0.783	0.584	0.466	0.072	0.067	0.074	0.855	0.650	0.540
Mongols	0.690	0.586	0.392	0.060	0.051	0.057	0.750	0.637	0.449
Tibetans	0.714	0.606	0.485	0.086	0.082	0.080	0.800	0.688	0.565

Sources: Based on China's censuses for 1982, 1990, and 2000.

in the overall dependency ratio. Between 1990 and 2000, the steep decline in the youth dependency ratio was partly offset by the increasing elderly dependency ratio in all ethnic groups except the Uighurs and Tibetans, but it was still precipitous enough to keep the overall dependency ratios not only low, but in a downward trend.

In comparison with the previous decade, the 1990s witnessed a faster decrease in the dependency ratios of the Man, Zhuang, Uighurs, and Mongols, which fell respectively by 2.4, 3.3, 2.7, and 3.5 per cent annually. While the Han, Hui, Miao, and Yi saw smaller reductions in dependency ratios, their populations too have a very favorable age structure. However, because of the lack of pension systems for the population, the increasing costs of health care, the decline in numbers of children in the family, and the growing economic precariousness, China faces the challenges of longer term population ageing, which will have a significant impact on society as a whole and on the population of each ethnic group.

15.3.5 Sex Ratios

Changes in the sex composition of the population have become a major source of concern in many Asian societies in recent years (Croll 2000, 2002; Goodkind 1996). Many populations are now facing an increasing female deficit, especially at young ages.[8] In countries where there is no son preference, the overall sex ratio (OSR) is usually in favor of females. Thus in Scandinavia, at the forefront of social progress, there are 97 men for every 100 women. In Africa, there are 99.8 men per 100 women. In Asia (excluding China)[9] the ratio in 2000 is notably higher at 104.5.

In China as a whole, the OSR increased from 105.2 in the mid-1960s to 106.3 in 2000. This ratio is 12 per cent higher than that of 94.7 men per 100 women which prevails in developed countries.[10] The ratio found in China is also 6.5 per cent higher than that for African countries and 1.7 per cent higher than that for other Asian countries. China not only displays a male majority, a characteristic without biological foundation,[11] but the proportion of its population that is male has also grown faster than that of females in recent years.[12] In other words, the female population has increasingly become disadvantaged, compared to their male counterparts; an increasing number of women has been missing, at least statistically (Attané 2004).[13]

When considering recent trends in the OSR by ethnic group, two broad groups stand out. The first includes those displaying an increasing ratio in recent years: the Han, Zhuang, Miao, Yi, and Tibetans; while the second group including the Man, Uighurs, and Mongols all show decreasing OSR. The Hui is in an intermediate situation, with a decreasing OSR between 1982 and 1990, and an increasing ratio since. These trends are largely related to two main factors: changes in the sex ratio at birth, and a sex differential in mortality. A faster improvement in the mortality of females compared to that of males could lead to a decrease in OSR. As shown in Table 15.9, all selected ethnic groups except the Mongols and Tibetans had an OSR greater than 100 in the year 2000. The Han, Zhuang, Man, Miao, and Yi all had an OSR higher than 105, while the two Muslim populations, the Hui, and Uighurs, had OSRs of 103.9 and 103.7 respectively.

Among children under 5, an increasing sex ratio has been observed in all selected ethnic groups without exception. Nevertheless, considerable differences exist in the pace of such increases. Larger increases, of more than 10 percentage points, have been found among the Han, Miao, and Zhuang in the last intercensal period, while only slight increases of 1.6 and 0.4 percentage points respectively were recorded for the Uighurs and Tibetans.

Similar trends can be observed in the sex ratio of children below the age of 1. The largest increase during the 1990s was found in the Han, Zhuang, Miao, and Yi. In 2000, the Han, Zhuang, and Miao had very unbalanced infant sex ratios, ranging from 116 to 122. In contrast, in the Uighur, Mongol, and Tibetan populations, the infant sex ratio showed a slight increase in the 1990s but was still close to the normal level of 105 in the year 2000, despite the fertility decline of recent years. Rising sex ratios at birth and the consequent high sex ratio at very young ages both result from a strong son preference, as discussed by Cai and Lavely in their contribution to this volume.[14]

Table 15.9 Sex ratios by ethnic group: 1990 and 2000

	Overall sex ratio					Sex ratio at ages 0–4[a]			Sex ratio at age 0[a]		
	1982	1990	2000	1982–90	1990–2000	1990	2000	1990–2000	1990	2000	1990–2000
Han	105.6	106.1	106.3	+0.5	+0.2	110.6	121.2	+10.6	112.2	118.6	+6.3
Zhuang	101.6	104.3	107.4	+2.7	+3.1	112.5	122.8	+10.3	115.4	122.5	+7.2
Man	114.5	109.5	108.0	−5.0	−1.4	108.7	112.3	+3.5	110.8	113.0	+2.2
Hui	103.4	103.2	103.9	−0.2	+0.7	105.4	111.5	+6.1	106.6	110.2	+3.5
Miao	105.2	107.9	108.7	+2.7	+0.9	106.7	117.7	+11.0	106.8	116.3	+9.4
Uighurs	105.1	104.5	103.5	−0.7	−0.9	102.0	103.6	+1.6	101.9	103.8	+1.9
Yi	101.9	103.6	105.7	+1.7	+2.1	105.1	111.5	+6.4	104.3	110.8	+6.5
Mongols	105.6	103.3	97.9	−2.4	−5.4	105.2	107.7	+2.5	106.4	107.2	+0.8
Tibetans	95.8	97.6	99.2	+1.9	+1.6	102.3	102.7	+0.4	102.1	103.6	+1.5

Note: [a]Data not available for 1982.

Sources: Based on China's censuses for 1982, 1990, and 2000.

15.4 CONCLUSIONS

The analysis presented in this chapter shows recent trends of increasing homogenization in demographic behavior among the nine selected ethnic groups. Nevertheless, great disparities remain between them in their age structure, sex ratio, fertility and mortality patterns, and process of demographic transition. The selected ethnic minority populations can be divided broadly into three groups. The first includes the Man, Zhuang, Hui, and Mongols who are, both culturally and demographically, the most akin to the Han. The second includes the Miao and Yi, whose behavior and main characteristics largely resemble those of the Zhuang, but with a time lag. The third group consists of the Uighurs and Tibetans, who have very different socio-economic conditions and demographic behavior.

Future demographic trends are uncertain. The most plausible forecast for fertility may be the convergence of the ethnic minorities' reproductive behavior with that of the Han, following the general trend of fertility transition across the world, so that their fertility levels fall to replacement, or below replacement, levels in the next decade. The homogenization of mortality may be more difficult to achieve. Improvement in life expectancy at birth was relatively slow during the 1990s, although some progress has been made. Considering the deterioration of the health system in some parts of the country and the growing economic disparities, especially in the remote rural areas where the ethnic minorities are concentrated, some socio-economically disadvantaged ethnic groups are now facing an increasing challenge in rapidly improving their mortality in the short term.

Another uncertainty concerns the possible changes in sex ratio among ethnic groups. Will fertility decline to, or below, replacement level in these minorities also lead to a growing imbalance in the sex ratio at birth, or an increase in the excess female infant mortality, especially among the Han and the Zhuang populations, which has been recently observed (Attané 2005). Since some ethnic minorities do not share the same culture as the Han—especially those aspects that bear upon a strong son preference—the extent and survival of their differences may play a major role in influencing sex ratios in these populations in the foreseeable future.

16

China's Demography in Perspective

John C. Caldwell and Zhongwei Zhao

The evidence presented here shows that China has been going through a profound demographic revolution. Because of the great improvements in mortality the life span of the Chinese, even those living in many poor and remote areas, has doubled in half a century. Their fertility, driven by the government directed family planning program, fell dramatically in the last 30 years of the twentieth century and the current total fertility rate (TFR) is extremely low by international standards. As in many other parts of the world, rapid population ageing has already begun. After several decades of strict control of population movements, the regulation of migration has finally been relaxed. China now has more than 140 million temporary migrants living and working outside their home counties. Urbanization has also accelerated and the urban population has shown extraordinary growth in recent years. Promoted by the national family planning campaign, age at marriage has risen steadily since the early 1980s and contraception has been used widely by couples of reproductive ages. These changes have been accompanied by a marked increase in premarital sex, divorce, abortion, and sex ratio at birth. China now has the most skewed child sex ratio in the world. It is noteworthy that, while mainland China has had very different political and economic systems since 1950, its demographic changes in many respects are similar to those recorded in its capitalist counterparts, Hong Kong and Taiwan. It is equally worth noting that similar demographic trends have been observed both in the Han population and many of China's ethnic minority groups. Because of these significant changes, China's current demographic regime is completely different from that of 30 years ago. This concluding chapter further examines this great transformation and its consequences from a broader and international perspective.

16.1 HISTORICAL POPULATION CHANGES IN CHINA AND THE WORLD

China is, and always has been, a major element in the world demography. Human (Homo sapiens) settlement there goes back more than 100,000 years. China constituted one of the earliest civilizations. According to available records, China's population was already close to 60 million in the year 2 AD. For the whole of the first millennium, there were notable fluctuations in the size of Chinese population. While there are marked variations in estimated population size for the world, many scholars believe that the Chinese population probably comprised a quarter or more of the world population during that period (McEvedy and Jones 1978; Grigg 1980; Maddison 2003). By the eleventh century, China's population had already reached 100 million (Zhao and Xie 1984). Although there were some oscillations, this upward trend continued over the next half millennium and the Chinese population grew to 150 million in the late sixteenth or the early seventeenth century (Ho 1959).

By this time, European travellers to the East were remarking on the dense and large populations of both China and India and comparing them with that of Europe. They concluded, quite correctly, that these three areas were the home of most of the human race, and if the number of their inhabitants could be estimated, some idea of the size of the world's population could be ascertained. Indeed, modern estimates of the population of the world in 1700 put the global figure at about 600 million (one-tenth of the population living today), with China, India, and Europe each the home of about one-quarter (Maddison 2003). While population records had long been collected and kept in China, a major source of information on seventeenth century China for the outside world was Martino Martini, the Jesuit priest who travelled to China and wrote for the Vatican the important and contentious memorial on the significance of ancestral rites. In 1655 he published his *Novus Atlas Sinensis* ([1655] 2000), exhibiting a feeling that the Chinese population was, if not greater than that of India, more noteworthy because of the striking appearance of its towns.

China's population has been such a large part of that of the world that differences in estimating it could significantly alter global estimates. Two major figures in the twentieth century reconstructions of its mid-seventeenth century population, Willcox (1931) and Carr-Saunders (1936), arrived at populations of 70 and 150 million respectively, the latter being 114 per cent above the former and raising the global figure by one-sixth.[1] As indicated earlier, this was not due to the fact that there were no Chinese population records for the time, but with regard to which ones were more representative, different interpretations were possible. While scholars made different estimates of China's population size in the early seventeenth century,[2] most of them have accepted that the Chinese population had reached about 300 million by the year 1800 and 430 million by 1850. During the next 100 years, population growth became slower. According to the 1953 census, the Chinese population was around 550 million in the mid-twentieth century (Zhao and Xie 1984; Yao and Yin 1994).

Because of its large population and relatively advanced economy, China also played a major part in the world economy over most of the last two millennia. Maddison estimated that in 1500 China, India, and Europe each contributed about one-quarter of the world's GDP (gross domestic product). By 1820, China and Europe each accounted for one-third of the world's production, and the three regions together for 81 per cent. Thereafter, European emigration to establish productive overseas lands and the Industrial Revolution in the west changed the economic situation dramatically. China's share of global GDP fell to 4.5 per cent by 1950, only to rise to 12.3 per cent by 2001. For the same dates India's share fell to 4.3 per cent and then slowly rose to 5.4 per cent in 2001, while Europe's share climbed to 39 per cent before declining to 26 per cent as its population, although becoming richer on a per capita basis, grew in numbers ever more slowly. In less than two centuries from 1820 to 2001 the aggregate production of the three regions fell from 81 per cent to 44 per cent of the world total, partly because of the rise of the United States (Maddison 2003).

One conclusion to be drawn from this discussion and recent historical investigation is that population growth was rather slow in China before 1500. Since then, it has accelerated and China's population multiplied about five-fold in the 450 years from 1500 to 1950. Accordingly, population in China during this period was not in Malthusian equilibrium. Indeed, its growth was not much less than the population growth recorded in Europe. During the period between 1700 and 1850, when China experienced its most rapid population growth before 1950, the average annual population growth was close to ten per 1,000 and similar to that observed in European countries (Zhao 1997*a*). It is particularly notable that this rapid population growth took place without an early Industrial Revolution. The major explanation was, as in Europe, capital investment, but in China it was less in factories than in canals and terraces, the marks of Wittfogel's hydraulic civilization. This was also likely to have been related to the introduction of new and high yield crops, extensive application of fertilizer, and increasing multiple cropping.[3] Intensification was especially great in Southern China, propelled by mass population movements from the north.

Another conclusion derived from recent studies of population history is about China's past demographic regime. Available data have shown that mortality was high in China in the last 300–400 years and nationwide long term mortality decline did not take place until the mid-twentieth century.

In contrast to the popular belief that fertility was very high in China in the past, marital fertility in most historical Chinese populations examined to date was only moderate and considerably lower than in some historical European populations. Chinese women married at young ages and almost universally, but a considerable proportion of men married at rather old ages or did not marry at all (Zhao 1997*a*). It was also noticeable that, although contraception and abortion were apparently practiced on a limited scale in the past, there was a significant level of infanticide well into the twentieth century.[4] This is one of the factors explaining the relatively low net reproduction rate and population growth in Chinese history. Infanticides often took place in the time of famines and other economically difficult circumstances, and the victims were largely girl babies. While scholars hold different views regarding the cause and nature of infanticide, there is evidence suggesting that it was used as a means of controlling family size (Zhao 2006). Moreover, in certain situations, for example the subdivision of already critically small peasant farm holdings, male babies were also killed (Lee *et al.* 1992; Lee *et al.* 1994). The Chinese situation was not unique; rather it was similar to that found in most of the old agrarian societies of Asia: Japan, Korea, and some castes in India (Caldwell and Caldwell 2005), where attitudes were very different from those found in the Judaeo-Christian tradition. Usually infanticide was regarded as unfortunate, but understandable in the circumstances. It was not seen as sinful and was often not punished by law.

16.2 CHINA'S DEMOGRAPHIC TRANSITION IN THE CONTEXT OF WORLD DEMOGRAPHIC CHANGES

Great historical events often initiate marked demographic changes. The French Revolution led to declines in both fertility and child mortality. The Russian Revolution had a significant impact on mortality (Caldwell 2004). The end of World War II saw unprecedented mortality declines throughout much of the developing world where life expectancy at birth showed a sharp increase in the post war decade. After a brief surge in childbearing, fertility decline also commenced in many less developed countries.

The establishment of the Peoples' Republic in 1949 not only began a new era in Chinese history, but also signified the start of China's demographic transition. This transition was a major component of world demographic changes that became more prominent and more widespread after World War II. It also bore many similarities to demographic changes taking place in other countries.

The Chinese Revolution heralded a steep fall in mortality, with a rise in life expectancy from around 35 years in 1949 to 50 years in 1957. There were probably a range of reasons for this spectacular mortality decline, as suggested in this book and elsewhere (Caldwell 1986; Banister 1987; Chapter 1, this volume). China's experience of lowering mortality is by no means unique, but rather similar to that observed in the former USSR, Cuba, and Vietnam. One clue for such similarity is provided by the rapid mortality decline in the Soviet Union's first dozen years after the 1917 Revolution. This tends to be forgotten now because of the difficulty experienced during the late twentieth century by the USSR (Russia since 1990) in improving its life expectancy much beyond 65 years. But, at higher mortality levels, the system had been very successful (Sigerist 1939; Lorimer 1946: 120–1). Part of the success in the former USSR, China, Cuba, and Vietnam was explained by an emphasis in the budget on health, and the recruitment of health workers. Part was due to rises in education levels, and part to a 'leveling up' of the extremely poor. But it seems plausible that a significant element was a more intrusive society. No longer could sickly children threatened with death be hidden away by poverty stricken families from detection by local level government and party officials. An intrusive society can improve health by suggesting or insisting on better ways of treatment or overcoming problems of accessing available treatments. The establishment of communes reinforced such interventions. These factors together with those operating in other populations such as improvements in health infrastructure and the use of new insecticides, vaccines and antibiotics contributed to the rapid mortality reduction in the early years of the People's Republic.

China's life expectancy was already about 65 years when economic reform began in the late 1970s. At this stage of the epidemiological transition, mortality had been reduced by victory over most infectious diseases, a process assisted by extensive use of immunization and other forms of disease prevention. But such success has also meant that most deaths are now caused by circulatory diseases and cancer, complaints with which most of the Chinese system is not very well equipped to cope. China's market economy has resulted in rapid income growth, and once high per capita incomes are achieved it will permit the spread of 'high-tech' medicine which alone can lead to infant mortality rates under ten per 1,000 births, or life expectancies of 80 years. But at income levels of the kind that China still exhibits a fully market based health system is not as efficient as socialized medicine. The deterioration of China's health care systems, especially the Cooperative Medical System in rural areas, has made it difficult to lower mortality further in poor areas and disadvantaged sub-population groups. These factors partly explain China's relatively slow improvement in mortality in the last quarter of a century. Given its real per capita income (measured by parity purchasing power) China's current mortality levels are no longer conspicuously better than other countries with similar living standards (Philippines, Sri Lanka, Lebanon, Ukraine, Jamaica, and Peru), but increasingly converge to a general pattern experienced by many populations (UN 2005).

China's 1949 Revolution was not at first accompanied by greater control of fertility. The reasons were a lack of contraceptive services or advice, an ideological stance that a socialist society did not need to reduce population growth rates, a light economic burden from children imposed by a socialist economy, especially in rural areas, a limited market in luxury goods, and free education and health services. In urban areas, however, children increasingly imposed expenses on parents and accommodation was scarce and usually very limited in size. Even when birth control was still ideologically disapproved, fertility began to fall in some larger cities (Lavely and Freedman 1990).[5]

China's fertility as a whole remained high during most of the 1950s and 1960s. There was a drastic and temporary fertility reduction in the 1959–61 famine when some 20 million anticipated births failed to occur, which has not yet been fully explained.[6] China's TFR was about six children per woman in the second half of the 1960s when few countries outside Sub-Saharan Africa still had such levels. Because of the rapid mortality decline, fertility of this magnitude inevitably led to a population explosion and China's population reached more than 800 million by the end of the 1960s (Yao and Yin 1994). Facing such increasing pressure, a national population policy was announced in 1971 and a family planning program began to be erected. Although popular demand for family planning did exist, the policy was largely an outcome of an administrative and academic debate about high rates of population growth hindering economic growth and about whether China could adequately cater for a population apparently heading for two billion in the early decades of the twenty-first century.

This debate was not solely due to the Chinese situation. The global mortality decline after World War II had led to increasingly high population growth rates across the developing world. Debate about whether governments should encourage and assist fertility control raged during the 1950s and 1960s. One example of influential publications to emerge from such discussion was, in 1958, *Population Growth and Development in Low-Income Countries* by Ansley Coale and Edgar Hoover, a book promising a large economic dividend, especially in terms of per capita incomes, from curbing population growth. It is particularly interesting to note that this was almost at the same time as Ma Yinchu proposed his well known New Population Theory in China. Although the suggestions made by Coale and Hoover were broadly similar to those proposed by Ma, their fates were radically different.[7] From the late 1960s the United Nations organization was advocating fertility control and assisting countries to organize family planning programs. In the west many university population programs were instituted or expanded during the 1960s and 1970s, thus giving an intellectual respectability and perspective to the issue. It is not irrelevant that after the People's Republic occupied the United Nations China seat from 1971, it began sending representatives to many United Nations' population workshops and conferences and students to western universities for demographic training.

Although India and Pakistan had instituted national family planning programs as early as 1951 and the late 1950s respectively, the real growth in such initiatives began in the 1960s when either government programs, or government assisted programs, started in Hong Kong, Singapore, South Korea, Taiwan, Thailand, Malaysia, Sri Lanka, Egypt, Chile, Honduras, and Mauritius. This upsurge was partly permitted by scientific breakthroughs that in the 1960s led to oral contraception, injectables, IUDs (intra-uterine contraceptive devices), better sterilization techniques, and safer abortions (including the suction abortion invented in China). These methods of fertility control became the engines of the new successful family planning programs. They were undertaken in all countries outside China with significant Chinese populations. In most Asian programs governments provided not only information and services but also added a moral dimension, arguing that fertility control was good for the family and necessary for the country. There was a degree of pressure to accept contraception in both Indonesia and India, such pressure being overt in India during the emergency of 1975–77.

China started its strong centrally directed nationwide family planning program in the early 1970s and advocated later marriage and having only one or two children. Penalties were introduced and imposed—sometimes haphazardly—for exceeding family size targets. By the late 1970s the famous one-child family policy was promulgated, and the family planning program was further strengthened in the two following decades (Chapter 2, this volume). The above discussion shows not how unique China's family planning program was, but rather how it was linked into the world system. The arguments and demographic models employed in China by influential academic researchers in the early stage of the family planning program were precisely those in favor of fertility control which had driven the assistance given to other developing country programs. The timing of the Chinese program's establishment occurred within a few years of the first of the other Asian programs (except India and Pakistan) being set up, and just as it was known that fertility decline was occurring in some of these countries.

Despite its enormous effort, the Chinese family planning program has met with some difficulties and sometimes failed to achieve its specific fertility targets. The demographic surveys of the 1980s and 1990s showed many families outside the cities having two or more children. Nevertheless, declines in fertility have had a telling impact on world demography. China's TFR is no longer six, but currently may be as low as 1.5, or 30 per cent below the replacement level. More important still is the fact that fertility has been low now for more than three decades (Chapter 4, this volume). Thus, there is now a two generational depressive effect on fertility. Today's mothers are themselves the daughters of a generation of women already restricted in numbers of their children. This would ensure the continuity of low population growth even if the TFR were to rise moderately. Despite this situation, population momentum (inertia in the change of age structure) means that zero population growth is not likely to be achieved before 2030 when the population will be about 1.45 billion (UN 2005: Medium Projection). At that date it will be similar to India's total, and the population of each of the two countries will have fallen from its ancient quarter of the world's population to under one-fifth.

16.3 THE NEW DEMOGRAPHIC EXPERIENCE AND DEMOGRAPHIC TRANSITION THEORY

What have China and other developing countries' new experiences added to our knowledge of historic demographic change and to theories of demographic transition? In western Europe and English speaking countries of overseas European settlement, fertility began to fall in the late nineteenth century and continued falling until World War II. This was in the context of preceding or accompanying mortality decline both generally and, more importantly among children. A major cause was that children in modernizing, largely non-agricultural societies were no longer productive. Indeed, most were undertaking full time education and incurring greater expenses of all kinds. In contrast to the situation in the late twentieth century, governments and social leaders opposed the use of contraception on moral grounds. Contraceptives were admittedly primitive and difficult to access. Nevertheless, once people began to desire fewer children there came into existence ideologies and organized groups justifying birth control and, especially between the two world wars, voluntary birth control clinics offering advice and services. They were an essential forerunner to the massive birth control programs in the developing world of the latter decades of the twentieth century.

After a brief post-war baby boom, fertility in many western countries began to fall again from the 1960s, reaching by the end of the century levels well below replacement. This time further falls in infant and child mortality were not a relevant factor in shaping fertility trends. Explanations include the massive entry of married women into the paid workforce and a growing individualism which gives priority to self-development over the bearing and raising of children (McDonald 2000). An enabling factor was the development in the 1960s of more effective and more easily used contraceptive methods, as noted above. Developed primarily to meet the needs of the Third World, they also met the needs of individuals in the First and Second World.

During the post-war period, new insecticides, vaccines, and antibiotics proved unexpectedly successful in reducing mortality in poor developing countries and led to rapid population growth so that by the early 1960s global population was expanding at over 2 per cent per annum (threatening to double every 35 years) and at more than 3 per cent in many developing countries. There was a growing international consensus that such rates threatened the earth's carrying capacity, frustrated economic growth, and imposed on women an unfair reproductive burden. In succession, western foundations and governments, and then international organizations, offered funding and technical assistance in setting up national family planning programs. Prime Minister Nehru had preceded most of this agitation, and indeed had given it direction, by announcing a family planning program for India in 1951, when learning that the census of that year had revealed faster population growth than had been expected. The Indian program was not very successful at first, having to rely almost solely on male sterilization, but its organizational nature and structure developed a pattern followed by many successive programs. National family planning programs became common in the 1960s, mostly dependent on the new birth control methods becoming available, and some, such as those in Taiwan, South Korea, and Singapore, evidencing success in reducing fertility by the end of the 1960s. China's adoption of a nationwide family planning program was slightly late, but the way in which the program has been implemented and the impact that the program has had on the reduction of fertility are unprecedented.

The twentieth century family planning programs, those in Asia and other developing countries in particular, are often regarded as nonhistorical, as being a 'technological fix' at odds with the low level of economic development and the slow realization by the populations involved that industrial civilization was not easily compatible with rearing large families. This view is almost certainly wrong. Historically, it probably became inevitable that a growing desire to limit family size and attempts by some to do so would find champions to justify the new trend and to argue that contraception should be improved. To a large extent birth control became accepted in the west in the interwar years, especially during the economic depression of the 1930s. It was on this base that prophets from the late 1940s began to argue for a birth control crusade to restrain rapid Third World population growth. After all, this was an obvious message from Malthus (1888) no matter what interpretation was placed on the essay by the author. It was a solution that had been suggested for India by

Indians and others during the whole first half of the twentieth century (Caldwell 1998). Nevertheless, Nehru's announcement in 1951 of a national program startled outside observers (Notestein 1951).

The reason for the surprise was that Asia had been seen through western eyes on the basis of western experience. The state in the west had never been the unchallenged arbiter of morals, especially of sexual and reproductive morals. The Christian churches claimed this area as their own, and clung to the fifth century AD interpretation by St. Augustine of Hippo of the scriptural account of the experience of Onan. Until the early twentieth century the Protestant churches were as one with the Catholic Church in their rejection of birth control. Thus, far from leading their electorates into an era of family planning, governments and other institutions followed social and behavioral change. Most western governments still leave family planning education and contraceptive supplies very largely to the medical profession and to retailers and pharmacists. Many are still reluctant to give technical assistance in this field. Northern European governments devote less than 3 per cent of their technical aid budget to the population field, while the proportion for Southern Europe is under 1.5 per cent (Ethelston 2004: 44–55).

But the situation in many Asian countries proved to be different. There were no monolithic religions with firmly organized hierarchies and a tradition of receiving binding moral interpretations from a supreme leader. Indeed, when there were scriptures they failed to deal clearly with birth control. In any case, there were strong traditions of moral leadership by secular leaders, taught in Confucianist countries and assumed by the mostly Brahmin elites in Hindu ones. This was especially the case when addressing national issues. The pattern was reinforced by colonial rulers and adopted by independent governments, especially those with communist or army leadership. The nearest thing to religious opposition were the suspicions of local mullahs that family limitation showed less than full trust in Allah, and—by some of Gandhi's adherents—that it was unnatural.

The Asian national family planning programs were strikingly similar. They all provided contraceptive services and advice. Most had some kind of outreach program whereby family planning workers, mostly female, contacted households, talking primarily to wives but also, if necessary, to husbands and parents-in-law. The program workers, backed by government information in the media, spread the message that limiting fertility was good for the family and the country. In nonMuslim countries there was a strong emphasis on semi-permanent or permanent methods that simplified logistic problems, cut down greatly the number of contacts that had to be made with each client, and placed little responsibility on the client for the continuation of contraception. This approach gave an emphasis to IUDs and sterilization, backed up by abortions, and sometimes supplemented by injectables or implants. In some of the programs inducements, or 'incentives,' were employed to encourage family planning acceptance.

In most ways the Chinese program has been strikingly similar to other Asian programs. The difference has been the employment not only of incentives but of penalties, often harsh, and frequently coming into action at very low parities, typically after the first child. In the earlier stages of the program enforced abortions, even third trimester ones, were occasionally used (Chapter 6, this volume). The system, however, has not been as mechanical or ruthlessly efficient as has often been pictured. If it had been so, then the 1982 One per 1,000 Fertility Survey would have recorded a TFR about one (that is because in the early years of the program large numbers of couples would have had one or more children before its inception leaving perhaps only a minority of nulliparous couples to proceed to their first child) rather than 2.6 for the year 1981. Obviously large numbers of parents were proceeding to their second child or more children. The present much lower fertility level might be partly explained by effective penalties, but it seems likely that the major explanation is that the population has become increasingly accustomed to being restricted to very small families and that socio-economic change has made many parents relieved at having no more children.

The increasingly close compliance with the program raises questions about why the pressure has not produced strong popular resistance. Why has there not been the kind of protest that threw Indira Gandhi from office in India in 1977? There are a number of factors contributing to this nationwide conformity. First of all, as noted earlier, differing from governments in the west, historically the Chinese government and social elite, as in some other countries, often assumed the role of moral authorities and played a stronger part in influencing the social behavior and practice of the masses. This was usually accomplished through the hierarchical political establishment and kinship organizations, such as the lineage and large extended family. This long tradition helps to legitimize and consolidate the government's leading role in family planning.

Secondly, differing from many western countries where reproduction for centuries was largely an issue concerning only the couple themselves, such decision making was often a familial or community prerogative in historical China. In Chinese history, individuals not only often lived in extended families with hierarchic structure, they were also frequently taught and encouraged to make sacrifices for the state, their families, and future generations. People's marriage and reproduction, including adoption, were often strongly influenced by, or even entirely decided by, their seniors especially their parents according to the interests of the large family or lineage. The impact of household composition and the status of a person within the family on the chance of marrying, time of having children, adoption within and beyond the extended family, and even the likelihood of dying has been revealed by recent examination of historical demographic data (Zhao 1997*b*; Lee and Wang 1999). There is a notable difference between collective and individual reproductive strategies as observed in China's on the one hand and in some European populations on the other. While it is very difficult for westerners to accept government intervention into their private life, for the Chinese 'the current family planning program' is to some extent, 'merely an extension of familial mode of reproduction to the local community or beyond,' as suggested by Lee and Wang (1999: 99). This difference once more demonstrates the importance of social institutions in influencing people's reproductive behavior and fertility changes, as pointed out by McNicoll (1980).

Thirdly, it is also important to note that there were popular demands for family planning even before China's national family campaign began. The ideas and practices of controlling family size were found in the past, over a period probably much longer than usually assumed (Zhao 1997*b*, 2006). This was one of the major reasons why China's fertility fell sharply in the 1970s. During the 1980s and 1990s, government family planning policies were tightened and further restrictions on the number of children that a couple could have were implemented. Some parents, especially those with a daughter and no son, solved the problem by sex selective abortion or even by sex selective infanticide. Some just ignored the regulations or avoided actions by the local family planning officials. During this period, however, people's reproductive desires and behavior also changed greatly (Zhang *et al.* 2006). The overwhelming majority of the population is now convinced that fertility should be regulated for the good of the country.

These factors and the great transformation brought about by the rapid socio-economic development of recent decades are all responsible for China's steep fertility decline and current low fertility. In addition to the theoretical contribution made by its fertility transition, China's efforts in lowering mortality, recent urbanization and migration have also added new experience to our knowledge on these issues. Since they have been addressed in Chapters 9, 10, 12, 13, and 14 of this book and elsewhere (Zhu 1999), these issues are not discussed further here.

16.4 FUTURE CHALLENGES AND POLICY RESPONSES

As has been shown by the United Nations' 2004 population projection (medium variants) and other chapters of this book, China's population will continue to grow in the next 25 years despite its TFR having fallen below the level of replacement for more than a decade and being likely to stay that low in the foreseeable future. Mortality will continue to decline and life expectancy at birth will further increase and perhaps reach 80 years or more by 2050. The Chinese population will become older and the proportion of the elderly, those very old in particular, will exhibit an extraordinary increase. Urbanization is mostly likely to become a major feature of future socio-economic development and demographic changes. By 2030, the urban population may reach 900 million and account for about 60 per cent of the national population. This will be partly the product of a further surge in the volume of rural–urban migration (UN 2005).

One of the most important policy decisions facing China is whether or when to remove the element of compulsion from its population program. Experiments are already being made to determine what would happen if pressure were to be released. It is possible to argue that there would be little change. After all, populations in every comparable area—Japan, South Korea, Taiwan, Singapore, and the Chinese of the diaspora found in other Southeast Asian countries—all have reached, without pressure, lower fertility rates. On the other hand, they all exhibit higher per capita incomes and lower proportions of the workforce in agriculture. It can also be argued that China is now a market economy, and that there might be some parallel to the recent declines in fertility in European socialist countries making the transition to the market. The total fertility rate in Eastern Europe fell by 40 per cent from around 2.1 in the late 1980s to about 1.3 in the early twenty-first century, which is even lower than China's current level (UN 2005). Certainly, China has experienced a marked rise in urbanization and incomes, and has become accustomed to fertility control and perhaps very small families.

There are reasons for removing the penalties for reproduction. The penalties evoke disapproval in much of the outside world and detract from the impression of a country modernizing very successfully. There is probably also widespread dissatisfaction inside China, especially with the way penalties are implemented. These penalizing measures may not really be needed. Most seriously, the future burden of aged population threatens to be enormous. A glance at the United Nations' 2004 projections shows the importance of the issue. The low projection, characterized by a 2050 TFR of 1.35 (probably not far below the present level and just possibly no lower) yields a 2050 population of 1.2 billion with 28 per cent of the population over 65 years of age (compared with 7.6 per cent now). The medium projection, with a 2050 TFR of 1.85 (higher than the present level and perhaps where a nonpenalized fertility rate would settle) yields a 2050 population of 1.4 billion with 24 per cent over 65 years. The high projection, with a 2050 TFR of 2.35, yields a population of 1.6 billion with 20 per cent over 65 years. These aged figures can be compared with the proportions over 65 years at present in countries which began their fertility transitions over a century ago: United States, 12 per cent; United Kingdom, 16 per cent; France, 17 per cent; Germany, 19 per cent; Italy and Japan, 20 per cent (UN 2005).

Given China's current level of development and the long term impact of population momentum, most policy makers and researchers undoubtedly want to see demographic outcomes similar to those mapped by the medium projection. If the family planning program were to continue to offer services and advice, but there were no penalties, and if the continued growth of the economy persists, there is a possibility that China's TFR could be 1.35 in 2050. It is far from impossible that, in the not too distant future, China will be encouraging higher fertility, even as high as replacement level. Singapore and South Korea offer precedents.

Another of China's most obvious unfinished demographic concerns is the acceptance that enormous economic growth, especially in a market economy, will lead to urbanization on an unprecedented scale. China's urban population is already around 40 per cent, with its biggest cities more than ten million people. If economic growth continues at anything like the present pace, and if population stabilizes around 1.4 billion, then the latter part of the present century could easily witness an urban population of more than one billion and the emergence of many mega-cities. Much of the new urban population will be the product of rural–urban migration, necessarily so with urban natural increase being zero or negative.

As shown in this book, until now policy and planning have failed to cope adequately with this new situation. At first, rural–urban migrants were regarded as 'floating population,' officially still living in villages but transiently in urban areas. Their existence was primarily recorded in their own villages or home towns where associated births or deaths were registered. Periodically they had to return to these villages if only to sort out the problems of their official existence. The system has only changed reluctantly and slowly. Nevertheless, many rural–urban migrants still live in semi-legal shanty towns, often on the edges of cities. Their children have no firm rights to be educated in public schools, and neither migrants nor their children are covered by the medical system which is provided largely for permanent urban employees. Indeed, they have no guarantee of continued urban employment or even residence (Chapters 12–14 in the book). Clearly, the issue of permanent rural–urban migration must soon be faced. There will be no simple market solution without legal and regulatory changes, because it is official attitudes that have so weighted the scales against the newcomers to the cities having equality with those registered as living there.

This book comes out at a critical time when China confronts many new demographic challenges. China has never been isolated from international thought and action in the population field. The present family planning program came into being as part of a general Asian forward movement to construct such programs. Similarly, China is becoming deeply aware of the issues in the present debate on the threatened burden of aged populations in countries with below replacement level fertility. It is very likely that China will move soon to stop fertility levels falling further and even to raise them to replacement level. This will require policy dexterity both to explain the change in direction and to prevent the national family planning program from overshooting its new target. The analysis of policy and administrative changes in the near future will almost certainly prove fascinating.

China's demography will continue to be of global importance. Its rapid mortality decline immediately after 1949 showed what could be achieved by organization and peace in spite of a severe shortage of medical supplies and equipment. Its high fertility until 1970 and the steep decline thereafter demonstrated the role in both circumstances of government population policy. It was this fertility decline that has been the central element in ensuring that the world's population will probably peak at around ten billion. Many outside observers who have deplored China's fertility control movement would, nevertheless, have been horrified by a China of two billion people, which would have been reached in 2015 if China's rapid fertility decline had not started in the early 1970s but two decades later.[8] China's profound demographic transformation is not a thing of the past. The major demographic changes that have been detailed here and those that are now taking place in China will inevitably have their significant impact on population changes in the world. China, as recently suggested by Vaclav Smil, will continue to develop and become the world's largest economy some time between 2025 and 2040, 'but its further rise will be checked by a multitude of internal limits and external complications.' China's future development will face 'uncommonly numerous' constraints and challenges including many demographic ones such as those addressed in this book (Smil 2005: 632, 623). The Chinese population drama is by no means drawing to a close.

Notes

CHAPTER 2

1. China's family planning program literally means a 'planned birth' program. It is different from the family planning in the sense used in the West, where individuals largely make contraception and reproduction decisions. China's family planning program is officially initiated, and remains imperative for individuals and their families. Since the majority of scholarly works and public media refer to the Chinese program as a family planning program, we adopt this common usage here as well. For detailed discussion of Chinese family planning programs since the founding of the People's Republic of China, see Scharping (2003) and Greenhalgh and Winckler (2005).
2. The word 'later' means encouraging late marriage and late childbearing, 'longer' advocated a longer (e.g., four years) interval between births, and 'fewer' having no more than two children.
3. The policy was not originally issued in the format of a government document or law. The National Planned Parenthood Conference initiated a recommendation, in 1979, to the state to encourage each couple to have only one child if possible. Later the Central Committee of the Chinese Communist Party issued an open letter, in September 1980, calling the Chinese Communist Party and Youth League members to have only one child. Meanwhile, as will become clear, the Chinese policy is not strictly a policy of one child per family, since a significant proportion of Chinese families, such as some rural, or ethnic minority, families are permitted to have more than one child. The one-child policy is used as a convenient short-hand to differentiate the policy from the earlier 'later, longer, and fewer' or two-children policy, as implemented in the 1970s.
4. According to the State Council white paper entitled 'China's Population and Development in the 21st Century', China has averted 'more than three hundred million' births with its state family planning programs. Scholarly research indicates that the state family planning programs have prevented 262 million births since 1971, and the combination of a state family planning program and family planning decisions of individual families have prevented 588 million births in total since 1955 (Liang and Li 2003). However, it is questionable to attribute the averted births to family planning in isolation. It is also unclear how the figure of averted births was calculated.
5. Ethnic minorities, except those with a population over ten million, are not subject to the one-child policy.
6. The one veto system was strengthened in 1991 after the publication of the No. 9 central document on family planning and population control.
7. The so-called one veto system had incurable defects in the Chinese context, and it never really worked. It might have been effective in its early years and among low rank cadres (mainly at village or township levels), but has never been applied to the

high level officials. Meanwhile, the population plans made by the family planning committees, were usually loose enough to be accomplished. For example, in the period of 1991 to 1995, only Gansu province did not reach its population plan. But there was no penalty applied to their top officials.

8. After the Population and Family Planning Law was passed by the National Congress in 2001, the State Family Planning Commission was renamed the State Population and Family Planning Commission in 2003. The State Population and Family Planning Commission is now in charge of broad population issues as they have emerged in the new era.
9. According to Feng and Hao (1992), two officials from the then State Family Planning Commission: a strict one-child policy, a one-and-a-half policy, a two-children policy, and a soft policy (see also Xie 2000*a*). In provinces like Jiangsu and Sichuan, all couples, including rural ones, are permitted a single child only. Rural couples in 19 other provinces are allowed to have two children, given the first child is a girl; rural couples in five other provinces, including Yunnan, Hainan, Ningxia, Qinghai, and Xinjiang, are allowed to have two children (Guo *et al.* 2003). Ethnic minorities are generally allowed to have two children per couple, or even three, with the exception of Tibet where there are no specific regulations on birth numbers.
10. According to the family planning workers survey conducted in 2001 by SFPC, there were over 526,000 workers, 75,760 township level family planning units, 87,005 units in total (http://www.chinapop.gov.cn/rkzh/zgrk/tjgb/t20040326_2841.htm).
11. One woman who had to pay the fine for a second child suspected the legitimacy of local cadres in imposing such a fine. She resisted paying, and indicated that she would pay the fine if it were indeed a state policy.
12. One migrant woman we encountered gave birth to a second child in a private clinic in Beijing in 2003. Her neighbor remarked that the 'unplanned' birth could even occur under the nose of the state officials in Beijing, which is not the place 'where heaven is high and emperor far away.'
13. Late marriage is often officially defined by age of woman at the time of marriage. For a woman, getting married after 23 is treated as a late marriage, while before 20 is treated as an early marriage.
14. Nevertheless, China's family planning program is also believed to have positive consequences for women (Yu *et al.* 1990). Recent studies have shown that population policy may empower not only women who practice family planning (Xie 2000*b*; Hardee *et al.* 2004) but also daughters in single-child families (Fong 2002; Tsui 2002). In urban areas, low fertility enables mothers to take paid work, and single daughters have more power than ever before to defy disadvantageous gender norms (Zhu *et al.* 1997).
15. The consensus among Chinese scholars and policy makers seems to be that China's current population policy should be generally maintained until at least 2010, but local modification should be conducted; and a 'natural transition' towards a 'two children per family' norm would be gradually put in place (Peng 2004). This is in contrast to the suspicion that Chinese national programs might be maintained 'even after population size begins to contract,' as claimed by Caldwell *et al.* (2002: 7).

CHAPTER 4

1. This method is used to compute the age-specific proportions of the current only child as well as the proportions by birth order of children aged 0–10 from the original data of the population census. It worked well when the sample data from the 1990 census were used for trial study.
2. In previous population censuses, these questions were asked of all women aged 15–64.
3. Mean age at childbearing is usually calculated with the weights being the number of women by age group. But this paper follows the technique proposed by Bongaarts and Feeney (1998) with the weights being age specific fertility rates. The mean age with fertility rates as weights in fact eliminate the age compositional effect from the index.
4. The lower value for the high parity may be due to the matching with the women aged above 50 being censored.
5. The year of 1991 in Chinese culture is a year of the goat, which is a year believed to bring misfortune to those, especially girls, born within it.
6. For example, the 1992 and 1997 surveys conducted by SPFPC were found to have bias in coverage favoring the rural cases. In the rural population the proportion of women in the reproductive ages was 73 per cent, according to the 1990 census. But it was over 80 per cent in the 1992 survey data and 77 per cent in the 1997 survey data (Hao and Gao 1997: 145; Guo 2000*c*).
7. The published total population of the 2000 census is 1.265 billion after upward adjustment for an underenumeration of 1.81 per cent; the actual enumerated total population is 1.243 billion, the difference equals 22.46 million. If the published annual birth numbers are correct, the population under age 15 at the census should be much larger, according to Yu's calculation. Moreover, it may be noticed, the difference in the two ways of estimating population under age 15 even exceeds the difference between the adjusted, and the actually enumerated, total population.
8. The figure is calculated by Guo, this chapter.
9. The population projections apply the model of parity progression by age (Ma 1993), but the TFR is calculated in the conventional way based upon annual births and women by age. The tempo effect of delayed childbearing is not considered in the projections.
10. Several Chinese demographers (Zha 1983; Lin 1984; Ma 1984) queried the validity of the TFR index itself as an indicator suitable for the evaluation of family planning activities.
11. This campaign was not confined to propaganda but was also extended to intense promotion of sterilization operations, according to Yao (1991).
12. The Chinese Government still quotes the actual TFR as 1.8 for the year 2000 and later years on many formal and informal occasions. In addition, the demographic data sheet published by the United Nations (2002) and Population Reference Bureau (2002) continue to cite China's TFR as 1.8.

CHAPTER 6

1. This is called *kai xiao kou, du da kou* in Chinese. The purpose of the adjustment is to allow many rural farmers to have a second child (open the small hole) while strictly prohibiting them from having a third (close the big hole). Thus the one-child policy, which only survived from 1980 to 1984, has in fact become a 1.5 child policy for China as a whole since 1985. See more details on the family planning policy in Chapter 2, this volume.
2. Some local studies indicate substantial increase in premarital sex and induced abortion among the adolescents over the last decade, in the large cities in particular (Wu *et al.* 1992; Xu 1998; Wang 1999).
3. Better educated women tend to live in urban areas where more contraceptive methods are available than in rural areas. They are also more likely to be aware of the side-effect of the long term contraceptive methods. In contrast, less educated women tend to live in rural areas where contraceptive methods are primarily IUD and sterilization, which are more reliable.
4. Conventionally, the first trimester consists of the first 12 weeks of pregnancy and the second trimester is from 13 to 25 weeks of pregnancy.
5. According to Bongaarts (1978, 1982) and Bongaarts and Potter (1983), averted births = abortions $\times$ 0.4 $\times$ $(1 + u)$, where u is contraceptive prevalence rate, $0.4 \times (1 + u)$ represents number of births averted by one abortion.

CHAPTER 7

1. For example, Chinese President Hu Jintao, then the vice president, in a March 2003 keynote speech at a seminar on population, resources and environment, emphasized the importance of a balanced sex ratio. At the recent 10th Chinese Women's National Congress, Pan Guiyu, the vice minister of the State Population and Family Planning Commission of China, asserted that 'the unbalanced sex ratio has become the most important problem in rural China.' Chinese newspapers have recently proclaimed that '50 Million Men Won't Be Able to Find Wives in a Few Years.'
2. The sex ratio of birth for 24 European countries from 1962 to 1980 ranged from 105.0 to 107.0 with 105.9 as median (Chahnazarian 1988). These values are very close to the mean value of the sex ratios at birth reported in the *United Nation Demographic Yearbook* (1995) from 100 countries and regions, excluding China. Based on Sweden's continuous annual time series of live births beginning in 1749, Johansson *et al.* (1991*a*; 1991*b*) argue that the sex ratio at birth normally varies in a narrow range between 105 and 106.
3. Yuanjiang Shi was split into two polygons in the original map because Dongting Lake divides the city in two. For technical reasons related to the calculation of the Local Moran I_i indicator, we joined these polygons and treat them as one in our analysis. Mangya Dacaidan is listed as a separate unit on the base map, but no data are provided in the CDC county table. According to the *Qinghai Statistical Yearbook* 2002, the population of Mangya Dacaidan was included in Delingha Shi. We have

joined these two units as and treated them as Delingha Shi. No data are provided for Taiwan (including Jinmen), Hong Kong, or Macau.

4. The mean and median value of county level child sex ratios is weighted equally for each county, irrelevant to county's population size, while the national level is weighted by each individual.
5. The county units contain on average around 30,000 persons age 0–4, implying a fairly restricted range of random variability. For example, assuming 30,000 children age 0–4 and a 'true' sex ratio of 106 males per 100 females implies a 95 per cent confidence interval of 104–8. The mainly Han counties of China Proper tend to have larger populations, so we would expect the greatest variability among the sparsely populated, mainly non-Han counties of the west.
6. It is important to note that a cluster is defined both by level of statistical significance and the definition of a neighboring unit adopted. In the case of Figure 7.3 neighboring units are defined as adjacent units, including (in chessboard terminology) both 'rook neighbors' (sharing common boundaries) and 'bishop neighbors' (sharing a common point), the combination of the two known as 'queen' neighbors. It is possible to define neighboring units less restrictively, for example, second order adjacency (adjacent to adjacent) and third order adjacency (adjacent to adjacent to adjacent), etc. Adjacency could also be defined by distance rather than contiguity.
7. A few counties are in the categories of high-low or low-high clusters. To simplify the map presentation, these cases have been omitted.
8. The sex ratio at age 0 in the 2000 cohort was reported as 117.8 in the 2000 census. The sex ratio of the same (2000) cohort was reported as 120.4 and 125.5 respectively in the 2001 and 2002 Population Change Surveys. This suggests that the census understates the sex ratio of the age 0 cohort. Since the early 1990s cohort sex ratios are almost invariably higher at older ages than at age 0 (NBS 1993–2003). The most recent enumerations seem to follow this pattern. For example, in the 2002 Population Change Survey, the sex ratios at age 0, 1 and 2 are 119.85, 123.63 and 125.47 respectively (NBS 2003).
9. For accounts of Chinese marriage markets in particular, see for example, Lavely 1991; Tuljapurkar *et al.* 1995; Guo and Deng 1996; Das Gupta and Li 1999.

CHAPTER 8

1. The authors would like to thank Heather Booth, Zhongwei Zhao, and Peter McDonald for insightful comments and their help. The authors also appreciate the help from Guangzhou Wang in using the 2000 census data.
2. The State Population and Family Planning Commission (SPFPC), previously known as the State Family Planning Commission (SFPC), was renamed in 2003.
3. Here the age-specific first marriage rate is obtained by dividing the marriage cases by the total number of cohort women each year between ages 15 and 30.
4. In the 1997 National Demographic and Reproductive Health Survey, marriage only referred to legal marriage, excluding cohabitation. In fact, there were few cases of cohabitation in China as a whole.

5. According to Coale *et al.* (1991), if mortality of fertile women and births outside of marriage (both at low levels in China) are ignored, the average number of children ever born to ever married women reaching age 50 is the total fertility rate, and is also equal to the total duration-specific fertility of this cohort.

CHAPTER 10

1. According to the Chinese Academy of Preventive Medicine, for example, the underreporting rate of deaths was 22.5 per cent and that of infant deaths 31 per cent in the data collected by them in 1998. The adjusted death rate was seven per 1,000 and infant mortality rate 30 per 1,000. However, the death rate which was computed by adding together all disease-specific death rates was only 5.4 per 1,000 (MoH and CAPM 1998: 13, 31, and 118).
2. For the debate on the far eastern mortality pattern see also Goldman (2003).
3. Life tables constructed by Yan and Chen have been used because they cover a longer period and are internally consistent. However, it is worth noting that life expectancies in these life tables are higher than those estimated by some other researchers, for example Banister. This may be related to different assumptions used in their studies. For detail, see Banister 1987; Yan and Chen 1991.
4. As mentioned in the previous note, life expectancies suggested by Yan and Chen are higher than those estimated by some other researchers. According to Banister, for example, life expectancy was around 40 years in the early 1950s and about 62 years in the early 1970s. These figures are eight and two years lower, respectively, than those estimated by Yan and Chen (Banister 1987: 116).
5. The Annual Population Change Survey data (NBS 1999) are used to estimate number of deaths in each broad age group, because they are more reliable than those obtained from the National Disease Surveillance Points although they also suffer from underregistration.

CHAPTER 11

1. These numbers refer to the year 1982, based on the Chinese census conducted that year. Mason's research was supported by a grant from the National Institute of Health, NIA RO1-AGO25488.
2. When pension payout increases, it means that the working population will have to pay more either as taxes or in other ways to fund the pension burden because China has a partial pay as you go system.
3. Any bequests are included in consumption.
4. The difference between mean age of producing and the mean age of consuming ($A_{Y^l} - A_C$) is equal to the ratio of lifecycle wealth (W) to labor income (or consumption):

$$\frac{W}{Y^l} = \frac{W}{C} = A_{Y^l} - A_C,$$

where the mean ages of producing and consuming are:

$$A_{Y^l} = \frac{\int_0^{\omega} aN(a)Y^l(a)da}{\int_0^{\omega} N(a)Y^l(a)da}$$

$$A_C = \frac{\int_0^{\omega} aN(a)C(a)da}{\int_0^{\omega} N(a)C(a)da}.$$

5. For a detailed discussion of the theoretical underpinnings of intergenerational transfers see Lee (1994).
6. Given a Cobb–Douglas production function, the relationship between output per worker and the capital output ratio is:

$$\frac{Y}{L} = \left(\frac{K}{Y}\right)^{\frac{\beta}{1-\beta}}$$

   Given an elasticity of output with respect to capital (β) of 0.35 a rise in the capital output ratio from 2.0 to 7.1 would produce essentially a doubling of output per worker.
7. See Lee *et al.* (2003) for a dynamic simulation analysis of Taiwan. The simulated transition from a low to a high capital intensive economy required closer to 50 than to 100 years.
8. Credit could play an important role if children financed their own consumption by borrowing from adults with a lifecycle surplus. The debt would be repaid when children reached lifecycle surplus ages and their creditors reached lifecycle deficit ages. When children's consumption is financed through transfers from parents and, to a lesser extent, the state, there is little demand for credit for lifecycle purposes.

CHAPTER 12

1. This research is supported, in part, by a FIRST Award from the US National Institute of Child Health and Human Development (1R29HD34848) whose support is gratefully acknowledged.
2. Some of these books include: Day and Ma 1994; Jin and Shao 1995; Huang 1997; Davin 1999; Fieke and Mallee 1999; Solinger 1999; Cai 2000; Xiang 2000; Cai *et al.* 2001; Iredale *et al.* 2001; Zhang 2001; Bai and Song 2002; Murphy 2002; Li 2003.
3. Some data such as the 2000 Chinese Population Census allow us to identify intracounty migration as well (NBS 2001). Unless otherwise noted, estimates of the

size of floating population in this chapter include only those who made intercounty moves.

4. It should be noted the time criterion (six months or one year) applies only to temporary migrants/floating population. Permanent migrants are always counted at their places of destination regardless of duration of residence at destination areas.
5. This part of the discussion draws heavily from the work of Liang and Ma (2004).
6. Caution should be exercised when using the sizes of floating population reported in 1990 census and in the 1995 survey because the 1990 census used a one-year residence criterion and the 1995 survey used a six-month criterion.
7. Shanghai Floating Migrant Survey uses a broad definition of floating migrant, which includes any nonShanghai individual who has stayed in Shanghai for more than a day at the time of the survey.
8. Recent work by Murphy (2002) suggests that in some locations, local policies play an important role in promoting return migration.
9. In most migrant sponsored schools that the author visited, tuition is about 300 *yuan* per semester.
10. The sample size for migrants in this study was not ideal (less than 100) and no information was collected about the STD infection situation of the migrant's spouse/partners.

CHAPTER 13

1. The author would like to acknowledge the contribution by Associate Professor Robyn Iredale to this section. A small portion of this section appeared in *International Migration Review* (2004), 38(146).
2. For detailed information about data and the 1997 Beijing Floating Population Census, see Guo and Iredale 2004.
3. The five Chinese cities include Beijing, Shejiazhuang (Hebei province), Shenyang (Liaoning province), Wuxi (Jiangsu province), and Dongguan (Guangdong province). The study was carried out from 2003 to 2005 and was supported by a two-year research grant from the Ford Foundation. Five communities were selected in each city based on the types of community, e.g., either migrant concentrated communities or mixed communities of local residents and migrants. In migrant concentrated communities, 100 migrant households were randomly selected and one adult member from each of the selected households then was interviewed using the structured questionnaire. In the mixed communities of local residents and migrants, around 50 local residents and 50 migrants were selected to fill in the individual questionnaire. The type of the five communities in Dongguan was different from that of other cities. All five communities were predominantly migrant concentrated communities, as this reflects the population structure of the city. The total number of individual interviews using the structured questionnaire was 2,531.
4. The total sample includes 22 per cent local residents who lived in the communities and 78 per cent migrants. Roughly equal proportions of male and female respondents were selected. From each of the selected households, only one adult member

was interviewed to fill in the individual questionnaire. The majority of respondents was aged between 15 and 59 years. In almost all the communities, more than two-thirds of the respondents held an agricultural *hukou* status. Marital status of the respondents in the five cities varied considerably. In all cities except for Dongguan, majority of the respondents were currently married, with the highest proportion of currently married (89.5 per cent) in Wuxin city. In Dongguan, more than half of the respondents were single and slightly less than half were currently married. This reflects the structure of the population in the selected communities in Dongguan. All the five communities were high-tech science park communities which provided dormitories for single young workers, of which most were migrants.

CHAPTER 14

1. The author would like to thank Bai Nansheng, Rachel Connelly, Delia Davin, Alan de Brauw, Cindy Fan, Robyn Iredale, Liang Zai, Larry Ma, Ma Zhongdong, Margaret Maurer-Fazio, Thomas Scharping, Dorothy Solinger, Zhang Weiguo, and Yang Xiushi for the generosity of their comments. They are in no way responsible for the interpretations in this final version.
2. One model that is frequently referenced is the Todaro (1969) model. The application of this influential model of migration in developing countries to contemporary China is generally inappropriate: the model was developed to explain why migration would occur in the face of high urban unemployment, such as was the case in Latin America and parts of Africa and Asia in the 1960s. In it migrants were willing to suffer unemployment while waiting for a job in the formal sector; even though their probability of employment there was low, the high urban wage in protected sectors yielded an expected wage that exceeded rural incomes. In China, migrants neither work in the formal sector (or when they do, they work under different conditions than do urban residents), nor are they frequently unemployed. Scholars seeking grounding in well known models of migration would be better advised to look to W. Arthur Lewis. For a review of migration models applied to China, see Scharping (1997).
3. Migration always 'requires the crossing of an intangible line that exists mainly on a map and is often invisible in space' (Cerutti and Massey 2004: 2), and whether or not this line is an international boundary is the formal distinction between internal and international migration. In most cases, government attempts to control the entry and exit of foreigners result in these two types of migration exhibiting very different characteristics, but major exceptions exist, as in the free movement of labor across international boundaries in the European Union or the restricted movement of Chinese into the cities. Saskia Sassen, seeking 'a set of basic features that observed labor migrations seem to share,' notes that 'migration is typically a move between two worlds, even if it is within a single region or country' (1999: xiv and 135). There could not exist a more succinct portrayal of contemporary Chinese labor migration.
4. From data received through personal correspondence with Margaret Maurer-Fazio, collected in a survey reported in Maurer-Fazio (forthcoming).
5. The film, *Shiqisui de Danche*, was banned in China but widely available on pirated DVDs.

6. Contributing to these changing perceptions is the realization that rural conditions are bad and becoming worse. A book on rural conditions, *Zhongguo Nongmin Diaocha* (The Chinese Peasant Study), published in 2004 and banned almost immediately because of a libel lawsuit brought by a rural official, received the Lettre Ulysses Award: the 'Nobel Prize of Journalism' (Spencer 2004). According to Hu Angang, the Director of the Center for China Studies at the Chinese Academy of Sciences and professor at Tsinghua University, the solution to rural problems lies in migration. He said that the 'ultimate goal . . . is to enable the peasants to become urban residents and become citizens in its true sense. This will be "the third liberation" of the Chinese peasants following the land reform and the system of contracted responsibility' (Sun 2005).
7. After a long period of omission, the relationship between migration and gender has received a great deal of attention in recent literature. For Mexico, see Hondagneu-Sotelo (1995) or Donato and Kanaiaupuni (2000) for representative examples.
8. 'Rural labor migrants' were those members of the floating population who held an agricultural *hukou* and whose job before migration was in agriculture. For a more detailed explanation, see Roberts (2002). As in any survey in a particular location, caution should be exercised in applying the results from Shanghai to other destinations in China.

CHAPTER 15

1. The variables used are the following: cross-border (yes/no), density, urbanization, life setting (mountain/plain/steppe/mixed), language spoken, ethno-linguistic group, religion. This sinicization index (calculated from 1990 census data) is taken from Attané (2000).
2. The Manchu ruled China from 1644 to 1911 (Qing dynasty).
3. See provincial family planning regulations, in *Zhongguo jihua shengyu nianjian* (1988, 1989); *Zhongguo renkou ziliao shouce* (1985).
4. The Zhuang were the only ethnic minority in that group in 1982.
5. Mortality in each ethnic group was estimated by using United Nations model life tables, based on an assumed increase in life expectancy at birth equal to the national observed increase; in this case, an average of three years in life expectancy per decade for the periods between 1973 and 1981 and between 1981 and 1990. As available data on mortality by age for ethnic groups in the 2000 census are questioned (Banister 2003), we assumed that survival rates by age increased at the same speed between 1990 and 2000 as during the previous intercensal period (1982–90). By using simulations (not presented here), we were able to demonstrate that the reconstruction method used is generally not too sensitive to assumed mortality levels.
6. Using 2000 census data, we reconstructed fertility trends from 1990 to 2000. For the period from 1975 and 1989 results are taken from Attané and Courbage (2000). As the Han amount to over 90 per cent of the total population, their fertility largely influences fertility at the national level. But a 0.4 point gap is observed between the assumed adjusted TFR for China in 1999 (around 1.8, see above) and the TFR reconstructed for the Han by using our method: 1.4 children per woman. The reason is

obviously an underestimation of enumerated births, which slightly but inevitably biases our results. Nevertheless, our results reveal a higher fertility than the TFR calculated from the 2000 census data using the traditional TFR calculation method.

7. The underreporting of births and of children at young ages at the 1999 census may partly explain the very low fertility observed among some ethnic groups, and especially among the Hans, at the end of the decade. By using age and sex data to elaborate backward projections, we cannot eliminate the effect of underreporting, and probably slightly underestimate fertility levels. The question of underreporting is discussed by many authors (see, for instance, Zhang 2003 and Retherford *et al.* 2005).
8. See for instance the proceedings of the seminar entitled, Gender Discriminations at Early Stages of Life in Asia, 24–26 November 2003, French Institute of Pondicherry, India; to be published but currently available at: attane@ined.fr
9. Including eastern, south-central, and south-eastern Asia (according to the United Nations definition), but excluding western Asia (see UN 2001).
10. According to the definition used by the United Nations (see UN 2001).
11. Nevertheless, some studies suggest that oriental sex ratios at birth (SRB), which influence overall sex ratio in the long term, tend to be higher than white SRBs, which are higher than those of black SRBs (Clarke 2000: 44).
12. Considering the increase in life expectancy, which is faster for women than for men in its early stages, the female sector of the Chinese population should increase faster than the male sector, resulting in a decreasing overall sex ratio. But the opposite situation has occurred.
13. In spite of a rapid increase from the 1960s, the overall sex ratio remains lower in 2000 than it was in 1953, showing that an abnormally high sex ratio is not a new phenomenon in China. We have to stress that until the early 1950s, an unbalanced sex ratio was the result of excess female mortality associated with female infanticide. Reduction in this practice and the improvements in women's status in the Communist era contributed to the reduction of the overall sex ratio during the following years.
14. For further discussion on the issue, see Park and Cho (1995) on Korea.

CHAPTER 16

1. This was also true for the mid-twentieth century. The 1954 United Nations *Demographic Year Book* showed China's population as 463 million, but following the release of the 1953 Census results the 1955 Year Book raised the population by 26 per cent to 583 million, thereby increasing the figure for the world's population estimate by about 5 per cent (UN 1955, 1956).
2. The high population estimate for the early seventeenth century was 150 million and made by Ho (1959). The estimates made by Zhao and Xie (1984) and other scholars are lower.
3. A brief review of these changes can be found in Lee and Wang (1999).
4. Fei (1939) records this practice in his village study of the late 1930s. For a recent study see Li *et al.* (2004).

5. In the early 1950s, the provision of abortion and family planning services was largely due to the consideration of protecting mothers and children's health, although the issue of population control was discussed by both academics and policy makers.
6. The famine was at least partly due to the failure of government policies. During the famine period, China's fertility was much lower than the average of the 1950s and 1960s. This fertility reduction could be a result of people's intentional fertility control or due to the fact that a large number of people delayed their marriages. But it also arises from the fact that severe malnutrition and poor health could lead to temporary sterility or miscarriages. As far as we know, there have been no detailed investigations on how and to what extent had these factors (especially the first two) contributed to the fertility reduction during this time.
7. Because of the intervention of the political leadership, Ma was severely condemned and forced to resign from the post of the president of Peking University. He was only rehabilitated (at the age of 97) in 1979 when the Chinese government pushed for the one-child policy and a stricter (compared with that of the early 1970s) family planning program. See also Chapter 1, this volume.
8. This estimate is based on the following assumptions: during the 1970s and 1980s China's population growth rates were the same as the average between 1965 and 1969; the 1990 growth rate were the same as that recorded in 1970; the 1995 rate were the same as that observed in 1975; and so on. Under this scenario, China's total population in the year 2015 would be around two billion rather than the currently estimated 1.4 billion.

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