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Structural Changes in Population and Development
— Japan's Experience in Aging —

FEBRUARY 1990

The Asian Population and Development Association

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THE ASIAN POPULATION AND DEVELOPMENT ASSOCIATION, 1990
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Foreword

The 21st century may be characterized by era of population aging in the world. In 1980, the world's elderly population aged 65 years or older had not yet exceeded 263 million people. However, this number is expected to climb to approximately 420 million by the year 2000, and to nearly double, to 800 million, by the year 2025.

In particular, this worldwide aging phenomenon should be watched closely in developing countries. In 1980, the elderly population in the developing countries was only slightly higher than in the developed countries, but by the year 2000, the figures will be 170 million in the developed countries, versus almost 240 million in the developing countries, and by 2025, the former will be 240 million, while the latter will more than double, to 556 million.

Moreover, 80% of this elderly population in developing countries is found in Asia. This indicates that Asia will be the focus of the aging problem in the 21st century.

The population aging is a result of the demographic transition caused by changes in the birth rate and death rate, Japan is the first non-Western country to achieve this demographic transition. In this regard, it will be most fortunate if Japan, with its pioneer experience, is able to play a guiding role for other Asian countries at different stages in their demographic transitions.

I would like to express my profound appreciation for the special cooperation that was received in preparing this report from specialists in the field.

Finally, I would like to thank Chairman Ryoichi Sasakawa of the Japan Shipbuilding Industry Foundation and Mr. Nafis Sadik of the United Nations Population Fund (UNFPA) for the generous assistance that both their organizations offered for the production of this report.

February, 1990

Tatsuo Tanaka
Chairman
The Asian Population and
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Table of Contents

Chapter 1

Overview and Introduction

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1. The 21st Century: Era of the Population Aging

The population of the developing regions makes up 75% of the world's total population, but the age composition of this population is extremely young. In 1980, the proportion of the population aged 65 or over in the developed regions was a substantially high 11.5%, as compared with the low ratio of only 4.0% in the developing regions; a level that is approximately one third of that found in the elderly population in the developed regions.

The absolute number of elderly people, however, is worthy of notice. In 1980, this figure was approximately the same in the developed and developing nations. The former (130.4 million) versus the latter (132.7 million), indicates that the elderly population is somewhat higher in developing countries. However, by the year 2000, these figures are expected to change to 169.2 million in the developed regions, and 248.5 million in the developing regions, a difference of almost 8 million people.

The rate of increase in the elderly population during the twenty year period between 1980 and the year 2000 should be 30% in developed regions, when compared with the substantially high ratio of 87% in the developing regions. This elderly population ratio amounts to 13.3% in the industrialized regions, versus a low 5.1% in the developing regions. Nevertheless, the rate of increase in this ratio in the developed regions from 11.5% to 13.3% is only 16%, versus the increase in the developing regions from 4.0% to 5.1%, an increase of 1.1 points, or 27%. The noticeably large denominator in the developing regions results in this tremendous increase in the elderly population.

In addition, the transition over the 25-year period from the year 2000 to 2025 is another point that is worthy of examination. The elderly population in the developing regions by 2025 will be 555.8 million, versus that of the industrialized regions at 242.4 million. This represents a rapid increase of approximately 2.3 times in the elderly population of the developing regions.

The world's elderly population, sum of the population aged over 65 in both these regions, is expected to soar to an enormous 800 million. This will be equal to 10% of the entire world population and will be almost double the figure of 418 million for the year 2000. This data indicates that the 21st century will usher in a new era characterized by population aging.

In this kind of world, it is probable that Asia will be the focus of the elderly population problem in the developing regions. This is because the proportion of the elderly population in the developing regions occupied by the elderly population of Asia is overwhelmingly

high. This proportion (82% in 1980, 83% in the year 2000, 79% in 2025) is remarkably high. Furthermore, it should also be taken into consideration that the ratio of Asia's elderly population is significantly higher than that of all the developing countries taken together.

When looked at from this perspective, it is probably not an exaggeration to say that the population aging era of the 21st century will be represented by Asia. The figures mentioned above have been compiled and are listed in Table 1.

Up until now, the population aging phenomenon is something that has only been observed in the developed regions, but it should be understood that the population aging expected in the developing regions presents a truly new problem which mankind will have to confront.

2. Stages of Transition in the Asian Population

In order to fully comprehend the phenomenon of the population aging, it is necessary to understand the factors that cause population transitions, especially fertility transitions. Therefore, an examination of the present status of the population transition in the Asian countries is in order.

The transition course from a high birth rate/high death rate to a low birth rate/low death rate, is referred to as a "demographic transition." The first countries to have achieved the status of low birth rates and low death rates, as well as the resulting low natural rate of increase (mainly under 1%), were the industrialized countries in Europe and North America.

After World War II, the one country outside of the sphere of influence of Western culture that underwent the same demographic transition pattern seen in the developed countries was the Asian nation of Japan. The Japanese experience, in which the demographic transition process was thought to be achievable only by the West European countries, but which Japan attained in a much shorter time period, proved that regions and countries outside of the sphere of influence of Western culture also could realize this process.

After Japan, the countries of Singapore, Hong Kong, Korea, and China attained the same demographic transition as Japan in a short period of time. The course of the drop in the birth rate in these four regions is shown in Figure 1.

However, the course of this demographic transition is not necessarily easy; the drop in the birth rate is not a simple process.

In order to thoroughly diffuse small family norm among general public so-called "modernization," a broad topic which encompasses socioeconomic improvements, including the raising of the living standard, improvement of the level of education, urbanization and industrialization, is necessary. In rural societies where this kind of modernization is not advancing and the illiteracy rate is high due to the poor level of education, a comprehensive program is necessary in which the government together with private groups will lead the people to family planning practice.

An improvement in the death rate is not as difficult to achieve as one in the birth rate. However, after achieving mortality decline to some extent, in order to improve the death rate further, improvements are necessary in many areas such as in medicine, public hygiene and pharmaceuticals, as well as in the people's fundamental knowledge and understanding of illness and nutrition. Even so, an improvement in the death rate is so widely desired that, thanks to the government's efforts, there are many cases where the death rate is declining faster than the birth rate.

In order to understand how this kind of demographic transition is progressing, it is necessary to look at those indices that reflect whether the population aging will begin early or late. For this purpose, by combining the level of the drops in the birth and death rates, indices can be derived that indicate the degree of demographic transition attained. In Table 2, figures are presented that indicate the degree of demographic transition in the Asian countries. Two sets of indices have been calculated. One of them (index 1) is based on the birth and death rates, while the other (index 2) is calculated by taking into consideration the urbanization-rate factor, as well as the birth and death rates. Since the urbanization rate is a factor that can affect the birth and death rates and make an excessive difference depending on the region (for example, Singapore and Hong Kong are cities in themselves), we will only consider index 1, calculated from the birth and death rates.

A demographic transition figure of about 1.00 indicates that the both birth and death rates have declined to low levels similar found the developed country, and so the demographic transition has reached completion. Included in this group are seven countries, starting with Japan and ending with China, in which the demographic transition index is at least 0.90.

In the second group, there are six countries in which this figure ranges from 0.7 to just below 0.9. The ASEAN countries of Malaysia and Thailand are included in this group. This group has already experienced a remarkable improvement in the death rate, and there is a tendency for the birth rate to decline steadily as well.

The third group represents countries with a transition index of between 0.5 and below 0.7. It includes eleven countries, from Turkey down. The death rate in these countries is dropping, but the drop in the birth rate is slow and remains at a fairly high level.

The fourth group is composed of nations with a transition index below 0.5. It includes fifteen countries starting from Iraq down to Afghanistan. Least-developed countries, such as Nepal, Bangladesh, and Bhutan, are included in this group. These are the countries in which the demographic transition is occurring at the slowest rate. All the countries in this group have a substantially high birth-rate level, with a crude birth rate of over 40 and a total fertility rate (TFR) of 5-6. There is no clear trend or evidence to suggest a drop in the birth rate. However, there is already a tendency for the present high death rate to drop. This tendency is clearly observed in that, twenty years ago, the crude death rate was at the high level of 25, and this has been improved to a level of approximately 15. Therefore, the average life expectancy has also improved from forty to fifty years.

Most countries in Africa can also be thought of as belonging to the Asian fourth group. Therefore, the four Asian groups listed above form a microcosm model that represents the world.

In all Asia's countries, a progressive drop in the death rate is underway, but these countries can be divided into different groups starting with the group at the initial stage of demographic transition in which there is no tendency for the birth rate to decline; the third group, in which an increasing drop in the death rate occurs with a slight decline in the birth rate; the second group, in which a substantially low death rate occurs with steady progress in lowering the birth rate; and finally, the first group in which demographic transition, consisting of low death and birth rates, has been achieved.

The population of China, which belongs to the first group, already exceeds 1.1 billion, but the aging trend which follows the attainment of demographic transition is accelerating. Thus, the population aged 65 or older has been about 90,000,000 in 1980, but will reach approximately 300 million in 2025. In this year the elderly population rate will exceed 20%.[1] India belongs to the third group, but its population is already over 800 million. The proportion of the population aged 65 or older is only 4.0%, but will rise to 5.6% in the year 2000, and will increase rapidly to 9.7% in 2025. This elderly population stood at 28 million people in 1980, and is expected to rise quickly to 55 million by the year 2000 and to 120 million by 2025.[4]

In this manner, along with the acceleration of aging found in Japan and China in the second and third decades of the 21st century, aging will increase rapidly in the countries belonging to the second and third groups from the 30's to the 50's, so aging in Asia and the entire world

will progress, ushering in a new era of population aging never before known in human history.

3. Direction of Measures to Cope with the Elderly Population

The population aging phenomenon is an inevitable result of the success of birth control as a policy to control rapid increases in the population rate. Unlike the developed countries, which have never experienced an unusual increase in their population rates, most developing countries find that such an increase hinders their progress toward modernization. In order to rid themselves of the misfortunes of poverty, malnutrition, and sickness, strong policies must be adopted to sustain economic growth and simultaneously keep the rate of population increase in check.

The adoption by China of a new economic structure in 1978 and the "One Child Policy" in 1979 has been an extremely significant experience. The extremely reformatory economic policies, including that which turned the collective farming system into on based on individual responsibility, brought about large-scale economic growth, as well as a substantial rise in the people's living standard. Furthermore, the unprecedented "one child" family-planning policy was implemented at precisely the right time to achieve individual expectations of achieving a high standard of living.

The ultimate objective of the birth control policy is the fundamental theme of socioeconomic modernization. Therefore, it must be kept in mind that the attainment of this objective, in other words, the completion of the demographic transition, signifies a triumph toward modernization. However, at the same time, this success inevitably results in changes in age composition, or the population aging phenomenon. Therefore, it is necessary to realize that the decline in the birth as cause of aging rate and the aging which occurs as a result are on two different planes.

Now we will examine some aspects pertaining to the direction of the steps that must be taken to cope with the aging population:

1) Since the pace of population aging differs depending on the rate of decline in the birth rate, this change is not the same for each country. By constantly monitoring the change in the birth rate and updating the future population estimate from that information, the aging trend becomes clear in detail.

2) The elderly population is one component of the change in age composition. That is to say, there is a relative relationship between it and other age groups, such as the child population and the productive

age population. Therefore, the elderly population is not an isolated group, but must be dealt with comprehensively as one group in the entire population. This means that a program that takes into account changes in the population based on sex and age differences must be incorporated dynamically in any socio-economic development plan.

3) In the initial stage of the aging process, the rate of increase in the elderly population is greatly exceeded by the rapid decrease in the child population, so the dependency ratio generally decreases dramatically. In Japan's case, the dependency ratio was 68 in 1955, but only 45 in 1970, a large decrease of 24%, or 23 persons. It should be understood that this is an extremely favorable condition for high economic growth. Also, it is clearly desirable for the advantageous condition of a low dependency ratio to be incorporated into socioeconomic planning.

In China also, according to joint Sino-Japanese population projections, in the first decade of the 21st century this ratio will reach the unprecedentedly low level of 41. During this favorable period, the effective implementation of a policy to cope with aging is necessary. This is because by the second half of the third decade of the 21st century, the dependency ratio will rise above 60.

4) There is also the problem of the elderly population's effect on the labor force. The importance of this aging of the labor force will probably increase with time: a) With the population aging, the young labor force population will decrease noticeably; b) The improvement in the health standard of age-limit retirees and their higher educational attainment and c) Remarkable extension of life expectancy and early retirement age will lengthen substantially the period in old age after retirement.

The retirement age for men in both Japan and China is 60 years. However, the average life expectancy for men is 75.6 years in Japan, 68.0 years in China (1985-90, United Nations estimate), 67.4 years in Korea (1985), and 71.3 years in Singapore. In most Asian countries, an improvement in the death rate will occur together with a significant increase in average longevity.

Generally, there is a deep interest in Asian countries associated with continued employment after retirement. From an economic viewpoint as well, many people wish to continue working even after they retire. In Japan, the labor force participation rate of men over 65 is 41.5% (1985), an extremely high figure when compared to 15.5% in the United States (1984) and 4.3% in France (1984).

The aging of the working age population, means that the labor force population (for example, the labor force from 15-60 years, or from 15-64 years) will also age.

In terms of formulation of policy for the labor force supply and demand plan, all the factors mentioned above must be considered so that an appropriate allocation of the elderly labor force and it's efficient application can be performed.

5) There is also the problem of the family and elderly support. In most Asian countries, old people hold a position of authority in the family structure, and all necessary support during old age is provided by the family. This is particularly true in countries and regions governed by the principles of Confucianism, in which the family has come to play an important role in terms of elderly support.

However, the function of this kind of family support of the elderly is thought to be changing, along with the acceleration of urbanization, industrialization, and population migration. On the other hand, population aging has resulted in the increase of more very old people over 75 and 80 years old, and, as a result, the number of bedridden old people with geriatric diseases who require long-term medical care has increased.

During the period of high economic growth in the 60s and 70s in Japan, a large portion of the young population in the rural villages migrated to the cities. The rural villages have since become regional societies with many old people, and this has created serious socioeconomic problems. In particular, the substantial decrease in the birth rate means that the number of children who would be responsible for taking care of the elderly has declined dramatically.

In China also, due to the remarkable economic growth resulting from the new economic structure, a large portion of the young population in rural villages has migrated to the cities, or became engaged in non-agricultural industries. The disruption of the typical family pattern is predicted due to the increased importance of the young generation in the family consciousness of urbanized society. This kind of change is not occurring in China alone. The same trend is observed in most Asian countries that are on the road to modernization.

4. The Problem of Aging in Transitional Period

Asia is currently in a violent stage of demographic transition. This is a hardship encountered on the road to modernization. After World War II, the first country outside of the sphere of influence of Western culture that achieved this population transition was Japan. Then, this demographic transition spread through East and Southeast Asia, to Korea, Singapore, Hong Kong, and China. Before long, this tendency will also become clearly apparent in South Asia.

Demographic transition inevitably results in the appearance of an elderly population. This is the first experience of population aging in Asia. The Asian population is huge and the elderly population is also enormous, and this theme is the main challenge that Asia will face in the 21st century.

The aging policies adopted in the United States and Europe may serve as one possible model for Asia. However, for Asia, with its different cultural background, economic development and social structure, this lesson alone will not be sufficient. The Asian family structure in particular is seen as a substantially different, unique characteristic.

Since the population aging and socioeconomic stages of development differ from country to country within Asia, it will be necessary to formulate policies to cope with the aging problem based on the individual characteristics of each country.

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Table 1 Change in the Distribution of the Elderly Population (aged over 65) in the World Total, Developing Regions, Industrialized Regions, and Asia (for the years 1980, 2000, and 2025)

	1980		2000		2025	
	Absolute Number	Percentage	Absolute Number	Percentage	Absolute Number	Percentage
Worldwide	263,142	5.9	417,757	6.8	798,197	9.7
Developing Regions	130,405	11.5	169,236	13.3	242,399	17.4
Developed Regions	132,737	4.0	248,520	5.1	555,798	8.2
Asia	109,045	4.4	205,677	6.1	437,277	10.3
Percentage of Total in Developing Regions	82.1		82.7		78.6	
Percentage of World Total	41.4		49.2		54.8	

Source: United Nations 1986, World Population Prospects, Estimates and Projections as Assessed in 1984 (Population Studies No.98), New York: United Nations

Remarks: Asia refers to the regions in East Asia, Southeast Asia and South Asia; Middle East is not included.

Table 2 Population Transition Indices for All Asian Countries

Country	Index 1	Index 2	Ranking	Difference
1.Japan	1.06	1.00	(3)	0.06
2.Hong Kong	1.05	1.02	(1)	0.03
3.Singapore	1.02	1.01	(2)	0.01
4.Cyprus	0.99	0.89	(5)	0.10
5.Israel	0.91	0.90	(4)	0.01
6.South Korea	0.90	0.84	(6)	0.06
7.China	0.90	0.76	(7)	0.14
8.Sri Lanka	0.83	0.71	(12)	0.12
9.Malaysia	0.76	0.68	(13)	0.08
10.North Korea	0.75	0.72	(11)	0.03
11.Lebanon	0.74	0.75	(8)	-0.01
12.Thailand	0.74	0.63	(16)	0.11
13.Bahrain	0.71	0.73	(9)	-0.02
14.Turkey	0.69	0.64	(15)	0.05
15.Kuwait	0.67	0.73	(10)	-0.06
16.United Arab Emirates	0.65	0.67	(14)	-0.02
17.Philippines	0.61	0.57	(18)	0.04
18.Qatar	0.57	0.63	(17)	-0.06
19.Indonesia	0.57	0.51	(20)	0.06
20.Burma	0.57	0.50	(22)	0.07
21.Vietnam	0.56	0.49	(23)	0.07
22.Mongolia	0.53	0.54	(19)	0.00
23.India	0.53	0.48	(24)	0.05
24.Iran	0.52	0.51	(21)	0.01
25.Iraq	0.44	0.48	(25)	-0.04
26.Jordan	0.39	0.44	(26)	-0.05
27.Syria	0.39	0.40	(28)	-0.01
28.Saudi Arabia	0.36	0.43	(27)	-0.07
29.Cambodia	0.36	0.31	(29)	0.05
30.Bhutan	0.35	0.29	(31)	0.06
31.Bangladesh	0.33	0.28	(33)	0.05
32.Pakistan	0.31	0.30	(30)	0.01
33.Nepal	0.31	0.27	(34)	0.04
34.Laos	0.30	0.26	(35)	0.04
35.Oman	0.27	0.23	(36)	0.04
36.People's Democratic Republic of Yemen	0.26	0.29	(32)	-0.03
37.East Timor	0.25	0.22	(37)	0.03
38.Arab Republic of Yemen	0.23	0.22	(38)	0.01
39.Afghanistan	0.16	0.16	(39)	0.00

Source: United Nations, World Population Prospects, Estimates and Projections as Assessed in 1984, calculated in 1986. ([2])

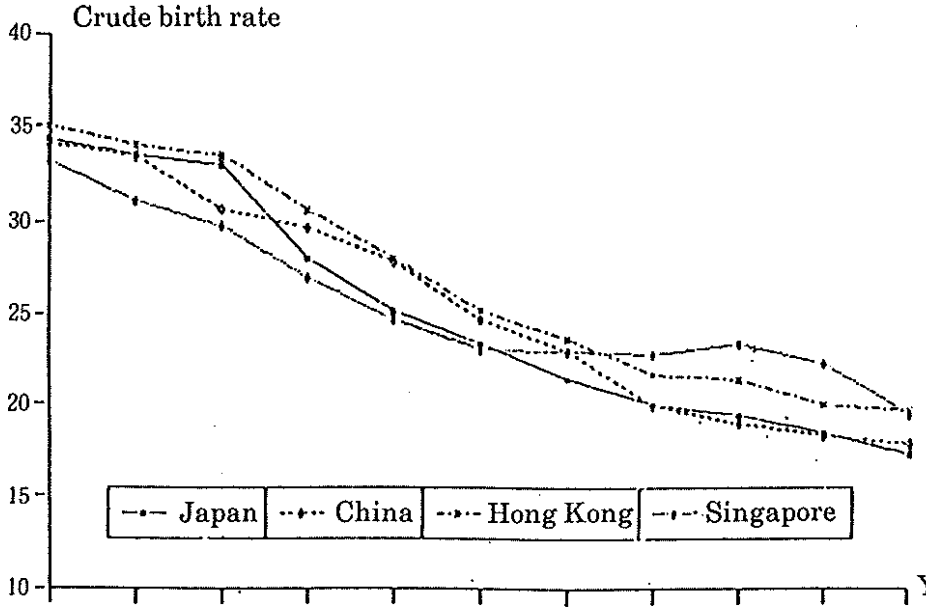
Remarks: Index 1 and Index 2 were calculated in the following manner.

Index 1 = 0.5[(7.5-TFR)/5.3] + 0.5[1-(75-e)/4.3]

Index 2 = 0.4[(7.5-TFR)/5.3] + 0.4[1-(75-e)/4.3] + 0.20 [U]

Computation method: Lee-Jay Cho and Janis Y. Togashi, Industrial Transition and Demographic Dynamics of the Asia-Pacific Region (Proceedings of the International Symposium on the Role of the Asia-Pacific Region in World Economic Development, in Commemoration of the 80th Anniversary; College of Economics, Nihon University, 1984

Figure 1 Comparison of the Drop in the Birth Rate in 4 Asian Countries



1947	48	49	50	51	52	53	54	55	56	57	Japan
1969	70	71	72	73	74	75	76	77	78	79	China
1961	62	63	64	65	66	67	68	69	70	71	Hong Kong
1964	65	66	67	68	69	70	71	72	73	74	Singapore

Source: [3]

Chapter 2

Demographic Transition and the Aging of the Population in Japan

I. Historical Background of Japan's Demographic Transition and Its Meaning in Asia

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I. Historical Background of Japan's Demographic Transition and Its Meaning in Asia

As Japan has modernized economically and socially since the Meiji Restoration, its population has also undergone a drastic structural change.

This change in population is what is generally called a "demographic transition." This is a process of the birth and death rates being reduced to a low level from the initial high level by going through various phases. Of course, such a trend in the birth and death rates causes the rate of population growth and the age distribution of the population to change drastically, which in turn exerts an important influence on the economic and social aspects of the country as a whole.

But demographic transition has not occurred in Japan alone. Many other developed nations have also experienced it in the course of their modernization. It should be noted, however, that Japan's demographic transition took place outside of Europe and America, and, more specifically, in a society which was influenced by Asian traditions. Whatever may be the case today, it was an exceptional demographic transition at that time. In this context, the author considers it worthwhile to discuss the background of the demographic transition in Japan and a variety of factors that have resulted from it so that they may serve as a guide in studying the demographic transitions in other Asian countries, as well as in many other developing countries.

1. Demographic Transition in Prewar Japan

It is generally understood that the demographic transition in Japan was, on the whole, similar to that experienced in the West. Recently, the results of a new study on the demographic transition of Britain have been published. According to the new study, the pattern of Britain's demographic transition was actually different from what had been considered the typical pattern of the demographic transition in that country. If we view demographic transition as a long-term trend of population, without paying too much attention to its details, however, it can be said that there is no clear difference between the new theory and the old ones. This question, by nature, needs to be discussed in detail, but is beyond the scope of this paper.

In Japan, the statistics of population dynamics have been available since 1899 and static statistics of population have been available since 1920. However, neither the dynamic statistics published before 1889, nor the static statistics published before 1920 are highly reliable. This is a well-known fact here in Japan, and some sets of estimated

figures have been published by experts in demographics. An analysis of chronological changes in the birth and death rates during the period from the Meiji Restoration to 1920 reveals that the death rate declined slightly and that the birth rate, on the other hand, changed little, although there were some fluctuations.

The main cause of the decline in the death rate was the gradually improvement of the people's standard of living with the advancement of economic and social modernization. The decline in the death rate slowed from the last years of the Meiji Restoration to the Taisho and Showa eras, largely due to the progress of industrialization. In response to this, however, the government stepped up its measures for the prevention of infectious diseases and for improving environmental sanitation, which in turn contributed to further declines in the death rate. On the other hand, there were few factors to help reduce the birth rate. As the Japanese economy continued to be modernized, the scope of activities of the general consumer expanded, which failed to make consumers aware of the mounting overpopulation. Under the government's policy for building up its economic and military strength, "it was imperative to increase the country's population as much as possible. While industrialization was in progress, agriculture was still the predominant sector of Japanese industry. It was thus only natural that the birth rate changed little in the decades after the Meiji Restoration.

However, the birth rate began to decrease gradually around 1920. This means that Japan's demographic transition had entered a new phase. In 1920, a national census was taken for the first time in Japan, which resulted in a drastic improvement in the quality of the country's demographic data. From that year on, it became possible to have a clear picture of trends in the country's population (see Fig. 1.).

In 1920, the birth rate was as high as 36.2 per mill, but it gradually declined until it reached 26.6 per mill in 1939. The birth rate rose slightly when the country came under the rule of a war regime. But the slight downward trend of the birth rate that had continued since 1920 remained unchanged, as is clear from Fig. 1.

We can attribute the main reason for the downward trend in the birth rate which started in 1920 to the fact that industrialization in Japan had reached a relatively high level. The primary agricultural industry, which represented approximately 80 percent of the total number of employed persons during the early years of the Meiji era, accounted for only about half (53.8 percent) of the country's employed population in 1920. On the other hand, the ratio of the country's urban population to its total population increased. The country's total population increased from approximately 35 million at the beginning of the Meiji era to approximately 56 million in 1920, and "population pressure" began to surface. "Rice riots" broke out in 1918, the debate over population problems continued from the last years of the Taisho era to early years

of the Showa era, and the Council for the Study of Population and Food Problems in 1927 was established against such a background.

It can be said that the decline in the birth rate was a phenomenon which reflected the general public's reaction to these factors. But this did not result from the government's efforts to prevent further increases in the country's population. It did explain why the pace of the decline in the birth rate was very slow. It was only after World War II that the country's population began to decline sharply.

2. Demographic Transition in Postwar Japan

Japan's demographic transition was interrupted temporarily by the outbreak of World War II. During the three-year period from 1944 to 1946 (noting that the year 1945 was when the Pacific War ended), it was impossible to collect and compile demographic data and, therefore, no such data were published. According to estimates made public after the war, the birth rate and the death rate in 1944 were 29.2 per mill and 17.4 per mill respectively. In 1945 the birth rate was 23.2 per mill, and the death rate 29.2 per mill, and in 1946 the birth rate was 25.3 per mill, and the death rate 17.6 per mill. These estimates indicate that the year 1945 was characterized by a remarkably high death rate, with the natural increase rate being below zero.

According to the demographic data made public in 1947 and there after, there was a phenomenal baby boom during the three-year period of 1947 - 1949, when both the birth rate and the death rate increased sharply. A baby boom during an immediate postwar period is not a rare phenomenon. As far as Japan is concerned, the period of the postwar baby boom was relatively short. It should be noted, however, that the total number of newborn babies in the three-year period was 8.06 million, which was extremely large when compared with the years immediately before and after this period. These newborn babies of the baby boom generation, were to exert a great influence on the Japanese economic and social aspects for a long time. They are now in their forties, and are certain to constitute a large proportion of the elderly population in the next century.

After the baby boom ended, the birth rate declined sharply. (see Fig. 2) The birth rate, which was 34.3 per mill in 1947, decreased to 17.2 per mill in 1957. In other words, the birth rate was reduced by half during this ten-year period. The number of newborn babies decreased by more than 1 million from 2.68 million in 1947 to 1.57 million in 1957. The sharp decline in the birth rate was due partially to the reaction to the baby boom. But the fundamental reason for this was the extreme poverty the Japanese people experienced immediately after the war. It was impossible for both parents and their children to

survive unless the number of newborn babies was minimized. In those days, few Japanese people had a satisfactory knowledge of family planning. Since abortion was not legalized yet, illegal abortions were rampant. While the economic rebuilding advanced and the standard of living was gradually improved, the birth rate continued to decline. After the war, the Japanese people were able to decide on whether or not to have children on their own.

In 1950, the Population Problems Study Group of Mainichi Shimbun conducted a survey titled "National Opinion Survey of the Present Condition of Family Planning." In this survey, 61 percent of the respondents were asked to express their opinions as to the now available easy contraception methods. The result was that 61 percent of them said, "It's good." They were also asked to answer the question, "If the rate of the growth of this country's population declines or the population is reduced as a result of the spread of the concept and practice of family planning, do you think it will benefit this country and your family?" Fifty-six percent of the respondents replied that it would benefit at least their families, while 14 percent said that it would not benefit their families. As to whether it would benefit this country, 36 percent replied affirmatively while 31 percent replied negatively. In reply to a question about the reasons for practicing contraception, 44 percent mentioned "financial reasons," 39 percent citing "for the child's health and/or education" and 32 percent "for reasons of mother's health."

In 1973, the Eugenic Protection Act was issued with the prevention of "the birth of defective babies and protecting mothers' lives and health from an eugenic point of view" as its objectives. In 1976, the Japanese government made a Cabinet decision in favor of birth control, and in 1977 the Ministry of Health and Welfare launched a national campaign to spread the concept and practice of family planning for the purpose of protecting mothers' health. These government policy measures were instrumental in providing the means for the Japanese people to practice fertility control on their own, as well as creating a new social environment which did not exist in prewar Japan. These measures' effects were great enough, as reflected in increases in both the number of abortions and the contraception practice rate.

The year 1955 was a turning point, and the Japanese economy completely regained its footing, entering a new stage of high growth. Japan was to witness a high level of economic growth which had never been imagined in prewar days and a remarkable improvement in the people's standards of living. Under such circumstances, both the birth rate and the death rate declined to low levels.

Between 1955 and 1974, the birth rate changed little, although it declined in 1966 because the year was one of those in which giving birth to female babies should be averted for superstitious reasons in Japan

and rose slightly around 1974 when many baby boomers reached marriageable and child-bearing ages. In 1966 the number of newborn babies was 1.36 million, a decrease of 460,000 when compared with the 1.82 million of the previous year. The birth rate decreased to 13.7 per mill from 18.6 per mill in the previous year. The number of newborn babies, which had never exceeded the 2-million mark since 1953, passed it from 1971 to 1974.

During the period of 1955 - 1974 the birth rate remained stable. When viewed from the standpoint of the population's reproduction rate, the country's population during this period stayed at a level appropriate for guaranteeing population replenishment, with the total fertility rate being 2.1 and the net reproduction rate 1.0. It should be noted, however, that the birth rate has continued to decline since 1975, causing both the total fertility rate and the net reproduction rate to decrease.

As is shown in Fig. 2., from 1955 to 1974 the national life remained stable economically, which was reflected in the trends in the birth rate. During this period, the birth rate stayed at a level which was appropriate demographically -- in other words, at a level conducive to the realization of a static state of population.

Trends in the birth rate since 1975 deserve careful attention. If these trends continue for a long time, they will exert an important influence, not only on future trends in the country's population, but also on various economic and social aspects of the country.

On the other hand, the death rate has declined satisfactorily since the end of the war. As a result, the average Japanese life span has increased markedly. Males' average life span and females' average life span, which were 50.1 years and 54.0 years, respectively, in 1947, have increased to 63.6 years and 67.7 years in 1955, 67.7 years and 72.9 years in 1965, 69.3 years and 74.7 years in 1975, and 74.8 years and 80.5 years in 1985. Males' average life span reached 75.6 years, and females' average life span 81.4 years, in 1987.

While the death rate for the young population, particularly the infant death rate, had decreased remarkably, that for the middle/old age population has yet to decrease significantly. In this connection, it is hoped that there will be considerable progress in the prevention and treatment of the major causes of death in persons of middle/old age, including cancer, heart diseases, strokes, etc. The decline in the death rate, however, has drastically increased the possibility of many people living to an advanced age. According to the life expectancy table for 1947, only 40 out of every 100 newborn baby boys were expected to live to be 65 years old, while 49 out every 100 newborn baby girls were expected to live to be 65. In other words, less than half of the average Japanese people were expected to live to an advanced age at that

time. By contrast, the life expectancy table for 1987 indicated that 82 in 100 newborn baby boys, and 91 in 100 newborn baby girls, were expected to live to be 65. Now only a few newborn babies were expected to die before they reached a great age.

3. A Consequence of Demographic Transition: the Aging of the Population

The transition from the dynamics of the population characterized by high birth and death rates to that of low birth and death rates is a process which occurs in keeping with the economical and social development in almost all countries. Changes in the age distribution of the population, including the aging of population, are also common to almost all countries. In the case of Japan, the birth rate, which began to decline slightly around 1920, decreased sharply after World War II. Consequently, it was around 1955 that the age distribution of the population began to change drastically.

The national census taken in 1920 revealed that Japan had a total population of 55.96 million in that year, of which the young (0 to 14) population accounted for 36.5 percent, the productive-age (15 - 64) population 58.3 percent, and the old-age (65 and older) population 5.3 percent.

According to the national census taken in 1955, on the other hand, of the country's total population of 90.08 million, the young generation represented 33.4 percent, the productive-age population 61.2 percent, and the old age population 5.3 percent. This means that, while there was a substantial increase in the total population between 1947 and 1955, there was no significant change in the age distribution of the population. As the birth rate was already on the decline, the ratio of the old-age population to total population never increased, while the ratio of the young population decreased slightly. After that, however, the ratio of the old-age population to the total changed drastically. It increased to 7.1 percent in 1970, to 10.3 percent in 1985, and to 11.2 percent in 1988.

In Japan, both the birth and death rates decreased sharply during the war. For this very reason, the pace of the population is aging is very fast now, and the proportion of the old-age population projected for the future is extremely high. According to recent population projections (see Table 1), the ratio is expected to reach 16.3 percent -- equal to the percentages currently recorded in Western countries -- by the end of this century. In the early years of the next century, it will exceed 20 percent and even thereafter will continue to increase until it reaches 24 percent.

Demographic transition is a phenomenon which is inevitably brought about by a country's economic and social modernization. When the death rate is reduced satisfactorily by economic and social modernization, it becomes possible to control further population growth. But, at the same time, the decline in the death rate results in a remarkable increase in the old-age population ratio. In that case, it will be imperative for the government to implement appropriate policy measures to prevent the increase in the relative number of elderly persons from causing the economic and social energies of the country to slacken or to hamper the economic and social development of the country.

4. Japan's Experience with Demographic Transition and Its Meaning in Asia

When compared with Japan's experience with demographic transition and the present condition of demographic transition in other Asian countries, the following points can be made.

As mentioned earlier, demographic transition is the pattern of trends in the birth and death rates. In the case of Japan in particular, the birth rate was in excess of 30 per mill from the Meiji to the Taisho eras and to the baby boom period of the Showa era. During this high birth rate period there were two stages, on each of which the death rate showed a distinctive trend. The first stage was the period from the Meiji to the Taisho eras, during which the death rate stayed at the level of over 20 per mill. The second stage was the Showa era, during which the death rate was less than 20 per mill, (but during which it never fell below the 10 percent level).

Next, it was in 1950 and after that the birth rate fell below the 30 per mill level. The birth rate stayed at the 20 per mill level for only five years, from 1950 to 1954. Since 1955, it has never exceeded 10 per mill. Since the birth rate began to fall below the 30 per mill level, the death rate has always stayed at low levels, never exceeding the 10 per mill mark, except for 1950.

The present pattern of demographic transition in other Asian countries as compared with that in Japan is, as shown in Table 2, characterized in part by the diversity of the level of the birth rate. There are not a few countries where the birth rate is in excess of 30 per mill, and in some countries it exceeds 40 per mill. There are also some countries where the birth rate stays at the 20 per mill level, and in still others it falls below the 10 per mill level.

In contrast to such a diversity in the level of the birth rate, there is a surprisingly narrow difference in the level of the death rate. In none of these Asian countries does the death rate exceed 20

per mill. In most of these countries the death rate falls below the 10 per mill level, although in some countries it stays at the 10 per mill level.

One of the striking differences in the demographic transitions of Japan and the other Asian countries is that, in Japan, the decline in the birth rate was triggered, not by the central government's policy measures to control further increases in population, but rather by the voluntary action of the Japanese people. In other Asian countries, on the other hand, the birth rate is effectively kept down, although in varying degrees, through the central governments' population policy measures.

As far as the death rate is concerned, there has been a significant improvement in the death rate as a result of the central government's active health policy measures in both Japan and other Asian countries. In Japan, the pace of decline in the death rate was slow during the prewar period because advanced health care/sanitation techniques were not available yet. After the war, however, there were phenomenal improvements in these techniques in both Japan and other Asian nations. As shown in Table 2, this has resulted in marked decreases in the death rate in most Asian countries.

Of course, a reduction in the death rate is welcome in all countries. The combination of a high death rate and a high birth rate, however, is bound to push up the rate of increase of the population, which, in effect, is one of the greatest challenges facing developing countries which are aiming seriously at economic and social development. It is, therefore, imperative for these countries to control their birth rates.

In relation to the problem of the aging populations, the need to plan and implement programs for controlling the birth rate will begin to emerge. Changes in the age composition of the population, owing to the decline in both the birth rate and the death rate, may be inevitable, but such changes should not be too drastic. The central governments' population policies should be formulated and implemented in harmony with their economic and social policies.

II. Stages of Population Aging

1. Prewar and Postwar Age Composition

(1) Rejuvenation of population

Aging is one of the two directions in which the age composition of

a population moves; rejuvenation is the other. It is often pointed out that before World War II the population of Japan continued to grow younger for a long time. For example, Tachi (1960, p. 488) states: "The average age of the population of Japan declined constantly from the early years of the Meiji era until the prewar period. In this sense, the population of Japan grew younger in the prewar period." Okazaki (1986, pp. 1-17) re-estimated the population of Japan by sex and age in the Meiji-Taisho era. The median age of the Japanese calculated by using Okazaki's data reveals a consistently declining tendency after the 1880s. The median age declined from 26.0 in 1883 to 22.5 in 1918, and, according to the population census data compiled since 1920, the median age dropped from 22.3 in 1920 to 21.9 in 1930. These figures also clearly demonstrate how the population of Japan grew younger over a long period of time from Meiji to the early Showa period.

The population of Japan grew younger in the prewar period largely as a result of the progressive increase in annual births and the gradual decline in death rates over the long term. A measurement of yearly trends in a population that has reached a certain age level reveals that a pyramidal shape of the age-sex composition is formed that is characterized by a basic tendency of accelerated expansionary replacement where not only is there population growth with successive age cohorts, but where the rate of growth also rises.

(2) Changes in postwar age composition and future trends

The three years between 1947 and 1949 are the period of the first postwar baby-boom in Japan. In this period, there were nearly 2.7 million births per year. The population aged 0 to 4 reached 11.21 million nationwide in the 1950 population census. Those aged one to three years in this age group were the first baby boomers. This 0-4 year age group is the last age group that inherits the pyramidal shape of the age-sex composition formed and maintained by the prewar generation. As long as the discussion is based on data by 5-year age groups, it can be said that the population of Japan maintained its pyramidal shape until 1950. Thus, it is from 1950 that this shape begins to collapse.

The annual number of births in Japan dropped to 2.34 million in 1950, and plunged to an average of 1.61 million in the five-year period from 1957 to 1961. Then there was a second baby boom from 1971 to 1974, during which the number of births per year averaged 2.04 million. After that, the number of births again declined sharply, falling to 1.35 million in 1987.

According to the medium variant population projections made by the Institute of Population Problems, Ministry of Health and Welfare, a third baby boom will occur during the four years from 1999 to 2002, with an estimated average of 1.78 million births per year, and a fourth baby

boom during the four years from 2028 to 2031, with an estimated average of 1.59 million births per year. The year 2085 is the last year of the ultra long-term population projections for reference, and falls in the same period as the predicted sixth baby boom when an estimated 1.56 million babies will be born.

In this baby-boom cycle, the period between the first and second boom is only about 25 years, but from the second baby boom onwards, the period between booms will be 28 to 29 years. Between one baby boom and the next, a period of decline in the number of births will come at the same interval. In certain years during the period of decline between the third and fourth baby boom, the number of births will fall below 1.43 million. In the period between the fourth and fifth baby boom and in the period between the fifth and sixth baby boom, there will be some years when the number of births plunges below the 1.44 million level and 1.46 million level, respectively. In this way, the fluctuations in the number of births will gradually become less pronounced, with the annual number of births tending to stabilize over the long term. From around the year 2050, for example, the annual number of births will tend to stabilize at about 1.52 million, if using 29-year moving average data. At any rate, however, since a declining tendency is expected in the number of births in Japan over the next century, it should not be too difficult to imagine the pattern of the age composition that will be formed on the basis of such a tendency.

The percent distribution of population by four age groups -- 0-24, 25-49, 50-74 and 75 and over -- are shown in Table 3 by selecting five different years in the prewar and postwar period, as well as the future. The 25-year age group adopted has the effect of removing much of the unevenness in the age composition which occurs when a baby boom cycle takes place.

In the year 2010, the first baby-boom born cohort will reach the middle of the 50-74 age group, the second baby boomers the middle of the 25-49 age group, and the third baby boomers the 0-24 age group. In that year, these three age groups will each account for about 30 percent of the total population, and the population pyramid will assume a perpendicular shape. The population will begin to approach this shape from around the year 2005, and, although it is not shown in Table 3, the same age composition will continue until about the year 2065.

Yearly changes in the age structure of population are rather smooth for the prewar cohorts having a pyramidal shape. Those for the cohorts born after the first baby boom, however, tend to fluctuate in essentially the same manner as the change in the annual number of births noted earlier. Thus, these yearly trends in population by age are based on cyclical fluctuations, and in them these emerge what we might call "knots" that divide the times. It can be said that these knots will emerge when a baby-boom born cohort reaches the age level concerned.

The first baby-boom born cohort, in particular, constitutes a point linking trends up to that point in the prewar generation population and those in the postwar generation population, regardless of which age group may be considered, thus significantly shifting at that point the pattern of yearly trends in population by age. Examples are given in Figure 3 where trends in the aged population by 5-year age groups are indicated for the population aged 65 and above. The figure clearly shows that the first baby-boom born cohort constitutes a significant transition point even when it reaches advanced age. Such a pattern of yearly trends in population by age groups is, of course, also observed in all other age groups, including the young. So long as the indices of the population aging are those related to its age composition, it is natural that such a transitional point should appear in the said composition.

In the foregoing discussion, we have surveyed the long-term trends in the age composition of Japan's population spanning the prewar and postwar period as well as the future. The discussion did not employ any indices directly related to population aging, using instead a simple age division to understand in a very general way the characteristics of the trends in the entire age composition of the population of Japan. Below we will observe the fluctuation tendency of the aging of Japan's population while noting as possible the stages at which such fluctuations occur. The population projection data used in this paper are derived from the above mentioned medium variant of the population projections made by the Institute of Population Problems. The latter projections are made up to the year 2025, and for reference ultra long-term projections are made up to the year 2085. But in this paper, with the exception of Figure 3, the year 2050 will be used as a convenient cut-off year for analyses accompanied by calculations, and changes projected up to that year will be discussed.

2. Trends in the Size of the Aged Population

(1) Some methodological assumptions

A simple age division widely used today in discussing the aging of a population involves dividing the population into three age groups: 0-14, 15-64 and 65 or more. Observations are sometimes made by dividing a population into groups of 0-19, 20-69 and 70 or more. Also widely used are indices such as the ratio of population 65 and over to population in all ages (the proportion of aged population), and the ratio of population 65 and over (the old-age dependency ratio) to population in ages 15-64 (the working-age population). In this paper, we will follow this common usage, employing in particular the proportion of the aged population. But before that, let us examine the trends in the very size of the aged population.

The population of Japan between 65 and 69 years of age increased from 3.01 million to 3.97 million in the 10 years from 1970 to 1980 (according to population census data). This translates into an annual average growth rate of 2.78 percent. The population aged 65 to 69 in 1970 is the cohort of those born between October 1900 and September 1905, and the same population in 1980 is the cohort of those born between October 1910 and September 1915. An interpolation of the number of births for each of these 5-year periods using the yearly number of births in Japan in the Meiji-Taisho period estimated by Yasukawa (1977) reveals that there were 8.23 million and 9.5 million births, respectively, or a growth rate of 1.44 percent each year. The increase in the proportion of the population aged 65 to 69 during the 10-year period noted above is, first, the result of the increase in the number of births in the period concerned. Another contributing factor is the cohort survival ratio from the time of birth up to ages 65 to 69. In 1970, the cohort survival ratio from the time of birth to ages 65 to 69 was 36.5 percent; this increased to 41.7 percent in 1980.

From the above relationship, we can see that the average growth rate of 2.78 percent in the population between 65 and 69 years of age from 1970 to 1980 is the sum of (a) the 1.44 percent that is computed to be the average annual growth rate in the number of births and (b) the 1.34 percent that is computed to be the average growth rate in the cohort survival ratio. We will not discuss this figure in detail, but in this example it is fair to say that the factor responsible for the growth in the size of the cohort at the time of birth and that responsible for improving the cohort survival ratio up until one reaches old age contribute about equally to the growth rate in the population aged 65-69 years.

Below we will treat the population 65 and over in one group, without subdividing it into 5-year age groups. This range of age is too wide for obtaining a cohort survival ratio from the time of birth by going back to the time of birth in terms of cohort. Thus this will be avoided, and the survival ratio will instead be obtained from the age-specific population related to a cohort 65 years before. In this case, ages 0 to 34 will be used as the age-specific population. The age range that corresponds to a cohort to this age range 65 years hence is the range from 65 to 99. The population aged 100 and over is relatively insignificant in the population 65 and above.

For instance, in the 1985 population census, the total number of people in the population 65 and over was only 0.01 percent larger than the total number of people in the population between 65 to 99 years of age. Since the population projections used in this discussion lump into one group all those aged 90 and above, there is no easy way of determining how the ratio will increase in the future. But based on our judgment of the 1985 example, ages 0 to 34 will be used as the age-specific population related to the cohort 65 years ago concerning the

population aged 65 and above. This means that a cohort survival ratio from ages 0 to 34 covering a period of 65 years will be obtained. In terms of census data, this constitutes a so-called census survival ratio. Here two points that should be remembered. First, the calculation for determining a cohort survival ratio will not go back beyond 1920. Hence the aged population for which a survival ratio may be calculated is the population 65 and over after 1985 (in 5-year intervals). Second, since the population of Japan as a whole is a tightly closed population, the survival ratio obtained (excluding the influence of its age composition) largely reflects its mortality level.

(2) Time characteristics of trends in the aged population

For the years 1920 to 2050 at 5-year intervals, Table 4 indicates the population in all ages, the population in ages 65 and over, the ratio of population in ages 65 and over (the proportion of aged population), the ratio 65 years ago of population 65 and over to the population aged 0 to 34 (the survival ratio) and the population aged 0 to 34 used in the survival ratio. The population aged 65 and over will continue to increase sharply until the year 2015, the last year when the population aged 65 and over will be constituted solely by the generation forming the pyramidal shape of age-sex composition. In other words, the population aged 65 to 69 this year is the same cohort as the population in ages 0 to 4 in 1950. As an increase in population 65 and over spanning a period of more than half a century, the said increase will probably never be repeated in the entire history of the population of Japan. The rate of the average annual increase in the population in question was 2.7 percent from 1950 to 1965. The same increase is calculated to be 3.5 percent from 1965 to 1990 and 2.9 percent from 1990 to 2015.

No reference data is contained in Table 4 explaining the trends in the size of population in ages 65 and over prior to 1985. But let us explain, for example, the rate of increase in the population aged 65 years and over from 1950 to 1985 on the basis of the population aged 35-69 years, as these two age groups are considered to be in a cohort relationship. The population aged 65 and over increased at an average annual rate of 3.1 percent during the 35 years from 1950 to 1985. The cohort survival ratio was 25.3 percent when the population aged 65 and over in 1950 was linked to the population aged 34 to 69 in 1920, while the same ratio was 47.7 percent, or 22 percent point higher, when the population aged 65 and over in 1955 was linked to the population aged 35 to 69 in 1955. The increase from 25.3 percent to 47.7 percent over the 30 years corresponds to an average annual growth rate of 1.8 percent. The average annual growth rate of the population aged 35 to 69 was 1.3 percent during the 35 years from 1920 to 1955. The two rates, 1.8 percent and 1.3 percent, are the breakdown of the average annual growth rate of 3.1 percent previously noted for the population aged 65 and over.

The population 65 and over has continued to increase at the 3.0 percent level since 1985 and will continue at this pace until the year 2015. Of course, the rate of growth will peak in the 1990s (at an average annual rate of 3.9%) and fall after that to 2.5 percent in the first half of the 2010s. The population 65 and over will peak in the year 2020, when there will be 31.88 million people in this group (as noted earlier, all discussion in this paper is based on 5-year interval data). But the growth rate in the second half of the 2010s will fall to an average annual growth of 0.8 percent. As noted earlier, the year 2015 is the year when the first baby-boom generation will have been incorporated into the population 65 and over as members of the age-specific population aged 65 to 69 years. It has already been remarked that the average annual growth rate of the population aged 65 and above during the 30-year period from 1985 to 2015 is 3.0 percent. If we seek the growth rate and the average annual growth rate over the same 30-year period from the survival rate indicated in Column (4) and the population in ages 0 to 34 65 years ago as indicated in Column (5), we obtain the figures 1.6 percent and 1.4 percent, respectively. These percentages constitute the breakdown of the 3.0 percent growth noted earlier.

As a supplementary item, it should be noted that the survival ratio indicated in Column (4) will peak at 53.1 percent in the year 2015 and then will continue to decline until around the year 2040. According to mortality assumed in the medium variant of the population projections made by the Institute of Population Problems used in this paper, the average life expectancy will continue to rise until the level hypothesized for the year 2025, and will level off after that. The fall in the survival ratio after the year 2015 shown in Column (4) is caused by changes in age composition (aging), which bear on the calculation of the survival ratio. Thus, it is not a rise in mortality itself but a decline only in appearance. To verify this in a simple way, we obtained the survival ratio by 5-year age groups (and by 10-year age groups in the case of population aged 90 and over), and applied it to a certain fixed age composition and computed the standardized survival ratio. We used the population of Japan that were aged 0 to 34 in 1935 and the same in 1950 as a standardized population. But in either case, although the standardized survival ratio (calculated for up to the year 2025) will rise slowly after the year 2035, the ratio is not expected to decline.

The method of argument adopted above involved obtaining data for explaining the increase in the aged population (65 and over) at a particular point in time when targeted for consideration by delving into the past as much as possible (i.e., to the time when those in the aged population were younger). But due to the lack of available data, we had to go back 65 years and adopted a method whereby we examined the population aged 0 to 34, and we sought our explanatory data in the trends for the growth rate of the population cohort concerned and in the trend for the cohort survival ratio during the time it took the

population concerned to become an aged population. To a large extent, the rise in the survival ratio (at least until the year 2015) can be regarded as an improvement in the mortality level. But trends in the population aged 0 to 34 are affected by both birth and death rates. Thus, considerable model calculations will be needed to compute and analyze both of these factors. Hence, in the present paper we did not conduct any analysis decomposed into both birth and death factors. The discussion so far can be summarized as follows: The influence on the rate of increase exerted by the population aged 65 and over stems more from improvements in the survival ratio from the days when the elderly were younger than from the growth rate in the younger population when the elderly belonged to the younger generation. Despite this tendency, however, the difference between these two factors is not significant.

3. Trends in the Proportion of the Aged Population

We have spent considerable time on the question of trends in the size of the aged population itself. But discussion of the trends in the proportion of the aged population, is still fraught with the problem of trends in the size of the population of all ages, which is the denominator of the proportion of the aged population. But the population in all ages is all-inclusive and therefore difficult to analyze. Generally, if we assume that population P consists of two parts, P_a and P_b, the proportion of P_a in P, that is, P_a/P, will be transformed into

$$P_a/P = P_a/(P_a + P_b)$$

$$= (P_a/P_b) / (1 + P_a/P_b),$$

and it will be possible to use the ratio of P_a to P_b to explain (P_a/P). Here, if we define P as the population in all ages, P_a as population 65 and over, P_b as population under 65 years of age, then trends in the proportion of the aged population to the population in all ages may be explained in terms of trends in the ratio of the population 65 and over to the population under 65 years of age. Japan's aged population, as noted previously, will be formed until the year 2015 by a generation characterized by a pyramidal shape of sex-age composition. By contrast, members of the cohorts born in 1950 and after, when the birth rate declined, were from 1955 put one after another into the population aged under 65 (discussing based on the 5-year interval data). Subsequently, by the year 2015, the population of Japan will be formed only by those cohorts. As a consequence, so long as we limit our discussion to the year 2015, it will be more appropriate to undertake analyses by separating the population in all ages into the population aged 65 and over and the population under 65.

The population of Japan under 65 years of age, which counted 79.87

million in 1950, will reach 110.05 million by the year 2005. It will then decline until the year 2050 when it drops to 98.4 million. The average annual growth rate, which was 1.3 percent in the first half of the 1950s decreased in successive years, excluding a few irregular cases. It will reach as low as 0.04 percent in 2000-2005. The year 2005 is the year when the first three baby-boom born cohorts will have appeared (the first baby-boom born cohort will have reached ages 55-59, the second ages 30-34, and third ages 0-4 ages). By the year 2030, the fourth baby-boom born cohort will have been added, and in that year the size of population under 65 will already have declined to a level below that recorded in the year 2025.

The tendency of the aged population in Japan to increase has already been discussed. Even from 1985 onwards, its average annual growth rate is expected to remain high at a rate of 3.0 percent until the year 2015. Meanwhile, although the population under 65 is expected to increase until the year 2005, because of its low rate of growth, as noted above, the ratio of the population 65 and over to that under 65 will continue to rise until the year 2005 when the denominator population will have reached its peak, rising from the 5.2 percent recorded in 1950 to 22.0 percent by the year 2005. In the period after 2005, when the denominator population will decline, the said ratio will rise at an accelerated pace, reaching 30.8 percent in the year 2020 when the population 65 and over will reach its peak. After that, the ratio in question will remain at about the same level until the year 2050. In the table below, we have selected only those years we consider useful as a reference, and present the ratio of the population aged 65 and over to that under 65 (1) and the proportion of the population aged 65 and over to that in all ages (2).

It is because of the formula cited above that the percentages in (1) are greater than those in (2) both in terms of absolute size and increase rate.

Year	(1)	(2)
1950	5.2%	4.9%
1985	11.5%	10.3%
2005	22.0%	18.0%
2015	29.1%	22.5%
2020	30.8%	23.6%
2050	30.8%	23.5%

4. Conclusion

The aged population of Japan is increasing sharply today, both in real numbers and ratio. Thus, in this paper we have looked forward to

the next 30 years, during which time the ratio of the aged population will reach the 23-24 percent level, as an important period for discussion. However, the above discussion on future population movements is different from those analyses concerning real conditions; they are discussions on results drawn mathematically from hypothetically established estimates. Thus, to reduce this weakness, in this paper we have tried, within the range permitted by the national census, to go back in time as much as possible, even for analyzing the future aspects of the structure of Japan's population, while placing an emphasis on providing an explanation within the context of the actual population structure.

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Table 1 Age Distribution of Population in Japan

(units: 10,000 persons and %)

Year	Total population	0 - 14	15 - 64	65 and older
1955	9,008	33.4	61.2	5.3
60	9,430	30.2	64.1	5.7
65	9,921	25.7	68.0	6.3
70	10,467	24.0	68.9	7.1
75	11,194	24.3	67.7	7.9
80	11,706	23.5	67.3	9.1
85	12,105	21.5	68.2	10.3
90	12,423	18.6	69.4	11.9
95	12,757	17.5	68.3	14.1
2000	13,119	18.0	65.8	16.3
10	13,582	18.6	61.4	20.0
20	13,530	16.5	59.9	23.6
30	13,407	17.2	59.7	23.1
40	13,165	18.1	57.8	24.1
50	12,868	17.1	59.4	23.5

Source: National Census Reports, Population Projections

Table 2 Birth Rate and Death Rate in Asian Countries (1987)

Country	Birth rate	Death rate	Rate of increase
Japan	11	7	4
China	21	7	14
Hong Kong	16	6	10
Singapore	17	6	11
Korea	20	6	14
Indonesia	29	9	20
Philippines	30	8	22
Thailand	25	7	18
Malaysia	31	6	15
India	32	11	21
Pakistan	47	12	35
Bangladesh	41	15	26
Sri Lanka	23	6	17

Source: World Development Report 1989

Table 3 Trends in the Percent Distribution of Population by Four Broad Age Groups, Japan, 1930-2035

Year	All Ages (*)	0-24	25-49	50-74	75+
1930	100 (64,450)	55	30	14	1
1960	100 (93,419)	49[1)]	34	16	2
1985	100 (117,060)	36[2)]	37[1)]	23	4
2010	100 (135,823)	30[3)]	31[2)]	30[1)]	9
2035	100 (133,133)	29[4)]	30[3)]	29[2)]	12[1)]

Notes: Figures in parentheses * are enumerated or projected population figures in thousands.
Figures with 1), 2), 3) or 4) include the first, second, third or forth baby-boom born cohorts.

Sources: Population census data for years upto 1985 and population projections (medium variant) by the Institute of Population Problems, Ministry of Health and Welfare, Tokyo, for the later years.

Table 4 Trends in the Number and Proportion of Aged Population, Japan, 1920-2050

Year t	Population in all ages	Population in ages 65+	(2)/(1)	Cohort survival ratio from ages 0-34 in year t-65	Population in ages 0-34 in year t-65
			(%)	(%)	
	(1)	(2)	(3)	(4)	(5)
1920	55,963	2,941	5.26		
1925	59,737	3,021	5.06		
1930	64,450	3,064	4.75		
1935	69,254	3,225	4.66		
1950	84,014	4,143	4.93		
1955	90,142	4,787	5.31		
1960	94,315	5,395	5.72		
1965	99,194	6,233	6.28		
1970	104,665	7,393	7.06		
1975	111,940	8,869	7.92		
1980	117,060	10,654	9.10		
1985	121,049	12,472	10.30	32.84	37,978
1990	124,225	14,818	11.93	36.16	40,979
1995	127,565	18,009	14.12	40.29	44,700
2000	131,192	21,338	16.26	44.33	48,130
2005	134,247	24,196	18.02		
2010	135,823	27,103	19.95		
2015	135,938	30,642	22.54	53.08	57,730
2020	135,304	31,879	23.56	52.09	61,198
2025	134,642	31,466	23.37	50.69	62,075
2030	134,067	31,002	23.12	49.72	62,349
2035	133,133	30,942	23.24	49.40	62,637
2040	131,646	31,738	24.11	49.35	64,308
2045	130,017	31,383	24.14	49.44	63,473
2050	128,681	30,281	23.53	50.37	60,112

Notes: Population in thousands in cols. (1), (2) and (5). Population figures for 1950-1965 are adjusted regarding the inclusion of Okinawa by use of age-specific ratios of the population in 1970 including Okinawa to that excluding Okinawa.

Sources: See Table 1.

Figure 1 Demographic Transition in Japan (1899 – 1943)

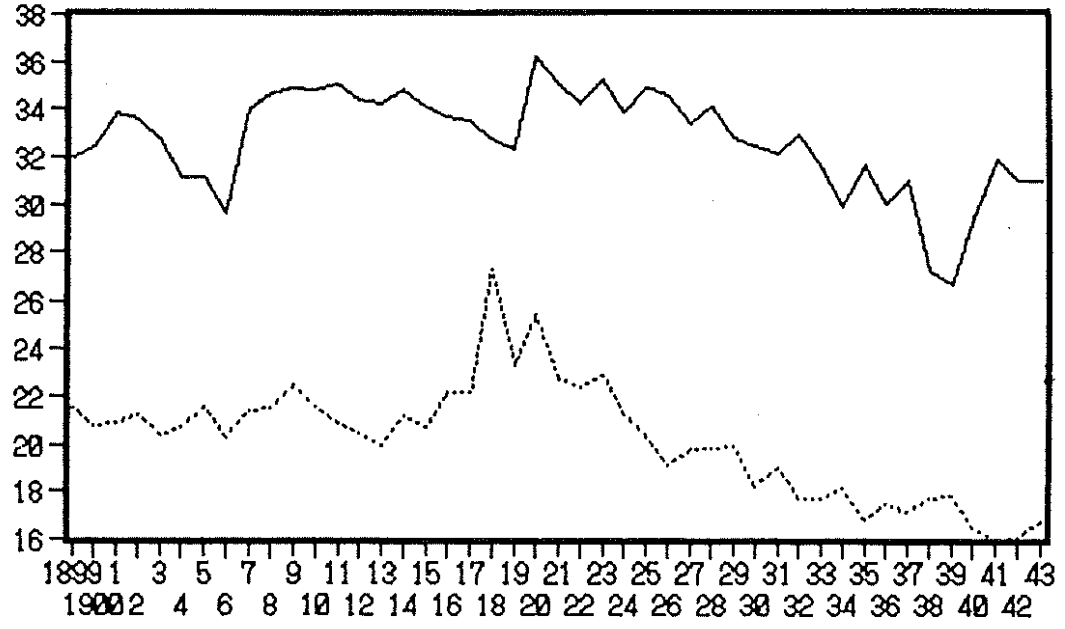


Figure 2 Demographic Transition in Japan (1947 – 68)

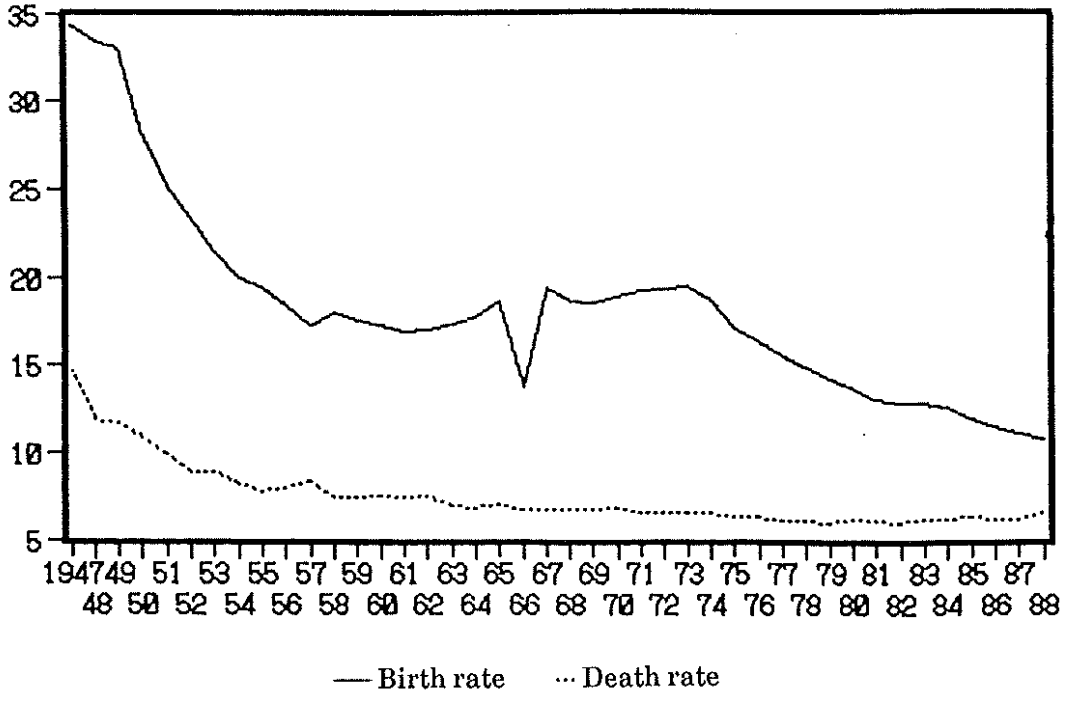
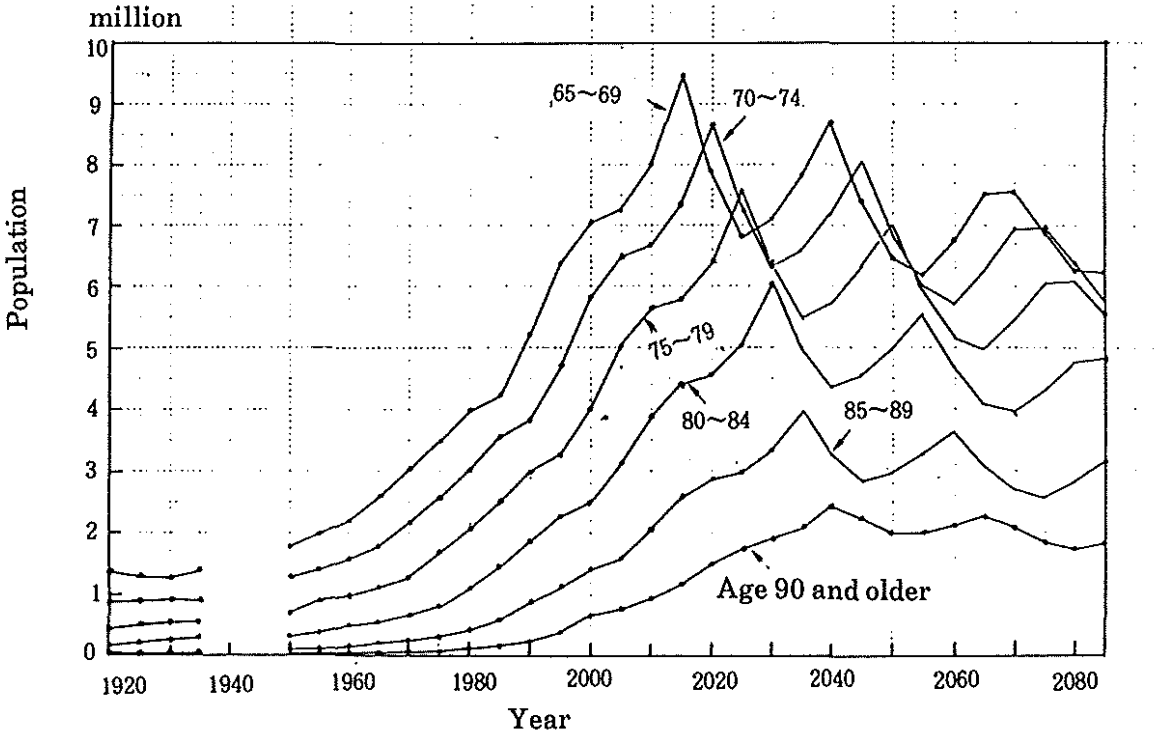


Figure3 Trends in Aged Population by 5-year Age Groups, Japan, 1920 – 2085



Source: See Table 3

Chapter 3

Outlook for the Aging Society and Future Challenges

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Preface

In 1979 the ratio of the elderly population reached 7 percent in Japan. It was around that time that the debate on the aging society intensified. However, it seems that, with the decision made on July 23, 1985 by the government to establish the "Ministerial Council for Dealing with a Long-lived Society," which was approved in a Cabinet meeting held on July 23, 1985, and the adoption on June 6, 1986 of the "Policy Outline for Dealing with a Long-lived Society", that the debate on the aging population shifted its focus to that of a "long-lived society."

This paper will discuss the outlook for the aging society and the challenges facing it on the basis of the findings of the "Opinion Survey on a Long-lived Society" which the Public Relations Department of the Prime Minister's Office conducted in September 1986.

1. Aging Society vs. a Long-lived Society

In recent years, such terms as "aging society," "long-lived society" and "the average life span of 80" have often been mentioned. It appears that these words are all used to convey the same meaning. Strictly speaking, however, there are some differences in the meanings of these terms.

According to Professor Fumio Miura, "while an aging society means a situation where the population structure is increasingly skewed toward the old-age group, or a society that is entering its aging phase, in a society of in which an "average life span of 80" indicates that the average life span or the life expectancy of the elderly is extending, thus making it possible for many people to live to be 80 years of age or older."[1] To analyze it from a demographical perspective, the recent aging of the Japanese society is attributable to "the decline in the death rate, particularly of the elderly,"[2] or "the extension of the average life expectancy for the old-age population, or longevity"[3] rather than a decline in the birth rate. As a result of such demographic changes, the term "long-lived society" has come to replace the term "aging society."[4] "When the term 'long-lived society' is used instead of the term 'aging society,' it is used to mean an aging society in which the people's life span is generally 80 years or more."[5] But at the same time, the term "long-lived society" seems to imply our desire that "such a society should be a happier and more affluent one for people 80 years of age and older."[6]

At any rate, it seems that underlying the shift in terminology from "aging society" to "long-lived society" is an "attempt to change the traditional negative image of the elderly to a positive one."[7]

2. The Outlook for the Aging Society

The author would like to discuss the outlook for the aging society in Japan, particularly its population structure and awareness (or image) aspects, on the basis of the above-mentioned change in word connotation.

According to the results of the most recent Population Census taken by the Management and Coordination Agency, the ratio of the elderly population as of 1985 was 10.30 percent. This ratio is relatively low when compared with that in other industrialized nations. However, it is expected to exceed 16 percent in the year 2000 and to reach 20 percent in 2015. In other words, Japan will most likely be the leader among the world's nations in terms of aging population at the beginning of the next century.

When we look at the trend of the "older aged group" (75 years of age or older), the ratio of this group's population, which was 3.89 percent in 1985, is expected to exceed 7 percent in 2000 and reach 10 percent in 2015 (see Table 3).

The emergence of such a situation may bring about drastic changes in the ratio of men and women, marital status, number of parents and children living together, degree of health, ratio of persons suffering from diseases, ratio of people receiving treatment, ratio of bedridden elderly and the ratio of elderly suffering from senile dementia (see Table 4).[8)]

What are the Japanese people's attitudes toward such an aging society (long-lived society)?

Let us examine the question based on the findings of the "Opinion Survey on a Long-lived Society," which was conducted in 1986 by the Public Relations Department of the Prime Minister's Office. According to this survey, 80.6 percent of the respondents replied that they were "interested in a long-lived society." As for the image of a long-lived society, 34.4 percent said it would be a "gloomy society," with 41.8 percent citing "dull society," and 37.8 percent an "affluent society." A breakdown by age group of the replies reveals that such images as "gloomy society" and "dull society" are held by respondents in their 20s or 30s, rather than by those in their 40s or 50s (see Tables 5, 6 and 7).

At any rate, as far as the findings of this survey are concerned, the general public's attitude to the aging society is ambivalent. While it is perceived as an "affluent society," it is also considered to be a "gloomy, dull society."[9)]

3. Challenges Facing Japan's Aging Society -- And Ways to Overcome Them

What challenges are such an aging society going to face?

It is generally believed that the aging society will face the following four challenges. The first challenge is to satisfy the people's need for economic stability. The second is to satisfy the need for good health -- a need to remain healthy and receive sufficient, inexpensive health care. The third challenge is to satisfy the need for emotional responsiveness -- a need to have candid talks with others and maintain personal relationships with other members of the family. The fourth challenge is to satisfy the desire for a meaningful life -- the need to engage in work, study, traveling or volunteer activities befitting one's physical strength. Shown in Fig. 3 is the relationship between this need structure and care for aging parents.[10)]

What does the general public think will be major problems facing a long-lived (or aging) society?

In the above-mentioned "Opinion Survey on a Long-lived Society," many respondents mentioned the "balance between pension benefits and the burden of contribution, "care for bedridden old persons," "medical expenses and the health insurance system," "improvement and expansion of health care and welfare facilities" and "employment opportunities for the elderly."

Judging from the findings of the opinion survey, many Japanese are worried that the forthcoming aging society will be confronted with many problems related to their financial situation, health and welfare (see Table 8).

Now let us examine how the general public in Japan is reacting to, and trying to solve, these problems on the basis of the findings of the "Opinion Survey on a Long-lived Society," bearing in mind the above-mentioned four challenges in the forthcoming aging society.

(1) Need for Economic Stability

To the question, "Who do you think should play an important role in the life of an aged person, particularly in terms of paying living and other expenses?," more than 80 percent of the respondents mentioned "the aged person himself or herself" and "other members of his or her family." Even among the younger respondents who are considered to be keenly aware of the importance of social welfare, only 12 to 13 percent mentioned "the central or local government" (see Table 9).

When asked what steps should be taken to ensure economic stability, 70 percent of the respondents mentioned "securing enough income and

savings."

Judging from these findings, the general public is highly oriented toward securing economic stability through self-supporting efforts.

(2) Need for Good Health

To the question, "Who do you think should play an important role in taking care of a sick old person?," more than 70 percent of the respondents mentioned "members of his or her family." The results imply that a similar attitude is indicated by almost all age groups (see Table 10).

Next, what are the Japanese people's attitudes toward health?

There was a slightly larger number of respondents who replied affirmatively than those who gave negative answers, when asked, "Do you feel concerned about the state of your health when you will become old."

In this survey, the respondents were also requested to answer the question, "What steps are you taking to prepare yourself for aging?" Responses cited most often included "careful about diet," "receive physical examination regularly," "lead a well-regulated life," "sleep and rest well" and "get rid of stress and enjoy pastimes as much as possible."

Judging from these findings, it appears that many Japanese are highly oriented toward fulfilling their need for good health through self-supporting efforts.

(3) Need for Emotional Responsiveness and Need for a Meaningful Life

Regarding close relationships with children, which is said to play an important role in providing the Japanese with emotional support, about 60 percent of the respondents said, "I want to maintain close relationships with my children." A breakdown by age group of the responses indicates that the older the respondent, the stronger is his or her desire for a close relationship with his or her children.

A more detailed analysis of those who replied, "I want to maintain close relationships with my children" shows that there were a slightly larger number of those who placed the utmost emphasis on the emotional aspects of their relationship with other members of their family, than those who wanted to remain independent of their children, both emotionally and financially. The younger the respondent, the stronger was his or her emphasis on the emotional aspects (see Table 11).

As regards the need for a meaningful life, more than 70 percent of the respondents mentioned "the aged person himself or herself" and

members of their family."

At the same time, it should be noted that (according to the findings of the "Opinion Survey of the General Public's Social Awareness") the general public in Japan thinks that in the 21st century the government's "welfare" policy measures will be given less priority than today, while the "income/asset gap will be widened." Based on the image the general public has of Japan in the 21st century, it is inferred that the gap between the rich and the poor will widen further despite the self-supporting efforts by the general public and the members of their families, and that it will be difficult to build a vital society in which the majority of the Japanese people will enjoy their longevity.

In that case, it will be imperative for the Japanese government to work out and implement policy measures aimed at realizing a vital society in which all the people rejoice in longevity through their self-supporting efforts with respect to their needs for emotional support and meaningful lives and through mutual aid, as well as public assistance, with respect to their needs for economic stability and good health.[12)]

Notes

1) Fumio Miura, "The Aging Society and You: What Will Happen in the 21st Century?" (Iwanami Junior Pocketbook), Iwanami Publishing Co., 1988, p. 113.

2) Fumio Miura, ibid., p. 114.
See Toshio Kuroda, "Mortality Trends among Elderly People and their Social Gerontorogical Implications in Japan" Japanese Journal of Gerontology, vol.7, Japanese Sociogerontorogical Association 1985, pp. 51-63 for a detailed analysis of this aspect.

3) Fumio Miura, ibid., p. 114.

4) Fumio Miura, ibid., p. 114.

5) Fumio Miura, ibid., p. 114.

6) Fumio Miura, ibid., p. 113.
The subtitle of the 1988 Health and Welfare White Paper was "A New Image of the Aged Person and a Long-lived and Welfare-Oriented Society Full of Vitality." In the White Paper, "a society in which the majority of the people enjoy their longevity" is defined as "a society in which elderly persons can maintain good health, actively make social contributions and enjoy economic stability, and in which elderly persons and other members of their family can co-

"other members of his or her family" to the question, "Who do you think should play an important role in encouraging an aged person to make the effort to fulfill his or her desire for a meaningful life?" But the number of the respondents who mentioned "the aged person himself or herself" exceeded those who mentioned "other members of his or her family." This pattern was common to almost all age groups (see Table 12).

Judging from these findings, it appears that many respondents place the most emphasis on close relationships with other members of the family, and with their children in particular, in regard to their need for emotional support, while many respondents want to fulfill their desire for a meaningful life through their own efforts and with the help of other members of their family.

At any rate, these findings indicate that many Japanese very much desire to solve the various problems involved in facing the four challenges of an aging society -- the need for economic stability, the need for good health, the need for emotional responsiveness and the need for a meaningful life -- through self-supporting efforts and with the help of other members of their family.

Reviewing the findings of the "Opinion Survey of Japanese People's Social Awareness" conducted in 1988 by the Public Relations Department of the Prime Minister's Office, and bearing in mind the above-mentioned survey findings, we notice that the image they have of Japan in the 21st century is that of "a society in which the uneven distribution of income/assets is more eminent" and that the percentage of the respondents who think that the government's "welfare policy measures are taking a turn for the worse"[11] is higher than ever.

It can be said that these findings clearly reflect that sentiments expressed by the respondents who participated in the "Opinion Survey on a Long-lived Society" -- "I have no choice but to solve problems facing an aging society through my own efforts and with the help of other members of my family."

Conclusion

I have described and analyzed the general public's view of the forthcoming aging society and the problems involved in the efforts to overcome the great challenges facing the aging society on the basis of the findings of the opinion surveys conducted by Public Relations Department of the Prime Minister's Office. To sum up these findings, the upcoming aging society is considered to be a "gloomy, dull society" and many Japanese intend to solve problems that may arise in such a society through the self-supporting efforts of "themselves" and "other

exist without anxiety in both their families and communities and in which the entire society, including the members of the rising generation who are to bear the destiny of their country on their shoulders, maintains its vitality." (Ministry of Health and Welfare, "Health and Welfare White Paper (1988)", pp. 1-2)

7) Toru Furuse, "The Path to A Creative Long-lived Society," Chuo Hoki Shuppan, 1986, p.3

8) This projection was made based on statistical data made public around 1985.

9) In the "Opinion Survey of the Japanese People's Social Awareness" conducted in 1988 by the Public Relations Department of the Prime Minister's Office, 42.7 percent of the respondents foresee "a society which lacks vitality, with aged persons being predominant" as the image of Japan in the 21st century. The findings of the two opinion surveys seem to indicate that those who think of Japan's aging society as a "happy society to live in" are in the minority.

10) Kiyomi Morioka, "Caring for Aged Parents," Kiyomi Morioka and Takashi Mochizuki, "New Family Sociology (revised edition)," Baifu-Kan, 1987, pp. 121-122.

11) Refer to the Economic Planning Agency National Life Bureau, "1988 Survey of Preferences in National Life -- Public Awareness of Gaps," Ministry of Finance Printing Bureau, 1988 for details of this.

12) This is because the majority of the Japanese people want to have their need for economic stability satisfied ("reform of the national pension system": 42.5 percent, "promotion of the employment of senior citizens": 22.0 percent) and good health ("improvement in health care services and facilities": 37.9 percent, "reform of the health care insurance system": 24.5 percent) when they think they will have to overcome the major challenges facing the aging society through their own efforts ("Opinion Survey on Long-lived Society").

Table 1 Present and Future of the Elderly Population

(units: 1,000 persons, percent)

Year	Total population	65 years or older	75 years or older
1985	121,049	10.30	3.89
1990	124,225	11.93	4.76
1995	127,565	14.12	5.48
2000	131,192	16.26	6.44
2005	134,247	18.02	7.80
2010	135,823	19.96	9.17
2015	135,938	22.54	10.22
2020	135,304	23.56	11.32
2025	134,642	23.37	12.90

Source: Ministry of Health and Welfare, Institute of Population Problems, "Predictions of Population of Japan (as of December 1986)," Institute of Population Problems Research Data, No. 244, February 1987

Table 3 Images of a Long-lived Society (1)

(units: persons, percent)

Age	Total	Happy society			Neutral	Gloomy society			Don't know
			Happy society	Somewhat happy society			Somewhat gloomy society	Gloomy society	
Total	3,898	27.1	11.9	15.2	34.7	34.4	26.1	8.3	3.8
20-29	631	21.1	7.4	13.6	33.6	40.4	31.7	8.7	4.9
30-39	1,126	23.7	7.9	15.8	36.5	36.3	26.6	9.8	3.5
40-49	1,021	25.6	12.8	12.7	36.9	34.3	26.0	8.3	3.2
50-59	1,120	35.3	17.5	17.8	31.6	29.2	22.5	6.7	3.9

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

Table 4 Images of a Long-lived Society (2)

(units: persons, percent)

Age	Total	Vital society			Neutral	Dull society			Don't know
			Vital society	Somewhat vital society			Somewhat dull society	Gloomy society	
Total	3,898	23.3	9.0	14.3	30.0	41.8	31.2	10.6	4.9
20-29	631	17.1	4.8	12.4	33.1	43.7	33.0	10.8	6.0
30-39	1,126	19.7	6.6	13.1	31.7	44.7	34.1	10.6	3.9
40-49	1,021	21.7	8.5	13.2	30.9	42.9	30.8	12.1	4.5
50-59	1,120	31.7	14.1	17.6	25.9	36.8	27.7	9.1	5.6

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

Table 2 Life Indicators for Aged Persons (by age group)

Item / Age	1 Male /female ratio	2 Married Men/Women		3 Living together rate	4 Degree of health	5 Ratio of persons suffering from disease	6 Ratio of persons receiving medical treatment	7 Ratio of bedridden aged people	8 Ratio of aged persons suffering from senile dementia
60-64	1.27	92.4	68.8	55.7	78.9	341.5*	107.08	0.95	-
65-69	1.35	90.4	54.4	57.4	69.0	434.6	134.56	1.74	1.2
70-74	1.37	85.4	40.1	61.9	64.0	537.6	183.44	2.93	3.1
75-79	1.45	78.3	26.1	68.2	59.4	566.8	211.06	4.81	4.7
80-84	1.64	66.5	13.6	77.7	54.1**	569.0**	214.36	8.74	13.1
85-	2.07	46.8	5.2	83.0			209.68	15.58	23.4
Average (65-)	1.44	81.8	36.2	64.6	63.2	512.4	177.50	4.22	4.6

Notes: (1) Figures represent the number of women for each man (based on "1985 National Census").
(2) Units given in terms of percentages (based on "1985 National Census").
(3) Units given in terms of percentages (based on "1985 Basic Survey of Health and Welfare Administration").
(4) This indicator was first adopted in the "1984 Survey of the Actual Situation of the Elderly." It represents the ratio of aged persons who replied "healthy" or "normal." Units given in terms of percentages.
(5) This indicator was first adopted in the "1985 Survey of the People's Health." Figures are for every 1,000 aged persons.
(6) This indicator was first adopted in "1984 Survey of Patients." Figures are for every 1,000 aged persons.
(7) This indicator was first used in the "1984 Survey of Health and Welfare Administration." Units given in terms of percentages.
(8) This indicator was first adopted in the "Report on the Survey of Actual Situation of Aged Persons' Lives and Health" (1980. Tokyo Metropolitan Government Welfare Bureau). Mild cases of senile dementia are included. The unit is percent.
(9) * denotes "55 - 64 years" and ** "80 years or older."

Source: Ministry of Health and Welfare, "Health and Welfare White Paper (1986)," Health and Welfare Statistics Association, 1987, p.14

Table 5 Images of a Long-lived Society (3)

(units: persons, percent)

Age	Total	Affluent society			Neutral	Poor society			Don't know
			Affluent society	Somewhat affluent society			Somewhat poor society	Poor sociey	
Total	3,898	37.8	16.2	21.6	32.2	24.3	17.4	6.8	5.8
20-29	631	37.2	15.4	21.9	33.1	20.9	15.7	5.2	8.7
30-39	1,126	36.8	14.6	22.2	32.8	25.8	18.2	7.5	4.7
40-49	1,021	35.0	15.7	19.3	34.6	25.8	19.0	6.8	4.7
50-59	1,120	41.6	18.7	22.9	28.9	23.3	16.2	7.1	6.2

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

Table 6 Problems Involved in an Aging Society

Age	Total	Employment of senior citizens	Balance between pension benefits and contribution burden	Health care for the elderly	Medical expenses and the health care insurance system	Caring for bedridden aged persons	Sufficient provision of health care and welfare facilities	Comfortable environment for the elderly
Total	3,898	28.6	51.5	20.0	36.9	37.1	30.7	20.4
20-29	631	32.0	47.7	12.7	39.0	37.9	32.3	17.1
30-39	1,126	30.6	54.7	16.9	36.7	36.1	32.9	20.4
40-49	1,021	28.3	52.6	22.1	36.8	39.2	30.2	20.2
50-59	1,120	24.9	49.5	25.4	36.1	36.0	28.0	22.5

Age	Total	Meaningful lives for aged persons	Personal relationships with other members of the family and the community	Generation gap	No problem	Others	Don't know
Total	3,898	18.9	15.8	9.8	1.2	0.3	2.7
20-29	631	17.4	18.2	11.9	0.8	0.2	4.6
30-39	1,126	22.2	15.2	9.3	1.1	0.2	1.8
40-49	1,021	17.3	16.2	9.3	1.3	0.3	2.3
50-59	1,120	17.8	14.6	9.5	1.3	0.4	3.1

Note: Multiple responses

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

Table 9 Who Should Take Care of Aged Parents (Emotional Support)

(units: persons, percent)

Age	Total	Close relationship with children				Independence of children both emotionally and economically	Other	Don't know
			Close relationship emphasizing emotional aspects	Close relationship emphasizing economic aspects	Close relationship emphasizing both emotional and economic aspects			
Total	3,898	60.8	37.4	4.0	19.4	31.2	0.7	7.2
20-29	631	55.9	38.5	1.7	15.7	29.3	0.3	14.4
30-39	1,126	57.6	37.3	3.8	16.5	35.6	0.5	6.2
40-49	1,021	60.6	37.2	4.3	19.1	33.6	0.9	4.9
50-59	1,120	67.0	37.1	5.1	24.8	25.7	1.1	6.3

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

Table 10 Who Should Satisfy Aged Persons' Needs for Meaningful Lives

(units: persons, percent)

Age	Total	Aged persons themselves	Other members of the family	Central and local governments	Neighbors /volunteers	Other	Don't know
Total	3,898	39.0	33.2	11.4	11.3	0.5	4.7
20-29	631	41.2	31.7	10.9	9.4	0.6	6.2
30-39	1,126	41.8	31.3	10.7	12.2	0.4	3.6
40-49	1,021	37.8	33.4	12.3	11.4	0.3	4.8
50-59	1,120	36.0	35.6	11.4	11.3	0.5	5.1

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

Table 7 Who Should Take Care of Aged Parents (economic support)

(units: persons, percent)

Age	Total	Aged persons themselves	Other members of the family	Central and local governments	Neighbors /volunteers	Other	Don't know
Total	3,898	54.8	32.3	11.4	-	0.2	1.3
20-29	631	51.3	34.7	12.2	-	0.3	1.4
30-39	1,126	55.4	30.2	13.6	-	-	0.8
40-49	1,021	54.8	32.5	10.8	-	0.2	1.8
50-59	1,120	56.1	32.8	9.5	-	0.4	1.3

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

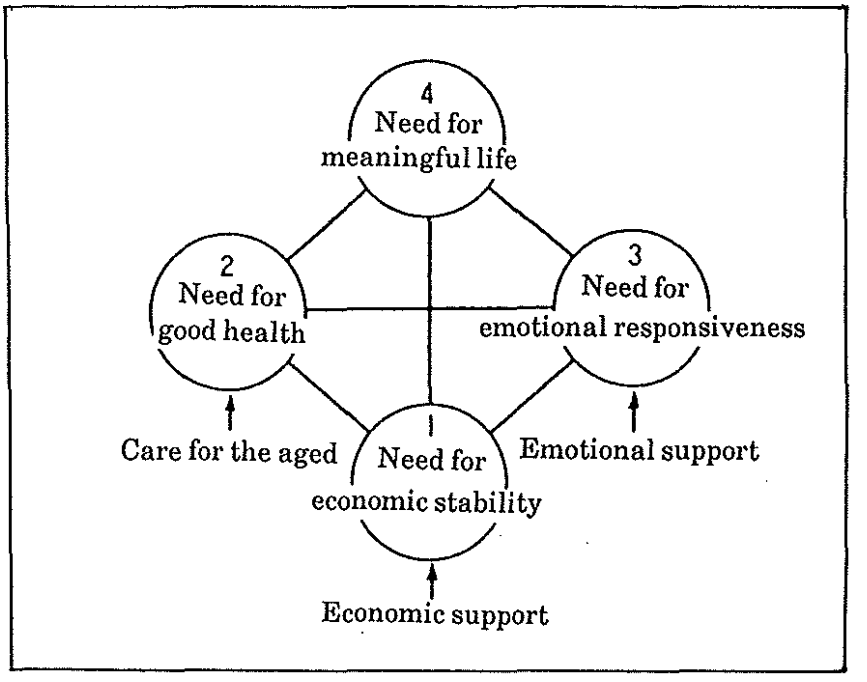
Table 8 Who Should Take Care of Aged Parents (personal care)

(units: persons, percent)

Age	Total	Aged persons themselves	Other members of the family	Central and local governments	Neighbors /volunteers	Other	Don't know
Total	3,898	4.4	75.8	15.9	1.3	0.4	2.2
20-29	631	4.0	78.6	12.5	1.4	0.6	2.9
30-39	1,126	3.6	74.8	17.7	1.6	0.3	2.1
40-49	1,021	5.0	73.2	18.3	1.4	0.4	1.8
50-59	1,120	4.9	77.7	13.9	0.8	0.5	2.1

Source: Prime Minister's Office; Public Relations Department, "Opinion Survey on a Long-lived Society" (1986)

Figure 1 Aged Person's Desires; Caring for Aged Persons



Source: Kiyomi Morioka, Takashi Mochizuki,
"New Family Sociology (revised edition)," Baifu-kan, 1987, p.123

Chapter 4

Structural Burden of the Dependent Population and the Family
– Children, the Elderly, and the Family –

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1. Objectives

The purpose of this chapter is to describe the effect of the transition from a "many births many deaths" population to a "few births few deaths" population on changes in the structure of dependent population and on the structure of a family, based on Japanese data collected over a long period of time.

As a result of population change, so called "demographic transition", the triangle model which represents the age distribution of a society in which many babies are born and many die, has been replaced by a new model shaped like a cannon shell which represents the age distribution of a society in which few babies are born and few die. The speed of this transition is ruled by the tempo of population change, concretely, the length of time which elapses between the beginning of the decline of the death rates and the point that a number of children for a woman finally declines to about two. This change was completed in a shorter period of time in Japan than in Western societies. In Asia there has recently been a remarkable fall in the birth rate. Thus it is very likely that the age distribution in this part of the world will rapidly change.

Every two years since 1950, the United Nations publishes population estimations and projections up to 2025 by age group for the world as a whole, for separate regions, and country by country.[1)] However, data on the age distribution of the Japanese population covering a 217 year period from 1868 to 2085 is also available.[2)] Accordingly, it is possible to examine changes in age distribution from the period prior to demographic transition to the period when the process is completed: in other words, the entire process of change in dependent population distribution and its effect on the family may be observed.

2. What is the Dependent Population?

Whereas a population distribution is indicated by using several indices such as: proportion by age, near age, and median age, the dependency ratio which expresses the shape of the population pyramid is defined with three indices. They are:

Total dependency ratio = (children + aged population) / (working age population)
Young dependency ratio = (children)/(working age population)
Old dependency ratio = (aged population)/(working age population).

If a human life consists of three periods; childhood when one is brought up and educated by one's parents, the period when a person is

engaged in productive activities or raising children, and the period after one retires from these activities, then the total dependency ratio is obtained by calculating the index, using the population divided into the three periods.

The ages at which people take up and retire from productive activities vary widely according to the economic conditions of each society and the individuals' preferences. In order to clarify changes over time and compare the situations by region, the United Nations calculates the total dependency ratio on the premise that those under 15 are minors, and people at 65 or over are the elderly. This paper employs the United Nations definition.

In addition to the definition of people at 65 or over as the elderly, people at 60 or over, has recently been used. Also with the increase in the ratio of people receiving higher education, the termination of childhood is sometimes considered to be 18 or even 20.

3. Four Stages in Japan's Total Dependency Ratio

Chart 1 shows changes in the dependent population in Japan over a period of 217 years between 1868 and 2085. An examination of variations in the total dependency ratio on the Chart reveals that this period can be divided into four stages: a stage when the index was stable, and three intermediate stages when it changed.

Stage 1 is the late nineteenth century, a somewhat stable period preceding the beginning of population change. During Stage 1, the total dependency ratio has moved from 55 to 60. Stage 2 is the period from 1910 to the 1940s. During this period, the total dependency ratio has been very stable, remaining at 70.

Stage 3 is the period when the burden of support has been lightest. Between 1965 and 1995, the total dependency ratio is less than 50 which is an even lower level than in Stage 1, the era which preceded the beginning of population change.

Stage 4 is the "aged society" which will appear in 2015. During this final stage, the total dependency ratio will be between 65 and 72, almost as high as it was during Stage 2.

The total dependency ratio is low before population change begins (Stage 1), temporarily rises to a high level after it begins (Stage 2), then falls to a low level again (Stage 3), and climbs to a high level in the final stage (Stage 4).

At the present time, Japan is in the somewhat stable third stage,

but it is important to understand that the final stage will arrive in only about 30 years. Now I will examine the causes and the nature of the change which is coming.

4. Causes of Changes in the Total Dependency Ratio

The total dependency ratio which has been broken down into the youth population and the elderly population reveals that a primary factor which determines the level of the index has been changing from the young people to the elderly with the passage of time. The reason is that the level of the total dependency ratio was determined solely by the young dependency ratio because the old dependency ratio was around 8 or 9 until the third stage. In other words, the young dependency ratio was less than 50 during Stage 1 and rose to 60 in Stage 2. It was 38 in 1965, the beginning of Stage 3. It was down to 32 in 1985, and by 1995 in the last part of Stage 3 it will drop to 26, about half of its Stage 1 level.

The change in this index between Stage 1 and Stage 2 is a result of an increase in the number of children as the birth rate rose and the infant death rate declined.

After 1950, the young dependency ratio dropped rapidly. The primary cause was a sudden fall in the birth rate after the baby boom which followed the Second World War. The total fertility rate was 4.7 in 1930 but declined to about 2 by 1955. As a result the under-15 population dropped from 30 million in 1950 to 26 million in 1985. It is estimated that it will be 22 million in 1995.

Another reason for the precipitous fall in the total dependency ratio is that people born during Stage 2 i.e.(the young dependency ratio was about 60) reached the productive population in the 1960s. In addition, the fall in the death rate after the war accelerated the growth of the productive population. The reason for this is that the ratio of people surviving to the age of 65 which--according to a 1935 - 1936 life table-- was formerly no more than about 40% for both men and women, rose to 65% for men and 75% for women by 1960, and by 1985, it had reached 81% for men and 90% for women. In this way, the prewar increase in the number of children and the postwar rise in the survival rate caused the number of people aged between 15 and 64 to jump from 50 million in 1950 to 75 million in 1975, a 50% rise in only 25 years. It is estimated that the population will be 87 million in 1995.

The increase in the survival rate will expand the elderly population. Stage 3 which met with the fall in the young dependency ratio was the period when young people were replaced by the elderly as the dominant sector of the dependent population. In brief, the old

dependency ratio, which was about 9 future between 1868 and 1965, will be 21 by 1995, more than double increase. It is also predicted that in 2010 the elderly population will pass the young population for the first time and the old dependency ratio will range from 37 to 42 after the appearance of an aged society in Japan in 2015.

Why will the old dependency ratio rise until 2015 and then become stable? As shown in Figure 2, two reasons are given; first, the elderly population will increase up to 2015 which is the year when the generation who was born in 1950, the final year of the postwar baby boom, will reach 65 years of age. Second, the generations who were born after 1950 comprise members who belong to the final stage of population change: that is, a period when few babies are born and few die, and the parent to child ratio is about 1.

In sum, during the period when the many siblings with fewer loss generation who was born during the population change transitional stage are young (Stage 2), there is an increase in the total dependency ratio which is composed mainly of young people. When this generation reaches its productive years (Stage 3), the total dependency ratio falls a little. If the birth rate fell by this period, the young dependency ratio would fall more quickly.

Even if the elderly population increases, the rapid increase in the young population and the productive population which appear by the period of Stage 2 prevents any change in their relative size. However, the fall in the young dependency ratio caused by the decline in the birth rate, and the fall in the death rate, will increase the relative size of the elderly population. The elderly dependency ratio will grow until the entire many births few deaths generation reaches 65, then it will become stable.

5. Changes in Dependency Ratios in Four Asian Countries

The relationship between transition of the dependency ratio and population change in Japan is also found in other societies. However, the speed of change is determined by the trend of birth and death rate in each society.

Based on data from the United Nations' Population Prospects 1988, Figure 3 shows changes in dependency ratios and two indices--the total and elderly populations--for three countries, China, Indonesia, and India accompanied by data about Japan.

There is almost no difference in the old dependency ratios between China, India, and Indonesia. Therefore, any change in the total dependency ratio which takes place up to 2015 will be entirely a result

of change in the young dependency ratio. In all three countries, the dependency ratio is at its highest level during the 1960s and the 1970s. Thus it is clear that these decades constituted Stage 2 where there were many children.

China's dependency ratio began to fall in 1975 and will be less than 50 in 1990. This will mark the beginning of Stage 3 where the productive population will increase rapidly. The dependency ratio began to fall in 1980 in Indonesia. And Indonesia will enter Stage 3 in 2005 when it drops below 50. In contrast, the birth rate is falling slowly in India so the dependency ratio is dropping gently and it is forecast that it will not fall below 50 until after 2020.

It is not possible to say when these countries will pass from Stage 3 to Stage 4 using material which covers only a period up to 2025. However, population prospects up to 2050 are available for China, so let's look at later changes in this country.[3] There are still many areas of uncertainty about trends in birth rates and death rates in China, a nation with one-fifth of the world's people inside its borders. Thus, the results of two hypothetical cases as shown: case 1 which assumes a slow decline in birth and death rates, and case 4 which assumes a rapid decline in both rates.

There is little difference in the young dependency ratio between the two cases. In both cases, it falls slowly after 1990. The difference between the two hypothetical situations lies in a large gap of the post-2010 old dependency ratios.

Although the difference in the assumption makes the indices of different the dependency ratios, the patterns of change are similar. This is due to the fact that there was a baby boom from the 1960s though early 1970s followed by a marked drop in the birth rate beginning in the late 1970s. In other words, the dependency ratio will decline when the "many siblings with fewer loss generation" born up to 1975 reach their productive years in the 1980s, and the old dependency ratio will rise until 2040, the year that the people born in 1975 reach 65 years of age. Put another way, the elderly proportion of China's population will increase until 2040. Therefore until 2040, China will be an aging society in which the proportion of the elderly increases, but in 2040 it will become an aged society.

6. Effect on the Family

The age distribution change in the population which is referred to as the transition from increasing children to increasing elderly--the growth of the elderly population--a process which is indicated by change in the dependency ratio, significantly affects the size and age

distribution of the working population. At the same time, it alters the size and structure of families. This section examines the effect on the number of households by the composition of household members and family structure.

The oldest and simplest nationwide household index, namely, the "mean size of a household," was 4.69 people based on the "table of family registration" as of 1873. According to the first national census which was completed in 1920 in the early part of Stage 2, the mean size of the household was 4.9 people. This shows that there was an increase of 0.2 children per household.

From 1920 to 1955, the young dependency ratio was high but the mean size of the household was stable at about 5 people. The reason is revealed by figures indicating the relationship of household members to the head of household. Non-relative household members, i.e. domestic servants, living-in employees, etc., dropped by 0.5 persons. This offset an increase by 0.5 persons related to the head of the household, i.g. children of household head.

After 1960, the household size shrunk, reaching 3.2 persons in 1985. This is a result of a reduction in families living together and an increase in one-person households.

Figure 5 shows the household member distribution in association with householder for households with two or more members between 1920 and 1980.

"Children of the householder" has the largest number and has changed the most over the years. Until 1955, an increase in the number of children accounted for the increase in family members, and the decline in the size of households after 1960 was a result of a fall in the average number of children per household. The average number of children per household in 1920 was 2.13 in 1920. By 1955, this figure had risen to 2.46 children per household, an increase by 0.3. This had dropped to 1.86 in 1965, and 1.49 in 1980, a decline of one person per household over the last 25 years.

Most of the "children of the householder" are unmarried, but some include married children and their spouses, 0.2 to 0.3 persons per household. What is even more interesting is the fact that the number of "married children" remained about the same as the number of grandchildren and parents of the householder over the years, and that all have recently declined.

As might be expected, the number of grandparents was always low, and the number of brothers and sisters and "other household members", i.e. uncles and aunts, and nieces and nephews, have all rapidly decreased since 1955.

In short, increase and decrease in the number of family members have been the direct result of change in the number of children. The number of children increased up to 1955 because the average number of children born to prewar couples remained stable at five per couple while improvements in the infant and childhood death rates indicated that more and more children survived. The reduction in the number of children after 1955, was caused by a post-war drop in the birth-rate and a reduction in the number of children born to each couple.

This post-war reduction in household size was accompanied by a simplification of the composition of household members. What effect has this simplification of the family structure in association with the householder had upon the number and the distribution of families or households which composed of only parents and their children and families or households which include the parents or grandchildren of the householder.

Figure 6 shows changes in the number of households between 1873 and 2025.[4] The total number of households increased at a gentle average rate of 1.1% per year, rising from 7.1 million in 1873 to reach 17.54 million in 1955.

The number of households began to increase rapidly in 1960, the year that the total dependency rate began to fall. The total number of households (all types) doubled in 20 years, reaching 33.6 million in 1975. This means that the annual average rate of increase was 3.3%. In 1985, the number of households in Japan had risen to 38 million, a fivefold increase in 100 years.

If the increase in households is broken down into three categories: stem family households which are primarily linear family households, nuclear family households, and one-person households, it is clear that since 1920 stem family households have not declined but rather, gradually increased in number. Therefore, the rapid increase in the total number of households is owing to a rise in the number of nuclear family households. In other words, stem family households numbered 6.35 million in 1955, 7 million in 1975, and 7.2 million in 1985, an increase of 850,000 in 30 years. There were 10.4 million nuclear family households in 1955, but by 1975 they had increased 10 million to reach a total of 20 million. By 1985, there were 22.8 million nuclear households in Japan.

There was a rapid increase in the number of nuclear family households without a decline in the number of stem family households during the period when the number of the dependent population was dropping. The reason is that the "many siblings with fewer loss generation" has formed nuclear family households. It is a principle of the family system in Japan that the first son lives with his parents after marriage. Therefore, the second and third sons establish new

households, namely nuclear family households without their parents after they get married. Of course we must not forget the economic aspect, namely that after 1960, rapid economic growth provided the employment and wages they needed to set up their own households.

Accordingly, the rate of increase in the number of nuclear family households slowed a little after 1975, the year the "low fertility low mortality" or "fewer siblings" generation born after 1950 reached marriageable age.

After the growth in nuclear family household began to slow in 1975, there was a marked increase in the number of one-person households, mainly among middle-aged and older women. However, as an age distribution stabilizes after the year 2000, the growth of one-person households will slow and in Stage 4, the aged society, household distribution by family structure will be stable.

For this reason, it is possible to refer to the period between 1960 and 1974 as the "era of the nuclear household," the period between 1975 - 2000 as the "era of the one-person household," and call the period beginning in 2015 the, " era of the aged society and population and household stability."

In sum, the total dependency ratio begins to rise for the first time when the "many births few deaths" generation which appears in the middle of the population change process, demographic transition, are young (Stage 2). When this generation begins to form its own households (Stage 3), the total dependency ratio falls, but this is the era when an increase in the working population is accompanied by a rapid increase in households, or in other words, the era of employment opportunities and housing shortage. The length of Stage 3 corresponds to the number of years which elapse between the time the young dependency ratio begins to rise and a long term falling trend appears in the birth-rate.

In Japan, the elevation of educational standards and the extension of the length of education have delayed the increase in the working population and created a youthful labor force capable of responding to technological progress. The extension of the time required to complete one's education has slowed the growth of the demand for housing and held the birth-rate down by delaying marriages. These factors made it possible for rapid economic growth and industrialization to absorb the huge increase in the size of the productive population which has occurred since 1955.

Notes

1) The latest revision of the United Nations population estimates and projections was published as World Population Prospects 1988, 1989 (United Nations Publication, Sales No. E.88.XIII.7)

2) Population by age data for 1868-1918, Yoichi Okazaki, "Population of Japan in the Meiji-Taisho Era and Its Trends," Jinko Mondai Kenkyu (Journal of Population Problems, No. 178, pp. 1-17, 1986. Data for 1920-1985, Japan Statistic Bureau, Population Census of Japan. Data for 1990 to 2085, Institute of Population Problems, Population Projections for Japan:1925-2085, Research Series No. 244, 1987.

3) Based upon result tables not included in: Naohiro Ogawa, "Aging in China, Demographic Alternatives," Asia-Pacific Population Journal, Vol. 3, No. 3, 1988, pp. 21-64. For details on these cases, see pages 30-31. The material used to make this figure was provided through the good offices of Professor Naohiro Ogawa, Nihon University Population Research Institute NUPRI.

4) Data for 1873, Meiji 6-nen Zenkoku-koseki-hyo(Table of the Family Registration, 1873). Data for 1920-1985, Japan Statistic Bureau, Population Census of Japan. Data for 1990-2085, Institute of Population Problems, Household Projections for Japan: 1985-2025, Research Series No. 249, 1987.

Table 1 Population by Three Age Groups and Dependency Ratio in Japan: 1868 - 2085

Year	Population (1000)				Proportion (0/0)			Dependency Ratio		
	Total	0-14	15-64	65+	0-14	15-64	65+	Total	Young	Old
Population Estimates										
1863	34,559	10,493	22,077	1,989	30.36	63.88	5.76	56.54	47.53	9.01
1873	35,099	10,330	22,753	2,016	29.43	64.82	5.74	54.26	45.40	8.86
1878	36,348	11,373	22,928	2,047	31.29	63.08	5.63	58.53	49.60	8.93
1883	37,770	12,240	23,438	2,093	32.41	62.05	5.54	61.15	52.22	8.93
1888	39,025	12,964	23,915	2,146	33.22	61.28	5.50	63.18	54.21	8.97
1893	40,442	13,252	24,975	2,214	32.77	61.76	5.48	61.93	53.06	8.87
1898	42,209	13.718	26,042	2,449	32.50	61.70	5.80	62.08	52.68	9.41
1903	44,729	15,087	27,250	2,392	33.73	60.92	5.35	64.14	55.36	8.78
1908	47,412	16,488	28,477	2,446	34.78	60.06	5.16	66.49	57.90	8.59
1913	50,937	18,408	29,877	2,652	36.14	58.65	5.21	70.49	61.61	8.88
1918	54,655	19,826	31,943	2,885	36.28	58.45	5.28	71.10	62.07	9.03
Census										
1920	55,963	20,416	32,605	2,941	36.48	58.26	5.26	71.64	62.62	9.02
1925	59,737	21,924	34,792	3,021	36.70	58.24	5.06	71.70	63.02	8.68
1930	64,450	23,579	37,807	3,064	36.59	58.66	4.75	70.47	62.37	8.10
1935	69,254	25,545	40,484	3,225	36.89	58.46	4.66	71.07	63.10	7.97
1940	71,933	26,383	42,096	3,454	36.68	58.52	4.80	70.88	62.67	8.21
1947	78,101	27,573	46,783	3,745	35.30	59.90	4.79	66.94	58.94	8.00
1950	83,200	29,428	49,658	4,109	35.37	59.69	4.94	67.54	59.26	8.27
1955	89,276	29,798	54,729	4,747	33.38	61.30	5.32	63.12	54.45	8.67
1960	93,419	28,067	60,002	5,350	30.04	64.23	5.73	55.69	46.78	8.92
1965	98,275	25,166	66,928	6,181	25.61	68.10	6.29	46.84	37.60	9.24
1970	104,665	25,153	72,119	7,393	24.03	68.90	7.06	45.13	34.88	10.25
1975	111,940	27,221	75,807	8,865	24.32	67.72	7.92	47.60	35.91	11.69
1980	117,060	27,507	78,835	10,647	23.50	67.35	9.10	48.40	34.89	13.51
1985	121,049	26,033	82,506	12,468	21.51	68.16	10.30	46.67	31.55	15.11
Population Projection, Medium Series										
1990	124,225	23,132	86,274	14,819	18.62	69.45	11.93	43.99	26.81	17.18
1995	127,565	22,387	87,168	18,009	17.55	68.33	14.12	46.34	25.68	20.66
2000	131,192	23,591	86,263	21,338	17.98	65.75	16.26	52.08	27.35	24.74
2005	134,247	25,164	84,888	24,195	18.74	63.23	18.02	58.15	29.64	28.50
2010	135,823	25,301	83,418	27,104	18.63	61.42	19.96	62.82	30.33	32.49
2015	135,938	23,876	81,419	30,643	17.56	59.89	22.54	66.96	29.32	37.64
2020	135,304	22,327	81,097	31,880	16.50	59.94	23.56	66.84	27.53	39.31
2025	134,642	22,075	81,102	31,465	16.40	60.24	23.37	66.02	27.22	38.80
2030	134,067	23,009	80,057	31,001	17.16	59.71	23.12	67.46	28.74	38.72
2035	133,133	23,914	78,278	30,941	17.96	58.80	23.24	70.08	30.55	39.53
2040	131,646	23,798	76,110	31,738	18.08	57.81	24.11	72.97	31.27	41.70
2045	130,017	22,809	75,824	31,384	17.54	58.32	24.14	71.47	30.08	41.39
2050	128,681	21,967	76,433	30,281	17.07	59.40	23.53	68.36	28.74	39.62
2055	127,704	22,017	76,770	28,917	17.24	60.12	22.64	66.35	28.68	37.67
2060	126,947	22,728	76,107	28,112	17.90	59.95	22.14	66.80	29.86	36.94
2065	126,215	23,266	74,751	28,199	18.43	59.23	22.34	68.85	31.12	37.72
2070	125,518	23,095	73,746	28,677	18.40	58.75	22.85	70.20	31.32	38.89
2075	124,890	22,466	73,739	28,685	17.99	59.04	22.97	69.37	30.47	38.90
2080	124,401	22,066	74,256	28,079	17.74	59.69	22.57	67.53	29.72	37.81
2085	124,066	22,277	74,473	27,316	17.96	60.03	22.02	66.59	29.91	36.68

Figure 1 Dependency Ratio in Japan: 1868 – 2085

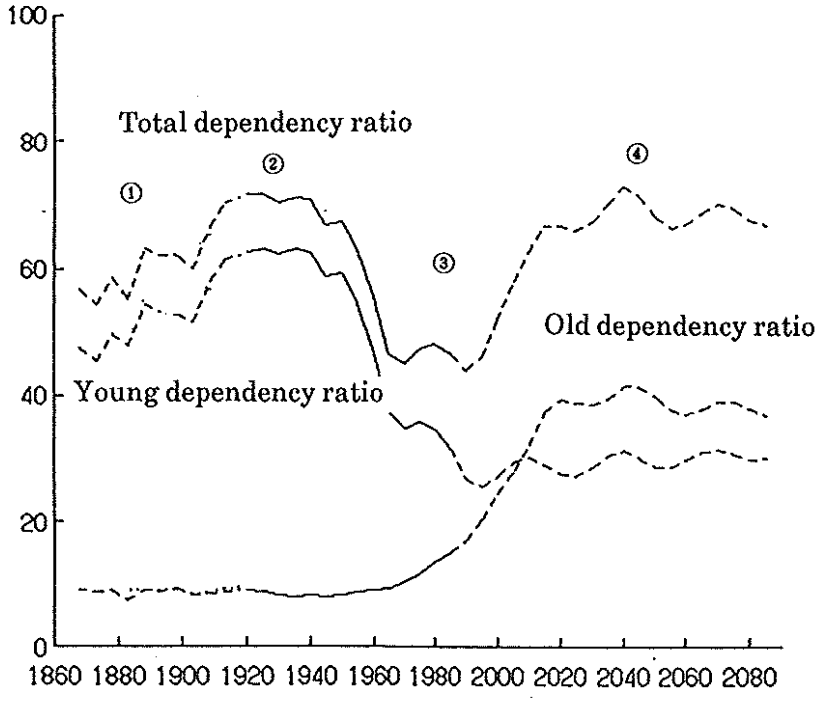


Figure 2 Changes in Population by Three Age Groups: Japan 1868 – 2085

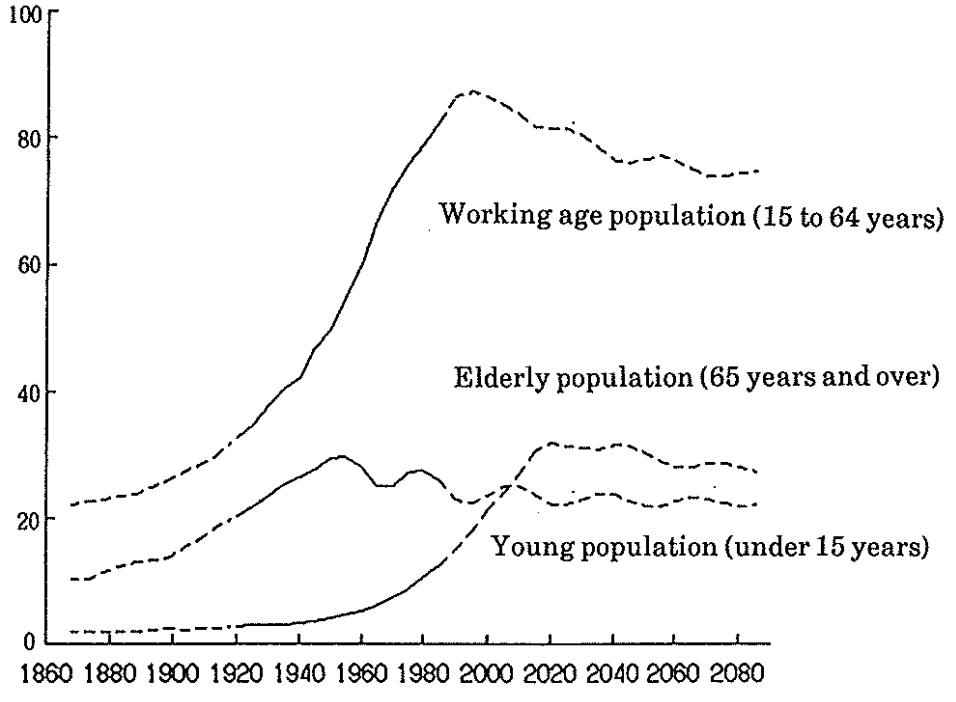


Figure 3 Changes in the Total Dependency Ratio in Four Asian Countries: 1950 – 2025

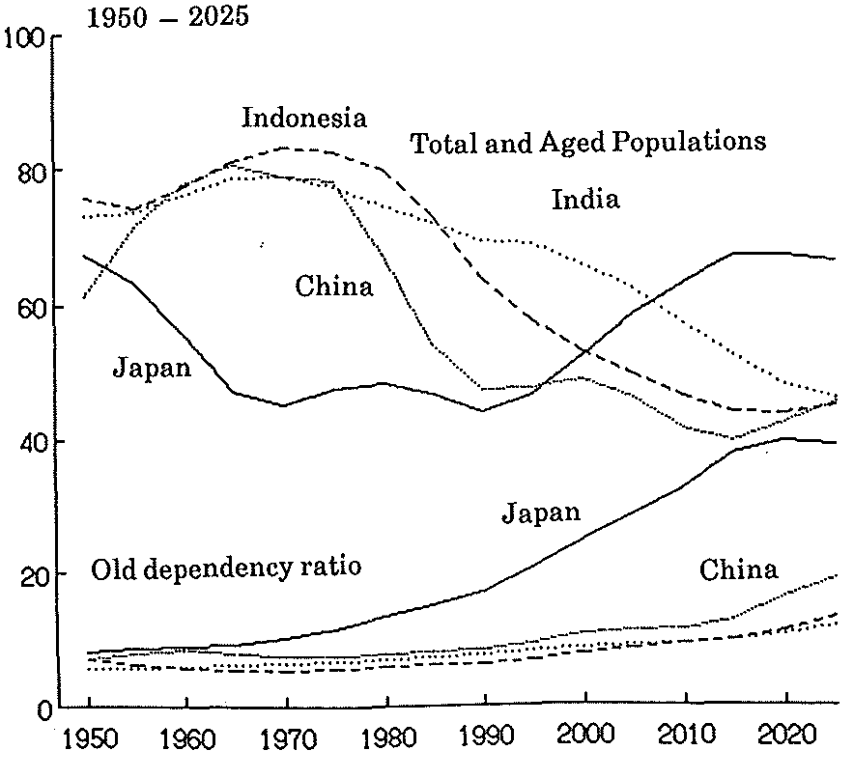


Figure 4 Changes in the Total Dependency Ratio in China: 1950 – 2050

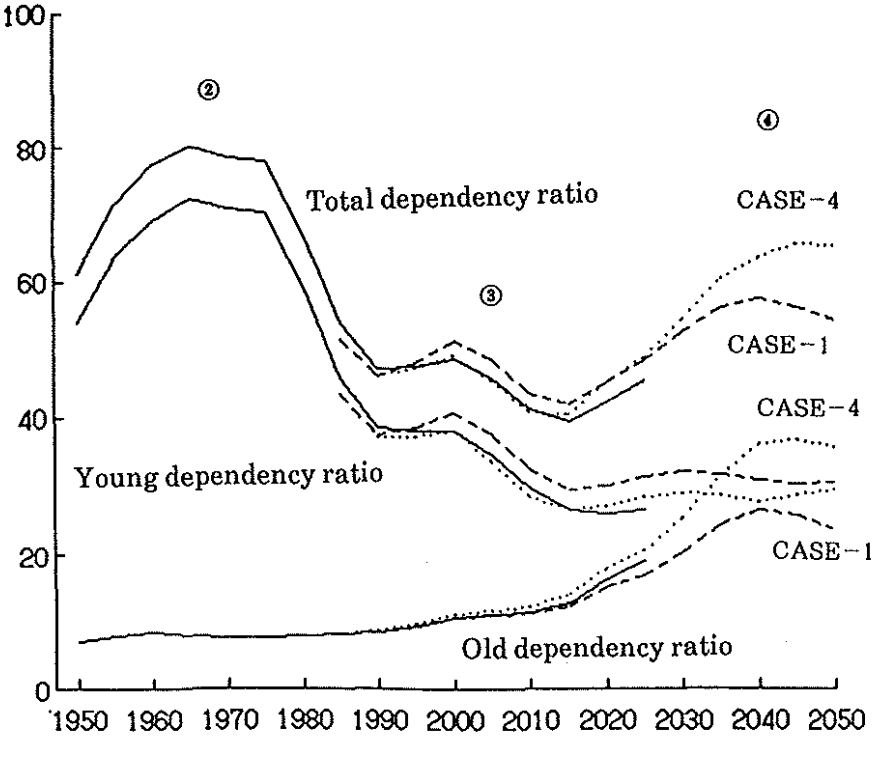


Figure 5 Average Number of Family Members by Relationship to Household Head: Japan, 1920 – 1980

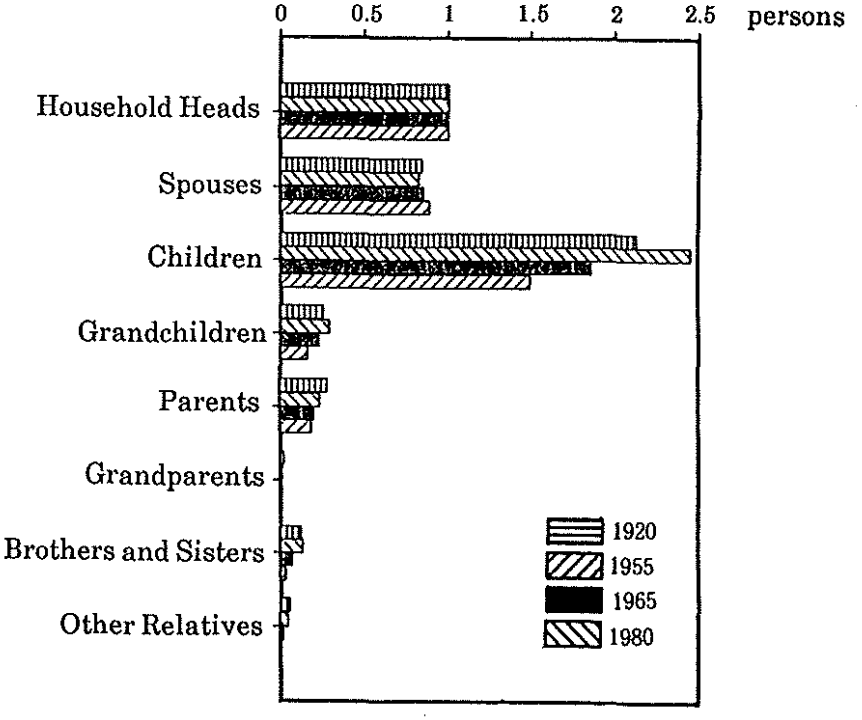
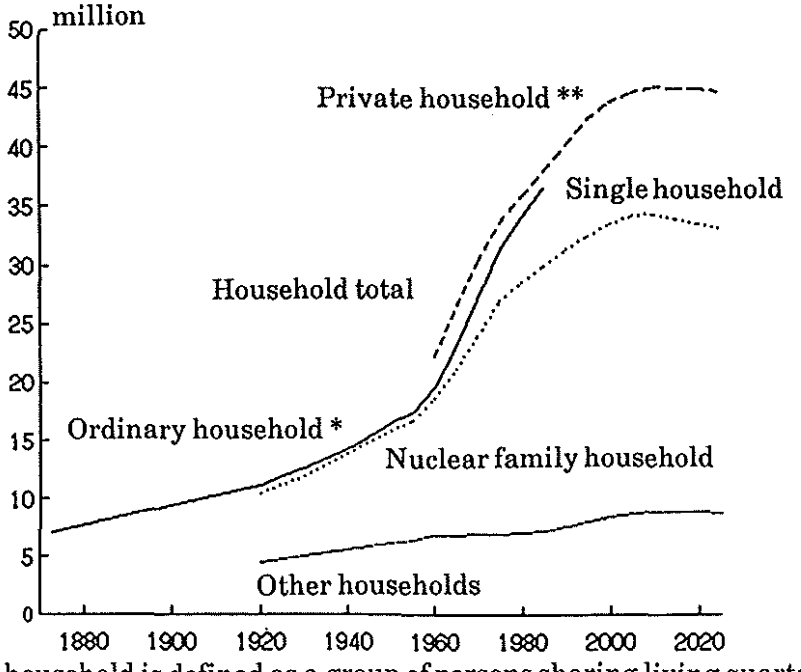
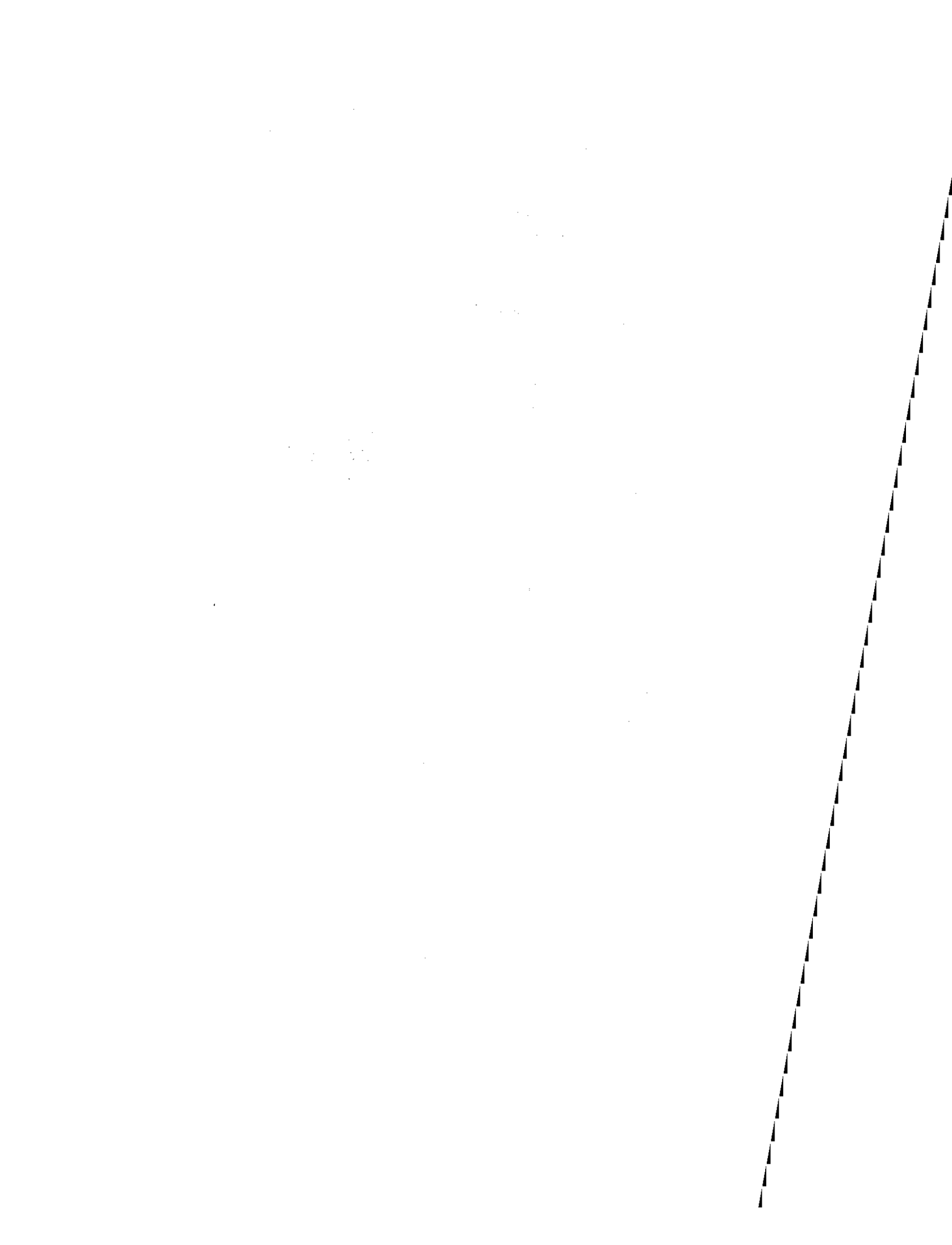


Figure 6 Changes in the Number of Households by Family Type: Japan, 1873 –2025



* Ordinary household is defined as a group of persons sharing living quarters and living expenses as well as a person who lives by himself occupying a dwelling house.

**Private household is defined as an Ordinary household and a person who lives in a dormitory for employees of a company/government.



Chapter 5

Changes in Age Distribution and Socioeconomic Development

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1. Patterns of Change in Age Distribution

The age distribution of a human population is determined by the level of its birth and death rates, provided it is not affected by migratory movement. A long-term observation of changes that take place in the age distribution of a particular country's population, as it progresses from early, middle and later stages of its modern development, clearly shows that these change are intimately related to the concept of "demographic transition" discussed in Chapter Two. Demographic transition is usually discussed in relation to changes in birth and death rates that take place in the process of modernization, but it could be interpreted in a wider sense to include changes in the age distribution as well. From the viewpoint of dynamic population change, it can be argued that the latter interpretation is more appropriate.

Since demographic transition is a fixed pattern of change in birth and death rates, changes in age distribution can also be regarded as a fixed pattern.

Unless it is disturbed dramatically by some cause such as war and famine, the age distribution of a human population at its early stages of modernization should form a population pyramid of the so-called "Mt. Fuji shape." Although this reflects the fact that conditions of both high birth rate and high death rate have been maintained over a long period of time, unless the birth rate level changes, there will be no marked changes in the age distribution even if the death rate declines slightly. As indicated previously by A.J. Coale and the present author, this can be demonstrated, both theoretically and empirically, by the theory of a stable population.[1) 2)]

Taking Japan's population as an example, the birth rate remained virtually unchanged at a high level during the period of nearly half century from the early days of Meiji era -- the starting point of Japan's modernization -- to around 1920. On the other hand, the death rate gradually declined during the same period. As shown in Figure 1, in 1920 the age distribution was in the typical "Mt. Fuji shape."

When the birth rate declines as demographic transition advances, the age distribution begins to change evenly. The lower part of the population pyramid shrinks, while the middle and upper parts spread, influenced by the lower death rate. In this case, the effect of the decline in the birth rate is more direct and more immediate, while that of the death rate is more indirect and more lagged. The population pyramid temporarily swells in the middle, and as the effect of birth and death rates gradually becomes universal, it shifts to the shape of a "hanging bell" corresponding to the dynamics of population; to wit, a lower birth rate and a lower death rate.

The population pyramid of Japan in 1985 illustrated in Figure 1 is deformed by the unusual swelling of the middle-aged generation brought about by the postwar baby boom. It is an example of an age distribution during a period of transition from a Mt. Fuji shape to a hanging bell shape. Generally speaking, from 1955 up to recent years, the age distribution of Japan's population exhibited a transitional pattern. Although the age distribution may have been of a transitional pattern, its relationship to the socioeconomic development of Japan is very important. This point will be discussed again in the chapters that follow.

When the age distribution is firmly and completely established in the final stage of demographic transition, that is, when the birth and death rates are both low, it is in the shape of a hanging bell. From the end of this century to the beginning of the next, the pattern of Japan's population will be characterized by this hanging bell shape. However, as shown in Figure 3, it will still be impossible to avoid the influence of a baby boom or other phenomena of the past. The main characteristic of an age distribution in the shape of a hanging bell is the high ratio of aged population to total population. Another important characteristic is that the proportion of each age population is nearly the same even in the working-age population, with virtually no discrepancy between age groups. The problem of the relationship between this and socioeconomic development should also be discussed on another occasion.

There would be no problem if demographic transition were firmly established and completed at the appropriate levels of birth and death rates. But it is problematical when the birth rate declines abnormally and the balance with the death rate is seriously disturbed, as is observed in some advanced industrial countries. In this case, the age distribution assumes the shape of a "vase," which is characterized by the narrowing of the lower part of the population pyramid. This age distribution looks unstable, but even in terms of population dynamics, it basically constitutes a decrease in population. Such a condition cannot last long; if it did, the decline of such a society would be unavoidable. Actually, as a result of declining birth rates, the advanced industrial countries of western Europe have recently been faced with the prospect of a "decrease in population," and a heated debate is taking place about whether or not socioeconomic measures should be adopted to cope with the situation.[3)]

2. Change in the Ratio of Dependent Population

Changes in age distribution exert extensive influence on various socioeconomic fields. The most important of these changes is the one that occurs in the ratio of dependent population to working-age

distribution. The burden of supporting the child population is heavy when the age distribution is in the "Mt. Fuji Shape." But the age distribution will change as the birth rate drops, and when it assumes the transitional pattern discussed earlier, the working-age population will come to account for a large proportion of the general population and the economic society will be filled with vitality. However, if the economy stagnates and the abundant working-age population cannot be fully utilized, the problem of unemployment or that of underemployment will result instead.

If the demographic transition advances further and the age distribution assumes the shape of a "hanging bell," the proportion of the aged population will increase. As a result, the burden of the aged population on the working-age population will gradually become so heavy it will give rise to the problem of the so-called aging population.

The ratio of dependent population is used as a method for quantifying changes in the burden on the working age population. In this case, the population of those between 0 to 14 years old is often used as the child population, and the population of those 65 years and older as the aged population. Of course, the working-age population consists of people from 15 to 64.

First, the "ratio of child population" is calculated as the child population's burden on the working-age population. This is the value obtained by dividing the child population by the working-age population. Next, the "dependency ratio of aged population" is calculated as the aged population's burden on the working-age population. This is the value obtained by dividing the aged population by the working-age population.

Although they are both dependent populations, the social evaluation of the aged population is different from that of the child population, and the amounts actually spent to support them also differ. The child population is a new generation with a future, while the aged population is a population that has already fulfilled its duty. But the latter has rendered valuable service to the building of the present society, and should therefore be given due social recognition. While the content may differ, the child population is provided with social expenditures in such areas as education and hygiene, whereas the aged population is provided with large social expenditures in the form of old-age pensions, old-age social welfare and so on. These expenditures can be added up, and by doing so, changes in the burden of the two types of dependent population on the working-age population can be observed. Since it is difficult to weigh the burden of supporting the child population and that of supporting the aged population, the "ratio of dependent population" is usually calculated by simply adding up the dependency ratio of the child population and that of the aged population.

Table 1 shows Japan's dependency ratio of child population and that of the aged population, as well as its ratio of dependent population since 1920 to the present and to the future. In this table, the first noteworthy point is the fact that the ratio of dependent population in 1920 was an extremely high 71.6 percent. This was because the dependency ratio of child population, at 62.6 percent, was also extremely high. By contrast, the dependency ratio of aged population was very low at 9.0 percent. In those days, although the birth rate was still high, the death rate was already rather low. But this was not enough to bring about an increase in the aged population. At present, a glance at the conditions of the developing countries reveals that, for example, conditions in India resemble the conditions in Japan in 1920: the ratio of dependent population is 72.7 percent, the dependency ratio of child population is 65.9 percent and the dependency ratio of aged population is 6.8 percent. Conditions in nearly all other developing countries, such as Thailand, the Philippines and Brazil, are similar to those found in India.

The Japanese population in 1920, like those of today's developing countries, was beset with the burden of large families. But the situation gradually improved with the passage of time -- albeit at a very slow pace. Needless to say, the situation improved because the dependency ratio of the child population declined; however, the dependency ratio of the aged population remained virtually unchanged.

The ratio of dependent population declined sharply in the postwar period, from 1950 onward. This was also brought about solely by a drop in the dependency ratio of child population. The dependency ratio of aged population had hardly changed. After the war, the Japanese economy developed rapidly and the standard of living of its people rose accordingly. Moreover, the quality of life improved remark- ably, so much so that it defies comparison with the prewar conditions. This situation served to lower the birth rate and bring down the ratio of the dependent population. But at the same time, the decline in the ratio of dependent population reduced the burden on the Japanese economy, thus raising the growth rate.

Roughly speaking, the postwar high growth rate can be regarded as a fact applicable to the period from the mid-1950s to the mid-1960s. But as shown in Table 1, the ratio of the dependent population had hit bottom by around 1970 and was beginning to rise. Thus the year 1970 was the turning point. However, a glance at the trend in the dependency ratio of child population and the trend in that of the aged population, as illustrated in Table 1, reveals that while the dependency ratio of child population continued to drop, the dependency ratio of the aged population gradually rose. As a result, the latter rise began to more than neutralize the drop in the dependency ratio of aged population from around the mid-1960s. The ratio of aged population to total population surpassed the 7-percent mark in 1970, the year of the transition

in the ratio of dependent population. It was around this time that people began to think seriously about the problem of the aging population.

In 1970, the time the ratio of dependent population hit bottom, the dependency ratio of child population was 34.9 percent, that of aged population 10.3 percent, with the ratio of the dependent population, the sum of these two ratios, reaching 45.1 percent. As of 1985, the dependency ratio of child population was 31.6 percent, that of aged population 15.1 percent, and the ratio of dependent population as the sum of the two ratios was 46.7 percent. A look at the ratios in the future shows that in the year 2000, the dependency ratio of child population will reach 27.4 percent, that of aged population 24.7 percent, with the ratio of dependent population rising to 52.1 percent. By the year 2025, when the population will have aged significantly, the dependency ratio of child population will be 27.2 percent, that of aged population 38.8 percent, with the ratio of dependent reaching 66.0 percent.

As of this moment, a comparison of the conditions in the major countries of the world shows that, as indicated in Table 2, they can be divided into two groups: those observed in the advanced industrial countries and those found in the developing countries. The dependency ratio of child population is low in the former and high in the latter, while the dependency ratio of the aged population is low in the latter and high in the former. However, the ratio of the dependent population, the sum of two dependency ratios, is low in the advanced industrial countries and high in the developing countries.

A closer examination of this reveals that, first, the advanced industrial countries can be further divided into those whose dependency ratio of aged population is above 20 percent and those whose dependency ratio of the same is below 20 percent. It is noteworthy that the dependency ratio of child population is generally low (at the 20-percent mark) in the former and high (at the 30-percent mark) in the latter. Japan now belongs to the latter, but will join the former in the future, as shown in Table 1.

Next, in the developing countries, the dependency ratio of aged population is generally low, but that of child population is markedly high. The developing countries can hence be divided into two groups: (1) those whose ratio of dependent population is noticeably high; and (2) those whose dependency ratio of child population is high and the ratio of dependent population is relatively low.

The age distribution changes along with progress in population transition, but the content of the problem of economic and social development will naturally differ in accordance with the age distribution that obtains.

3. Changes in Age Distribution and Their Significance for Socioeconomic Development

Naturally, as the age distribution of a human population changes, a shift in the emphasis of socioeconomic development cannot be avoided. The present chapter will conclude by presenting the main points of this shift in emphasis.

Needless to say, building a socioeconomic infrastructure is the most important task in achieving modern development as a policy. But as a policy that relates directly to population, devising measures concerning health and hygiene, as well as the prevention and cure of sickness, is also an important task. It is universally observed that the birth rate drops in the first stage of demographic transition. This is the result of an enormous effort on the part of a modern state to improve the health of its people and exterminate contagious diseases. This is obvious in the light of not only the past experiences of advanced industrial countries but also of the recent experiences of developing countries.

The policy of spreading education is another important task in the early stages of modernization. Of particular importance is the spread of universal education, which is generally administered as public, compulsory education. The spread of education has an enormous effect, not only in expanding knowledge, but also in helping to spread an attitude toward life based on rationalism, which is indispensable to modern life. Thus the spread of universal education has to be implemented for the entire nation, regardless of whether the person targeted is female or male, or is of the upper, lower or middle class.

In the early stages of modernization, since the age distribution of a population assumes the "Mt. Fuji-shape," the basic policies of health, medical treatment and education are inevitably directed toward the younger population, which has an absolute majority. The planning and implementation of these policies will require huge amounts of funds. But the effect of these policies will directly bring about improvements in the mental and physical qualities of the people, and give rise to various factors that contribute to socioeconomic development, such as supplying a capable work force and even lowering the birth rate.

The second stage of demographic transition appears as population growth, which is brought about by a gap in the birth and death rates, and as a midsection bulge in the age distribution. As noted in the previous section, at this stage, the ratio of dependent population to working-age population declines, thus resulting in a favorable condition for socioeconomic development. In particular, there is an abundant work

force, both qualitatively and quantitatively, which constitutes an important developmental factor. Thus, the emphasis at this stage is placed on the implementation of the economic growth policy that capitalizes on this favorable condition. The economic growth that Japan experienced during the prewar and postwar periods is development that she achieved under a number of favorable conditions. In a nutshell, Japan achieved economic growth because she was blessed with an abundant supply of labor, which she skillfully utilized.

A major problem confronting many developing countries today is rapid population growth. This is brought about by a high birth rate combined with an extremely low death rate. Many developing countries are striving to restrain population growth by endeavoring to spread family planning as a national policy. This population policy proves to be extremely effective at the second stage of population transition, and results in an accelerated pace toward the third stage of demographic transition, namely, that of a low birth rate and a low death rate.

As is the case in many advanced industrial countries, as well as in some developing countries which have already entered this stage, the age distribution of their respective population gradually begins to change in the direction of a "hanging bell." The industrial structure becomes more sophisticated, the nation's living standard improves, and significant changes are brought about in the content of the industrial structure. The problem of socioeconomic development inevitably changes in response to these structural changes. The most important challenge at this stage lies in the implementation of measures to cope with the problem of the so-called "aging society." As mentioned previously, although the ratio of the dependent population to the working-age population will again rise, it should not be impossible to support the lives of the elderly since there is no comparison between the social and economic strength of a country at the third stage of demographic transition and that of a country at the first stage. Rather, the task of socioeconomic development should be to build an "affluent society" in which not only the elderly, but the entire nation can live with a sense of satisfaction.

Notes

1) Coale, Ausley J. How the Age Distribution of Human Population Is Determined, Cold Spring Harbor Symposium on Quantitative Biology, vol. xx, 11, 1957.

2) Okazaki Yoichi. Jinko Tokei [Revised Edition]" (Population Statistics), Kokinshoin, pp. 160-163.

3) Teitelubaum, M.S., Winter, Jay M. The Fear of Population Decline (translation supervised by Kuroda Toshio and Kono Shigemi), Tagashuppan.)

Table 1 Trends in the Ratio of the Dependent Population

Year	Child population (%)	Aged population (%)	Dependent population (%)
1920	62.6	9.0	71.6
25	63.0	8.7	71.6
30	62.4	8.1	70.5
35	63.1	8.0	71.1
40	61.0	8.0	69.0
50	59.4	8.3	67.7
55	54.6	8.7	63.3
60	47.0	8.9	59.9
65	37.9	9.2	47.1
70	34.9	10.3	45.1
75	35.9	11.7	47.6
80	34.9	13.5	48.4
85	31.6	15.1	46.7
90	26.8	17.2	44.0
95	25.7	20.7	46.3
2000	27.4	24.7	52.1
05	29.6	28.5	58.2
10	30.3	32.5	62.8
15	29.3	37.6	67.0
20	27.5	39.3	66.8
25	27.2	38.8	66.0

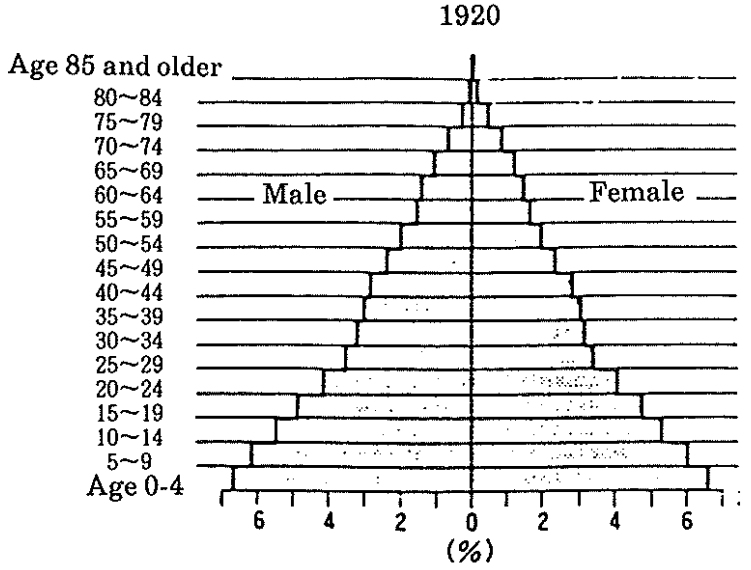
Source: Until 1985, Population Census; 1990 and onward, "Population Pjojection for Japan: 1985-2085" Institute of Population Problems, Ministry of Health and Welfare

Table 2 International Comparison of the Ratio of Dependent Population

Name of Country	Year	Child population	Aged population	Dependent population
Sweden	1985	27.2	27.6	54.8
Britain	1984	29.3	22.9	52.1
West Germany	1984	22.4	21.1	43.5
Switzerland	1982	27.4	20.3	47.7
East Germany	1985	28.7	20.2	48.9
Italy	1982	32.6	20.2	52.8
France	1985	32.4	19.5	51.9
Netherlands	1985	28.9	17.5	46.4
U.S.A.	1985	32.8	18.0	50.8
Japan	1985	31.6	15.1	46.7
Australia	1983	37.1	15.2	52.3
Argentina	1985	51.3	14.1	65.4
Chile	1984	49.9	9.0	58.9
Singapore	1985	34.6	7.4	42.0
China	1982	54.6	8.0	62.6
Sri Lanka	1984	58.4	7.2	65.6
Brazil	1985	61.4	7.3	68.7
Pakistan	1981	86.9	8.3	95.2
South Korea	1984	49.2	6.2	55.4
India	1985	65.9	6.8	72.7
Indonesia	1984	69.0	5.7	74.7
Philippines	1984	67.3	5.3	72.6
Bangladesh	1981	89.4	5.8	95.2
Thailand	1985	60.3	5.5	65.8

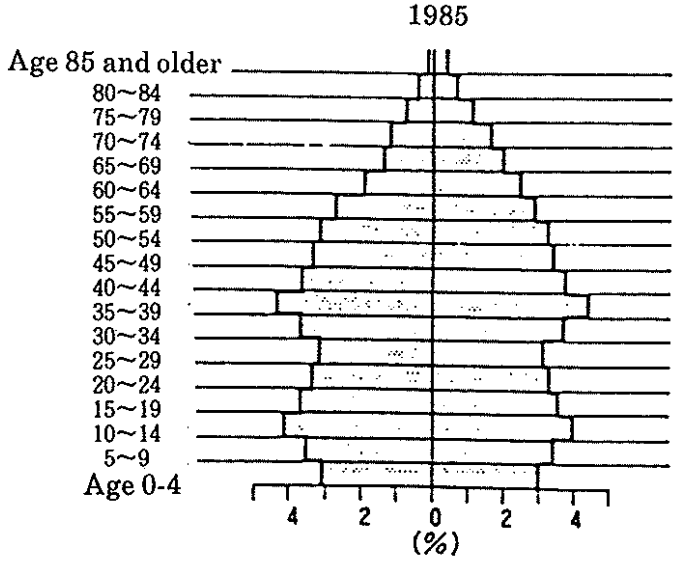
Source: U.N., Demographic Yearbook

Figure 1 Population Pyramid in the Shape of Mt. Fuji



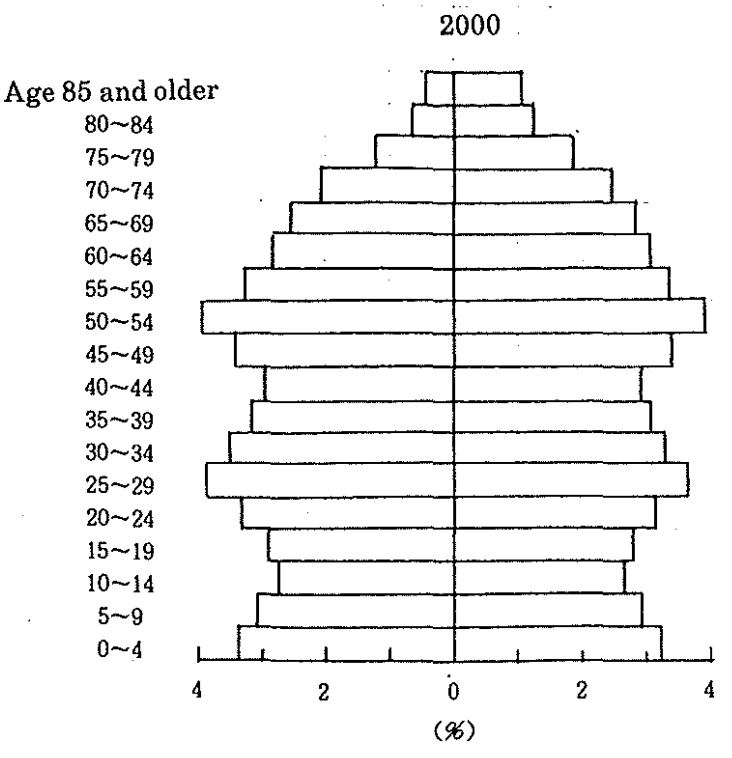
Source: National Census

Figure 2 Population Pyramid in a Transition Period



Source: National Census

Figure 3 Population Pyramid in the Shape of a Hanging Bell



Source: "Population Projections for Japan: 1985 – 2085,"
Institute of Population Problems,
Ministry of Health and Welfare

Chapter 6

Aging of the Population and the Generational Change of the Aged

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1. The Aging of the Japanese Population

At the present time, Japan's population is aging rapidly. The proportion of the aged people in Japanese population (the percentage of people who are 65 or older) was 4.9% in 1950, had passed 7% in 1970, and rose above 10% in 1985. According to population forecasts prepared by the Institute of Population Problems of the Ministry of Health and Welfare,[1)] the population will continue to age at an increasing rate, and the percentage of the aged in the population will be 16.3% in the year 2000, and reach 23.6% in 2020. In the first quarter of the twenty-first century, Japan will be an "ultraaged society" which any society has never experienced.

The aging of the population is also taking place in the U.S. and Europe but the phenomenon in Japan has unique characteristics which distinguish it from the European and U.S. trends. It is the most recent one, and besides, it is happening much more quickly. For example, in Japan it took only 25 years for the proportion of the aged in the population to rise from 7% to 14%, but in Sweden it took 85 years, and in the United Kingdom and West Germany it took 45 years.

One index which clearly shows the scale of the social economic impact which this rapid aging process is generating is the aged dependency ratio (the ratio of elderly population to working population). If the working population is taken to be those between 15 and 64, and the aged population is taken to be people 65 and over, the aged dependency ratio was 8% in 1950, but continued to rise, surpassing 10% in 1970, and reached 15.1% in 1985. According to population forecasts, it will be 20% in 1990, pass the 30% mark in 2010, and reach 39.3% in the year 2020. These figures mean that in the 35 years period beginning in 1985, the burden of supporting the aged in Japan will increase almost 2.6 times for the workers of the society. This sharp increase in the cost of supporting the aged which will result from such rapid high-level aging will inevitably have an effect on the way we support our elderly citizens.

2. Changes in the Support of the Elderly

The concept of support for the aged will be broken down into three aspects, economic support, physical support (nursing care), and psychological and emotional support. Here, let us consider the question of who takes responsibility to provide each aspect.

Prior to the era of accelerated economic growth, in Japan, both in theory and in practice, the family took full responsibility for the support of the aged. Despite industrialization, in other words,

modernization, which began in the Meiji period, the percentage of the working population engaged in primary industry in 1955 was 41%, the self-employed and the family workers composed 54% of the working population, and 44% of the people lived in farming regions (rural districts). Society was still dominated by agricultural and farm community values, income levels were low, and social security system was underdeveloped. As a result, throughout society the concept of "familism," the doctrine that the elderly relied upon their children and that children took care of their parents in their old age, was still generally adhered to.

However, after the middle of the 1950s, Japanese society and the economy changed radically along with the rapid growth in the economy. By 1985, The percentage of the working population employed in the primary industry was only 9%, and only 25% of the working population were the self-employed or family workers. The farming region population had fallen to 23%. The agrarian or rural community society, or the self-employed-centered society has been replaced by the industrial urban society, or an employee-centered society; wage levels have risen and a social welfare system has been highly developed. The role of the family as the supporter of its aged members has been steadily changing, and familism has been discarded as the "non-familial support of the aged" becomes more and more prevalent.

As for the first aspect of support, economic support, the idea, "Children take responsibility for their parents in their old age, has rapidly weakened since the end of the war."[2] According to a recent survey comparing the elderly in various nations of the world,[3] in attitude and in practice, only less than 20% of elderly people rely upon their families (mainly son's families) for their income in their old age. This is completely different from the situation in Thailand and Korea, where 60% to 70% are supported by their children. When asked whether they anticipated supporting themselves or relying upon social welfare, the responses were closer to the U.S. where the idea of self-support dominated than they were to Europe where people tend to rely more upon social welfare.

Familism still dominates the provision of physical support. The same international survey reveals that in both attitude and in practice, an overwhelming majority of people (more than 90%) still rely on their family (husbands on their wife, wives on their daughters-in-law or daughters) for nursing care in their old age. In this regard, Japan is much closer to Thailand where familism dominates, than it is to Europe and the U.S. where people are inclined to use publicly or privately operated nursing services.

There appears to be some weakening of familism in the provision of psychological and emotional support. The same international survey examined people's attitudes towards relations with their children and

grandchildren in their old age, and revealed that a little less than 60% want to live with them in Japan. This is much higher than in Europe and the U.S. where less than 10% want to live with their children, but it is much lower than in Korea and Thailand. The percentage of the elderly (those over 65) who live with their son and his wife has dropped gradually, but steadily, since the war, and now stands at about 60%.

As the above figures indicate, during the post-war years in Japan, familism has ceased to be a significant factor determining how the elderly will be supported economically but it still has considerable influence on the provision of psychological and emotional support, and is the major determinant of the source of physical support. It is said that since the beginning of the 1980s, Japan has got out from a modern industrial society and has entered a post-industrial or post-modern society. I wonder how familism as a concept governing support for the elderly will change as Japan advances to the over-aged society in the future.

3. Cohort Change of the Elderly

When discussing the issue of support for the elderly, it is easy to make the mistake of concluding that elderly people are the same in every generation. Despite the steady changes that have taken place since the war, most of the elderly people in Japan still want to live with their children and grandchildren and expect their families to care for them. I wonder if these familistic values which old people hold will survive in the future? Or can we expect them to change radically? I will consider these questions by examining changes in the cohort characteristics of the elderly.

(1) Changes in the Demographic Characteristics

I will break the total population down into three age groups (birth cohorts) based on 1985, and compare the average number of siblings at their birth and their rate of survival.[4] The group aged 60 or more (pre 1925 birth- year cohort) can be called the "high fertility and mortality" generation; an average of about 5 children were born, but 70% (3.5 persons) survived to the age of 15, half of them (2.5) lived to forty, and only 40% (2 persons) reached the age of 65. The next group, those 30 to 59 years old in 1985 (cohorts born between 1926 and 1955), can be referred to as the "high fertility - low mortality" generation. An average of four children were born in each family with 70% (three persons) surviving at both age 15 and age 40, and it is likely that 66% (2.7 persons) will survive to the age of 65. The third group, those under thirty in 1985 (born after 1955), are the "low fertility and mortality" generation. There are an average of two children born in each family, and it is likely that about two will reach 40, and slightly

less than two will survive to the age of 65.

In 1985 the Japanese population consisted of three generations, the elderly population (parent generation), the prime of life population (child generation), and the youthful population (grandchild generation), which respectively represent the initial stage of demographic transition, the transitional stage, and the post transitional stage, and this structure makes it possible for the relatively few members of the parent generation still alive to depend upon the relatively large child generation raised in large families. However, when the present child generation becomes the elderly in 40 years, this relatively numerous parent generation will be dependent on a child generation of people raised in very small families. Therefore, if we take into account the fact that there will be an imbalance between the parent and child generation which will be to the disadvantage of the child generation, then we can see that it may possibly be extremely difficult to maintain family centered support for the elderly in the future.

(2) Changes in Social and Economic Characteristics.

Throughout the postwar period of accerelated economic growth, rapid changes occurred in many areas of Japanese society. They include: rising wages, growing industrialization, the expansion of the service economy, a proportional increase in salaried employees, a decrease in farmers and increase in white-collar employment, urbanization, and the nuclearization of the family.

Because so much social and economic changes have occurred in such a short period of time, today's elderly have had the experience of living in radically different types of society at different stages of their lives, beginning in their childhoods and continuing through their youth, middle years, and into their old age. In addition, the population of Japan is composed of age groups which have sharply different generational experiences. It is clear that the elderly forty years from now will have lived extremely different lives than the elderly of the present day. Looked at from another point of view, it can be said that the great social and economic changes which have marked the 40 years since the war are, with time-lag, expressed as changes in the career characteristics of the elderly. Next, I will trace this process in concrete terms.

(1) Rise in Education Levels

Beginning with the establishment of the education system in the early years of the Meiji era and with the major postwar educational reforms, the ratio of students advancing from primary to secondary education and from secondary to more advanced education has risen steadily. This increase in the rate of advancement to higher education results in differences in the academic careers of people of different

generations so that the educational background of the elderly 40 years from now will be extremely different than that of today's elderly population.

Table 1 shows that the over 65 population of 1985 belong to the birth-year cohort born prior to 1920. Of those between 65 and 69 (birth-year cohort 1916 to 1920), 66% of the men and 71% of the women completed only compulsory education, 22% of the men and 26% of the women completed high school education, and 9% of the men and 3% of the women completed college. Of course, as for the cohorts prior to it, the overall educational level is lower. Thus, of all those over 65 in 1985, 70.4% of the men and 76.8% of the women completed only compulsory education. Compulsory education was the main source of education for today's elderly people.

In the year 2000, the over 65 population will be made up of the cohort born prior to 1935. Of those who will be between 65 and 69 (the 1931 to 1935 cohort) in the year 2000, 46% of the men and 50% of the women will have only completed compulsory education, 38% of the men and 45% of the women will have only high school education, and 16% of the men and 5% of the women will have college educations. Of all those over 65 in the year 2000, more than half will only have completed compulsory education, but a new birth year cohort in which those with only compulsory education are a minority will have joined the ranks of the elderly.

In the year 2025, the over 65 population will consist of the birth-year cohorts born before 1960. Based upon records of academic advancement during the 1970s, it can be forecast that of those between 65 and 69 (the 1956 to 1960 birth year cohort), 11% of the men and 8% of the women will have only completed compulsory education, 44% of the men and 52% of the women will have high school educations, and 45% of the men and 40% of the women will have college educations. The proportion of all people over 65 with only compulsory education will be reduced to a small minority of the total, with about half possessing high school educations, and between 20% and 30% will have college educations.

(2) Urbanization

Japan was urbanized slowly before the war, and rapidly after the war. In 1920, 18% of the total population lived in cities. By 1940, this figure had increased to 38%. In 1955 it was 56%, and in 1985 it reached 76%. Despite the fact that the unification of towns and villages increased the land area regarded administratively as city territory, Japan changed completely from an agrarian society to an urban society. Although the proportion of elderly people living in cities was always about 7% to 14% below that of the general population, it did increase markedly between 1920 when it was 11% and 1985 when it had reached 70%.

A study of changes in residence of those making up the aged population in 1985 (See Figure 1) reveals that as they aged, they experienced the trend towards urbanization in Japan. Of those who were between 65 and 69 in 1985 (the 1916 to 1920 birth year cohort), 15% lived in a city as children (0 to 4), between 40 and 50% lived in cities in their twenties (1935 to 1945), between 60 and 70% lived in the city in their forties (1955 to 1960), and 70% of them lived in the city between the ages of 65 and 69 (1985). The previous birth-year cohorts had almost the same experience. Prior to the war, there was no period when many towns and villages were amalgamated similar to that which occurred after the war, so I believe that the prewar growth of the urban population reflects a migration of people from farming communities to the city. To sum up, most of the people belonging to this cohort were born and raised in the country and moved to the city in their youth. This trend continued after the postwar unification of towns and villages.

The proportion of the members of the cohorts born after the 1916 to 1920 period who were born and raised in the city steadily increases along with the urbanization of Japanese society as a whole. More than half of the people in the cohort born between 1951 and 1955, and 3/4 of the people in the 1966 to 1970 cohort spent their childhoods in the city. Seventy percent for the cohort born between 1936 and 1940 lived in the city as youths, as did 80% of those born 1951 and 1955. So by the year 2025, more than half of the elderly will have been born in the city, and 80% will have lived in the city in their youth.

Despite the fact that 70% of today's elderly people live in the city, they are mostly "urbanized people" who still hold the values of the farm communities where more than half of them lived when they were young. In the future the mainstream will be "urbanized people" more than half of whom lived in the city in their youth, and finally 40 years from now, the mainstream of the aged population will be "urbanites" who were born and raised in the city.

(3) Employment History

The structure of Japan's working population has undergone great change as the country has become more industrialized. In 1930, people employed in agriculture and the fishing industry comprised 50% of the working population. By 1955, they had declined to 41%, and by 1985, to 9% of the employed population. In contrast to this, the proportion of the population engaged in non-agricultural manual and non-manual labor were 31% and 19% respectively in 1930, but their numbers increased to 44% and 47% respectively by 1985.[5)]

During the same period, the percentage of the elderly (65 years or over) who worked slowly declined before the war, and this continued after the war. Between 1955 and 1985 the percentage of the elderly who

still worked fell from 36% to 25%. There are two reasons for this trend. One is the decline in farmers and non-agricultural self-employed, sectors where the proportion of elderly workers is high. The other reason is that the aging of the population is increasing the relative numbers of people in late old age, a group that tends to work very little. In 1955 the percentages of elderly people working in agricultural, forestry and fisheries, non-agricultural manual work, and non-manual work were 40%, 33%, and 26% respectively. In 1985, the figures had changed to 36%, 27%, and 37% respectively.

The elderly population's current employment situation and occupations are not the same as they were when they were younger. One reason is that there has been an over-all change in the structure of employment throughout society in the same way society has urbanized. Another reason is that the practice of mandatory retirement has wrought great changes in the employment situation. According to Table 2, when they were young (25 to 29 years old), 26% of the men in the 1916 to 1920 cohort (65 to 69 years old in 1985) worked in agriculture, 37% were engaged in non-agricultural manual labor, 33% in non-manual labor, and 4% were unemployed. The percentages of the members of earlier cohorts working in agricultural were even higher. However, the situation will be different for the male elderly in 2025. Of the members of the cohort born between 1956 and 1960 (between 65 and 69 years old in 2025), 4% will have worked in agricultural in their youth, 50% in non-agricultural manual labor, and 41% will have worked in non-manual labor when they were young. The figures for all the elderly living in 2025 will be agricultural 5%, non-agricultural manual 51%, and non-manual 40%.

Between 1/4 and 1/3 of the elderly men alive today began their working lives in agricultural. In contrast, only a few percent of the elderly men of 2025 will have any experience of agricultural work. The separation of the elderly from farm work and their conversion into a white collar class is proceeding rapidly.

4. Cohort Change and Changes in Values and Behavior.

In the preceding sections I have shown that in the next 40 years, the nature of the elderly portion of the population will change. Their past careers will be different, in other words, the "high fertility and mortality" generation will be replaced by the "high fertility - low mortality" generation, and their educational level will rise. In addition, "urbanized people" will be replaced by "urbanites," and agricultural work experience will give way to non-agricultural and white-collar work experience. Although not demonstrated above, the majority of today's elderly citizens are a generation which provided family support for its own elderly members, and in their prime years lived in three-generation households. However, the percentage of people

in their prime years, the group who will be the elderly in 40 years, who now live in three-generation households, is no more than half of what it was for the present elderly population.[6]

How will the problem of support for the elderly be affected by the changes in their background and life experiences which are occurring as the population ages? One way to consider this issue is to examine the differences in behavior patterns which are the result of differences in their educational level, for example. Figures showing the percentage of the elderly in the work force and in the non-agricultural work force by educational level in 1980 (Table 3), show that for all age levels, the percentage in the work force including agriculture, and the percentage in the non-agricultural work force are higher for people with higher educations. In addition, figures showing what proportion of elderly people positively used their free time for activities in 1981, broken down by education level, show a correlation between education level and a level of learning, social service, sports, and travel activity (Table 4). Also, a number of surveys show that the higher a person' education, the less likely he or she is to want to live with family members, particularly a son and his wife.[7]

If it is assumed that generally, there is a direct relationship between the extent of an elderly person's education, and his desire to work and make positive full use of his spare time, and that educated people are more independent and self-reliant, and therefore have little desire to rely upon their sons and daughters, then it is possible to forecast that in the future the number of old people who look to their families for support will decrease in direct proportion to the increase in the average educational level of the elderly population as a whole, and that there will be a substantial swing to non-familism in the area of support for the aged.

The same arguments can probably be made about the other changes in the life courses of the elderly. The present elderly population were largely born in the country, worked in agriculture, and experienced life in an extended family. The group which will form the elderly population in 40 years are largely city born, have only experienced salaried employment in secondary and tertiary industries, and have only lived in a nuclear family. It is perfectly natural that the values they hold and their conduct are far different from the familistic values which have persisted to the present day.

These days we frequently hear about the gap in values between generations; a gap which appears when a member of the older generation turns to his or her family for support only to find that the young or middle-aged children do not necessarily fully accept this responsibility. The problem of a generational gap surrounding the issue of family support may be a transitional phenomenon. This is because it can be forecast that with the change in the life experiences of the

elderly that has accompanied general social and economic change, the concepts of familism will lose their authority not only for the young, but also for the elderly.

5. Conclusion --Implications for Other Asian Countries--

Until about 15 years ago, Japan was referred to as the only non-western country to have achieved fertility transition. However this situation is now undergoing change. The NIEs states such as Singapore, Korea, Taiwan, and Hong Kong, and even China have virtually achieved fertility transiton, and Thailand and Indonesia are on the way to achieving a marked reduction in fertility.[8] People in these countries are already looking ahead to the middle of the next century and becoming increasingly concerned about the future aging of their population.[9] It is expected that because fertility transition in these nations has occurred as rapidly as it did in Japan, the aging of the population will proceed at the same brisk pace. In each country they have to think about the eventual appearance of an ultraaged society similar to the one expected to develop in Japan. Also, fertility transition in these countries will be accompanied or followed by ongoing rapid social and economic change; industrialization, urbanization, and a continuous rise in educational levels. There is no doubt that, in the midst of this rapid social and economic change, the support of the elderly, the most vulnerable members of such a society, will become a serious problem.

The aging of the populations of these nations will occur in societies where the concept of familism is as strong or even stronger than it is in Japan. In other words, the first stage of the aging process in these nations will differ from the same process as it occurred in the U.S. and Europe. Unlike the western countries, each family will be expected to take responsibility for the care of its older members. Based on the Japanese experience, the care families provide for the elderly during the early stages of the process will have great significance by easing the shock that rapid social and economic changes will inflict on old people. Then as the aging of the population continues, I believe that changes will occur in the social and economic background of the elderly themselves, and this will be accompanied by changes in their values. The best way to deal with aging problems in Asia seems to be to introduce social policies for the aged which are consistent with familism and to eventually change them in accordance with the gradual cohort changes in familistic values.

Notes

1) Ministry of Health and Welfare, Institute of Population Problems, Estimates of the future population of Japan (Estimated November 1986), 1987.

2) The Mainichi Newspaper Company Population Problem Board of Investigation, The 19th national survey report on family planning, 1988.

3) General Affairs Office, Senior Citizens's Policy Room, An international survey comparing the lives and consciousness of elderly people, 1981 and 1986.

4) The statistics on the number of children presented hereafter are estimates derived from the National Fertility Surveys held by Institute of Population Problems, Ministry of Health and Welfare, Birthrate surveys. Survival rates are based on: Kazumasa Kobayashi and Yoshiharu Nanjo, Generational Life Tables for Japan, Nihon University, Population Research Center, 1988.

5) Below, "non-manual" refers to professional, technical, managerial, clerical, and sales employment. "Non-agricultural manual" refers to any work which is neither agricultural nor non-manual (production processes, transportation, communications, services, etc.)

6) In the 1940s, 60% of newly married couples (child generation) lived with a parent or parents but by 1970, this figure was down to 30%. Ministry of Health and Welfare, Institute of Population Problems, (Eighth National Fertity Survey, Report no. 2) Young bachelors' views of marriage and fertility, 1983. According to come study, the percentage of young people who could possibly live with their parents, and actually did live with them after marriage was close to 100% in the 1940s, but had dropped to 50% by the 1970s. Kiyoshi Hiroshima, "A Demographic Analysis of the Proportion of Parents and Children Living Together in Japan," Population Problem Research, Volume 169, 1984, pp 31-42.

7) For example, the Life Insurance Culture Center, The Survey of the Life of the Elderly and nursing care, 1984.

8) United Nations, World Population Trends and Policies, 1989 Monitoring Report, 1989.

9) Quanhe Yang, The Aging of China's Population: Perspective and Implications, Asian Pacific Population Journal, Vol. 3, No. 1, 1988, pp. 55-74.

Table 1 Changes in the distribution of elderly people by educational level

(Men) (%)

Age	1985			2000			2025		
	Primary	Secondary	Higher	Primary	Secondary	Higher	Primary	Secondary	Higher
Total of those 65 years and older	70.4	19.4	10.2	53.8	31.3	15.0	23.6	45.7	30.7
65 - 69	67.0	22.1	10.7	45.9	37.8	16.3	11.3	44.0	44.5
70 - 74	68.7	20.9	10.6	51.2	32.8	15.8	19.3	47.0	32.0
75 - 79	72.2	17.4	10.1	60.9	24.2	14.7	25.0	47.6	27.2
80 - 84	77.2	13.7	8.7	67.0	22.1	10.7	33.6	44.8	21.4
85 - 89	80.2	11.7	7.7	68.7	20.9	10.6	38.9	43.0	18.0
90 -	80.6	10.7	8.3	72.2	17.4	10.1	45.9	37.7	16.3

(Women) (%)

Age	1985			2000			2025		
	Primary	Secondary	Higher	Primary	Secondary	Higher	Primary	Secondary	Higher
Total of those 65 years and older	76.8	20.7	2.5	59.8	35.8	4.4	25.6	53.6	20.8
65 - 69	71.3	25.8	2.7	49.8	44.6	5.5	8.3	51.6	40.0
70 - 74	74.2	22.7	2.7	54.3	40.7	4.9	17.1	56.9	25.9
75 - 79	79.0	17.9	2.7	65.3	30.5	4.0	24.8	57.6	17.5
80 - 84	84.6	13.1	1.8	71.3	25.8	2.7	36.0	53.0	10.8
85 - 89	87.7	10.4	1.2	74.2	22.7	2.7	44.6	47.8	7.5
90 -	89.0	8.6	1.4	79.0	17.9	2.7	49.8	44.6	5.5

Notes: 1. In the future the population composition by level of education by age for men an women in 1980, will be handled by birth-year cohorts.

2. The academic divisions are as follows: Primary = Completion of Compulsory Education + the Old Youth Schools + Preschool; Secondary = Graduates of Old Middle Schools + New High Schools; Higher = Graduates of 2 Year Colleges + Universities + Still Studying

Source: Statistical Office of the General Affairs Bureau, "National Census" 1980

Table 2 Changes in the Working Life of the Elderly

(Men) (%)

Age	1985				2000				2025			
	Agri-culture	Non-agri-cultural-manual	Non-manual	Un-employed	Agri-culture	Non-agri-cultural-manual	Non-manual	Un-employed	Agri-culture	Non-agri-cultural-manual	Non-manual	Un-employed
Total of those 65 years and older	28.3	36.4	30.6	4.8	22.7	41.7	30.7	4.9	4.9	50.8	39.9	4.4
65 - 69	26.4	36.9	32.5	4.2	18.1	48.2	29.8	3.9	3.5	50.2	41.3	5.0
70 - 74	26.6	36.5	32.8	4.1	24.5	39.3	30.0	6.2	3.5	50.2	41.3	5.0
75 - 79	29.5	34.9	27.4	8.2	25.4	36.9	32.7	5.0	3.9	50.7	40.9	4.5
80 - 84	32.9	37.4	26.4	3.3	26.4	36.9	32.5	4.2	5.1	52.8	39.2	2.9
85 - 89	35.4	36.6	26.0	2.0	26.6	36.5	32.8	4.1	10.0	51.8	34.2	4.0
90 -	38.9	33.6	25.6	1.9	29.5	34.9	27.4	8.2	18.1	48.2	29.8	3.9

(Women) (%)

Age	1985				2000				2025			
	Agri-culture	Non-agri-cultural-manual	Non-manual	Un-employed	Agri-culture	Non-agri-cultural-manual	Non-manual	Un-employed	Agri-culture	Non-agri-cultural-manual	Non-manual	Un-employed
Total of those 65 years and older												
65 - 69	30.2	11.8	10.7	47.3	23.3	10.8	11.0	54.9	5.9	14.0	27.0	53.2
70 - 74	29.1	12.6	10.7	47.6	12.6	8.8	8.8	69.8	2.6	13.3	34.5	49.6
75 - 79	28.3	14.0	11.6	46.1	27.2	10.6	10.7	51.0	3.4	12.8	25.9	55.9
80 - 84	31.2	6.6	8.9	53.3	29.1	12.6	10.7	47.6	7.1	16.2	20.8	54.2
85 - 89	34.3	5.8	8.8	51.1	31.3	12.9	11.2	44.6	12.6	15.6	17.6	50.1
90 -	37.0	5.8	9.3	47.9	28.3	14.0	11.6	46.1	20.8	14.5	14.6	53.2

Notes: 1. Occupation classifications are as follows. Agricultural: farming, forestry, and fishing. Non-manual: Specialized, management, office, and sales employment. Non-agricultural manual: All occupations excluding agricultural and non-manual.
2. In principle, each birth-year cohort is classed according to the work performed between the ages of 25 and 29. When data for this age level was not available, the occupation distribution for the next highest age level was used.

Source: Statistical Office of the General Affairs Bureau, "National Census" based on all census results

Table 3 The Percentage of the Elderly Working and the Percentage Working in Non-agricultural Occupations by Educational Level (1980)

(Men) (%)

Age	Educational Level: Primary		Secondary		Higer	
	Percentage in the Work Force	Percentage in the Non-agricultural Work Force	Percentage in the Work Force	Percentage in the Non-agricultural Work Force	Percentage in the Work Force	Percentage in the Non-agricultural Work Force
65 - 69	63.7	40.6	66.8	55.2	70.7	66.4
70 - 74	43.1	24.4	47.3	37.1	53.5	48.8
75 - 79	27.3	14.5	33.0	25.6	40.0	36.3
80 - 84	15.8	7.8	21.6	17.4	30.6	28.7
85 -	8.5	4.9	14.8	12.4	20.8	19.6

(Women) (%)

Age	Educational Level: Primary		Secondary		Higer	
	Percentage in the Work Force	Percentage in the Non-agricultural Work Force	Percentage in the Work Force	Percentage in the Non-agricultural Work Force	Percentage in the Work Force	Percentage in the Non-agricultural Work Force
65 - 69	26.8	15.5	25.7	20.4	26.9	24.3
70 - 74	15.0	8.6	15.9	12.7	19.2	17.0
75 - 79	8.0	4.7	9.5	7.9	13.3	12.2
80 - 84	4.0	2.4	5.8	5.0	10.2	9.4
85 -	1.8	1.1	3.1	2.8	5.9	5.7

Note: Percentage in the Work Force = Population in the Work Force/Total Population Percentage in the Non-agricultural Work Force = (Population in the Work Force - Agricultural Workers)/Total Population Source Material: Statistical Office of the General Affairs Bureau, "National Census" 1980

Table 4 The Percentage of Elderly People Active by Level of Education, and by Class of Activity (1981)

(Men) (%)

Age	Type of Activity											
	Study			Social Service			Sports			Travel		
	Primary	Secondary	Higher	Primary	Secondary	Higher	Primary	Secondary	Higher	Primary	Secondary	Higher
65 - 69	22.1	46.7	71.6	30.2	32.4	36.1	18.3	30.1	45.9	61.9	73.0	82.6
70 -	17.6	39.3	64.3	25.8	29.8	31.9	16.2	24.6	37.8	47.7	62.8	66.2

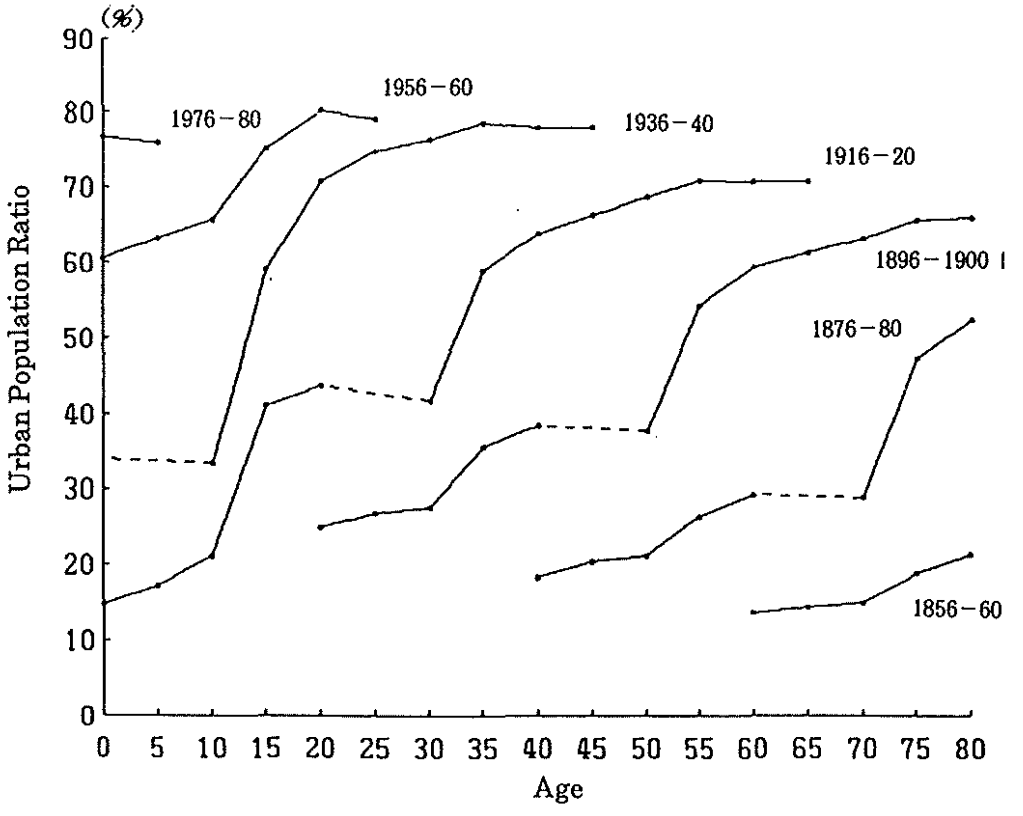
(Women) (%)

Age	Type of Activity											
	Study			Social Service			Sports			Travel		
	Primary	Secondary	Higher	Primary	Secondary	Higher	Primary	Secondary	Higher	Primary	Secondary	Higher
65 - 69	17.5	40.7	58.0	25.2	28.6	37.5	9.7	14.7	13.7	58.0	69.7	71.4
70 -	11.7	31.4	56.4	17.1	19.6	28.3	7.3	10.7	17.8	39.7	55.2	64.4

Notes: "Study" refers to study at any type of school or adult education classes. (Formal education is excluded). "Social service" is any unpaid activity which advances the welfare of the society and the district. "Sports" means sports as a recreational activity. "Travel" indicates any trip in which the traveller stays away from home at least one night. "Activity Rate" is the number of people who were involved in the above activity once during the preceding year divided by the total membership of the group.

Source: Statistical Office of the General Affairs Bureau,
Life Activities of the People of Japan - Interpreted by the 1981 Social Life Basic Survey, 1983

Figure 1 Urban Population Ratio by Age and by Birth-year Cohort



Note: For example, the 1916 to 1920 graph shows what percentage of the members of the 1916 to 1920 cohort were living in a city each year.

Source: Statistical Office of the General Affairs Bureau (National Census)