

Xiaoying ZHENG, "Regional Difference of Population Life Expectancy in China", CICRED Seminar on *Mortality as Both a Determinant and a Consequence of Poverty and Hunger*, Thiruvananthapuram, India, February 23-25, 2005, pp. 1-26.

Draft paper before publication, please do not use it as reference

Regional Differences of Population Life Expectancy in China

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(This is first draft so that don't cite it as reference currently. I will modify the details after meeting)

Abstract: With census 1982, 1990 and 2000 data, the research included analyzing life expectancy trends and regional disparities since 1980s, and attempt to understand socioeconomic characters that affect the regional disparity. The results revealed that prominent regional disparities are screened from relevantly high average life expectancy. During the past two decades, regional disparities are enlarged with improvement of average life expectancy. The research results reveal that economic characters are most significant factors to regional disparity of both female and male population mortality. West and poor areas and remote areas collect lowest average life expectancy, where poverty is none the less most important obstacle to further life expectancy improvement. Culture and education character is second important factor to regional disparity of mortality. Female education level is especially important to regional disparity not only of female population, but also of male population. Basic sanitary conditions take effect on regional disparity of mortality level to some extent. As far as female mortality disparity among areas is concerned, fertility level has close relationship with mortality level. All the result indicate that education improvement in less developed areas, basic sanitary facility supplementation, such as toilet, gas and electricity substitution for traditional fuel step by step will take effect on regional disparity diminution and female average life expectancy improvement.

During the second half of 20th century, the development in the field of family planning, immunization, primary health care, nutrition improvement, infectious disease control, education, sanitation housing and so on result in marketable improvement of health status and average life expectancy. The achievement is praised as First Sanitation Revolution, for the exceeding attribute from economic development. Although the great accomplishment achieved in population health, severer imbalance of social development among geographic expansion leded to health disparities existing not only between urban-rural areas and wealthy-poverty areas, but also diversified socioeconomic hierarchies in same geographic area. For example, the health problems of poor population in urban city and specific floating population are questions for discussion.

Average life expectancy is a key index of social development, because it can reflect the changes of mortality level and patterns and health pattern to some extent. With continuous increase of life expectancy after 1980s, the predominated regional disparities of life expectancy are enlarged, but not shrink. With census 1982, 1990 and 2000 data, the research included analyzing life expectancy trends and regional disparities since 1980s, and attempt to understand socioeconomic characters that affect the regional disparity.

Data source and mortality data adjustment

The data in this paper come mainly from the Chinese third, fourth and fifth census (State Department of China Population Census Bureau and State Statistical Bureau Population Statistical Department, 1985, 1993, 2002). In this paper, the data which come from corresponded years survey of Taiwan is included, but not including the data of Hong Kong and Macao. The three censuses provided specific data base for the research of the recent 20 years mortality level of China. Although there is some degree of failing to report mortality, mortality data from different point of time basically reflect the mortality level at that time.

We must evaluate the quality of the several Chinese censuses and every provinces mortality data before analyzing the trend of population expectation changing and regional differences. At the same time, the unifying method which be used to adjust and correct data should be used to ensure the comparison of the different point times. There are many methods to adjust and correct the mortality, and a few of scholars have evaluated the integrality of the third and fourth census mortality data. The existing literatures indicate that the quality of the Chinese third census mortality data is better and could be used in analyzing research without any adjust before (You, 1984; Jiang etc., 1984). The quality of 1990 census mortality data, as some scholars studied, have some degree of failing to report, especially the data of infant mortality (Zhang etc., 1992; Zhai, 1993; Sun, 1993). In this paper, the life-table models are used to revise the mortality data. By comparison and observation of the census data and 14 kinds of model life table (the east, south, west, and north model of the Princeton model life table; the general, far-east, Chile, south Asia and Latin America model life table of the developing countries; the South-west, Huazhong, Huadong, North-east and Sinkiang model life table) (the committee of model life table, 1991; Coale, Ansley and Paul Demeny, 1969; United Nations, 1982), the west life model was selected as the standard of the revision.

The outcome and discussion

1. The increasing of the life expectancy

As the life expectancy is a synthetical index to estimate mortality level of a population without the influence of the difference of age structure, the comparison could be made in different time, places and population. The U.N. soft wares of calculating the mortality were used to compile the 1981, 1989 and 2000 sex-specified life table (U.N., 1988; the health research team of PKU, 2004), and three years sex-specified average life expectancy at birth and five average left-lives of special ages are obtained. As showed in table 1 and table 2.

In table 1, the average life expectancy of male are 66.6, 67.9 and 70.0 in 1981, 1989 and 2000 respectively. Accordingly, the female life expectancy are 68.08, 71.1 and 73.5. In 1980s, the life expectancy at birth have increased dramatically, and the life expectancies of male and female in 2000 increase by 3.4 and 4.7 years

than those in 1981.

The increase speed of male life expectancy in 1990s was slightly higher than that in 1980s. The average amount of increase in 1980s and 1990s are 0.17 and 0.19, but the female average amount (0.22) of increase in life expectancy in 1990s was smaller than that in 1980s which was 0.29. According to the experience of the population transition of other countries, when the average life expectancy reaches certain level, it would have the trend to decrease. The United Nations experimental data show when the average life expectancy reaches 67.5-70.0, the male average life expectancy increases 0.75 per five years and the female average life expectancy increases 1.8 per five years. And when the average life expectancy gets to 70-72.5, the increase of average life expectancy of male and female per five years are 0.5 and 1.4. From this point of view, the female average increasing speed of life expectancy from 80s is comparatively in certain degree. No matter what in 1980s and 1990s, the female average life expectancy higher than that of male. And just for this, the average life expectancy between male and female broaden from 1980s. The female average life expectancy at birth only 2.2 years higher than that of male in 1981, but in the end of 1980s, the difference extended to 3.1 years, and it reached 3.5 years by the end of 1990s.

It was very similar between the mortality level in China from 80s and the European, American countries from 50s to 70s. At the beginning of the 1950s, the western European male and female average life expectancy is 68 and 72, then, the average life expectancy increased to 68 and 75 at the beginning of the 70s. The north European the average life expectancy increased to 69 and 76, North America 68 and 76 (United Nations, 2001). In the 20 years, the average life expectancy in west European increased 3 and 5 years, comparatively the north European and North American increased 2 and 4 years. The discrepancy between male and female in west European, north European and North American from 50s to 70s took on the trend of expansion, for the difference between male and female in west European, north European and North American are 3, 5 and 4 years, but in 70s they expanded to 7 years. But the female average life expectancy of China in 1981 and 2000 lower than the three regions from 50s to 70s, accordingly, the discrepancy of average life expectancy between male and female in China were also lower than European and American.

2. Regional difference of average life expectancy in China

Findings of the research reveal that predominate regional disparities and further improvement of life expectancy coexist for the time being. The disparities of life expectancy reflect the expectancy of natural resources, geographic characters, socioeconomic and culture development among diversified provinces to some extent.

Evaluated and adjusted age-specific mortality result in life expectancy at birth since 1980s, sorted by primarily adjusted female life expectancy (See Table 3). Regional disparities of mortality level are predominant. Shanghai, Beijing, Tianjin and Taiwan province have lowest mortality rate, whose life expectancy at birth for male is 72-77 and for female is 77-81, and infant mortality is only around 10%, according to census 2000 data. Highest mortality rate appear in west-south provinces, Tibet, Yunnan and Guizhou provinces included, whose life expectancy at birth for male is only 62-66 and for female is only 64-69, and infant mortality is as high as 50-70%.

The adjusted data and Table 3 show that, mortality decline in large step in all provinces since 1980s. Half of all the provinces have less than 70-years life expectancy for female population in 1981 and only one thirds

of all provinces rested on this level. In 1981, only three provinces exceeded 70 years for male life expectancy, while only 5 in 1989 that reached this level. However, one thirds of all provinces have oncoming or over 75-year for female life expectancy, especially Shanghai reached 80.8, and only three provinces have life expectancy no more than 70 years old. Shanghai, Beijing and Tianjin have male life expectancy in excess of 74, while half of all provinces have higher life expectancy than average for male and only Yunna and Tibet is under 65 years old.

As adjusted life expectancy data have revealed, about half of all provinces have higher life expectancy than average and half under average in 2000, 1989 and 1981, both for female and for male. Among all provinces, besides Shanghai, Beijing, Taiwan and Tianjin, Liaoning, Jiangsu, Hebei and Shandong province have lowest mortality levels for the previous three census, whose life expectancy for female are all over 75 years old. On the contrary, Tibet, Yunnan, Qinghai, Guizhou, Sinkiang, Ningxia and Sichuan have highest mortality level for previous three census, Chongqing included, which are all seated at west and south of China. The difference of mortality level between the highest and the lowest might result from geographic characters, for the fact that the provinces with lowest mortality are all seated at eastern coast. During the period of 1981 to 2000, life expectancy in each province increase by 2.6 to 5.6 years. Amplitude for female is larger than for male, which is about 2.7 to 5.5 years. As a matter of fact, two thirds of provinces have amplitude of 3.3 to 4.5 years, while corresponding figure for female is 3.7 to 5.1 years. The provinces that have higher mortality will not have larger amplitude for sure. However, the provinces that have lower mortality will not have smaller amplitude. No definite pattern exists for the time being. When it comes to the gender disparity, amplitude for female is larger than for male, which enlarges the life expectancy disparity between male and female. The number of provinces that have larger gender disparity than 3 years is only 10 in 1981, which increased to 17 in 1989 and 25 in 2000. The largest gender disparity appeared in Taiwan province, which is 5.7 years in 2000, 5.4 and 5.2 years in 1989 and 1981 respectively. The smallest gender disparities appeared in Tibet and Yunna. Corresponding figure for Tibet in 2000 is only 2.5 and for Yunnan is 2.1 in 1989.

The life expectancies at birth of the 32 provinces in 2000 can be grouped into 4 categories. The first category contains Shanghai, Beijing and Tianjin, with a life expectancy at birth above 74 years for males and 77 year for females. The life expectancy in these 3 regions has reached the level of the developed countries. The life expectancy at birth in Shanghai is the highest in China, being 77 years for males and 80.8 years for females in 2000. The second category includes Jiangsu, Liaoning, Hebei, Jilin, Heilongjiang, Shandong, Zhejiang, Guangdong, Henan and Shanxi, with life expectancy between 70-72 years for males and 73-76 years for females. The third category includes Anhui, Fujian, Inner Mongolia, Shannxi, Jiangxi, Gansu, Hubei, Hunan, Hainan, Guangxi, Ningxia, Sichuan and Xinjiang, with life expectancy between 68-70 years for males and 70-73 years for females. The forth category includes Guizhou, Yunnan and Tibet, with life expectancy between 62-68 years for males and 64-70 years for females. The life expectancy at birth of Tibet is the lowest in China, only 61.6 years for males and 64.1 years for females in 2000. In addition, Chongqing and Qinghai males also belong to the forth category but their females belong to the third category (See Figure 1 and 2).

The life expectancy of different provinces increased differently in 1981-2000. Table 4 has the list of average life expectancy for male and female during the period of 1981 to 2000 in all the provinces, Chongqing, Hainan and Tibet province excluded. From 1981 to 2000, Shanghai experienced the most significant increase in life expectancy for males, increased 5.6 years and Hebei experienced the smallest increase for males, only 2.6 years. For females, Heilongjiang has experienced the biggest increase of 5.5

years and Guangxi had the smallest increase of only 2.7 years.

The regional disparity was quite large although all the provinces have experienced some increases in life expectancy. If Chongqing, Hainan and Tibet are excluded because no separate mortality data are available for them in 1981, the life expectancy of Shanghai was then the highest among all provinces in 1981, being 71.4 years for males and 75.4 years for females and Guizhou had the lowest life expectancy for males (62.5 years) and Yunnan had the lowest life expectancy for females (62.7 years old). The gap of life expectancy between the highest and the lowest was 8.9 years for males and 12.7 years for females. In 2000, the life expectancy of Shanghai was the highest among the provinces, being 77.0 years for males and 80.8 years for females, while the life expectancy of Yunnan was the lowest with 64.8 for males and 67.8 for females. The gap was 12.2 years for males and 13.0 years for females. Obviously, the regional disparity of life expectancy is very large, especially for male.

3. Changes of age-specific mortality on provincial expectances

The analysis of provincial adjusted census expectances clearly displays different effect that the decline of age-specific mortality takes on improvement of average expectance. In 1981-2000, amplitude of average expectance in China is 3.44 years for male and 4.74 years for female. Most of provinces have more than 3 years of amplitude. 21 provinces have higher expectance than average for male, 13 provinces for female. To be more specific, the provinces of Taiwan, Beijing, Tianjin, Shanxi, Liaoning, Fujian, Hubei, Hunan, Sichuan, Yunnan and Shaanxi etc. have highest amplitude for male expectance, while Beijing, Tianjin, Shanxi, Inner Mongolia, Liaoning, Jilin, Heilongjiang, Shanghai, Hubei, Hunan, Sichua, Yunnan and Shaanxi etc. have highest amplitude for female expectance. No obvious difference exists in the contribution of decline of age-specific mortality to general expectance improvement between male and female. On the contrary, the declines of mortality in various age groups affect general expectance improvement to different extent. For example, the decline of mortality of those who are under 14 years old has first importance to expectance improvement, mortality of those who are over 60 years old take second importance, while other age groups have relatively less importance. (See Table 5 and 6)

Assume census 1990 as analysis midpoint, variation difference of age-specific mortality is visible between the period of 1981-1989 and 1989-2000. As time pass by from one period to the other, the importance of declining mortality of those who are under 14 years old is dominating although flagging. At the same time, declining mortality of the elderly and middle aged adult is augmenting expectance improvement. During the period of 1981-1989, 23 provinces have improved expectance for more than 1.38 years, which is average amplitude of the whole country. Yunnan province even has highest amplitude of all provinces for 3.1 years. Comparison of different variation of age-specific mortality reveals more than 50% contributors of 18 provinces are from declining children mortality while there are only four provinces of Beijing, Tianjin, Shanghai, Taiwan where the declining elderly mortality contributes more to amplitude of expectance(contribution factors are larger than 40%). The contribution of declining mortality of younger adult is not so obvious except in Jiangxi, Shandong, Heinan, Guangxi and Ningxia province whose correspondent contribution factors vary from 10 to 15%. In addition, contribution patterns of female and male age-specific mortality are identical while most provinces, except Xinjiang, Yunnan and Fujian, have higher amplitude of expectance for female than for male population. 12 provinces have higher amplitudes of expectance than average level. In 22 provinces, children mortality decline has predominant influence on expectance amplitude. Shanghai, Taiwan, Beijing and Tianjing have sequent significant contribution from

elderly mortality to life expectancy improvement. In the year 1989 to 2000, life expectancy in all provinces have further increase, however, the increase pattern is changing obviously due to changing age-specific mortality patterns. Most provinces have relatively less significant contribution from children mortality but more significant from elderly mortality, as Shanghai, Beijing, Tianjin, Taiwan and Liaoning for example. When it comes to male population, Guangdong, Tibet, Guizhou, Jilin, Sinkiang, Hubei and Qinghai have significant influence from children mortality on life expectancy changes. As far as female population is concerned, only Guangdong, Tibet, Hunan, Anhui, Hubei, Guangxi and Zhejiang have significant contribution from children mortality. Specific provinces have significant contribution from middle aged mortality, such as male population in Fujian, Henan, Jiangxi, Taiwan, Hebei and Liaoning province and female population in Inner Mongolia, Liaoning, Jilin and Gansu province.

In conclusion, the comparison of age-specific mortality pattern changes in specific provinces between 1980s and 1990s reveals that life expectancy improvement contributes more to younger mortality decline in 1980s, while contributes more to elderly mortality decline in 1990s. The provinces seated at the eastern coast have faster transition than average level.

4. Socioeconomic factors multianalysis of regional difference of life expectancy

The multianalysis in the research takes average life expectancy at birth for both female and male population in each province as dependent variable, and GDP per capita, female illiteracy rate, proportion of seminar middle schooled on population over 6 years old, urban/county population proportion, proportion of household without toilet, or without bathing facility, or without tap water, or without gas and electricity as fuel, hospital beds per 10,000, and health personnel number per 10,000 as independent variables. When it comes to the female average life expectancy multianalysis, total fertility rate is an additional independent variable.

Table 7 indicates that economy, culture and education and basic sanitary facility is the most important factors that affect female regional disparities of average life expectancy. The four variables entered into the regression function can explain about 92% of the regional disparities. The most significant factor is regional economic status and female education level to be continued. The results from Table 7 also display positive relation between fertility level and female average life expectancy, which indicate that education improvement in less developed areas, basic sanitary facility supplementation, such as toilet, gas and electricity substitution for traditional fuel step by step will take effect on regional disparity diminution and female average life expectancy improvement.

Table 8 takes male average life expectancy as dependent variable in multianalysis and results in the same conclusion. Economic character is none the less most important to mortality levels. It is notable that female education level is more significant to regional disparity of male average life expectancy than entire education level.

West and poor areas and remote areas collect lowest life expectancy for whole country. Regression above revealed economic characters as most significant to average life expectancy, which draw the conclusion that poverty is the key obstacle to further life expectancy improvement in the long run. West areas in China include ten provinces, whose land account for 56.8% for whole country and population account for 23% for whole population. 307 of the 592 national recognized poor counties are sited at west areas, whose

socioeconomic status, education and health care status are all relatively less developed than developed areas. Taking Guizhou, Gansu, Qinghai, Ningxia and Sinkiang province as representatives, poor areas have lower GDP per capita and correspondently higher illiteracy proportion in population at and over 15 years old, Sinkjiang excluded (See Table 9). The index representing economy, education, health status and human general development, such as life expectancy, education index, GDP, human development index, are lower in west areas than in east areas (See Figure 3). Mortality in lower aged group, especially infant mortality has large impact on life expectancy. Infant mortality in west areas in China is notably higher than average level, which reflects health potential in early stage of life in these areas is relatively weak. Life quality, low birth weight and children undernourishment problems in remote and poor rural areas are unconventionally prominent. In relatively field surveys, birth defects that cause disability and idiot are comparatively high in Shanxi and Guizhou province.

Conclusion

Research outcomes revealed that prominent regional disparities are screened from relatively high average life expectancy. During the past two decades, regional disparities are enlarged with improvement of average life expectancy. The research results reveal that economic characters are most significant factors to regional disparity of both female and male population mortality. West and poor areas and remote areas collect lowest average life expectancy, where poverty is none the less most important obstacle to further life expectancy improvement. Culture and education character is second important factor to regional disparity of mortality. Female education level is especially important to regional disparity not only of female population, but also of male population. Basic sanitary conditions take effect on regional disparity of mortality level to some extent. As far as female mortality disparity among areas is concerned, fertility level has close relationship with mortality level. All the result indicate that education improvement in less developed areas, basic sanitary facility supplementation, such as toilet, gas and electricity substitution for traditional fuel step by step will take effect on regional disparity diminution and female average life expectancy improvement.

表 1 中国分年龄,分性别平均预期余寿(岁),1981,1989,2000

Table 1: life expectancy by age, sex in china, 1981,1989,2000

年龄(岁) (age)	不同年龄时的平均预期寿命(岁) (LE by age)					
	男 性(male)			女 性(female)		
	1981	1989	2000	1981	1989	2000
0	66.56	67.94	70.00	68.76	71.07	73.50
15	55.86	56.57	58.01	58.31	59.74	61.56
30	41.85	42.56	43.97	44.26	45.57	47.10
45	28.12	28.80	30.18	30.48	31.52	32.85
60	16.14	16.64	17.65	17.90	18.64	19.62

表 2 80年代和90年代中国人口平均预期寿命的年平均增长量

Table 2 average LE annual growth in 1980s and 1990s, China

年龄(岁) (age)	男 性(male)		女 性(female)	
	80年代(1980s)	90年代(1990s)	80年代 (1980s)	90年代 (1990s)
	0	0.17	0.19	0.29
15	0.09	0.13	0.18	0.17
30	0.09	0.13	0.16	0.14
45	0.09	0.13	0.13	0.12
60	0.06	0.09	0.09	0.09

表 3 各省市自治区初步修正后男女出生时预期寿命按女性预期寿命排序 1981, 1989, 2000

Table 3 Adjusted LE at birth by sex, province (sorted by female LE), 1981, 1989, 2000

	2000		1989			
	男	女	男	女		
	(male)	(female)	(male)	(female)		
上海(Shanghai)	77.0	80.8	上海(Shanghai)	73.5	77.4	上海(Shanghai)
北京(Beijing)	74.7	78.5	台湾(Taiwan)	70.2	75.6	台湾(Taiwan)
台湾(Taiwan)	71.9	77.6	北京(Beijing)	72.3	75.5	北京(Beijing)
天津(Tianjin)	74.0	77.5	天津(Tianjin)	71.7	74.0	江苏(Jiangsu)
辽宁(Liaoning)	71.9	75.7	江苏(Jiangsu)	69.5	73.8	天津(Tianjin)
江苏(Jiangsu)	71.9	75.5	山东(Shandong)	69.0	73.2	山东(Shandong)
河北(Hebei)	71.3	75.2	河北(Hebei)	70.0	73.1	河北(Hebei)
吉林(Jilin)	71.3	74.9	浙江(Zhejiang)	69.0	73.0	辽宁(Liaonig)

山东(Shandong)	70.9	74.8	辽宁(Liaoning)	69.8	72.9	浙江(Zhejiang)
黑龙江(Heilongjiang)	70.9	74.8	吉林(Jilin)	69.7	72.4	广东(Guangdong)
浙江(Zhejiang)	70.7	74.6	河南(Henan)	68.3	72.0	河南(Henan)
广东(Guangdong)	70.3	73.6	黑龙江(Heilongjiang)	68.9	71.9	吉林(Jilin)
山西(Shanxi)	70.2	73.1	广东(Guangdong)	68.6	71.8	广西(Guangxi)
河南(Henan)	70.3	73.1	山西(Shanxi)	68.2	71.1	黑龙江(Heilongjiang)
安徽(Anhui)	69.9	72.7	江西(Jiangxi)	67.7	71.0	福建(Fujian)
福建(Fujian)	69.8	72.7	安徽(Anhui)	68.2	71.0	安徽(Anhui)
内蒙(Inner Mongolia)	69.8	72.6	广西(Guangxi)	67.0	70.9	江西(Jiangxi)
陕西(Shanxi)	69.7	72.6	海南(Hainan)	67.1	70.8	山西(Shanxi)
湖南(Hunan)	69.2	72.4	陕西(Shanxi)	67.3	70.5	内蒙(Inner Mongolia)
湖北(Hubei)	69.2	72.4	福建(Fujian)	67.6	70.4	甘肃(Gansu)
江西(Jiangxi)	69.5	72.4	内蒙(Inner Mongolia)	68.3	70.0	湖南(Hunan)
海南(Hainan)	69.1	72.3	甘肃(Gansu)	67.3	69.8	陕西(Shanxi)
广西(Guangxi)	69.0	72.2	湖南(Hunan)	66.7	69.8	宁夏(Ningxia)
甘肃(Gansu)	69.2	72.1	四川(Sichuan)	66.5	69.3	新疆(Xinjiang)
四川(Sichuan)	68.4	71.7	湖北(Hubei)	66.3	69.3	湖北(Hubei)
宁夏(Ningxia)	68.8	71.6	宁夏(Ningxia)	67.0	69.2	四川(Sichuan)
重庆(Chongqing)	67.9	71.6	新疆(Xinjiang)	66.5	68.7	青海(Qinghai)
新疆(Xinjiang)	68.3	71.4	青海(Qinghai)	64.9	68.1	贵州(Guizhou)
青海(Qinghai)	66.9	70.5	贵州(Guizhou)	64.5	67.4	云南(Yunnan)
贵州(Guizhou)	66.3	69.3	云南(Yunnan)	63.6	65.7	海南(Hainan)
云南(Yunnan)	64.8	67.8	西藏(Tibet)	59.8	62.2	西藏(Tibet)

西藏(Tibet)	61.6	64.1	重庆(Chongqing)	---	---	重庆(Chongqing)
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资料来源: 作者计算

Sources: Calculated by author

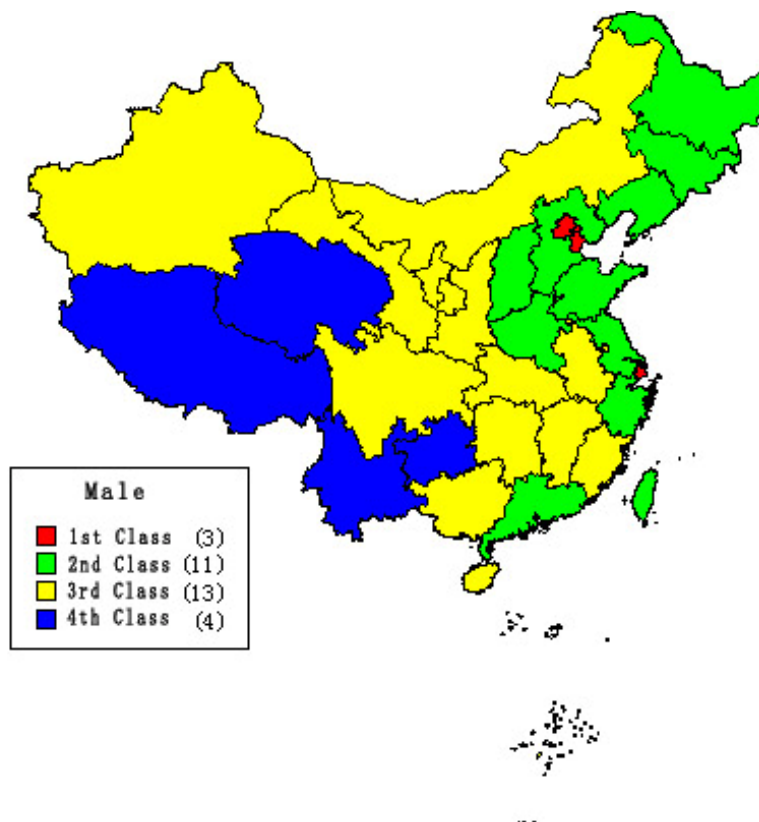


图1 各省市出生时平均预期寿命分类,男性,2000

Figure 1 Average LE at birth by province and level, male, 2000

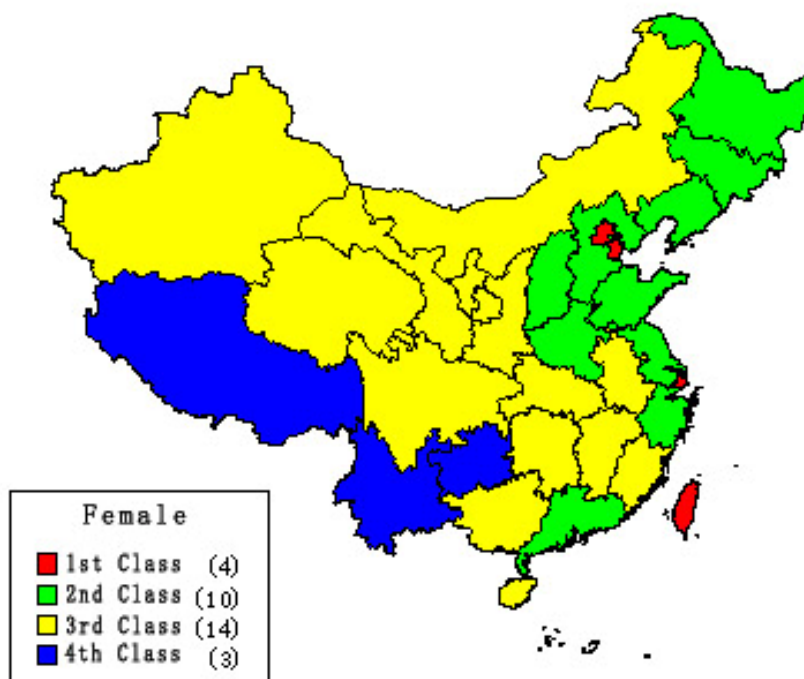


图2 各省市出生时平均预期寿命分类,女性,2000

Figure 2 Average LE at birth by province and level, female, 2000

表 4 各省市自治区 1981-2000 年出生时的平均预期寿命的增量 (岁)

Table4 Average LE at birth growth by province, 1981-2000

男 性 (Male)				
第一组(Group 1)	第二组 (Group 2)	第三组 (Group 3)		
上海(Shanghai)5.6	黑龙江(Heilongjiang) 3.9	河南(Henan) 3.3		
湖北(Hubei) 4.6	天津(Tianjin) 3.9	广东(Guangdong) 3.2		
四川(Sichuan) 4.6	内蒙(Inner Mongolia) 3.9	青海(Qinghai) 3.2		
陕西(Shanxi) 4.5	贵州(Guizhou) 3.8	广西(Guangxi) 3		
辽宁(Liaoning)4.4	宁夏(Ningxia) 3.8	山东(Shandong) 3		
云南(Yunnan) 4.3	江苏(Jiangsu) 3.7	河北(Hebei) 2.6		
湖南(Hunan) 4.2	浙江(Zhejiang) 3.7			
山西(Shanxi) 4.1				
福建(Fujian) 4.1	甘肃(Gansu) 3.6			
北京(Beijing) 4.0	江西(Jiangxi) 3.6			
	新疆(Xinjiang) 3.6			
	安徽(Anhui) 3.4	吉		
	林(Jilin) 3.4	林		
女 性(Female)				
第一组(Group 1)	第二组 (Group 2)	第三组 (Group 3)	第四组(Group 4)	
黑龙江(Heilongjiang) 5.5	湖南(Hunan) 4.9	山西(Shanxi) 4.6	江苏(Jiangsu) 3.4	
湖北(Hubei) 5.5	吉林(Jilin) 4.9	新疆(Xinjiang) 4.5	广东(Guangdong) 3.3	
四川(Sichuan) 5.4	内蒙(Inner Mongolia) 4.8	甘肃(Gansu) 4.4	山东(Shandong) 3.2	
	青海(Qinghai) 4.8			
天津(Tianjin) 5.4		贵州(Guizhou) 4.4	河南(Henan) 3.1	
			广西(Guangxi) 2.7	

上海(Shanghai)	5.4	宁夏(Ningxia)	4.4
陕西(Shanxi)	5.2	浙江(Zhejiang)	3.9
北京(Beijing)	5.1	河北(Hebei)	3.7
云南(Yunnan)	5.1	安徽(Anhui)	3.6
辽宁(Liaoning)	5.0	福建(Fujian)	3.6
		江西(Jiangxi)	3.6

安徽	1.805	52.3	0.275	8.0	0.143	4.1	0.456	13.2	0.775	22.4	3.46	100.0
Anhui												
福建	1.593	38.9	0.432	10.6	0.392	9.6	0.845	20.8	0.813	20.0	4.07	100.0
Fujian												
江西	1.406	38.8	0.429	11.8	0.194	5.4	0.742	20.4	0.857	23.6	3.63	100.0
Jiangxi												

资料来源：作者计算

Sources: calculated by author

表 5 (续) 分省各年龄组在总人口预期寿命(死亡水平)变化中所占百分比, 男性, 1981 - 2000

Table5 percent of LE changes by province and age group, male, 1981-2000 (continued)

地 区 region	15 岁以下(under 15)		15 - 29		30 - 44		45-59		60+		合 计 Total	
	预期寿命差(岁) LE changes	百分比(%)	预期寿命差(岁) LE changes	百分比 (%)	预期寿命差(岁) LE changes	百分比 (%)	预期寿命差(岁) LE changes	百分比 (%)	预期寿命差 (岁)	百分比 (%)	预期寿命差(岁) LE changes	百分比 (%)
山东 Shandong	1.123	37.2	0.243	8.1	0.192	6.4	0.505	16.7	0.954	31.6	3.02	100.0
河南 Henan	1.647	49.7	0.277	8.3	0.130	3.9	0.624	18.8	0.637	19.2	3.32	100.0
湖北 Hubei	2.346	51.4	0.472	10.3	0.426	9.3	0.583	12.8	0.738	16.2	4.57	100.0
湖南 Hunan	1.974	47.3	0.430	10.3	0.352	8.4	0.443	10.6	0.974	23.3	4.17	100.0
广东 Guangdong	1.979	60.7	0.143	4.4	0.250	7.7	0.334	10.2	0.555	17.0	3.26	100.0
广西 Guangxi	1.036	34.6	0.331	11.1	0.193	6.5	0.546	18.2	0.885	29.6	2.99	100.0
四川 Sichuan	2.571	56.6	0.199	4.4	0.285	6.3	0.586	12.9	0.903	19.9	4.54	100.0
贵州 Guizhou	1.828	47.1	0.214	5.5	0.281	7.2	0.614	15.8	0.944	24.3	3.88	100.0

云南	2.954	69.6	0.212	5.0	0.118	2.8	0.190	4.5	0.769	18.1	4.24	100.0
Yunnan												
西藏												
Tibet												
陕西	2.398	53.7	0.167	3.7	0.254	5.7	0.659	14.8	0.989	22.1	4.47	100.0
Shanxi												
甘肃	1.921	54.1	0.137	3.9	0.146	4.1	0.692	19.5	0.653	18.4	3.55	100.0
Gansu												
青海	1.580	49.7	0.322	10.1	0.381	12.0	0.365	11.5	0.531	16.7	3.18	100.0
Qinghai												
宁夏	1.578	41.3	0.459	12.0	0.520	13.6	0.590	15.4	0.672	17.6	3.82	100.0
Ningxia												
新疆	1.990	54.4	0.222	6.1	0.308	8.4	0.433	11.9	0.701	19.2	3.65	100.0
Xinjiang												

资料来源：作者计算

Sources: Calculated by author

表6 分省各年龄组在总人口预期寿命(死亡水平)变化中所占百分比,女性,1981-2000

Table6 percent of LE changes by province and age group, female, 1981-2000

地 区 region	15岁以下(under 15)		15 - 29		30 - 44		45-59		60+		合 计 Total	
	预期寿命差	百分	预期寿命差	百分比	预期寿命	百分比	预期寿命	百分	预期寿命差	百分	预期寿命差	百分比
	(岁)	比	(岁)	(%)	差(岁)	(%)	差(岁)	比	(岁)	比	(岁)	(%)
	LE changes	(%)	LE changes		LE changes		LE changes	(%)	LE changes	(%)	LE changes	
全国 whole nation	1.665	35.1	0.427	9.0	0.496	10.5	0.741	15.6	1.416	29.8	4.74	100.0
北京 Beijing	0.780	15.4	0.272	5.4	0.293	5.8	0.924	18.2	2.802	55.2	5.07	100.0
天津 Tianjin	1.077	20.0	0.367	6.8	0.417	7.7	1.054	19.6	2.469	45.9	5.38	100.0
河北 Hebei	1.497	40.0	0.274	7.3	0.356	9.5	0.613	16.4	1.005	26.8	3.75	100.0
山西 Shanxi	1.822	39.3	0.251	5.4	0.485	10.4	0.766	16.5	1.319	28.4	4.64	100.0

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安徽	1.807	50.0	0.445	12.3	0.347	9.6	0.338	9.4	0.673	18.7	3.61	100.0
Anhui												
福建	1.687	48.1	0.457	13.0	0.310	8.8	0.354	10.1	0.698	19.9	3.51	100.0
Fujian												
江西	1.490	41.4	0.448	12.4	0.382	10.6	0.334	9.3	0.948	26.3	3.60	100.0
Jiangxi												

资料来源：作者计算

sources: Calculated by author

表 6 (续) 分省各年龄组在总人口预期寿命(死亡水平)变化中所占百分比, 女性, 1981 - 2000

Table6 percent of LE changes by province and age group, female, 1981-2000 (continued)

地 区 region	15 岁以下(under 15)		15 - 29		30 - 44		45-59		60+		合 计 Total	
	预期寿命差	百分	预期寿命差	百分比	预期寿命	百分比	预期寿命	百分	预期寿命差	百分	预期寿命差	百分比
	(岁)	比	(岁)	(%)	差(岁)	(%)	差(岁)	比	(岁)	比	(岁)	(%)
	LE changes	(%)	LE changes		LE changes		LE changes	(%)	LE changes	(%)	LE changes	
山东 Shandong	1.092	34.3	0.385	12.1	0.407	12.8	0.380	12.0	0.916	28.8	3.18	100.0
河南 Henan	1.553	50.1	0.430	13.9	0.293	9.4	0.209	6.7	0.616	19.9	3.10	100.0
湖北 Hubei	2.616	47.5	0.684	12.4	0.515	9.4	0.677	12.3	1.012	18.4	5.50	100.0
湖南 Hunan	2.158	44.2	0.636	13.0	0.530	10.9	0.521	10.7	1.035	21.2	4.88	100.0
广东 Guangdong	2.022	59.9	0.210	6.2	0.211	6.3	0.280	8.3	0.654	19.4	3.38	100.0

宁夏	1.752	39.3	0.628	14.1	0.604	13.5	0.617	13.8	0.860	19.3	4.46	100.0
Ningxia												
新疆	1.955	43.9	0.384	8.6	0.549	12.3	0.596	13.4	0.969	21.7	4.45	100.0
Xinjiang												

资料来源：作者计算

Sources: calculated by author

表7 以女性平均预期寿命为因变量的多元回归分析结果

Table7 The results of multi-regression (female LE as dependent variable)

入选变量 Variables entered	标准偏回归系数Bete Standard partial regression Coefficient Beta	顺序 order
人均国民收入 (GNP per captia)	0.539	1
女性文盲率 (female illiteracy rate)	-0.399	2
无厕所住户比例(percent of no toilet)	-0.220	3
总和生育率 (TFR)	-0.148	4

R2=0.929 Adjusted R2=0.918

表8 以男性平均预期寿命为因变量的多元回归分析结果

Table7 The results of multi-regression (male LE as dependent variable)

入选变量 Variables entered	标准偏回归系数Bete Standard partial regression Coefficient Beta	顺序 order
人均国民收入(GNP per captia)	0.437	1
女性文盲率(female illiteracy rate)	-0.412	2
高中程度以上人口占6岁以上人口百分比 (percent of above high school education in population 6+)	0.218	3
无厕所住户比例(female illiteracy rate)	-0.213	4

R2=0.919 Adjusted R2=0.907

表 9.贫困地区基本情况与全国平均水平的比较 (1998)

Table9 general situation in poor area (compared with average level of whole nation, 1998)

省份 province	人口数 (万人) population (10 thousand)	人均国内生产总 值 (元) GDP per captia (yuan)	15 岁及以上文 盲比例 (%) illiteracy rate over 15(%)	卫生技术人员比 例 (‰) Propotion of Health professions (‰)
全国 whole nation	124810	6392	15.78	3.5
贵州 Guizhou	3658	2301	28.98	2.3
甘肃 Gansu	2519	3453	28.65	3.2
青海 Qinghai	503	4377	42.92	4.2
宁夏 Ningxia	538	4228	25.56	4.1

新疆 Xinjiang

1747

6390

11.44

5.6

资料来源：国家统计局(1999)：《中国统计年鉴》，北京：中国统计出版社。

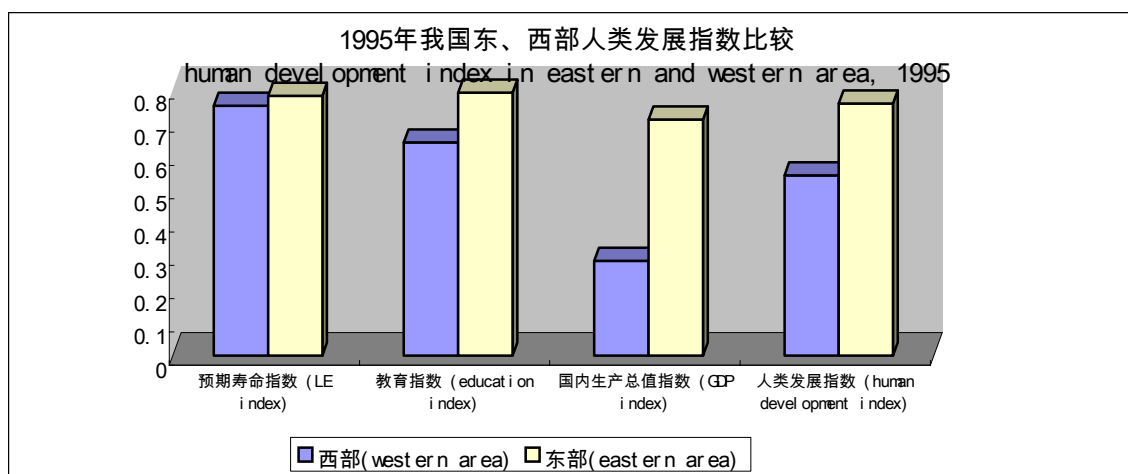


图 3 1995 年我国东西部几个社会发展指数的比较

figure3 human development index in eastern and western area in China, 1995

(资料来源：《1997 年中国人类发展报告》，联合国开发计划署，1998)