Comparative Study on Mortality Patterns in Japan and China

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Abstract On the basis of the 1990 Chinese death notice data and 1990 Japanese populations vital statistical materials, the mortality patterns and proportions of individual causes of death in the two countries were compared.

In both sexes, the mortality rates were the highest in almost all age groups in Chinese rural areas followed by urban areas and Japan.

In Japan and in Chinese urban areas, malignant neoplasms, cardiovascular diseases and cerebrovascular diseases were the major causes of death, with these three making up about 60% of the total. In Chinese rural areas, these three conditions were responsible for 43% of all deaths, a considerably lower figure as compared to those in the other two areas, and the mortality rates for infectious diseases and accident/suicide were higher than those in the other two areas. Of the three major adult diseases, cerebrovascular diseases were found to be especially frequent in both Chinese urban and rural areas. On the other hand, ischemic heart disease was found at comparable levels in Japan and China and the rate was lower than in other developed countries. Site-specific mortality rates for malignant neoplasms were characterized by high rates for lung, liver and esophageal cancers in China. The mortality rates for bronchitis in both Chinese urban and rural areas were markedly higher than those in Japan.

These differences in mortality rates and proportions of individual causes of death between China and Japan are thought to be attributable to the differences in medical services and the level of risk factors for each disease.

Key words: Vital statistics, Japan, China, Comparative study

Introduction

Mortality rate is one of the important indices reflecting the standard of health in a given region, and is closely connected with the socio-economic, medical and welfare circumstances of that region. At present, China is undergoing rapid development, while Japan is already an industrially advanced country. In addition, Japan and China both have their own characteris-

tic lifestyles, including dietary habits. A number of studies have already focused on the health status in China¹⁻⁴, but no comparative study has been done in detail of the mortality patterns in Japan and China. Because China covers such a vast area and its population is so huge, there are many difficulties to collect statistical data on a national scale. Previously collected statistical data have shown problems such as regional bias and a low cover rate versus the entire population.

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Also, international classifications of causes of death and diseases have not been adopted. So statistics have not been suitable for comparative studies. Recently, however, the Ministry of Public Health of the People's Republic of China has begun to prepare statistical data on mortality for the first time on a national scale in China based on the 9th International Classification of Diseases. In the present study, making use of these materials, we compared the mortality pattern and structure of causes of death in Japan and China.

Materials and methods

The Center for Health Statistics Information, in the Chinese Ministry of Public Health, has been selecting regions at random to implement a death notice system. In the regions, the cause of death must be certificated by a medical doctor and reported to health service center in each city or prefecture. The number of such regions has been increasing year by year, and as of 1990 included 40 cities (population 56, 863, 043) and 70

rural prefectures (population 42, 836, 397), for a total of 99, 699, 440 people amounting to 8.8% of the national population. For the cities, the major urban areas such as Beijing, Changchun, Tianjin, Shanghai, Nanking and Guangzhou have been selected, and thus almost all major urban areas are included. In addition, 24 other small and medium sized cities and rural prefectures have been selected from all over the country, thus eliminating any geographical bias. From 1987, causes of death have been classified according to the International Classification of Diseases (ICD-9) of the WHO in all of the target regions. The data from each region are delivered via each province to the Center for Health Statistics Information of the Ministry of Public Health and totaled.

For comparison of the mortality patterns in China and Japan, the above mentioned data for 1990⁵⁾ were used in the case of China, and the 1990 Population Vital Statistics⁶⁾ (Statistics and Information Department, Minister's Secretariat, Min-

Table 1 Age-sex composition of the population in 1990.

Age class	Men			Women		
	Urban in China	Rural in China	Japan	Urban in China	Rural in China	Japan
0-4	1891418	1925352	3317367	1790615	1758214	3152423
5-9	1993204	1834839	3810008	1890151	1681190	3626648
10-14	1924846	2047967	4358230	1818723	1903155	4137679
15-19	2493022	2341105	5107977	2286017	2241831	4859735
20-24	2858592	2168016	4437613	2484774	2136316	4283828
25-29	3278262	1991489	4035709	2984482	1943280	3940802
30-34	3101030	1767743	3891907	2909759	1689816	3821102
35-39	2518592	1637904	4499773	2337183	1558134	4446124
40-44	1892111	1314634	5333198	1760901	1229992	5284445
45-49	1559997	1067790	4471972	1490236	981569	4517682
50-54	1532499	935443	3990975	1483416	869264	4077648
55-59	1428318	842074	3781532	1353925	809540	3932241
60-64	1087403	702122	3234444	1047472	700079	3501226
65-69	757850	537074	2189318	781119	582043	2901553
70-74	481090	349686	1556586	547097	429603	2253254
75-79	272485	198097	1196534	365895	286666	1817939
80-84	117517	91856	678463	197806	164859	1153257
85-	44269	37647	357363	100940	80008	764842
Total	29232505	21790838	60248969	27630521	21045559	62472428

istry of Health and Welfare, Japan, 1992) in the case of Japan. Table 1 shows the populations of Japan and China in 1990.

Adjusted mortality rates were determined by the direct method with the 1985 total Japan population model used as the standard population.

Results

1. Comparison of mortality rates according to age group

Table 2 shows crude and age-adjusted mortality rates according to region. Crude mortality rates for the entire population, men, and women were all highest in Japan. However, adjusted mortality rates per 100,000 population were 1,111.7 for men in Chinese urban areas and 1,186.0 for

men in Chinese rural areas, rates approximately 1.5- and 1.6-fold higher than the corresponding Japanese rates. Similarly, for Chinese women, the rates were 772.6 and 815.8 for urban and rural areas respectively, about 1.8- and 1.9-fold higher than the corresponding Japanese rates.

Figures 1 and 2 illustrate mortality rates according to sex and age in Chinese urban and rural areas and in Japan. Comparing Chinese urban areas and Japan, rates for men in the 15-19, 20-24 and 45-49-year-old groups were higher in the latter, whereas those for the other age groups were higher in the former. On the other hand, comparing Chinese rural areas and Japan, mortality rates were higher for all age groups in the former. For women as well, mortality rates in

Table 2 Comparison of Mortality Rates in China and Japan (1990).

Mortality Rate #	Total			Men			Women		
	China		Japan	China		Japan	China		Japan
	Urban	Rural		Urban	Rural		Urban	Rural	
Crude	585.1	643.3	668.4	621.0	688.1	736.5	547.1	596.9	602.8
Standardized*	922.7	982.1	561.1	1111.7	1186.0	747.9	772.6	815.8	423.0

#: annual rates per 100,000 population

*: mortality rate standardized by the direct method to the age distribution in 5-year age groups of the total Japanese population model in 1985

Fig. 1 Mortality Rates of Men (per 100,000 population).

Fig. 2 Mortality Rates of Women (per 100,000 population).

both Chinese urban and rural areas were higher than those in Japan in all age groups.

In the comparison of Chinese urban and rural areas, mortality rates for men were higher in the latter between 0 and 74 year, but higher in the former for those aged 75 years and over. For women, mortality rates were higher in rural as compared to urban areas in the age groups 0-64 years and 70-74 years, but higher in the urban areas in the 65-69 and ≥ 75 -year-old groups.

2. Order of causes of death

Table 3 shows the order of causes of death and the proportion of deaths due to each cause. In Japan the first cause of death for the both sexes was malignant neoplasms, followed by cardiovascular diseases in second place, and cerebrovascular diseases in third, with these three causes of death accounting for 61.4% of the total. In Chinese urban areas, malignant neoplasms were the first cause of death followed by cerebrovascular diseases in second place and cardiovascular diseases in third, with these three causes of death accounting for 57.6% of the total. In Chinese rural areas, the cause of death was bronchitis, followed by malignant neoplasms in second place, and cerebrovascular diseases in third. Malignant neoplasms, cerebrovascular diseases, and cardiovascular diseases accounted for 43.5% of the total deaths in this population, a figure considerably lower than the corresponding figures in the Japanese and Chinese urban populations. Looking at the order of deaths according to sex, in Chinese urban areas and in Japan the order of causes of death was the same for both men and women as with both sexes combined. In the Chinese rural areas, malignant neoplasms, bronchitis and cerebrovascular diseases were the first, second and third causes of death in men, while in the women the corresponding order was bronchitis, cerebrovascular diseases and malignant neoplasms.

3. Mortality rates for selected causes of death in each age class (Table 4, Table 5)

The mortality rates for infectious diseases

were higher in China, particularly in rural areas, than in Japan for both sexes in all age groups. The mortality rates for accident and suicide were higher in Chinese rural areas than the others in almost all age groups. The mortality rates for pneumonia in the groups aged 0-19 years and the mortality rates for bronchitis in the groups aged 40-59, 60-79 and 80 and over years were markedly higher in China, particularly in rural areas, than Japan for both sexes. On the other hand, those for pneumonia in the age groups aged 60-79 and 80 and over were higher in Japan than in China. In the groups aged 60-79 and 80 and over, the mortality rates for cerebrovascular diseases were higher in China than in Japan. The mortality rates for malignant neoplasms and heart diseases were not different among three areas.

4. Age-adjusted mortality rates for major causes of death

The age-adjusted mortality rates for major causes of death are outlined in Table 6. The age-adjusted mortality rates for malignant neoplasms were highest for both sexes in Chinese urban areas, followed by Chinese rural areas and Japan, with the differences among the areas being relatively small (men: 242.4, 223.5 and 215.6 respectively; women: 130.8, 116.0 and 107.7 respectively). The adjusted mortality rates for cerebrovascular diseases were highest for both sexes in Chinese urban areas, followed by Chinese rural areas and Japan, with the rates in China ≥ 2 -fold those in Japan (men: 242.4, 211.8 and 97.9; women: 172.0, 154.4 and 68.6). The adjusted mortality rates for cardiovascular diseases were higher for both sexes in Chinese urban areas than in Japan, but similar in Chinese rural areas and Japan. The adjusted mortality rates for bronchitis were markedly higher in China than in Japan, with the difference between Chinese urban and rural areas also being large (Chinese rural areas, Chinese urban areas, Japan: 271.1, 166.6 and 16.6 in men, and 189.4, 111.3 and 5.8 in women respectively). The adjusted mortality rates for infectious diseases and accident and suicide were higher in

Table 3 Mortality Rates and Proportions of selected causes of death.

Rank	All					
	Urban in China		Rural in China		Japan	
	Cause of death	Rate percent	Cause of death	Rate percent	Cause of death	Rate percent
1 st	Malignant neoplasms	128.0 21.9	Bronchitis	129.6 20.1	Malignant neoplasms	177.2 26.5
2 nd	CVA	121.8 20.8	Malignant neoplasms	112.4 17.5	Heart disease	133.7 20.0
3 rd	Heart disease	87.2 14.9	CVA	103.9 16.2	CVA	99.4 14.9
4 th	Bronchitis	75.2 12.9	Accident, Suicide	68.5 10.6	Pneumonia	55.6 8.3
5 th	Accident, Suicide	40.4 6.9	Heart disease	63.3 9.8	Accident, Suicide	45.3 6.8
	all causes	585.1 100.0	all causes	643.3 100.0	all causes	668.4 100.4
	Men					
	Urban in China		Rural in China		Japan	
	Cause of death	Rate percent	Cause of death	Rate percent	Cause of death	Rate percent
1 st	Malignant neoplasms	155.1 25.0	Malignant neoplasms	140.4 20.4	Malignant neoplasms	216.4 29.4
2 nd	CVA	126.4 20.4	Bronchitis	131.7 19.1	Heart disease	135 18.3
3 rd	Heart disease	83.8 13.5	CVA	104.0 15.1	CVA	95.6 13.0
4 th	Bronchitis	77.0 12.4	Accident, Suicide	77.6 11.3	Pneumonia	64.1 8.7
5 th	Accident, Suicide	47.1 7.6	Heart disease	61.2 8.9	Accident, Suicide	60.9 8.3
	all causes	621.0 100.0	all causes	688.0 100.0	all causes	736.5 100.0
	Women					
	Urban in China		Rural in China		Japan	
	Cause of death	Rate percent	Cause of death	Rate percent	Cause of death	Rate percent
1 st	Malignant neoplasms	99.4 18.2	Bronchitis	127.4 21.3	Malignant neoplasms	139.3 23.1
2 nd	CVA	117.0 21.4	CAV	103.8 17.4	Heart disease	132.5 22.0
3 rd	Heart disease	90.9 16.6	Malignant neoplasms	83.3 14.0	CVA	103 17.1
4 th	Bronchitis	73.4 13.4	Heart disease	65.5 11.0	Pneumonia	47.4 7.9
5 th	Accident, Suicide	33.4 6.1	Accident, Suicide	59.1 9.9	Accident, Suicide	30.3 5.0
	all causes	547.1 100.0	all causes	596.9 100.0	all causes	602.8 100.0

Rate: annual mortality rate per 100,000 population

CVA; cerebrovascular disease

Bronchitis; bronchitis, emphysema and bronchial asthma

Table 4 Mortality rates from selected causes of death for each age class (Men).

Age class	District	Malignant neoplasms	Cerebro-vascular	Heart disease	Bronchitis	Pneumonia	Infectious disease	Accident suicide
0-19	Urban in China	6.6	0.4	1.2	0.3	11.5	4.1	26.7
	Rural in China	5.0	0.3	1.1	0.4	41.2	11.9	57.6
	Japan	4.2	0.4	2.6	0.8	1.5	1.1	22.8
20-39	Urban in China	21.6	3.7	6.8	1.6	0.6	6.1	43.0
	Rural in China	28.5	3.4	8.6	3.3	1.6	11.0	69.1
	Japan	13.4	4.4	11.0	1.1	1.2	1.2	46.0
40-59	Urban in China	187.2	78.0	58.5	25.5	2.0	20.3	44.0
	Rural in China	243.8	67.5	49.7	72.1	4.5	37.2	80.7
	Japan	161.4	47.9	65.1	2.7	9.3	7.0	67.4
60-79	Urban in China	1035.9	942.5	540.9	559.7	32.3	94.3	104.8
	Rural in China	913.4	807.9	397.9	1049.7	51.7	150.7	165.7
	Japan	926.4	318.0	446.0	56.4	198.2	46.0	118.4
80-	Urban in China	2056.4	4325.5	3570.8	3787.1	480.2	248.5	579.8
	Rural in China	1209.2	3974.4	2639.3	5142.0	497.3	274.9	507.4
	Japan	2250.7	2159.7	2688.1	408.7	1959.4	168.9	328.3

annual rates per 100,000 population
Bronchitis: bronchitis, emphysema and bronchial asthma
Cerebrovascular: Cerebrovascular disease

Table 5 Mortality rates from selected causes of death for each age class (Women).

Age class	District	Malignant neoplasms	Cerebro-vascular	Heart disease	Bronchitis	Pneumonia	Infectious disease	Accident suicide
0-19	Urban in China	5.1	0.2	0.8	0.2	10.7	3.5	17.6
	Rural in China	3.8	0.2	1.1	0.4	41.1	10.7	46.2
	Japan	2.9	0.3	2.1	0.5	1.0	1.0	9.0
20-39	Urban in China	17.0	2.2	5.9	1.4	0.4	3.5	22.0
	Rural in China	18.5	2.7	9.7	3.3	1.6	8.2	52.4
	Japan	15.3	1.9	4.1	0.7	1.1	0.7	14.7
40-59	Urban in China	115.9	64.2	52.8	21.0	1.9	9.4	24.4
	Rural in China	122.3	51.4	44.4	55.1	3.4	20.7	44.6
	Japan	101.1	24.5	22.2	2.0	3.8	3.0	24.7
60-79	Urban in China	555.5	662.9	458.7	393.2	25.8	38.7	77.9
	Rural in China	463.7	579.7	330.4	721.4	40.3	72.3	117.0
	Japan	425.6	221.7	278.8	19.9	82.1	20.7	62.6
80-	Urban in China	986.8	3347.0	2885.4	2692.6	356.1	122.2	632.0
	Rural in China	761.2	3289.1	1901.0	4075.2	424.7	182.1	415.3
	Japan	1118.3	1896.2	2534.7	140.6	1041.9	95.2	213.7

annual rates per 100,000 population

Bronchitis: bronchitis, emphysema and bronchial asthma

Cerebrovascular: Cerebrovascular disease

Table 6 Standardized mortality rates from selected causes of death (1990).

Cause	Men			Women		
	China		Japan	China		Japan
	Urban	Rural		Urban	Rural	
Malignant neoplasms	242.4	223.5	215.6	130.8	116.0	107.7
Cerebrovascular disease	244.9	211.8	97.9	172.0	154.4	68.6
Heart disease	168.7	125.2	132.4	133.3	95.3	87.4
Hypertensive disease	21.2	23.5	5.9	18.8	18.0	5.8
Pneumonia	19.0	30.8	67.1	14.1	26.9	30.1
Bronchitis	166.6	271.1	16.6	111.3	189.4	5.8
Liver cirrhosis	19.2	25.0	18.3	9.4	11.5	6.5
Diabetes Mellitus	10.9	4.5	7.5	13.8	4.5	5.7
Infectious disease	26.7	43.1	12.0	12.1	24.2	5.7
Accident and suicide	58.9	91.4	59.9	40.7	63.8	25.5
All causes	1111.7	1186.0	747.9	772.6	815.8	423.0

annual rates per 100,000 population

mortality rates standardized by direct method to the age distribution in 5-year age groups of the total Japanese population model in 1985

Bronchitis; bronchitis, emphysema and bronchial asthma

Table 7 Standardized mortality rates from selected malignant neoplasms (1990).

Neoplasms site	Men			Women		
	China		Japan	China		Japan
	Urban	Rural		Urban	Rural	
Esophagus	22.6	43.3	9.8	8.3	22.3	1.5
Stomach	45.8	54.5	49.6	19.6	26.6	21.6
Rectum	13.7	9.3	9.1	10.7	7.2	4.6
Liver	40.2	51.6	29.4	14.4	18.6	8.4
Lung	67.8	34.8	45.0	29.6	12.1	11.6
Breast	—	—	—	8.4	4.1	8.2
Uterus	—	—	—	4.1	5.0	5.9

annual rates per 100,000 population

mortality rates standardized by direct method to the age distribution in 5-year age groups of the total Japanese population model in 1985

Chinese rural areas than in the others.

5. Age-adjusted mortality rates for malignant neoplasms according to site (Table 7)

The first and second most common sites of malignant neoplasms resulting in death in men were the lung and stomach in Chinese urban areas, stomach and liver in Chinese rural areas and stomach and lung in Japan. In women, these were the lung and stomach in Chinese urban areas, stomach and esophagus in Chinese rural areas and stomach and lung in Japan.

Although mortality due to stomach cancer was highest in Chinese rural areas, the differences between Chinese rural areas, Chinese urban areas and Japan were not great. Mortality due to lung cancer was highest in both sexes in Chinese urban areas, with a large difference particularly in women. Mortalities due to liver cancer and esophageal cancer were higher in China as compared to Japan, particularly in the rural areas. No difference in uterine cancer mortality was noted among the three areas, while breast

Table 8 Standardized mortality rates from each type of heart diseases (1990).

Heart disease type	Men			Women		
	China		Japan	China		Japan
	Urban	Rural		Urban	Rural	
Rheumatic	8.0	9.7	0.7	13.7	13.0	1.1
Ischemic	49.3	24.2	45.4	45.6	21.2	38.6
AMI	22.7	14.3	29.7	17.7	10.8	22.5

annual rates per 100,000 population

mortality rates standardized by direct method to the age distribution in 5-year age groups of the total Japanese population model in 1985

AMI; acute myocardial infarction

cancer mortality tended to be lower in the Chinese rural areas as compared to Chinese urban areas and Japan.

6. Age-adjusted mortality rates according to type of cardiovascular disease (Table 8)

In China, in both urban and rural areas, mortality rates for chronic rheumatic heart disease were higher than in Japan. Mortality rates for ischemic heart disease were approximately the same in Chinese urban areas and Japan, but tended to be lower in Chinese rural areas.

Discussion

It was clarified in this study that mortality rates were higher in China than in Japan and that within China itself they were higher in rural areas than in urban areas. Particularly the mortality rates for bronchitis, cerebrovascular diseases and acute diseases such as infectious diseases and accident/suicide were markedly higher in China than in Japan. In contrast, the mortality rates for malignant neoplasms and heart diseases did not differ among the three areas and those for ischemic heart disease were almost same among the three areas and being lower than in other developed countries⁷⁾.

In part, the high mortality rates in China, particularly for infectious diseases, bronchitis and accidents, might be caused by the low availability of medical facilities and medical workers and their utilization. In Japan, the numbers of hospital beds, physicians and nurses per 100,000

population in 1986 were 641, 212 and 526 respectively⁸⁾. In contrast, based on data from a 1985 survey the corresponding figures in Chinese urban areas were 454, 215 and 185 and in Chinese rural areas 153, 32, and 30⁹⁾. These differences between Japan and Chinese urban areas were small, whereas Chinese rural areas were considerably poorer than the other two areas. Also, based on the 1984 Chinese Rural Medical Service Survey⁹⁾, 1985 Chinese Urban Medical Service Survey¹⁰⁾ and a survey conducted by Sugaya et al.¹¹⁾ in Japan, the frequency of medical service utilization in Chinese rural areas was 2.6 times per year per person, whereas it was 4 times in Chinese urban areas, and 21 times in Japan. These differences might make it difficult to cure particularly acute diseases such as infectious diseases and to treat accident victims and prevent and control chronic diseases, such as cerebrovascular diseases and bronchitis.

Additionally, the differences in the mortality rates among the three areas could be caused by the differences in the risk factor levels for each disease. The mortality rates for bronchitis were extremely high in China, especially in rural areas. Since the diagnostic criteria was not clear, this might include some cases of pneumonia as bronchitis. However, even taking this into consideration, its mortality rates were extremely high in China. In Japan, a number of studies have described the association between chronic bronchitis and air pollution^{12),13)}. Because coal has been

the major source of energy in China, development of coal-using industries has caused severe air pollution, particularly in urban areas¹⁴⁾ and coal use for cooking and heating has caused indoor air pollution¹⁵⁾. Some reports have suggested that this air pollution in China is related to chronic obstructive lung diseases¹⁶⁾. The higher rates in rural areas compared to urban areas might be partly caused by the poor medical environment as mentioned above.

In China, the mortality rates for cerebrovascular diseases were higher than in Japan. It was reported that prevalence, morbidity and mortality rates all differed widely according to area in China¹⁷⁾ but no adequate epidemiological studies on the risk factors for stroke such as prevalence of hypertension on a national scale have been conducted. Thus the excess deaths for cerebrovascular diseases in China could not be sufficiently clarified.

The mortality rates for malignant neoplasms did not differ greatly between China and Japan. However site-specific mortality rates showed regional differences. The mortality rates for lung cancer were higher for both sexes in Chinese urban areas than in Japan or Chinese rural areas and those for liver and esophageal cancer were higher in both areas in China than in Japan. Smoking has been determined to be a major cause of lung cancer in China as in Japan¹⁸⁾. The smoking prevalence in 1984 was not different between Japan and China, that is, almost 60% for males and 10% for females^{19),20)}. This smoking prevalence has gradually decreased in Japan¹⁹⁾. In contrast, cigarette consumption in China increased annually from the early 1950s to 1987²⁰⁾, but the change of the smoking prevalence was not reported. Although the excess deaths due to lung cancer in Chinese urban areas could not be explained by comparing annual smoking prevalences in the two countries, the accumulated effects of smoking should be considered²¹⁾. As for malignancy of the liver, although the mortality rates in Japan are higher than in Western

countries⁷⁾, China exceeded Japan, particularly in rural regions. A similar tendency was found for liver cirrhosis. The carrier state of hepatitis B virus is known to be a risk factor for liver cirrhosis and hepato-cellular carcinoma and it was reported that the prevalence of hepatitis B virus carriers in China was approximately 10% and thus higher than in Japan^{22),23)}. Referring to breast cancer, the mortality rates in Chinese urban areas and in Japan were at the same level and higher than in rural areas. Westernized life style is known to be a risk factor for breast cancer in Japan and geographically the mortality rates in big towns were higher than in small towns²⁴⁾.

Several decades ago, the mortality rates for infectious diseases and cerebrovascular diseases were also extremely high in Japan²⁵⁾. Those have been improved by many control measures against these diseases. For cerebrovascular diseases for example, some systematic studies revealed hypertension to be a major risk factor and control measures against hypertension could have decreased the incidence and the mortality rates for these diseases²⁶⁾. For improvement of the mortality rates in China, future studies on a national scale of the factors responsible for each disease will be important.

Abstract

On the basis of the 1990 Chinese death notice data and 1990 Japanese population vital statistical materials, the mortality patterns and proportions of individual causes of death in the two countries were compared.

In both sexes, the mortality rates were highest in almost all age groups in Chinese rural areas followed by Chinese urban areas and Japan.

In Japan and in Chinese urban areas, malignant neoplasms, cardiovascular diseases and cerebrovascular diseases were the major causes of death, with these three making up about 60% of the total. In Chinese rural areas, these three conditions were responsible for 43% of all deaths,

a considerably lower figure as compared to those in the other two areas, and the mortality rates for infectious diseases and accident/suicide were higher than those in the other two areas. Of the three major adult diseases, cerebrovascular diseases were found to be especially frequent in both Chinese urban and rural areas. On the other hand, ischemic heart disease was found at comparable levels in Japan and China and the rate was lower than in other developed countries. Site-specific mortality rates for malignant neoplasms were characterized by high rates for lung, liver and esophageal cancers in China. The mortality rates for bronchitis in both Chinese urban and rural areas were markedly higher than those in Japan.

These differences in mortality rates and proportions of individual causes of death between China and Japan are thought to be attributable to the differences in medical services and the level of risk factors for each disease.

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