

## Population Aging in Japan, with Reference to China

*Many countries of Asia  
will be the first among the currently  
less developed to show explicit concern  
for accommodating an aging population*

By Toshio Kuroda\*

The 1980s may be characterized by two demographic issues which are receiving rapidly increasing attention.

One is the problem of urbanization which is taking on a completely new dimension. All urban areas have problems, but in the developing regions problems have a more immediate impact. In fact, urbanization may be one

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**Table 1: Absolute numbers, population proportions, and growth rates of the elderly population (65 or more years of age)**

Regions, countries and areas	1980		2000		Annual growth rate (per cent)
	Absolute number	Population proportion (per cent)	Absolute number	Population proportion (per cent)	
<b>World</b>	255 939 000	5.7	404 966 000	6.6	2.3
MDCs	129 791000	11.4	168 313 000	13.2	1.3
LDCs	126 148 000	3.8	236 653 000	4.9	3.1
<b>Asia</b>	102 580 000	4.1	193 157 000	5.7	3.2
Bangladesh	3 008 000	3.4	4 154 000	2.8	1.6
China	47 009 000	4.7	85 932 000	6.8	3.0
Hong Kong	325 000	6.5	660 000	9.6	3.5
India	22 187 000	3.2	46 337 000	4.8	3.7
Indonesia	5 047 000	3.3	9 368 000	4.6	3.1
Japan	10 647 000	9.0	21404 000	16.4	2.9
Malaysia	508 000	3.7	934 000	4.5	3.0
Nepal	439 000	3.0	797 000	3.5	3.0
Pakistan	2 482 000	2.8	4 241 000	3.0	2.7
Philippines	1 380 000	2.9	3 083 000	4.1	4.0
Republic of Korea	1496 000	3.9	3 238 000	6.5	3.9
Singapore	114 000	4.7	208 000	7.0	3.0
Sri Lanka	616 000	4.2	1 239 000	5.9	3.5
Thailand	1458 000	3.1	2 954 000	4.5	3.5

Source: United Nations: *World Population Prospects, Estimates and Projections as Assessed in 1984*. New York, 1986.

Note: Data for Japan are from the 1980 Census and also Nihon University Population Research Institute's projections made in 1986 for the year 2000.

of the distinguishing characteristics of a developing country. It is the basic reason why, since 1980, the United Nations Fund for Population Activities (UNFPA) has devoted considerable effort to the holding of serial international meetings on urbanization, large cities, medium-sized cities and small cities. The most recent such meeting was the Conference on Population and Development in Medium-Sized Cities, held at Kobe, Japan, from 11 to 14 August 1987.

The second demographic issue concerns population aging. The World Assembly on Aging held at Vienna in 1982 marked the beginning of accelerated consideration of the aging process and its socio-economic implications. Another reason for the increasing level of attention being given to aging in Asia is the growing recognition that the problem of aging is occurring and will occur in the countries where fertility reduction has been most successful. Thus, many countries of Asia will be the first among the currently less developed to show explicit concern for accommodating an aging population, the size of which is expected to increase in the near future.

**Table 1** provides three measures of aging for selected countries and areas of the region: the absolute number of the elderly, the proportion of the population over age 65, and the annual growth rate of the elderly population. Statistics for 1980 and 2000 estimated by the United Nations are shown in order to suggest the magnitude of change. In 1980, the elderly were more or less equally distributed among the more developed and the less developed countries of the world, but in the future the majority of the elderly will live in the less developed countries, especially in Asia.

By the year 2000, the elderly population in Asia will be about 48 per cent of the world total and 82 per cent of the total elderly in the less developed countries despite Asia's still very small elderly population proportion; in the year 2000, 5.7 per cent in Asia compared with 13.2 per cent in the more developed countries during the same year.

More significant for many countries and areas of the region, however, is the fact that the absolute numbers of the elderly are growing rapidly, although the proportions over age 65 are not large, except in Japan and Hong Kong. In particular, there is increasing recognition of the necessity of planning approaches for accommodating their increase in countries such as China, the Republic of Korea and Singapore where the reduction of fertility, the major cause of aging, has been successful.

### **Demographic transition**

Demographic transition is characterized by changing patterns in birth and death rates, and exhibits the following trends: a pattern of high birth

and high death rates in pre-modern times followed by high birth and low death rates during the beginning stages of modernization, culminating in a pattern of low birth and low death rates with the achievement of full modernization.

Demographic transitions inevitably bring about changes in the age structure of a population. These changes occur in a continuous process and must be considered in their totality.

The aging of the population is one type of age structure transition. The speed and extent of aging is determined by the factors controlling demographic changes, the transition, pattern of birth and death rates. With a sharp, rapid decrease in the birth rate, the onset of the aging process is accelerated and its extent deepened.

Effects on age structure caused by changes in the death rate are more complex. Historically, improvements in the general mortality rate were brought about mainly by decreases in the infant mortality rate. Such decreases, when significant, increase the size of the young population, i.e. of children 0 to 14 years old. Consequently, the size of the elderly population decreases proportionally, and the reverse of population aging, i.e. "rejuvenation", occurs.

Until quite recently, a country would experience an improvement in the death rate with the achievement of a decrease in the infant mortality rate, or in some cases in the mortality rate of the young population. However, a new trend in the improvement of the general mortality rate has emerged, brought about by a lowering of the mortality rate of the elderly population. This trend is especially significant in Japan and the United States of America and is receiving widespread attention as a new factor in the aging of the population.

While a decrease in the death rate was once a cause of "rejuvenation" of the population, this newly observed increase in the survival probability of the elderly population has become a factor in the aging of the population. Thus, continuous research into and careful consideration of the implications of this change in the age structure with regard to the mortality rate is necessary.

### **Transitions in age structure: Japan**

The onset of modernization in Japan accompanied the collapse of the feudal system under the Tokugawa Shogunate and the establishment of the Meiji Restoration Government (1868). **Table 2** presents data for the approximately 70-year period from the early Meiji era (1870) to the Second World War and table 3 presents data for the approximately 40-year period from the end of the Second World War to the present. The birth rate shows a rising tendency from 1890 to around 1910, which marks the beginning of a long-term trend towards lower birth rates. Despite considerable fluctuation, the death rate has

**Table 2: Vital rates from the early stages of modernization in Japan to Second World War (per cent)**

Period	Birth rate	Death rate	Natural increase rate
1870-1874	36.3	31.3	5.0
1875-1879	36.4	31.3	5.1
1880-1884	33.9	28.3	5.6
1885-1889	33.7	28.1	5.6
1890-1894	34.3	27.3	7.0
1895-1899	36.3	27.0	9.3
1900-1904	35.2	24.2	11.0
1905-1909	37.0	25.3	11.8
1910-1914	35.6	22.1	13.5
1915-1919	33.2	22.3	10.9
1920-1924	35.0	23.0	12.0
1925-1929	34.0	19.8	14.3
1930-1934	31.8	18.1	13.6
1935-1939	29.3	17.4	11.9
1940-1943	30.7	16.3	14.4

*Sources:* The data for 1870 to 1920 are taken from *Population Estimates by Age and Sex from the Meiji Restoration to 1920*, Research Document No. 145 of the Institute of Population Problems, Japanese Ministry of Health and Welfare, 1 February 1962. Statistics for the period after 1920 are based on calculations by the Institute of Population Problems, Ministry of Health and Welfare.

maintained an overall declining tendency to the present, excluding the short period preceding and following the end of the Second World War.

The natural increase rate deserves special note. In Japan's long history before the Second World War, this rate never exceeded the 1 per cent mark until the turn of the twentieth century. Even at its peak in the pre-war era, it exceeded 1.4 per cent only during the five-year period 1925-1929 and the four-year period 1940-1943.

After the Second World War, the natural increase rate temporarily surpassed 2 per cent owing to the "baby boom". Since then, it dropped to 1 per cent in 1956 owing to a sharp decline in the birth rate; it remained at that level fairly steadily with minor fluctuations until 1977 when it dropped below the 1 per cent mark. A further decline to 0.6 per cent was experienced in 1981, since which time the rate has levelled off.

**Table 3: Vital rates in Japan during the period  
from the end of the Second World War to 1984 (per cent)**

Year	Birth rate	Death rate	Natural increase rate
1944	* 29.2	* 17.4	11.8
1945	* 23.2	* 29.2	- 6.0
1946	* 25.3	* 17.6	7.7
1947	34.3	14.6	19.7
1948	33.5	11.9	21.6
1949	33.9	11.6	21.4
1950	28.1	10.9	17.2
1951	25.3	9.9	15.4
1952	23.4	8.9	14.4
1953	21.5	8.9	12.6
1954	20.0	8.2	11.9
1955	19.4	7.8	11.6
1956	18.4	8.0	10.4
1957	17.2	8.3	8.9
1958	18.0	7.4	10.5
1959	17.5	7.4	10.1
1960	17.2	7.6	9.6
1961	16.9	7.4	9.5
1962	17.0	7.5	9.5
1963	17.3	7.0	10.3
1964	17.7	6.9	10.7
1965	18.6	7.1	11.4
1966	13.7	6.8	7.0
1967	19.3	6.7	12.6
1968	18.4	6.8	11.6
1969	18.5	6.8	11.7
1970	18.8	6.9	11.9
1971	19.2	6.6	12.6
1972	19.3	6.5	12.8
1973	19.4	6.6	12.8
1974	18.6	6.5	12.1
1975	17.1	6.3	10.8
1976	16.3	6.3	10.0
1977	15.5	6.1	9.4
1978	14.9	6.1	8.8
1979	14.2	6.0	8.2

**Table 3: (continued)**

Year	Birth rate	Death rate	Natural increase rate
1980	13.6	6.2	7.4
1981	13.0	6.1	6.9
1982	12.8	6.0	6.8
1983	12.7	6.2	6.5
1984	12.5	6.2	6.3
1985	11.9	6.3	5.6
1986	11.4	6.2	5.2

Source: *Vital Statistics*, Ministry of Health and Welfare.

Note: \* = Estimated by Japanese specialists, using the *United Nations Demographic Yearbook*, 1951 edition.

Worthy of note is the birth rate and the impact it has had on the aging of the population. The birth rate dropped from a high of 33-34 per thousand population during the baby boom of 1947-1949 to 17 per thousand in 1957, at which point it stabilized; after showing a slight tendency to increase, it started to decline further from a peak of 19.4 per thousand in 1973. Although the rate of decrease has slowed recently, the downward trend has continued with the birth rate falling to 11.4 per thousand in 1986, a decrease of 41.2 per cent in 13 years. This tendency is seen not only in the crude birth rate but also in the total fertility rate, the gross reproduction rate and the net reproduction rate (see **table 4**). However, it is noteworthy that the reproduction rates have exhibited a rising tendency, though slight, from 1982 to 1984; however, they again came back to a low level in 1985.

The age structure transition is the result, in general, of the changes in the vital rates summarized in **table 5**. Projections concerning the age structure of the future population up to the year 2025 have been included in an attempt to clarify the long-term characteristics of this shift over a period of 150 years. Average age, median age, age dependency ratio and aging index are provided in addition to the percentage distribution of each age group in the total population.

**Table 6** is a comprehensive summary of the three approximately 50-year-long phases which can be distinguished in the transition of the age structure occurring over the 150-year period. The first phase, from 1870 (the beginning of the Meiji era) to 1925 (the end of the Taisho era), is characterized by the following tendencies: (a) a decline in the proportion of the population

**Table 4: Various reproduction rates of the female population of Japan**

<b>Year</b>	<b>Total fertility rate</b>	<b>Gross reproduction rate</b>	<b>Net reproduction rate</b>
1920	5.24	2.56	1.59
1925	5.11	2.51	1.56
1930	4.71	2.30	1.52
1937	4.36	2.13	1.49
1940	4.11	2.01	1.44
1947	4.54	2.21	1.72
1950	3.65	1.77	1.51
1955	2.37	1.15	1.06
1960	2.00	0.98	0.92
1961	1.96	0.95	0.91
1962	1.98	0.96	0.92
1963	2.01	0.98	0.94
1964	2.05	0.99	0.96
1965	2.14	1.04	1.01
1966	1.58	0.76	0.74
1967	2.23	1.08	1.05
1968	2.13	1.03	1.00
1969	2.13	1.03	1.00
1970	2.14	1.03	1.00
1971	2.16	1.04	1.02
1972	2.14	1.04	1.01
1973	2.14	1.04	1.01
1974	2.05	0.99	0.97
1975	1.91	0.93	0.91
1976	1.85	0.90	0.88
1977	1.80	0.87	0.86
1978	1.79	0.87	0.86
1979	1.77	0.86	0.85
1980	1.75	0.85	0.84
1981	1.74	0.85	0.83
1982	1.77	0.86	0.85
1983	1.80	0.88	0.86
1984	1.81	0.88	0.87
1985	1.76	0.86	0.85

*Source: Latest Demographic Statistics, the Institute of Population Problems, Japanese Ministry of Health and Welfare, 1986.*



**Table 5 : Demographic indicators of changes in age composition in Japan**

Year	Percentage distribution by age group			Average age	Median age	Dependency ratio (per 100)			Aging index *
	0-14	15-64	65+			Total	Young	Aged	
1870	28.1	65.2	6.7	30.7	27.6	53.4	43.1	10.3	23.8
75	30.4	63.0	6.6	30.1	27.1	58.7	48.2	10.5	21.6
80	31.9	61.7	6.4	29.4	26.6	62.1	51.7	10.4	20.2
85	33.0	60.6	6.4	29.1	25.7	65.0	54.4	10.6	19.4
90	32.8	60.8	6.3	28.8	25.0	64.4	53.9	10.4	19.3
95	32.7	61.2	6.1	28.5	24.3	63.4	53.4	10.0	18.6
1900	33.9	60.7	5.4	28.0	24.1	64.7	55.8	8.9	16.0
05	34.8	60.1	5.2	27.6	23.9	66.4	57.9	8.6	14.9
10	36.0	58.8	5.2	27.2	23.1	70.1	61.2	8.8	14.4
15	36.3	58.4	5.3	26.9	22.5	71.2	62.1	8.1	14.5
20	36.5	58.3	5.3	26.7	22.2	71.6	62.6	9.0	14.4
25	36.7	58.2	5.1	26.5	22.0	71.7	63.0	8.7	13.8
30	36.6	58.1	4.8	26.3	21.8	70.5	62.4	8.1	13.0
35	36.9	58.5	4.7	26.3	22.0	71.1	63.1	8.0	12.6
40	36.1	59.2	4.7	26.6	22.1	69.0	61.0	8.0	13.1
45	35.3	59.9	4.8	26.7	22.3	66.9	58.9	8.0	13.6
50	35.4	59.7	4.9	26.6	22.2	67.7	59.4	8.3	13.6
55	33.4	61.3	5.3	27.6	23.6	63.3	54.6	8.7	15.9
60	30.0	64.2	5.7	29.0	25.6	55.9	47.0	8.9	19.0
65	25.6	68.1	6.3	30.3	27.4	47.1	37.9	9.2	24.4
70	23.9	69.0	7.1	31.5	29.0	45.1	34.9	10.3	29.4
75	24.3	67.7	7.9	32.5	30.6	47.6	35.9	11.7	32.6
80	23.5	67.4	9.1	33.9	32.5	48.4	34.9	13.5	38.7
85	21.5	68.2	10.3	35.7	35.2	46.7	31.6	15.1	47.9
90	18.5	69.6	11.9	37.4	37.4	43.7	26.6	17.1	64.6
95	17.0	68.8	14.2	38.9	38.9	45.4	24.8	20.6	83.3
2000	17.0	66.5	16.5	40.0	39.8	50.3	25.5	24.8	97.0
05	17.2	64.3	18.5	41.2	40.8	55.5	26.8	28.8	107.4
10	16.8	62.5	20.7	42.3	42.0	59.9	26.9	33.0	122.8
15	15.7	60.9	23.4	43.3	43.5	64.3	25.8	38.5	149.4
20	14.8	61.6	24.6	44.1	45.1	65.1	24.5	40.6	165.8
25	14.9	60.6	24.5	44.5	45.8	65.0	24.6	40.4	164.1

Source: The data up to 1915 were calculated on the basis of Okazaki's work. The data from 1920 to 1980 were calculated on the basis of census figures. The data for 1985 to 2025 were calculated on the basis of the future population projections prepared by the Nihon University Population Research Institute in 1982.

\* Note: Aging index =  $\frac{\text{Persons 65 years \& over}}{\text{Children 14 years \& under}} \times 100$

**Table 6: Selected demographic indicators by three phases for Japan  
(1870 to 2025)**

Phase	Percentage distribution by age group			Aging index	Dependency ratio	Average age
	65 +	0-14	15-64			
<b>Phase I</b>						
1870	6.7	28.1	65.2	23.8	53.4	30.7
1925	5.1	36.7	58.2	13.8	71.7	26.5
Rate of increase/ decrease	-23.9	+30.6	-10.7	-42.0	+34.0	-13.7%
<b>Phase II</b>						
1925	5.1	36.7	58.2	-13.8	71.7	26.5
1970	7.1	23.9	69.0	29.4	45.1	31.5
Rate of increase/ decrease	+39.2	-34.9	+18.6	+113.0	-37.1	+18.9%
<b>Phase III</b>						
<b>Early</b>						
1970	7.1	23.9	69.0	29.4	45.1	31.5
2000	16.5	17.0	66.5	97.0	50.3	40.1
Rate of increase/ decrease	+132.4	-28.9	-3.6	+229.9	+11.5	+27.3%
<b>Later</b>						
2000	16.5	17.0	66.5	97.0	50.3	40.1
2025	24.5	14.9	60.6	164.1	65.0	44.5
Rate of increase/ decrease	+48.5	-12.4	-8.9	+69.2	+29.2	+11.0%

Source: See table 5.

over 65 years of age from 6.7 to 5.1 per cent, (b) a marked increase in the proportion of the population 0 to 14 years of age from 28.2 to 36.7 per cent, (c) a decrease in the proportion of the population between the ages of 15 and 64 years from 65.2 to 58.2 per cent, (d) a sharp drop in the aging index from 23.8 to 14.5, and (e) an increase in the dependency ratio from 53.5 to 71.7. In other words, this phase was marked by what may be called a rejuvenation of the age structure of the population.

The second phase, from 1925 to 1970, which includes the Second World War years, exhibited the following characteristics: (a) a marked reduction in the proportion of the population aged 0 to 14 years from 36.6 to 24.0 per cent, (b) a marked increase in the proportion of the working age-population from 58.2 to 69.0 per cent and (c) a sharp decrease in the dependency ratio from 72 to 45. In 1970, the dependency ratio dropped to the extremely low level of 45.1 per cent, a very rare phenomenon viewed even on an international scale. The average life expectancy exceeded 70 years of age for the first time (males, 69.3 years; females 74.7; average: 72.0). Population migration was also significant during this period, with major influxes into the three large metropolitan areas, Tokyo, Osaka and Nagoya, reaching a peak and starting to decline. In 1967, the Japanese population reached 100 million and various indices indicate that the Japanese population was moving into a new transition period at that time.

The third phase, which will extend from 1970 into the twenty-first century, has as its major characteristics aging and long life expectancy. This period may, however, be divided into early and later stages according to the speed and extent of the aging process.

In the early stage, i.e. the 30 years from 1970 to 2000, aging of the population will proceed at an accelerating pace. Based on data from the 1986 projection of the Nihon University Population Research Institute, it is estimated that the proportion of the population over 65 years of age will rapidly increase from 7.1 to 16.5 per cent, thus nearly equalling the 16.9 per cent level of Sweden in 1980, which among the developed countries currently has the highest level of elderly in the population. The aging index will also show a more than three-fold increase from 29.4 to 97.0 during this period. Thus, the elderly population (people over 65 years of age), which was once less than one-third of the young population 0 to 14 years of age, will grow so rapidly that both populations will be nearly equal in size. However, since the size of the young population will continue to decrease, the ratio of the dependent population, i.e. the combined young and elderly population, to the working age population will be 50.3 per cent.

The latter half of the third phase will be characterized by "heavy aging". The elderly population will exceed 20 per cent of the population in 2010 and will reach the extraordinarily high level of more than 24 per cent in 2020. According to United Nations estimates, the highest ratios of elderly populations to total populations in 2025 for western countries will reach the 22 per cent level, i.e. 22.7 per cent in the Netherlands, 22.3 per cent in Finland, Denmark and Sweden, and 22.1 per cent in the Federal Republic of Germany. In France and the United Kingdom of Great Britain and Northern Ireland, the figures are 19.4 and 18.3 per cent and are not expected to reach 20 per cent.

It is predicted that Japan will far exceed those levels. Japan's aging index will exceed 100 after 2005 and 166 in 2020.

Judged by any indicator, Japan will find itself the most elderly society in the world.

### **Middle-aged and elderly populations**

For a comprehensive study of aging issues, several points require attention. First, as the elderly population comprises merely one part of the total population and has an inseparable relationship with the other portions of the population in the socio-economic environment, it is important to consider the elderly population in the context of age structure shifts. Furthermore, due consideration must be given to the middle-aged population, as it comprises a reserve of people soon to become elderly. Lastly, it is important to understand that the elderly population cannot be viewed as a single homogeneous group, but should be classified into several stages, owing to the great differences in health, level of activity, morbidity and mortality rates, among those in their 60s, 70s, and 80s. It is also clear that while the population over 65 years of age will increase greatly in absolute terms, the increase in the number of the very old will be particularly marked.

#### **Middle-age**

“Middle-age” is a vague term that is defined loosely according to the needs of a given study. For convenience sake, middle age will be used in this article to indicate those in the age group 50 to 64 years. These are the years immediately preceding and following retirement, which border on the lower limit of what is considered to be “old age”, i.e. 65.

A marked increase in the middle-aged population by the end of this century will parallel the increase in the elderly population, and at nearly the same level. However, it is important to remember that the sharp expected increase in the size of the elderly population, especially in the first quarter of the next century, will be due to the increase during this century in the size of the middle-aged population. Therefore, it will be necessary in the remaining years of this century to focus on the issues of the middle-aged population as a means of addressing the issues of the elderly population of the next century.

As is shown in **table 7**, the middle-aged population will increase by 12.1 million in the 25 years from 1975 to 2000, while the population over 65 years of age will increase by 12.5 million. However, in the 25 years from the year 2000 to 2025, the middle-aged population will decrease by more than one million, while the elderly population will increase by about 10 million (rate

**Table 7 : Trends in adult population by age groups with emphasis on the middle-aged population in Japan (1975 to 2025)**

Year	Actual No. (Unit: thousands of population)				Index (with 1975 as 100)			
	20-34	35-49	50-64	65 +	20-34	35-49	50-64	65 +
1975	29 100	24 010	14 738	8 865	100.0	100.0	100.0	100.0
1980	27 671	25 645	17 289	10 647	95.1	106.8	117.3	120.1
1985	25 086	28 121	20 347	12 472	86.2	117.1	138.1	140.7
1990	24 941	28 728	22 578	14 801	85.7	119.6	153.3	167.0
1995	27 102	27 293	24 324	17 984	93.1	113.7	165.0	202.9
2000	27 401	24 727	26 882	21 408	94.2	103.0	182.0	241.5
2005	25 886	24 624	27 549	24 430	88.9	102.6	186.9	275.6
2010	22 777	26 777	26 204	27 395	78.3	111.5	177.8	309.0
2015	21 472	27 069	23 780	30 879	73.8	112.7	161.4	348.3
2020	21 943	25 540	23 713	31 984	75.4	106.4	160.9	360.8
2025	22 626	22 494	25 796	31 374	77.8	93.7	175.0	353.9

*Source:* The data up to 1980 are based on census statistics. The data after 1985 are based on future population projections by the Nihon University Population Research Institute, 1986.

of increase: 46.5 per cent). These facts explain why the Japanese Government refers to the remaining years of this century as the “Era of the Middle-Aged.”

**Table 7** provides a breakdown of the actual number of individuals and the population index by age group to enable comparison of the middle-aged group with others in the working age population, and with the elderly population in the period from 1975 to 2025. The young working age population 20 to 34 years of age will experience a decrease during this period. The decrease will exceed 4 million people in 1990 as compared with 1975, and it is expected to have great economic and social consequences. In contrast, those in the intermediate working age population, i.e. people 35 to 49 years of age, will have increased in number by 4.7 million by 1990. However, this will change into a sharply decreasing tendency; in the short span of only 10 years until the year 2000, this group will have decreased by about 4 million. These severe fluctuations in the working age population over a comparatively short period are expected to have a grave impact on society.

The population in the 50 to 64-year-old age range will undergo different changes from the other working age population groups, as their numbers are expected to show a tendency towards continuous increase. This group will increase by more than 12 million (for a rate of increase of 82 per cent) in the 25-year period from 1975 to 2000. However, this sharply rising trend will

level off by 2025 and thereafter begin to decline. What should be noted here is the increase in the proportion of the middle-aged population as a part of the entire working age population. If the working age population is defined as comprising individuals 20 to 64 years of age, the proportion of the middle-aged population was only 21.7 per cent in 1975. It rapidly increased to 27.7 per cent in 1985 and will increase to 33.9 per cent in the year 2000 and finally 36.4 per cent in 2025. This tendency may be termed the “aging of the productive population.” As this phenomenon will naturally bring about the aging of labour force population, its effect on the economy and society will be great.

### Elderly

As previously mentioned, the aging of the Japanese population, i.e. the increase in the proportion of the elderly population, is expected to proceed at an internationally unprecedented speed and attain levels hitherto never experienced. It is not appropriate to discuss the increase in the elderly population as a single group, since distinct changes will occur in the age groups comprising those over 70 and 80 years of age. Although these groups, as a part of the population over 65 years of age, will exhibit the same tendency to increase in size, the rate at which they will do so will differ greatly. Moreover, marked differences in the areas of health, family status and economic conditions require that these groups be given separate consideration because of wide variances in related political, administrative and socio-economic implications. Therefore, in the following discussion, the population over 65 years of age is divided into three groups: those over 65 years, over 75 years and over 85 years, to enable an examination of the differences in their pattern of increase. **Table 8** shows their actual numbers and proportion of the increase of the aged population of those in the three age groups for the 45-year period from 1980 to 2025.

**Table 8: Increase in the elderly population by age group in Japan (1980 to 2025)**

Age	1980		2000		2025		1980-2025 Increase
	Number (10,000)	Per cent	Number (10,000)	Per cent	Number (10,000)	Per cent	
65+	1 065	100.0	2 141	100.0	3 137	100.0	2.9 times
75+	366	34.4	822	38.4	1 668	53.2	4.6 times
85+	53	5.0	168	7.8	362	11.5	6.8 times

Source: Future Population Projections, the Nihon University Population Research Institute, 1986.

As may be seen from the table, the rate of increase is markedly different in the case of the over-75 and over-85 age groups, as compared with the over-65 age group as a whole, i.e. 4.6 times for the over-75 age group and 6.8 for the over-85 age group as opposed to 2.9 times for the entire population over 65 years of age. The proportion of those over 75 years and over 85 years will rapidly increase. The population over 75 years of age accounted for about one-third of the population over age 65 in 1980 and will account for more than half of the population (53.5 per cent) in 2025. The very old population, i.e. those over 85 years of age, accounted for only 5 per cent of the population in 1980, but will have more than doubled to 11.5 per cent in 2025. This higher rate of increase in the upper ranges of the aged population is what is meant by the “aging of the elderly population.” It must be emphasized that this aging of the elderly population requires special consideration from the standpoint of policy for the previously mentioned physical, social and economic reasons.

### Similarities between Japan and China

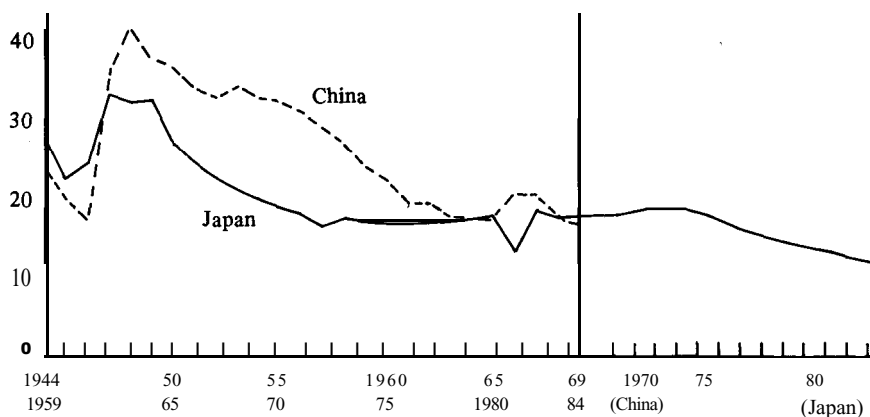
The demographic transition in China is very similar to the one which occurred in Japan in several aspects. An important point to note with regard to these fertility transitions is that, in the case of Japan, the birth rate dropped by half from 34.3 to 17.2 per thousand during the 10 years between 1947 and 1957 and that a comparable change occurred in China (see **table 9**). In

**Table 9: Comparison of fertility transitions in Japan and China**

Japan		China	
Year	Birth rate	Year	Birth rate
1947	34.3	1963	43.4
1948	33.5	1964	39.1
1949	33.0	....	....
....	....	50 per cent decrease	50 per cent decrease
....	....		
....	....		
....	....		
1957	17.2	1969	34.1
		....	....
		1976	19.9
		....	....
		1979	17.8

Sources: Japanese data from *Vital Statistics* by the Ministry of Health and Welfare. Chinese data from *China Statistical Yearbook*, 1984 edition.

**Figure: Comparison of fertility transitions in Japan and China**



China, the birth rate declined by almost half from 34.1 in 1969 to 17.8 per thousand in 1979. Both the initial and the final levels of the birth rate and the period required for the decrease are nearly the same. If the rate of 43.4 per thousand in 1963 is considered as the starting point of China's birth rate decline, the halfway point, i.e. 19.9 per thousand, was reached in 13 years (in 1976). In either case, the fact that requires special attention is that the Japanese fertility transition experience, i.e. the achievement of a 50-per cent drop in the birth rate within 10 years which at the time was said to be unprecedented, was repeated in China 22 years later.

For the sake of clarity, the data from Japan and China have been combined by overlapping time scales in the accompanying figure to highlight the similarities in the two fertility transitions. An examination of subsequent fertility behaviour reveals that fertility control was far greater in Japan than it was in China. However, the speed of implementation of fertility control in China was also extremely rapid. It is assumed that the transition which will occur hereafter will be on a level corresponding to that of Japan over the past 15 years. In other words, the transition of fertility behaviour in China has followed the pattern of modern fertility decline with a 15-year delay.

In comparison with China, where the influence of government policies on fertility behaviour is much stronger and far more effective, the Japanese case is remarkably different. In Japan, explicit population measures were not instituted by the Government. Instead, economic and social pressures produced a strong motivation for fertility control. Whether the motivation to practise family planning was provided by the adoption of strict population policies on the part of the Government or whether harsh socio-economic conditions pro-



vided the inducement does not matter, as both were strong enough to achieve an unprecedented level of fertility control.

As previously mentioned, a fertility or demographic transition brings about changes in the age structure of a population in like degree. In view of the marked similarity in the fertility transitions of Japan and China, it may be assumed that their age structure transitions will also be similar. Thus, it may be expected that future age structure shifts in China will follow a pattern similar to that of Japan. Of course, it must not be forgotten that the pattern of the age structure transition will be influenced by the progress of the fertility transition in China. However, considering the trends to date, it is not expected to differ greatly from the Japanese pattern.

As predictions about future age structure transitions must be based on future population projections, this article uses United Nations estimates of the Chinese population.

The latest population census, conducted in China during 1982, reveals an age structure which closely resembles that of Japan in 1955. **Table 10** shows the population distribution by age group, the age dependency ratio and the aging index.

Since the age structure of China in 1982 is similar to that of Japan in 1955, the age dependency ratio and aging index are also similar. The only difference is a 27-year time lag. Thus, although the age structure of China currently is young, it is expected that the marked drop in the birth rate will, in its course, bring about an accelerated aging of the population. The proportion of the population over 65 years of age was less than 5 per cent in 1982, but it is estimated that it will reach 7.3 per cent by the end of this century. In a period of less than 20 years, China will have become an elderly society.

**Table 10: Comparison of the age composition of Japan in 1955 and China in 1982**

Country	Year	Per cent distribution by age group			Age dependency ratio			Aging index
		0-14	15-64	65+	Total	Young	Elderly	
Japan	1955	32.4	61.3	5.3	63.3	54.6	8.7	15.9
China	1982	33.6	61.5	4.9	62.6	54.6	8.0	14.6

*Sources:* Japanese data from the 1955 Census performed by the Japanese Government. Chinese data from the 1982 Population Census.

**Table 11: Comparison of the age compositions of China in 2000 and of Japan in 1970 and 2000**

Country	Year	Per cent distribution by age group			Age dependency ratio			Aging index
		0-14	15-64	65 +	Total	Young	Elderly	
China	2000	24.3	68.3	1.3	46.3	35.6	10.7	30.0
Japan	1970	23.9	69.0	7.1	45.1	34.9	10.3	29.7
Japan	2000	17.0	66.5	16.5	50.3	25.5	24.8	97.0

*Sources:* Japanese data from the 1970 Census, and the 1986 projections of the Japanese population in the year 2000 by the Nihon University Population Research Institute. Chinese data from *United Nations: World Population Prospects, Estimates and Projections as Assessed in 1984*. New York, 1986.

A comparison of the degree of aging indicates that China will reach the 1970 Japanese level in the year 2000. **Table 11** compares the age compositions of China in 2000 and of Japan in 1970 and 2000. Particularly worthy of note in this context is the unprecedentedly low dependency ratio of 45 that Japan enjoyed in 1970.

This contrasts sharply with the high ratio of around 70 with which Japan had been burdened for many years prior to the Second World War; this provided a highly favourable demographic environment for Japan's period of rapid economic growth.

The age dependency ratio of the Chinese population in the year 2000 is projected to be 46.3, close to Japan's 1970 level of 45.1. Thus, the burden on people in their productive years will be very light; it will result in a population structure highly conducive to economic development.

What will the age structure of the Chinese population be in the next century and how will it compare with that of Japan? As shown in **table 12**, the age dependency ratio of the Chinese population in 2010 will be 43.7, which is lower than that of Japan in 1970. This favourable structure will prevail through 2020, when the ratio will still be as low as 44.5, and 2025, when it will have climbed somewhat but will nonetheless remain below the 50 mark at 47.8.

In contrast, Japan will experience a rapid rise in its age dependency

**Table 12: Comparison of the age structure transitions of the Chinese and Japanese populations after the year 2000**

Year	China				Japan			
	Age dependency ratio			Aging index	Age dependency ratio			Aging index
	Total	Young	Elderly		Total	Young	Elderly	
2000	46.3	35.6	10.7	30.0	50.3	25.5	24.8	97.0
2010	43.7	31.7	12.0	37.6	59.9	26.9	33.0	122.8
2020	44.5	28.2	16.2	57.1	65.1	24.5	40.6	165.8
2025	47.8	28.2	19.6	69.6	65.0	24.6	40.4	164.1

*Sources:* Japanese data from the 1986 projections of the Nihon University Population Research Institute. Chinese data from *United Nations: World Population Prospects, Estimates and Projections as Assessed in 1984*. New York, 1986.

ratio during the next century; the age dependency ratio will be 59.9 in 2010 and 65.1 in 2020. The aging of the Japanese population will be severe. The aging index, which shows the proportion of the elderly population with the young population set at 100, will reach extreme heights as 123 in 2010 and 166 in 2020.

However, the Chinese population in the first quarter of the twenty-first century will have an age dependency ratio as low as 40 and a very low aging index of 38 in 2010. This will be approximately one-third that of the Japanese level. In 2020, the aging index will rise to nearly 60 in China, still a low level which will be close to one-third of the Japanese level.

With such a light dependency structure towards the end of this century and the expectation that this favourable structure will continue for at least 25 years into the next century, China will enjoy demographic conditions conducive to rapid, high-level development, which may be achieved if the next several decades are used effectively.

### **Policy direction**

The following policy recommendations are based on the demographic analysis of population aging presented previously in this article.

The first recommendation concerns the age dependency ratio. In the

case of Japan, the age dependency ratio will remain below 50 throughout the remainder of this century. Therefore, these years have great significance as a preparatory period for developing the means to cope with the serious problems associated with a population which will be experienced in the coming century. It is extremely important to formulate definite measures during this period. Because of the heavy dependent population burdens of the next century, it will be of little use to make hasty policy decisions once the situation has already become a reality.

In the case of China, it is expected that the dependent population burden will be extraordinarily low for the next several decades from the end of this century into the next century. China will easily be able to cope with the expected aging of its population by utilizing this favourable period to its greatest advantage. The problem will involve the policies that China implements to cope with the complexities of the age structure transition.

A second policy consideration concerns the increased burden posed by population aging; measures must be devised to alleviate this problem. For Japan, an extension of the retirement age and creation of employment opportunities for those who wish to work after retirement are two practices which would contribute to this goal. Employment would not only provide income to supplement government pensions, but it would also help the elderly to find meaning in their lives as well as help to promote better health thus reducing medical expenditures. In Japan, it would be practically impossible to bring the population below age 20 into the labour force owing to the increasing proportion attending institutes of higher education. The young population, if defined in terms of dependency, does not comprise those in the 0 to 14 age group, but those in the range of 0 to 19 years. This is another factor that will increase the burden on the productive population. Thus, facilitating the employment of retired and elderly people takes on even greater importance. In fact, 65 per cent of 6.5 to 69-year-old men and 4.5 per cent of 70 to 74-year-old men are currently employed. This fact indicates that encouragement of employment in those age brackets through government policies is quite feasible. To make it possible for people to work past age 65, it is extremely important, however, to promote and maintain health, which will also contribute to controlling currently sharply rising medical expenditures.

The third recommendation for dealing with the problem of an aging population is not focused on the elderly alone. Policy measures must be comprehensive and systematically developed for society as a whole. The elderly are not a group isolated from society; they are a useful and valuable human resource for the development of society as a whole. Efforts to promote the welfare of all the people including children, the elderly, the ill and the labour force concern the redistribution of social resources.