



WOMEN'S HEALTH STATUS AND GENDER INEQUALITY IN CHINA

MEI-YU YU¹* and ROSEMARY SARRI²

¹Center for Nursing Research, School of Nursing, University of Michigan, Room 3248, 400 N. Ingalls, Ann Arbor, MI 48109-0482, U.S.A. and ²Institute for Social Research, University of Michigan, Ann Arbor, MI 48109, U.S.A.

Abstract—This paper examines the health status of women in China by reviewing levels and trends of female mortality at several phases of a woman's life cycle focusing on infancy, girlhood, childbearing and old age. The mortality rates of Chinese women and men are compared for the period 1950–1990 as are comparisons with women in selected countries. The cause-specific death rate, expressed as a percentage of all deaths, and the burden of disease, measured in terms of the disability-adjusted life years (DALYs), are used to reflect the changing patterns of female diseases and causes of deaths. Significant improvement in the health status of Chinese women since 1950 is widely acknowledged as a major achievement for a developing country with the largest population in the world, but the differentials in women's health by region and urban/rural areas are considerable. The Physical Quality of Life Index (PQLI) indicates that the overall level of physical well-being of Chinese women has increased in recent decades, but disparity in health between men and women still exists. The Gender-Related Development Index (GDI) further reveals that China has achieved significant progress in women's health during the past four decades, but far less has been achieved with respect to gender equality overall. The final sections of the paper focus on the discussion of some health problems faced by the female population during the process of economic reform since the 1980s. In order to promote gender equality between women and men, concerns on women's health care needs are highlighted. © 1997 Elsevier Science Ltd. All rights reserved

Key words—Chinese women, health status, mortality, gender equality

INTRODUCTION

The improvement in the health status of the Chinese since the 1950s is widely acknowledged as a major achievement for a developing country. Prior to 1950, life expectancy had lagged behind that of many other countries, and the Chinese were often referred to as the "sick people of Asia". Between 1950 and 1990, China's life expectancy at birth increased from 35 to 70 years (ECYPHRC, 1992; World Bank, 1993a). This change is noteworthy for three reasons: (1) the size of the population also increased rapidly in this period; (2) China had to recover from many years of internal and external war; and (3) it had to achieve a level of economic development that was a prerequisite for health improvement.

Although the health status of the Chinese has been studied by many, especially since the 1980s when China's demographic data became available (Chen and Zhu, 1984; Jamison *et al.*, 1984; Young and Prost, 1985; Banister, 1987; World Bank, 1992), little research has been done on similarities and differences in health between sexes. Moreover, there have been few studies of minority, occupational or urban versus rural groups.

This paper examines the health status of the female population in China by focusing on several important phases in a woman's life cycle: infancy, girlhood, the childbearing years and old age. The study covers the period from 1949, when the People's Republic of China was established, to the 1990s, the most recent period for which data are available. We use several mortality indices as indicators of women's health including mortality rates for infants, one to four year olds and adult childbearing women, as well as life expectancy at birth. The cause-specific death rates, expressed as a percentage of all deaths, and the burden of disease, measured in terms of the disability-adjusted life years (DALYs), are used to reflect the changing patterns of female diseases and causes of death. The overall level of physical well-being of Chinese women is estimated by the Physical Quality of Life Index (PQLI). Gender inequality is measured by the Gender-Related Development Index (GDI). The paper also discusses the contemporary health problems experienced by Chinese women, explores the factors influencing women's health, and highlights concerns on health care needs of women in the future.

Interest in the health status of Chinese women has grown in recent years for a variety of reasons. China is the country with the largest total popu-

*Author for correspondence.

lation as well as the greatest number of women in the world—548.69 million females in 1990—one-fifth of the entire female population of the earth (Population Census Office of China, 1993a). The devaluation of Chinese women can be traced to long-standing cultural values derived from Confucius and Mencius and from the patriarchal family structure which requires that a woman move to her husband's family home when she marries. Although the socioeconomic status of Chinese women has risen considerably since the 1950s, the process of female liberation in China remains far from complete. Gender inequality in China is observable in many aspects, so health care differentials are not unexpected. In particular, it is necessary to study the new demographic and socioeconomic issues encountered during the process of economic reform since the 1980s as these new changes are likely to have a significant effect on women's health.

DATA AVAILABILITY AND RELIABILITY

There was no national death registration system or population census in old China. Prior to 1950, the death rates were reported only for some cities or rural areas for certain years, and mortality data by gender were rarely available. The data used in this paper for the period of the 1930s and 1940s were mainly adapted from the population statistics published by the Statistical Bureau (Zhu Ji Chu) of the Republic of China in 1971 and 1973 (Statistical Bureau of the Republic of China, 1971; Statistical Bureau of the Republic of China, 1973).

Although China established a household registration system in the 1950s and conducted two population censuses in 1953 and 1964, respectively, the population statistics were seldom published and the field of demography was forbidden in China for over 30 years following 1949. In 1979, the Chinese government began to publish population data. Since then they have published data from the 1953, 1964, 1982 and 1990 censuses. These data provide the best profile of Chinese demographic trends ever available (Banister, 1984). Both the 1982 and 1990 censuses collected information about deaths and were processed by computer. Generally accurate reporting of age and the apparent consistency of coverage in the censuses make it possible to construct life tables and analyze mortality for each intercensal period (Coale, 1984; Coale and Li, 1991). A number of surveys conducted in recent decades also provided valuable information, e.g. the 1973–1975 cancer epidemiological survey, the 1988 fertility and contraceptive survey, the 1982 and 1988 fertility surveys, the 1987 1% population sample survey, the 1989 survey on maternal deaths, the 1992 sample survey on the status of children aged 0–14, and the yearly national population change surveys since 1982. Some reports and/or

statistics based on these censuses or surveys can be found in a series of annual statistical reference publications, such as *China Statistical Yearbook* and *China Population Statistics Yearbook* issued by the State Statistical Bureau of China; *Almanac of China Population* published by the Population Research Institute, Chinese Academy of Social Science (CASS); and *Yearbook of Public Health in the People's Republic of China* compiled by the Editorial Committee of the Yearbook.

The potential sources influencing reliability of mortality statistics include quantitative errors (such as underregistration, duplicate registration, or omissions) and qualitative errors (such as errors in reporting, recording, and processing the information regarding age, occupation, or other characteristics of the decedent) (United Nations, 1961). Researchers have shown concern about the undercount of deaths reflected in the official data. Coale notes that the mortality rates derived from the 1982 and 1990 censuses appear to provide a reliable record of mortality in the 1980s, but the evidence of defects in the data takes the form of an apparent understatement of the number of deaths in the two six-month periods of 1989 (Coale, 1993). In light of considerably lower infant mortality rates in 1989 than in 1990, Zhai (1993) believes that the longer the period between the dates of deaths and the census resulted in the underreporting of infant deaths. The analysis by Li (1994) indicates that underregistration of deaths in the 1990 census happened more frequently among young children than among adults, more among female infants than among male infants, more among women than among men, and more in 1989 than in 1990.

In light of the consideration of the underreported deaths, China's mortality rates have been adjusted by scholars (Jamison *et al.*, 1984; Banister, 1987; Poston, 1990; Coale and Li, 1991; Zhai, 1993; Li, 1994). In order to better understand trends in the health status of Chinese women, we have compared some of the reconstructed data with the official data. This paper, however, does not evaluate the method and accuracy of the mortality statistics used by these re-estimates.

The partial data used in this paper, including DALYs, PQLI and GDI, are adopted from the publications of the United Nations, the World Bank, the World Health Organization, etc. (Morris, 1979; World Bank, 1993b; United Nations Development Programme, 1995). These publications provide comprehensive updated data and reports on demographic characteristics, and the socioeconomic status and health of women in China and other countries of the world.

MORTALITY AND HEALTH PROBLEMS OF WOMEN IN CHINA

Female mortality indices, including the infant mortality rate, one to four years mortality rate, maternal mortality rate, and life expectancy at birth, are examined here. Trends in these mortality indices may reflect progress and problems in the health status of Chinese women. Mortality rates of women in contemporary China are compared with those of women in "old China" (prior to 1950), of Chinese men, and of women in other countries.

Infant mortality rate

The infant mortality rate (IMR) of females was extremely high prior to 1949, particularly in rural areas of China. The female IMR in Jiangyin County of Jiangsu province, for example, reached 223.8 per 1000 live births in 1931–1932; 284.8 in 1932–1933; and 402.4 in 1933–1934 which were 24 to 84 per 1000 higher than the male IMR for the same period (Statistical Bureau of the Republic of China, 1973).

According to Banister's adjusted data (1987), the female IMR declined from 170 per 1000 in 1953 to 136 in 1957, then experienced an upward swing in 1958 and reached 180 per 1000 in 1961. In the spring of 1958, the "Great Leap Forward" was launched in China but nothing worked as expected. A sharp increase in mortality occurred during and immediately after the Leap because of the severity of food shortages resulting from government policy decisions and natural disasters (Banister, 1987; Peng, 1987). After 1961, the female IMR decreased gradually to under 60 per 1000 in 1972 and to 53 per 1000 in 1974. In light of Banister's data (1987), the female IMRs were lower than or closer to the male rates from 1953 to 1974, except for the 5 years

from 1956 to 1960 when female rates were 0.5 to 6.9 higher than male rates.

Table 1 presents the official IMR by sex from China's surveys and population censuses (Population Statistical Department of the State Statistical Bureau, 1989; Population Census Office of China, 1993b; Xu *et al.*, 1994), and adjusted data by Banister (1987), Li (1994), and Lu and Wei (1990). The table also compares differences between female and male rates (F–M); a minus denotes that the female death rate is lower than male rate. China's female IMR remains a contentious issue. First, Banister reported a higher female IMR than the official rates in all years between 1975 and 1984 except 1978. Specifically, the differences between the two data sets reached 16 to 30 per 1000 after 1980. Second, Banister's data indicate that the trend in female infant mortality is upward after 1980. China's official data, however, fluctuated between 36 to 42 per 1000 in that same period. Third, Banister's IMRs on females were all higher than those of males, and the biggest discrepancy reached 33 per 1000 in 1984. According to the official data, however, the female IMR was lower than the male rate in the period of 1975–1987, except in 1986.

The underenumeration of infant deaths has been studied by others. The official publication reported that 1981 IMRs were 38.68 and 35.90 per 1000 for males and females, respectively (Population Statistical Department of the State Statistical Bureau, 1989). Hao's adjusted 1981 IMRs were higher than those reported in the official data: 45.3 per 1000 for males versus 43.5 for females (Hao *et al.*, 1988). The 1990 population census reported a higher female IMR than for males in 1989 as well as in the first six months of 1990 (Population Census Office of China, 1993b; Xu *et al.*, 1994).

Table 1. Infant mortality rate (per 1000 live births) by data source and sex in the period of 1975–1990, China

Year	Based on China's survey and population census			Based on adjusted infant mortality rate		
	Male	Female	F–M ^a	Male	Female	F–M ^a
1975	50.22	45.74	–4.48	48.4	48.9	0.5
1976	45.70	42.65	–3.05	44.5	45.2	0.7
1977	41.96	37.99	–3.97	40.7	41.5	0.8
1978	43.80	38.09	–5.71	36.8	37.7	0.9
1979	41.31	36.77	–4.54	36.3	42.7	6.4
1980	43.48	41.99	–1.49	35.8	47.7	11.9
1981	38.68	35.90	–2.78	35.3	52.6	17.3
1982	37.06	35.72	–1.34	34.9	57.5	22.6
1983	42.60	40.05	–2.55	34.4	62.4	28.0
1984	39.57	37.15	–2.42	33.9	67.2	33.3
1985	39.01	35.57	–3.44			
1986	36.49	37.87	1.38			
1987	40.66	38.91	–1.75			
1989	21.21	23.84	2.63	32.19	36.83	4.64
1990 ^b	29.00	33.71	4.71	32.13	38.07	–5.94

Sources:

1975–1987 China's data: Population Statistical Department of the State Statistical Bureau (1989);

1989 China's data: Population Census Office of China (1993b);

1990 China's data: Xu *et al.* (1994);

adjusted 1975–1984 data: Banister (1987);

adjusted 1989 data: Li (1994);

adjusted 1990 data: Lu and Wei (1990).

^aDifference between female and male data;

^bdata for the first six months of 1990.

Nonetheless, the implausibly low relative numbers of deaths in 1989 are probably the result of the undercounting of deaths in that year (Coale, 1993; Zhai, 1993). Lu and Wei's (1990) estimated female IMR was 4.4 points higher than that of the census data.

Numerous factors affect IMRs. In addition to quantitative and qualitative errors such as underregistration, duplicate registration and inaccurate information regarding age or death, other influences include socioeconomic conditions, medical health factors, gender status, etc. (United Nations, 1973). In Chinese society, the philosophies of Confucius and Mencius, which contend that "males are exalted and females are demeaned," has had a deep and lasting impact for thousands of years. Strong preference for sons may lead to a higher female infant mortality rate due to abandonment, neglect or even violence. As reported by the Statistical Bureau of China, a higher 1987 female mortality rate than that reported in the 1981 female data and the 1987 male data was the result of less care of females. Unequal treatment of males and females is a significant cause of female infant morbidity and mortality (Economic and Social Council, 1992; Heise *et al.*, 1994; Yu and Sarri, 1995).

The phenomenon of "missing girls" in China (Johansson and Hygren, 1991; Riley, 1996) in the 1980 s is further evidence that gender discrimination has a profound effect on the physical and mental well-being of female infants. Given the traditional preference in China for sons, the family planning campaigns inevitably increase pressures for the one child to be a son. This situation is especially true in

rural areas where a male labor force is still believed to be necessary for a mode of production that requires physical labor. As observed by Coale and Banister (1994), China's sex ratios at birth (number of boys per 100 girls) were higher than 110 in most of the years between the 1930 s and the 1940 s. Although China's sex ratio at birth declined to under 110 for the majority of the years since the 1950 s, the ratios rose sharply in the 1980 s, especially at higher birth orders. It has been estimated that some 12% of female infants are unaccounted for each year, the victims of some combination of sex-selective abortion, abandonment, infanticide, or underreporting (Hull, 1990; Coale, 1991; Zeng *et al.*, 1993; Coale and Banister, 1994). The availability of portable ultrasound machines makes it possible to identify the sex of fetuses and adopt sex-selective abortion if the fetus is a female. Although ultrasound machines may not be available in some less developed areas, sex-selective abortion could be attempted if the gender of a fetus is identified by other means such as fortune-telling and reliance on folk beliefs. A significant imbalance in the numbers of female and male births will have a long-term impact on a number of social issues, such as marriage problems for these cohorts and societal instability resulting from the population's abnormal sex ratio (Chun, 1996).

One to four years female mortality rates

The health consequences caused by gender discrimination can be further explored by examining the one to four years female mortality rate. The female one to four years mortality rate in China

Table 2. One to four years mortality rate (per 1000 live births) by sex and urban/rural areas in 1957, 1973–1975, 1981 and 1990, China

Year/urban and rural	Male	Female	F–M ^a
<i>Whole country</i>			
1957	14.8	17.0	2.2
1973–1975	9.1	9.3	0.2
1981	4.0	4.4	0.4
1990	2.35	2.48	0.13
<i>1990 data</i>			
<i>Country by age (years old)</i>			
1	4.10	4.51	0.41
2	2.47	2.78	0.31
3	1.54	1.52	–0.02
4	1.21	1.05	–0.16
<i>Urban areas^b by age (years old)</i>			
1	2.04	2.14	0.10
2	1.45	1.42	–0.03
3	0.95	0.76	–0.19
4	0.77	0.70	–0.07
<i>Rural areas^c by age (years old)</i>			
1	4.65	5.14	0.49
2	2.73	3.14	0.41
3	1.70	1.72	0.02
4	1.33	1.14	–0.19

Sources:

1957 and 1981 data: Liu (1985);

1973–1975 data: Banister (1986);

1990 data: Xu *et al.* (1994).

^aDifference between female and male data;

^binclude both cities and towns;

^crefer to counties in 10% sampling tabulation of the 1990 census of China.

declined remarkably from 17 per 1000 in 1957 to 2.48 per 1000 in 1990 (Liu, 1985; Banister, 1986; Xu *et al.*, 1994) (top section of Table 2). Although the gender gap has narrowed, females aged one to four years still had higher death rates than males at the same ages for all the selected years listed in the table.

The age and urban/rural differentials (Xu *et al.*, 1994) in terms of mortality rate were considerable in 1990 (Table 2). Compared with males, China's higher female one to four years mortality rates were mainly due to the higher rates at ages one and two. In particular, the one to two years female rates in rural areas were double those in urban areas.

Traditionally, females leave home after getting married, and this is still true in most rural families. Compared with boys, daughters may receive less care and education, but work longer hours and experience higher risks of morbidity and mortality. As a consequence of the one-child policy combined with a cultural preference for male heirs, some parents abandon girls. It is estimated that the total number of abandoned children in China is around 150,000 including healthy girls and disabled boys and girls (Johnson, 1996). In addition to domestic adoption, international adoptions have been permitted since the late 1980s. The number of adoptions from China to the United States alone climbed to several hundreds per annum in the early 1990s (Johnson, 1996). The striking number of orphanages in China and the intercountry adoptions initiatives developed in the past decade are testimony to a growing problem of unwanted and abandoned children who are disproportionately girls.

Maternal mortality rate

Motherhood is an important phase in a woman's life cycle. The indicator used to reflect reproductive health of women at childbearing age for this study is maternal mortality rate, the annual number of maternal deaths per 100,000 live births in the same year. Maternal deaths are caused by and complications of pregnancy and childbirth (United Nations, 1995a).

Dominated by the doctrine of Confucius and Mencius which held that "of the three unfilial acts, the worst is to have no son," Chinese women were expected to bear many children, particularly sons, during their reproductive years. As a result of poor prenatal and maternal care, the maternal mortality rate of China was estimated as high as 1,500 per 100,000 prior to 1949 (ECYPHPRC, 1991).

After 1949, maternity and child care became an important public health issue in China. The Constitution, laws and other legal documents have established specific provisions pertaining to the protection of mothers and children. Development of maternity care organizations, facilities, and trained personnel have contributed toward improvement of the health status of mothers (Chen and Zhu, 1984). In 1989, China conducted a maternal mortality survey which covered a population of 100 million in 30 provinces, municipalities and autonomous regions. The survey (Table 3) estimated that China's maternal mortality rate was 94.7 per 100,000 in 1989, one fifteenth of the rate before 1949. As shown in the top portion of Table 3, China's maternal mortality rate continued to drop in the 1990s and was below 70 in 1993 (ECYPHPRC, 1995). Nevertheless, these data should be viewed with

Table 3. 1989–1993 maternal mortality rates, and six leading causes of maternal deaths in 1989, China

Year/causes	Order	Nation Rate (per 100,000)	% of total deaths	Order	Urban Rate (per 100,000)	% of total deaths	Order	Rural Rate (per 100,000)	% of total deaths
<i>1989–1993 maternal mortality rates</i>									
1989		94.7			49.9			114.9	
1990		88.9			45.9			112.5	
1991		80.0			46.3			100.0	
1992		76.5			42.7			97.9	
1993		67.3			38.5			85.1	
<i>Leading causes of maternal deaths in 1989</i>									
Obstetric hemorrhage	1	36.3	49.1	1	13.5	36.7	1	50.6	52.1
Gestational hypertension	2	7.5	10.1	2	3.9	10.6	2	9.7	10.0
Heart disease	3	6.6	8.9	2	3.9	10.6	3	8.3	8.5
Postpartum infection	4	4.4	5.9	6	1.2	3.4	4	6.4	6.6
Amniotic fluid embolism	5	4.0	5.4	3	3.2	8.7	6	4.5	4.6
Other infections	5	4.0	5.4	4	2.8	7.7	5	4.7	4.8
Liver diseases	6	2.8	3.8	5	2.3	6.3			

Sources:
leading causes of maternal deaths in 1989: ECYPHPRC (1991);
1989–1993 maternal mortality rate: ECYPHPRC (1995).

caution. As observed by the World Health Organization, most official maternal mortality rates are underestimates (AbouZahr and Royston, 1991). The pace of progress in reducing maternal mortality in China is uneven. Although the gap between urban and rural areas in terms of maternal mortality rates had narrowed, the rural rates were still 46 to 67 per 100,000 higher than the urban rates in the early 1990s (ECYPHPRC, 1995). Relatively higher maternal mortality rates were also found in small and medium sized cities, remote mountain areas and Southwest China. Women who are poor, who receive little or no prenatal care education, or deliver at home are likely to be at higher risk for maternal death (AbouZahr and Royston, 1991; Lawson, 1994).

Table 3 also presents the six leading causes of maternal mortality in 1989 (ECYPHPRC, 1991). The first leading cause in both urban and rural areas was obstetric hemorrhage, followed by gestational hypertension and heart disease. About 52% of the maternal deaths were caused by obstetric hemorrhage in China's rural areas where blood was in short supply.

According to statistics reported by the World Health Organization (1995a), hemorrhage is also the leading cause of maternal death worldwide, accounting for 25% of the total maternal deaths in the world. Four other major complications listed in the report of the World Health Organization are infections, hypertensive disorders of pregnancy, obstructed labor, and unsafe abortion.

Although unsafe abortion is not listed as a leading cause of maternal deaths in 1989 in China, some statistics merit attention. It has been reported that the ratio of abortions to births in China was 632 per 1000 live births in 1989 and was as high as 1,130 per 1000 live births in Guanxi and 2022 in Shanghai (Wang *et al.*, 1991; Tien *et al.*, 1992).

Life expectancy at birth

Life expectancy at birth is an estimate of the average number of additional years a newborn infant

can expect to live. As displayed in Table 4 (Banister, 1987; Population Statistical Department of the State Statistical Bureau, 1989; ECYPHPRC, 1992; Zhai, 1993), the trends and levels of Chinese female life expectancy at birth vary by data source. With a few exceptions, the adjusted data by Banister and Zhai are lower than those of official figures. A sharp decline in life expectancy at birth for both males and females in 1960, as reported by Banister (1987), reflects a mortality crisis resulting from the food shortage at the end of the 1950s.

Disregarding the discrepancies among the data sources, both official and adjusted data in Table 4 generally agree that women's health status improved after the 1950s. The female life expectancy at birth has increased from about 35 years in 1931 to more than 70 years in the 1990s. The 1990 life expectancy at birth was three years longer for women than for men (ECYPHPRC, 1992).

Because of population aging, China is now faced with the challenge of extended geriatric care. Although the overall socioeconomic status of Chinese women has risen substantially since 1949, older women are still among the most economically disadvantaged population groups. The women who are currently 60 years and over were born in the early years of this century when most of them had no opportunities to attend at school and work outside the home. The 1990 census (Population Census Office of China, 1993a; Population Statistical Department of the State Statistical Bureau, 1993) reports that the percentages of widowed people aged 60 and over were 24% for males versus 51% for females; illiterate or semi-illiterate persons aged 65 and over (those who knew less than 1,500 Chinese characters, were not able to read simple books and newspapers, and could not write a simple message) were 55% for males versus 92% for females; and the non-working persons aged 65 and older were 67% for males versus 79% for females.

In China's urban areas, retired women with little education and lower rates of participation in the

Table 4. Life expectancy at birth (years) by sex and data source in selected years between 1931 and 1990, China

Year	Based on China's surveys and population censuses				Based on adjusted life expectancy at birth			
	Nation	Male	Female	F-M ^a	Nation	Male	Female	F-M ^a
1931		34.85	34.63	-0.22				
Before 1949	35.0							
1957	57.0				49.5	48.4	50.9	2.5
1960					24.6	24.3	25.3	1.0
1973-1975		63.6	66.3	2.7	63.8 ^b	62.7 ^b	64.8 ^b	2.1
1981	67.9	66.4	69.3	2.9	64.8	64.5	65.0	0.5
1985	68.9	67.0	71.0	4.0	64.6 ^c	64.9 ^c	64.1 ^c	-0.8
1990		67.87	71.17	3.30		66.35	70.37	4.02

Sources:

China's data: ECYPHPRC (1992); Zhai (1993); Population Statistical Department of the State Statistical Bureau (1989);

adjusted data except 1990: Banister (1987);

adjusted data in 1990: Zhai (1993).

^aDifference between female and male data;

^bAdjusted data in 1975;

^cAdjusted data in 1984.

labor force receive lower pensions than men. In fact, many older women have no pensions because they have never been employed in the labor force. They now experience serious economic hardship due to increased living and medical expenses. There is no unified pension system in China's rural areas. Women who are elderly and in rural areas, especially those who have no source of income and no spouse or relatives on whom they can rely, may be in a "double jeopardy" situation.

The family in China remains the basic unit and is responsible for the primary care of the aged. Care of the elderly will become a more serious problem after the year 2000, given the increase in the elderly population and the shortage of children as a consequence of the "one-child" family policy adopted in the late 1970s. A married couple will have four parents to care for in a society that lacks an established social security or private pension system for most citizens. China is now in the process of developing a social insurance system, and the demands on that system will probably be greater than any country has previously experienced. It can be anticipated that the status of older women as well as men will remain problematic for many years, but older women are likely to remain as the most disadvantaged.

CAUSES OF DEATH OR DISABILITY

The cause-specific death rates, expressed as a percentage of all deaths reported in China since the 1980s, indicate that causes of female deaths in China, mainly in urban areas, have evolved from a predominance of acute and infectious diseases prior to 1950 to chronic and degenerative diseases. The statistics in Nanjing city in 1935 reveal that more than 62% of female deaths were due to acute and infectious diseases (excluding tuberculosis).

Tuberculosis accounted for 6.5% of the total female deaths in the capital of the Republic of China (Statistical Bureau of the Republic of China, 1973).

Of the ten leading causes of female deaths in China in 1994, chronic diseases and diseases associated with aging, rather than infectious and acute diseases, were leading causes of deaths (Table 5) (ECYPHPRC, 1995). In urban areas, cerebrovascular diseases, malignant tumors and heart disease caused 57% of female deaths in urban areas. It was the first time that mental illness and neuroses were identified as the 9th and 10th leading causes of female deaths in urban areas. The percentages of urban female deaths caused by mental disorders among total female deaths increased from 1.17% in 1989 to 1.44% in 1994 (ECYPHPRC, 1990; ECYPHPRC, 1995). In rural areas, respiratory diseases were the leading cause of female deaths; neonatal diseases, tuberculosis and infectious diseases were not listed among the ten leading causes of female deaths in urban areas but were listed as the 7th, 8th, and 9th in rural areas. Injury and toxicosis were the fifth leading causes of female deaths nationally, but the percentage of deaths caused by these was 5% higher in rural than in urban areas (ECYPHPRC, 1995).

Table 5 presents the 10 leading causes of female deaths in a sample of urban and rural areas so generalization is limited for several reasons. First, there may be differences in diagnosis and classification despite the use of the International Classification of Disease (ICD) categories. Second, the data in Table 5 came from 34 cities and 101 counties. However, China has almost 2200 counties and 30% of them have a per capita annual income of 150–300 yuan (Editorial Committee, 1992). The cause-specific death rates might present a different picture if more cities and counties were included, especially those of the poorer areas. Lawson's study (1994)

Table 5. Ten leading causes of female deaths by urban and rural areas in 1994, China

Causes	Urban ^a		Rural ^b	
	Order	% of total deaths	Order	% of total deaths
Cerebrovascular diseases	1	22.35	2	17.04
Malignant tumor	2	18.14	3	13.93
Respiratory diseases	3	17.04	1	27.15
Heart disease	4	16.61	4	11.32
Injury and toxicosis	5	5.67	5	10.76
Digestive diseases	6	3.16	6	4.38
Endocrine, nutrition, metabolic and immunity diseases	7	2.96		
Neonatal diseases			7	1.83
Tuberculosis			8	1.34
Infectious diseases (excluding tuberculosis)			9	1.30
Urinary and reproductive diseases	8	1.63	10	1.25
Mental illness	9	1.44		
Neuroses	10	0.85		

Source: ECYPHPRC (1995).

^aBased on data from 34 cities (whole or part of cities);

^bBased on data from 101 counties (whole or part of counties).

concluded that cause-of-death patterns in Chinese cities are similar to those in industrially developed countries; the patterns in the poorer rural areas are more typical of developing countries.

The changes in the pattern of the causes of deaths in China is supported by another assessment, identified as the Global Burden of Disease (GBD) (World Bank, 1993b). The GBD quantifies the full loss of healthy life which is measured in units of disability-adjusted life years (DALYs). A total of about 100 diseases and injuries are categorized into three groups: communicable, maternal and prenatal diseases; noncommunicable diseases; and injuries. The 1990 DALYs listed in Table 6 support the observation that noncommunicable diseases have become a major cause of loss of women's health in China. China's percentage of total DALYs due to noncommunicable diseases, 57.1%, was lower than those of the established market economies (80.6%) but higher than those of India (39.4%) and the average level of the world (49.1%).

Injuries to Chinese women resulted in higher female disability rates (14.1% as measured by DALYS) than was the case for women in a sister country, India, or with respect to the world average of 8.2%. The data are consistent with those in Table 5 which indicate that injury and toxicosis as the fifth leading causes of female deaths in both Chinese urban and rural areas.

A striking finding regarding deaths caused by injury was the female suicide rate. According to Pearson (1995), there are more suicides among women than men (24.4 versus 17.7 per 100,000); the suicide rate of women aged 20–24 in rural areas is five times greater than in urban areas (78.3 versus 15.9/100,000). An analysis by Li and Baker (1991) reports that compared with American women, the suicide rate for Chinese women is more than 10 times the U.S. rate at ages 15–25. Such high levels of female suicide in China, especially in rural areas, may be caused by the lower status of women, poverty, family crises, marriage and childbearing problems, all which lead to higher psychological and social burdens that women have to bear (Li and Baker, 1991; Pearson, 1995).

PHYSICAL WELL-BEING OF CHINESE WOMEN AND GENDER INEQUALITY

It is desirable to have a summary measure of physical well-being so that changes in overall health can be measured over extended periods of time. One such measure is the Physical Quality of Life Index (PQLI). Overall progress in the physical well-being of Chinese women can be measured by the PQLI which was developed by the Overseas Development Council (ODC) in the 1970s (Morris, 1979). The PQLI has three components: literacy, infant mortality and life expectancy at age one, with a minimal value of 0 to a maximum value of 100. This measurement facilitates international as well as historical, regional, and subpopulation comparisons within a nation.

Considering the factor of underestimated deaths, China's PQLIs in 1975, 1981, 1984, and 1990 in Table 7 were calculated based on adjusted mortality indices; the literacy rates were adopted from a report by the United Nations (Morris, 1979; Banister, 1987; Lu and Wei, 1990; UNESCO, 1993; Zhai, 1993).

Due to improvements in female infant mortality, life expectancy and literacy, the PQLIs of Chinese women increased from 66 in 1975 to 81 in 1990, reflecting the overall level of physical well-being of Chinese women. On the other hand, the lower female than male values for all years listed in the table suggest unequal opportunities for females in education and health care.

In order to further demonstrate the degree of gender inequality in China and to compare it with other selected countries of the world, another measure, the Gender-Related Development Index (GDI), introduced by the 1995 Human Development Report (United Nations Development Programme, 1995), is used. Based on longevity, knowledge and access to the basic resources individuals need to develop their capabilities, the GDI "focuses on inequality between women and men as well as on the average achievement of all people taken together" (United Nations Development Programme, 1995).

Among ten countries with more than a 100 million population each (Table 8) (United Nations, 1994; United Nations Development Programme,

Table 6. Female burden of disease by cause in 1990 in China, India, EME, and the world

	Communicable, maternal and perinatal causes		Noncommunicable diseases		Injuries		Total	
	DALYs lost (millions)	% of total	DALYs lost (millions)	% of total	DALYs lost (millions)	% of total	DALYs lost (millions)	%
China	28.14	28.8	55.81	57.1	13.85	14.1	97.80	100
India	77.29	52.5	57.89	39.4	11.94	8.1	147.11	100
EME*	4.88	11.7	33.48	80.6	3.21	7.7	41.57	100
World	318.27	49.1	277.28	42.7	53.39	8.2	648.94	100

Sources: World Bank (1993b).

*Established market economies (EME) include 35 economies: U.S.A., Canada, Japan, Australia, New Zealand, Germany, Italy, United Kingdom, France, etc. (World Bank, 1993a, Table A.10).

Table 7. Life expectancy at age one, infant mortality, literacy, and physical quality of life index^a (PQLI) by sex in the selected years, China

Year	Sex	Life expectancy at age one ^b		Infant mortality rate per 1000 live births		Adult literacy rate ^c		PQLI ^b
		Years	Index it		Index e	%	Index i	
1975	Men	64.9 ^d	68.9	48.4	81.4	76.0	76.0	75
	Women	67.1 ^d	74.7	48.9	81.1	44.0	44.0	66
1981	Men	65.9	71.4	35.3	87.3	77.3	77.3	79
	Women	67.6	75.9	52.6	79.5	46.5	46.5	67
1984	Men	66.2	72.2	33.9	87.9	81.0	81.0	80
	Women	67.7	76.2	67.2	72.9	54.2	54.2	68
1990	Men	67.6	75.8	32.1	88.7	87.0	87.0	84
	Women	72.2	87.6	38.1	86.0	68.1	68.1	81

Sources:

adjusted life expectancy at birth: Banister (1987); Zhai (1993);

adjusted infant mortality rate: Banister (1987); Lu and Wei (1990);

literacy rates: 1975 data from Morris (1979); data in other years from UNESCO (1993).

^aBased on adjusted mortality indices;

^bthe formula used to approximate the life expectancy at age one is:

$$e_1 = \frac{e_n - 1 + q_0(1 - k_0)}{1 - q_0},$$

where e_1 = life expectancy at age one, e_n = life expectancy at birth, q_0 = infant mortality rate per 1000 live births, and k_0 = estimated average survival period (0.2 years) during the first year.

The formula used to calculate PQLI is:

$$PQLI = (it + e + i)/3,$$

where $it = (229 - [\text{infant mortality rate}])/2.22$, $e = ([\text{life expectancy at age one}] - 38)/0.39$, and i = % literate rate for population ages 15 years old and older (Morris, 1979);

^cestimated rates; the term "adult" refers to those aged 15 and over. The 1975 male and female rates are arbitrarily estimated according to China's literacy rate, 60%, in the early 1970 s (Morris, 1979). The rates in 1981 and 1984 are estimated according to the average annual increase rates in the period of 1980 and 1990. The rates in 1980 and 1990 are adopted from the *World Education Report 1993* (UNESCO, 1993). The following is the formula used to calculate the average annual increase rate, r :

$$r = \sqrt[n]{P_e/P_i} - 1,$$

where P_i is the initial rate, P_e is the rate at the end of the period, and n is the length of the period (in years);

^dlife expectancy at birth in 1973–1975.

1995), China's GDI in the early 1990 s was lower than the three more developed countries, as well as Brazil and Indonesia. In addition to Japan and Indonesia, China's GDI was also lower than other seven Asian countries, including Hong Kong, Singapore, Thailand, South Korea, Malaysia, the Philippines, and Mongolia.

It is important to note that there are substantial regional differentials in terms of women's health status in China. With a few exceptions, the three municipalities of Beijing, Shanghai, and Tianjing, and the provinces situated in the northeastern and eastern parts of China had lower infant mortality rates and higher life expectancies at birth than those in the western and southwestern regions which have relatively lower levels of socioeconomic development and health care. For example, Xinjian, an autonomous area in western China, had the highest female infant mortality rate (137 per 1000 live births), which was 120 higher than Beijing (Hao *et al.*, 1988). Xinjian had the lowest female life expectancy (58 years), 17 years below that of Shanghai.

DISCUSSION

We have examined the health status of Chinese women for the period from the 1950 s to the 1990 s

by historically reviewing the mortality indices published by Chinese and other sources. We have also incorporated additional information about mortality rates in countries other than China. There are disagreements about the quality of China's mortality statistics, and validity of the IMR seems to be the most controversial. In order to better understand the health status of Chinese women, we have compared selected adjusted data and official statistics. From the perspective of social science theory we have considered how cultural values and the socioeconomic status of women in China are associated with policies and practices that influence mortality patterns. However, evaluation on the method and accuracy of the reconstructed mortality rates is beyond the scope of this paper.

Despite the contentious reports on female mortality levels and trends in China, the increase in female PQLI in recent decades indicates that there has been progress in the overall well-being of Chinese women. The female infant mortality rate has declined from as high as more than 400 per 1000 in some areas prior to 1949 to under 50 per 1000 in 1990 nationally; the maternal mortality rate has decreased from 1,500 per 100,000 before 1950 to under 100 per 100,000 in the 1990 s; and the life expectancy of women has doubled in the past four decades to a level of 70 years in 1990. Chronic and

Table 8. Gender-Related Development Index (GDI) in China and the selected 16 countries or regions

Country	Gender-related development index (GDI)	Share of earned income (%)		Life expectancy 1992 (years)		Adult literacy rate 1990 (%)		Combined primary, secondary & tertiary gross enrollment ratio 1992 (%)	
		Female	Male	Female	Male	Female	Male	Female	Male
China	0.578	31.2	68.8	70.4	66.7	70.0	88.2	51.8	58.0
<i>Countries with a population > 100 million^a</i>									
United States	0.901	34.6	65.4	79.3	72.5	99.0	99.0	98.1	91.9
Japan	0.896	33.5	66.5	82.5	76.4	99.0	99.0	76.3	78.4
Russian Federation	0.822	38.4	61.6	73.6	61.7	98.7	98.7	69.7	67.3
Brazil	0.709	22.9	77.1	68.7	64.0	81.3	82.2	69.7	71.1
Indonesia	0.591	25.3	74.7	64.5	61.0	76.4	88.8	57.1	63.5
India	0.401	19.2	80.8	60.4	60.3	35.2	63.7	45.8	63.8
Nigeria	0.383	28.5	71.5	52.0	48.8	42.1	63.4	47.3	55.5
Pakistan	0.360	10.1	89.9	62.6	60.0	22.3	47.8	16.3	32.6
Bangladesh	0.334	22.8	77.2	55.6	55.6	24.4	47.8	32.8	43.1
<i>Other selected Asian countries or regions</i>									
Hong Kong	0.854	29.4	70.6	81.8	75.6	86.5	95.7	69.7	70.2
Singapore	0.822	28.9	71.1	77.4	72.4	84.3	95.4	66.3	68.9
Thailand	0.798	34.6	65.4	71.8	66.3	91.4	95.8	52.8	53.1
Korea, Rep. of	0.780	22.0	78.0	74.9	67.3	95.8	99.1	75.0	83.5
Malaysia	0.768	29.2	70.8	73.0	68.7	75.4	87.8	61.1	59.6
Philippines	0.625	21.1	78.9	68.2	64.5	93.7	94.4	78.2	76.6
Mongolia	0.596	38.5	61.5	65.0	62.3	74.8	87.4	62.9	56.2

Sources: United Nations Development Programme (1995);

^aAccording to *World Population 1994* (United Nations (1994)).

degenerative diseases now predominate as the leading causes of death among Chinese women, especially in urban areas.

The data presented need careful review since they are national average levels. The differentials in women's health by region and urban/rural areas are still considerable. The female and male PQLIs reflect that gender inequality in health status still exists in China. The discrepancies in GDI between China and some countries suggest that China still has a long way to go to achieve the level of gender equality of some developed countries and middle income Asian countries with whom China is competing in the global economy.

China's economic reform has had mixed impacts on women's health. On one hand, women benefit from improved health services and living conditions. On the other hand, China is encountering new health issues during the process of modernization. Our concern about future health care needs of women in China and in other developing countries are highlighted in the following sections. Because China has the largest population in the world and is now one of the world's leading economies, what happens there with respect to the status and well-being of women is likely to have repercussions in various parts of the world. Although our discussion applies specifically to China, it should also be relevant for women in many other countries.

● China promulgated the "Law of the People's Republic of China on Maternal and Infant Health Care" in 1994 with the principles of guaranteeing the health of mothers and infants, improving the

quality of births, and strictly forbidding the identification of fetus gender through technological means unless it is necessary on medical grounds (Xinhua News Agency, 1994). It appears that substantial effort is required to insure the enforcement of this law and monitoring of its impact. Special education and public information efforts should be directed to increase public awareness of the value of female children to people at all levels of society. It is important to provide attractive benefits for parents of female babies, and to help couples who have only daughters.

● A further focus of maternal care in China should be to overcome uneven development of maternal care by region with particular attention to obstetric hemorrhage and other leading causes of maternal deaths. To better use facilities and personnel already available, to improve women's knowledge of safe motherhood, and to further develop effective transport systems that can transfer emergency cases to a clinic or hospital on time for effective treatment are all needed actions. The provision of good quality maternal health service is essential. In remote rural and mountain areas with limited resources and difficult conditions, the training of more skilled rural midwives should be one of the economical and effective ways to reduce preventable maternal deaths.

Some statistics regarding abortion rates in China are noteworthy. After the implementation of the one-child family policy, the contraceptive period for women of childbearing age has become longer. The need for abortions can be reduced by producing

and providing more effective and safer contraceptive methods, and by educating family planning staff and medical practitioners on how to provide better services. Among all contraceptive methods used by couples of childbearing age in 1992 in China, only 12% were vasectomy operations, and 4% were condoms (Shanghai International Center for Population Communication, China, and Jiafu Information Dissemination Center of China, 1995). With regard to the principle of gender equality, efforts should be devoted to research on male contraceptive methods and to enhancing the consciousness of males on their responsibility for contraception.

● Due to longer life expectancy at birth, older Chinese women greatly outnumber older men, but they are one of the most economically disadvantaged population groups (Yu *et al.*, 1988). To enhance older women's well-being is a critical issue requiring support from local governments and communities. More employment opportunities for retired women should be created since many of them are in their early to mid-50s. The principle of "equal reward for equal work" should be mandated for all women, including the elderly. Older widows should be encouraged to overcome the traditional ideology of one marriage for life. Men whose parents-in-law have only had daughters should be encouraged to live in their wives' homes.

● The data with regard to differences between men and women in terms of mental illness and injury deaths have raised serious public health issues, while the research in these areas is still in its infancy in China. The striking findings regarding higher suicide rates for women than men in China, particularly among younger women in rural areas, illustrate that urgent strategies are needed for protecting women's mental health. Both governmental resources and women's non-governmental resources should be developed to ensure achievement of gender equality, and to provide assistance to women who face life crises. It is encouraging to see that some non-governmental agencies in China, largely staffed by women, are beginning to respond to women's crisis situations. The hotline opened by Women's Research Institute, a purely private non-profit women's service and research organization, strives to help Chinese women improve their psychological health as well as their physical health (Women's Research Institute of China Academy of Management Science, 1995). Women's status is also being advanced by another non-governmental agency, the China Population Welfare Foundation. Its main activities are poverty eradication, illiteracy elimination and treatment of illness (China Population Welfare Foundation, 1995). Many more of these organizations are needed not only in

cities but also rural areas if women's mental as well as physical health is to be addressed.

● China seems to be experiencing a pattern similar to that found in more technologically developed nations, that is, technological development is being accompanied by a new set of occupational and environmental problems (Christiani *et al.*, 1985). Unfortunately, the lack of information restricts reporting on these developments in China today. Available data from 1978 to 1991 report that the number of business enterprises in rural areas alone increased 11.5 times (Levine, 1996). Nonetheless, women's occupational and environmental health has received considerably less attention than other women's health issues, such as maternal and child health. Occupational protection for female workers in the countryside is inadequate following the rapid development of township enterprises (Royston and Armstrong, 1989). Environmental and occupational health problems require preventive interventions by government and health workers of China along with international cooperation, in terms of financial and technical support (Christiani *et al.*, 1985; Quinn *et al.*, 1987; Levine, 1996).

● The seriousness of China's tobacco-related health problems is unmatched anywhere in the world (Peto, 1994; Skolnick, 1996). If present smoking patterns in China persist, by the time the young people of today reach middle and old age, tobacco-related illness among them will account for about two million deaths per year (World Bank, 1992). China's health problems from tobacco also involve an estimated half a billion passive smokers, most of whom live in overcrowded, poorly ventilated homes with one or more smokers (Skolnick, 1996). Most people are unaware of the dangers and economic burdens presented by smoking although some anti-smoking efforts have begun in China. Specific studies on the subsequent impact on the health of women or passive smokers are scant. Compared with Chinese men, few Chinese women smoke, except in Manchuria. According to the 1984 smoking survey in China, less than one in ten smokers were women (World Bank, 1992). However, the impact of more than 200 million male smokers on women's health are considerable. The fact that the leading cause of rural female deaths was respiratory diseases in 1994 suggests a public health issue related to smoking. Control of the future effects of current smoking habits, for smokers themselves as well as for passive smokers, should be a top priority in China.

● Of the 1.2 billion population in China only 260 million (22%) have medical health insurance (Cao, 1996). The majority of people in China, mainly those in rural areas, do not have adequate access to health care. A report in 1994 indicated that at least 80 million poverty-stricken people in China's rural areas had an annual income of less than 300 yuan (Wang, 1994) and lacked adequate food, clothing

and health care. In addition to long-term efforts devoted to development of a health insurance system in both urban and rural China, programs are needed to meet special needs of people in poverty including girls experiencing discrimination, poor mothers with young children, and elderly women without financial sources.

● The improvement of women's health conditions should be incorporated into programs for improving women's socioeconomic status. Numerous studies have shown that the key to improving women's socioeconomic status is education. Nevertheless, data of the 1990 census reveal that one of five children aged 6–14 in China was not attending school and 56% of them were females (Population Statistical Department of the State Statistical Bureau, 1993). Another report estimated that China had nearly 10 million school dropouts in 1995, the majority of being girls. Girls in rural China are often kept at home by parents to help with farming and other chores, so they receive minimal schooling (Tyler, 1995). An increase in female education will contribute to women's empowerment (United Nations, 1995b). Efforts should be directed to combat illiteracy and to provide universal access to equal education, especially for young women.

Health is a fundamental human right and enhancement of women's quality of life is the surest road to health for all (World Health Organization, 1995b). Despite the accomplishments in women's socioeconomic and health status, the goal of equality between women and men in China has not been reached. Achievement of full quality for women will demand tremendous effort, but its pursuit will have positive effects for the entire society and for the world, given China's enormous population.

Acknowledgements—An earlier version of this article was presented at the NGO Forum of the UN Fourth World Conference on Women, August 31–September 8, 1995, Huairou–Beijing, China. We wish to convey our appreciation to Dr. Deborah Oakley for reading our manuscript and offering invaluable comments. We are also grateful to Stuart Baggaley and Susan Frank for their editorial suggestions.

REFERENCES

- AbouZahr, C. and Royston, E. (1991) *Maternal Mortality: A Global Factbook*. World Health Organization, Geneva.
- Banister, J. (1984) An analysis of recent data on the population of China. *Population and Development Review* 10(2), 241–271.
- Banister, J. (1986) *China: Recent Trends in Health and Mortality*. Staff paper of the Center for International Research (CIR), No. 23, U.S. Bureau of the Census, Washington, DC.
- Banister, J. (1987) *China's Changing Population*. Stanford University Press, Stanford.
- Cao, Z. Y. (1996) China's health care for the 21st century. Paper presented at the 1996 Healthcare for the Twenty-First Century: Eastern and Western Perspectives, Springfield, IL, June 3–15.
- Chen, H. F. and Zhu, C. (eds) (1984) *Chinese Health Care, Volume 3 of Modern Chinese Medicine*. MTP Press, Lancaster.
- China Population Welfare Foundation (1995) "Programme of Happiness"—An Action to Help Impoverished Mothers. Organizing Committee of the "Programme of Happiness", Beijing.
- Christiani, D. C., Quinn, M. M., Wegman, D. H. and Levenstein, C. (1985) Problems of modernization and occupational health in the People's Republic of China. *Scandinavian Journal of Work, Environment and Health* 11(4), 5–6.
- Chun, C. (1996) Emergency appeal on unbalance of sex ratio in China. *China News Digest* 252, 5–7.
- Coale, A. J. (1984) Rapid population change in China, 1952–1982. Report No. 27, Committee on Population and Demography. National Academy Press, Washington, D.C.
- Coale, A. J. (1991) Excess female mortality and the balance of the sexes in the population: an estimate of the number of "missing females". *Population and Development Review* 17(3), 517–523.
- Coale, A. J. (1993) Mortality schedules in China derived from data in the 1982 and 1990 censuses. Working Paper No. 93-7, Office of Population Research, Princeton University. Princeton, New Jersey.
- Coale, A. J. and Banister, J. (1994) Five decades of missing females in China. *Demography* 31(3), 459–479.
- Coale, A. J. and Li, S. (1991) The effect of age misreporting in China on the calculation of mortality rates at very high ages. *Demography* 28(2), 293–301.
- Economic and Social Council (1992) *Report of the Working Group on Violence Against Women*. E/CN.6/WG.2/L.3, United Nations, Vienna.
- Editorial Committee (1992) *Demographic and Economic Data of the Underdeveloped Regions of China*. Beijing University Press, Beijing.
- Editorial Committee of Yearbook of Public Health in the People's Republic of China (ECYPHPRC) (1990) *Yearbook of Public Health in the People's Republic of China 1990*. The People's Medical Publishing House, Beijing.
- Editorial Committee of Yearbook of Public Health in the People's Republic of China (ECYPHPRC) (1991) *Yearbook of Public Health in the People's Republic of China 1991*. The People's Medical Publishing House, Beijing.
- Editorial Committee of Yearbook of Public Health in the People's Republic of China (ECYPHPRC) (1992) *Yearbook of Public Health in the People's Republic of China 1992*. The People's Medical Publishing House, Beijing.
- Editorial Committee of Yearbook of Public Health in the People's Republic of China (ECYPHPRC) (1995) *Yearbook of Public Health in the People's Republic of China 1995*. The People's Medical Publishing House, Beijing.
- Hao, H. S., Arriaga, E. and Banister, J. (1988) An analysis of provincial mortality of China. *Population Research (Renkou Yanjiu)* 4, 1–10.
- Heise, L. L., Pitanguy, J. and Germain, A. (1994) Violence against women: the hidden health burden. *World Bank Discussion Papers* 255, 3–13.
- Hull, T. H. (1990) Recent trends in sex ratios at birth in China. *Population and Development Review* 16(1), 63–83.
- Jamison, D. T., Evans, J. R., King, T., Porter, I., Prescott, N. and Prost, A. (1984) *China: The Health Sector*. A

- World Bank Country Study. The World Bank, Washington, DC.
- Johansson, S. and Hygren, O. (1991) The missing girls of China: a new demographic account. *Population and Development Review* 17(1), 35–51.
- Johnson, K. (1996) The politics of infant abandonment in China. *Population and Development* 22(1), 77–98.
- Lawson, J. S. (1994) Health status differentials in the People's Republic of China. *American Journal of Public Health* 84(5), 737–741.
- Levine, S. (1996) *Industrial Growth and China's Occupational Health*. University of Michigan, Ann Arbor, MI.
- Li, G. and Baker, S. P. (1991) A comparison of injury death rates in China and the United States, 1986. *American Journal of Public Health* 81(5), 605–609.
- Li, S. Z. (1994) Changes of mortality levels and patterns in the 1980s in China. *Population Research (Renkou Yanjiu)* 2, 37–44.
- Liu, Z. (1985) General situation of population development in new China. *Almanac of China's Population* 1985, 186–193.
- Lu, L. and Wei, X. (1990) The abridged life tables in China in 1990. *Population Research (Renkou Yanjiu)* 1, 63–64.
- Morris, M. D. (1979) *Measuring the Condition of the World's Poor: The Physical Quality of Life Index*. Published for the Overseas Development Council, Pergamon Press, New York.
- Pearson, V. (1995) Goods on which one loses: women and mental health in China. *Social Science & Medicine* 41(8), 1159–1173.
- Peng, X. (1987) Demographic consequences of the Great Leap Forward in China's provinces. *Population and Development Review* 13(4), 639–670.
- Peto, R. (1994) Smoking and death: the past 40 years and the next 40. *British Medical Journal* 309, 937–939.
- Population Census Office of China (1993a) *Tabulation of the 1990 Population Census of the People's Republic of China*, Vol. 2. China Statistics Press, Beijing.
- Population Census Office of China (1993b) *Tabulation on the 1990 Population Census of the People's Republic of China*, Vol. 4. China Statistics Publishing House, Beijing.
- Population Statistical Department of the State Statistical Bureau (1989) *China Population Statistics Yearbook 1989*. Scientific and Technological Documents Publishing House, Beijing.
- Population Statistical Department of the State Statistical Bureau (1993) *China Population Statistics Yearbook 1993*. China statistical Publishing House, Beijing.
- Poston, D. J. (1990) Patterns of infant mortality in China. Population and Development Program, 1990 Working Paper Series 2.19, Cornell University.
- Quinn, M. M., Punnett, L., Christiani, D. C., Levenstein, C. and Wegman, D. H. (1987) Modernization and trends in occupational health and safety in the People's Republic of China 1981–1986. *American Journal of Industrial Medicine* 12, 499–506.
- Riley, N. (1996) China's "missing girls": prospects and policy. *Population Today* February, 4–5.
- Shanghai International Center for Population Communication, China, and Jiafu Information Dissemination Center of China (1995) *Women and Family Planning in China*. Shanghai International Center for Population Communication, China, and Jiafu Information Dissemination Center of China, Shanghai.
- Skolnick, A. A. (1996) Answer sought for "Tobacco Giant" China's problem. *American Medical Association* 275(16), 1220–1221.
- Statistical Bureau of the Republic of China (Guo Min Zheng Fu Zhu Ji Chu) (1971) *China's Population Statistics*. Xuehai Publishing House, Taipei.
- Statistical Bureau of the Republic of China (Guo Min Zheng Fu Zhu Ji Chu) (1973) *Statistics and Analysis on China's Population Issues*. Zhongshan Tu Shu Company, Hong Kong.
- Tien, H. Y., Zhang, T. L., Ping, Y., Li, J. N. and Liang, Z. T. (1992) China's demographic dilemmas. *Population Bulletin* 47(1), 12–14.
- Tyler, P. (1995) China's country schools are failing. *New York Times* 31 December, 5.
- United Nations (1961) *1961 Demographic Yearbook*, 13th edn. United Nations, New York.
- United Nations (1973) *The Determinants and Consequences of Population Trends: New Summary of Findings on Interaction of Demographic, Economic and Social Factors*, Vol. 1. United Nations, New York.
- United Nations (1994) *World Population 1994*. United Nations, New York.
- United Nations (1995a) *1993 Demographic Yearbook*, 45th edn. United Nations, New York.
- United Nations (1995b) *Summary of the Programme of Action of the International Conference on Population and Development*. United Nations, New York.
- United Nations Development Programme (1995) *Human Development Report 1995*. Published for the United Nations Development Programme, Oxford University Press, New York.
- United Nations Educational, Scientific and Cultural Organization (UNESCO) (1993) *World Education Reports 1993*. UNESCO, France.
- Wang, X. (1994) China strives to eradicate poverty. *Beijing Review* 37(20), 7–12.
- Wang, Y., Becker, S., Chow, L. P. and Wang, S. X. (1991) Induced abortion in eight provinces of China. *Asia-Pacific Journal of Public Health* 5(1), 32–40.
- Women's Research Institute of China Academy of Management Science (1995) *Women Studying the Female Gender, Women Helping Women*. Women's Health Institute, Beijing.
- World Bank (1992) *China: Long-term Issues and Options in the Health Transition. A World Bank country study*. World Bank, Washington, DC.
- World Bank (1993a) *The World Bank Atlas 1994*. World Bank, Washington, DC.
- World Bank (1993b) *World Development Report 1993: Investing in Health*. Published for the World Bank, Oxford University Press, Oxford.
- World Health Organization (1995a) *The World Health Report 1995—Bridging the Gaps*. World Health Organization, Geneva.
- World Health Organization (1995b) *Women's Health: Improve our Health Improve the World*. World Health Organization position paper, World Health Organization, Geneva.
- Xinhua News Agency (1994) Law on maternal, infant health care reported. *Daily Report, China* 1 November, 29.
- Xu, B. Z., Rimpela, A., Jarvelin, M. R. and Nieminen, M. (1994) Sex difference of infant and child mortality in China. *Scandinavian Journal of Social Medicine* 22(4), 242–248.
- Young, M. E. and Prost, A. (1985) *Child Health in China*. World Bank staff working paper no. 767, World Bank, Washington, DC.
- Yu, M. Y. and Sarri, R. (1995) Trends in women's health status in China: 1950 s–1990. Paper presentation at the NGO Forum of the UN Fourth World Conference on Women, August 30–September 8, Huairon–Beijing, China.
- Yu, M. Y., Liang, J. and Gu, S. Z. (1988) Family support of elderly women in Hubei, China. Paper pre-

- sented at the 41st Annual Scientific Meeting of the Gerontological Society of America, November 18–22, San Francisco.
- Zeng, Y., Tu, P., Gu, B. C., Xu, Y., Li, B. H. and Li, Y. P. (1993) Causes and implications of the recent increase in the reported sex ratio at birth in China. *Population and Development Review* **19**(2), 283–302.
- Zhai, Z. W. (1993) An adjustment of 1990's IMR and an estimation of life table. *Population Research (Renkou Yanjiu)* **2**, 9–16.