

Population Aging in Japan : a Lesson for Brazil

Eliane Satie Sendo, Masaiwa Inoue, MS Laskar and Noriaki Harada

Department of Hygiene, Yamaguchi University School of Medicine, 1-1-1,
Minami-Kogushi, Ube, Yamaguchi 755-8505, Japan
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Abstract The purpose of this study was to compare demographic trends in the aging of the Japanese and Brazilian populations on the basis of health indicator data collected by the statistics bureaus of the Japanese and Brazilian governments. The demographic and health indicator data from surveys by the Statistics Bureaus of the Japanese and Brazilian governments and other sources were obtained from websites. The data showed that Japan has an aging population, that the number of elderly persons in Japan is increasing and that the Government of Japan has a plan to address future demands for health resources by this aging population, whereas Brazil has a rapidly population aging but no plan for its future health services. Brazil may need to increase the number of hospitals and hospital beds and develop a medical care plan for the elderly within its Unified Health System.

Key words: aging, medical care, health indicator, Japan, Brazil

Introduction

A worldwide increase in the elderly population has been documented by several surveys.¹⁾²⁾ This is of concern to managers of health care systems, because expensive interventions are required for chronic diseases that beset this population. The fast change in demographics requires new policies to minimize the impact on health systems.

Japan is currently undergoing a remarkable demographic change. Japan has the fourth-oldest old population in the world. By 2050, one out of every three elderly persons will be at least 80 years old.³⁾ This demographic transformation has profound implications for the Japanese social security systems, and, as a result, the "Long-Term Care Insurance System" namely the "Kaigo Hoken Seido" has been introduced.

Brazil became a main destination for overseas migration of Japanese laborers beginning about 80 years ago, when the Japanese

government made emigration a state policy. Many people emigrated from Yamaguchi Prefecture. Most of the Japanese Brazilians are now advanced in age. However, there is little information on the demanded health system for the elderly persons in Brazil including elderly Japanese-Brazilians.

In 2000, elderly persons (that is, persons aged 60 years or older) represented 8.1% of the population of Brazil. The percentage is expected to increase to about 25.0% by 2050.³⁾ This demographic transformation has implications for provisions of health care needed by such a large proportion of older people. Aging of the population in Brazil will bring with it new challenges that differ from those confronted by developed countries like Japan, and there are technologies and knowledge that developed countries can share with developing countries.

The purpose of this study was to compare demographic trends in aging of the Japanese and Brazilian populations derived from

health indicator data. In addition, comparison is also made between São Paulo, Brazil, and Yamaguchi Prefecture, Japan, because São Paulo is one of the cities that accepted many immigrants from Yamaguchi Prefecture. Although there are various population and regional differences, the two specific areas were selected as representative regions of the two countries. We discuss how the Japanese experience can contribute to the establishment of policies in Brazil that will reduce the impact of the aging population on the Brazilian health system.

Methods

Demographic and health indicator data obtained through surveys conducted by the statistics bureaus of the Japanese and Brazilian governments and obtained from other sources were used.⁴⁻⁸⁾ Most of the data are available on websites and are as up to data as possible. The demographic indicators used in this study included elderly population estimates, fertility rate, life expectancy at birth and old-age dependency ratio (the number of persons aged 65 years and over per 100 persons aged 15 to 64 years). The health resource indicators included the number of physicians, dentists, nurses, general hospitals and hospital beds per 1000 population. These data were analyzed to understand the situation in each country and compared to identify potential suggestions for formulation of Brazilian health system policies that will meet the needs of the aging population. Data from Yamaguchi Prefecture, Japan, and São Paulo, Brazil, were also included for comparison between the two regions.

Results

Japan

In 1945, after the end of the World War II, Japan went through a reconstruction period. This period includes the first baby boom (1947-1949). As shown in Table 1, in 1950, persons aged 60 years or over represented 7.7% of the population in Japan, with approximately 75% of elderly persons belonging to the young-elderly group (60-69 years of age).

After the reconstruction period, Japan entered a high economic growth period, and social conditions in Japan improved considerably. In 1960, 8.9% of the population was made up of elderly persons (Table 1). The size of the population and the numbers of physicians, dentists, nurses and hospitals in Yamaguchi Prefecture were 1.7%, 1.8%, 1.7%, 1.0% and 2.2% of the respective totals in Japan. The percentage of elderly persons in Japan increased from 8.9% in 1960 to 10.7% in 1970. In 1970, life expectancy at birth was 69.8 years for males and 75.2 years for females in Japan as a whole and 69.2 years for males and 75.3 years for females in Yamaguchi, in particular (Table 1).

These changes have resulted in an aging society in Japan. The improvement in the health situation is due to new medical technologies that have been effective in reducing mortality, which in turn have increased life expectancy. The old-age dependency ratio increased from 8.3 in 1950 to 13.5 in 1980 (Table 1). In 1990, the elderly persons comprised 17.3% of the national population, life expectancy at birth was 76.0 years for males and 82.1 years for females, and the old-age dependency ratio was 17.3. The public health expenditure as a percentage of the gross domestic product (%GDP) was 4.6 in 1990, 6.0 in 2000 and 6.2 in the following year (Table 1). Currently, elderly persons comprise 25.6% of the national population, and half of these persons (13.2% of the national population) are aged 70 years or over (Table 1).

Brazil

Before introduction of the Unified Health System (UHS) in Brazil, there was a lack of information available on the Internet. In 1980, elderly persons represented 6.1% of the Brazilian population, and the fertility rate was 4.3 (Table 2). The estimated population and total number of elderly persons in São Paulo were 21.0% and 1.3% of the respective totals in Brazil. During the decade after introduction of the UHS (1990-2000), the elderly population increased to 6.1% of the total population in Brazil. The country's fertility rate decreased from 4.3 (1980) to 2.2 (2000) (Table 2).

The numbers of physicians, dentists and

Table 1 Past and projected demographic and health resource indicators in Japan and Yamaguchi

Indicators	1950	1960	1970	1980	1990	2000	2003	2025	2050
Japan									
Population (millions)	83.2	93.4	103.7	117.1	123.6	126.9	127.6	121.1	100.6
Persons 60 years old or over (%)	7.71	8.86	10.66	12.90	17.31	23.46	25.55	34.89	42.02
Persons 60-69 years old (%)	4.90	5.45	6.47	7.20	9.61	11.71	12.31	11.97	13.28
Persons 70 years old or over (%)	2.81	3.41	4.19	5.71	7.70	11.75	13.24	22.92	28.74
Fertility rate	3.7	...	...	1.8	...	1.4	1.3	1.6	1.8
Life expectancy at birth male	...	...	69.84	73.57	76.04	77.71	78.36	...	...
Life expectancy at birth female	...	...	75.23	79.00	82.07	84.62	85.33	...	...
Old-age dependency ratio	8.28	8.92	10.25	13.50	17.33	25.30	28.46	46.09	59.11
Physicians per 1000	...	1.10	1.14	1.33	1.71	2.01	...	...	...
Dentists per 1000	...	0.35	0.36	0.45	0.59	0.71	...	...	...
Nurses per 1000	...	1.98	1.23	2.11	3.20	5.14	...	...	...
General hospitals per 1000	...	0.65	0.77	0.77	0.82	0.73	0.72 ^a	...	...
Hospital beds per 1000	...	7.35	10.24	11.27	13.58	12.97	...	...	...
Public health expenditure (%GDP)	...	...	...	...	4.6	6.0	6.2 ^b	...	...
Yamaguchi									
Population (millions)	1.5	1.6	1.5	1.6	1.6	1.5	1.5	...	...
Persons 60 years old or over (%)	...	...	13.30	16.26	22.44	28.86	30.89	...	...
Persons 60-69 years old (%)	...	...	...	8.82	11.82	13.35	13.56	...	...
Persons 70 years old or over (%)	...	...	...	7.44	10.62	15.51	17.33	...	...
Fertility rate	...	...	...	...	...	...	...	...	...
Life expectancy at birth male	...	...	69.16	72.96	75.74	77.03	...	...	...
Life expectancy at birth female	...	...	75.33	79.14	82.46	84.61	...	...	...
Old-age dependency ratio	...	...	13.35	17.55	23.94	34.90	38.18	...	...
Physicians per 1000	...	1.14	1.29	1.41	...	2.28	...	...	...
Dentists per 1000	...	0.35	0.40	0.41	...	0.50	...	...	...
Nurses per 1000	...	1.21	1.62	2.57	...	6.46	...	...	...
General hospitals per 1000	...	0.82	0.87	0.88	...	0.99	1.00 ^a	...	...
Beds per 1000	...	8.25	11.43	13.32	...	18.62	18.67 ^a	...	...
Yamaguchi in relation to Japan (calculated by the first author)									
Population (%)	1.85	1.71	1.46	1.35	1.27	1.20	1.18	...	...
Persons 60 years old or over (%)	...	...	0.19	0.21	0.28	0.35	0.36	...	...
Persons 60-69 years old (%)	...	...	...	0.11	0.15	0.16	0.16	...	...
Persons 70 years old or over (%)	...	...	...	0.10	0.13	0.19	0.20	...	...
Physicians (%)	...	1.77	1.64	1.44	...	1.36	...	...	...
Dentists (%)	...	1.72	1.61	1.24	...	0.98	...	...	...
Nurses (%)	...	1.04	1.92	1.64	...	1.51	...	...	...
Hospitals (%)	...	2.16	1.64	1.54	...	1.64	1.65 ^a	...	...

Sources: Ministry of Internal Affairs and Communications, Statistics Bureau, Japan; Yamaguchi Prefecture, Yamaguchi prefecture statistics division, Japan; United Nations, Human Development Report. Notes. Three dots (...) indicate that data were not available or not found. ^a: Data as of 2002; ^b: Data as of 2001.

nurses (per 1000 population) in São Paulo were higher than the respective numbers for the country as a whole (Table 3). The numbers of beds and hospitals in São Paulo were similar to those in the country as a whole; however, this number did not comply with the dynamics of human resources (Table 3). In 2000, the estimated population and number of elderly persons in São Paulo represented 22.0% and 1.4% of the total numbers in Brazil (Table 2). The numbers of physicians, dentists, nurses and hospitals in São Paulo were 27.2%, 35.8%, 28.7% and 11.2% of the respective totals in Brazil (Table 3).

In São Paulo, elderly persons aged 60 years or over, 60-69 years and 70 years or over in

2000 represented 6.3%, 3.9% and 2.4%, respectively of the total population. During the decade after introduction of the UHS (1990-2000), the public health expenditure did not show any change (%GDP, 3.0% in 1990, 3.4% in 1996, 2.9% in 1998 and 3.4% in 2000).

According to projections for Brazil, the elderly population will be increased from the current 6.3% of the national population to 8.4% in 2025, with 3.8% aged 70 years or over, and to 24.7% in 2050, with 13.2% aged 70 years or over (Table 2). According to projections for São Paulo, 7.6% of the population will be aged 60 years or over in 2010, and 7.2% in 2020.

Table 2 Past and projected demographic indicators in Brazil and São Paulo

Indicators	1980	1990	2000	2004	2010	2020	2025	2030	2040	2050
Brazil										
Population (millions)	118.6	144.1	169.8	179.1	196.8	219.1	228.9	237.7	251.4	259.8
Persons 60 years old or over (%)	6.09	6.13	6.12	6.31	7.38	6.94	8.42	11.91	13.71	24.65
Persons 60-69 years old (%)	3.77	3.73	3.67	3.78	4.16	3.91	4.66	6.77	7.74	11.44
Persons 70 years old or over (%)	...	2.32	2.40	2.53	3.22	3.03	3.76	5.14	5.97	13.21
Fertility rate	4.3	...	2.2	2.2	...	...	2.1	...	...	2.1
Life expectancy at birth male	...	...	64.77	...	...	...	73.69	...	...	78.16
Life expectancy at birth female	...	...	72.55	...	...	...	80.86	...	...	84.54
Old-age dependency ratio	...	8.93	9.06	...	...	...	15.29	...	...	29.71
São Paulo										
Population (millions)	24.9	31.5	37.4	39.8	43.4	48.7	...	...	...	...
Persons 60 years old or over (%)	6.33	6.24	6.29	6.51	7.63	7.17	...	...	...	...
Persons 60-69 years old (%)	3.98	3.88	3.89	4.02	4.33	4.07	...	...	...	...
Persons 70 years old or over (%)	2.35	2.36	2.40	2.49	3.30	3.09	...	...	...	...
Fertility rate	...	...	...	...	...	...	...	...	...	...
Life expectancy at birth male	...	...	65.44	...	...	...	...	...	...	...
Life expectancy at birth female	...	...	74.8	...	...	...	...	...	...	...
Old-age dependency ratio	6.47	7.62	9.04	...	...	...	...	...	...	...
São Paulo in relation to Brazil (calculated by the first author)										
Sao Paulo population (%)	21.03	21.88	22.02	22.23	22.07	22.23	...	...	...	...
Persons 60 years old or over (%)	1.33	1.37	1.38	1.45	1.69	1.59	...	...	...	...
Persons 60-69 years old (%)	0.84	0.85	0.85	0.89	0.96	0.91	...	...	...	...
Persons 70 years old or over (%)	0.49	0.52	0.53	0.55	0.73	0.69	...	...	...	...

Sources: Department of Information and Informatics of Unified Health System, Brazil; State System of Data Analysis Foundation, Brazil. Note. Three dots (...) indicate that data were not available or not found.

Table 3 Health resource indicators for Brazil and São Paulo

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Brazil													
Physicians per 1000	1.35	1.34	1.44	1.94	2.08	...
Dentists per 1000	0.64	0.85	0.89	0.86	0.96	...
Nurses per 1000	0.45	0.42	0.45	0.53	0.52	...
General hospitals per 1000	0.040	0.041	0.041	0.040	0.040	0.040	0.039	0.039	0.038	0.037	0.033
Beds per 1000	3.71	...	3.66	...	...	...	...	...	...	2.96	...	...	2.66
Public health expenditure (%GDP)	3.0	...	...	...	...	1.9	3.4	3.4	2.9	...	3.4	3.2	...
Sao Paulo													
Physicians per 1000	1.96	1.99	2.02	2.42	2.53	...
Dentists per 1000	1.10	1.39	1.44	1.40	1.54	...
Nurses per 1000	0.59	0.55	0.59	0.70	0.65	...
General hospitals per 1000	0.024	0.024	0.023	0.021	0.021	0.020	0.020	0.020	0.019	0.019	0.016
Hospital beds per 1000	4.06	...	3.91	...	...	...	...	...	...	2.86	...	...	2.50
São Paulo in relation to Brazil (calculated by the first author)													
Physicians São Paulo (% Physicians Brazil)	31.53	32.36	30.53	27.21	26.57	...
Dentists São Paulo (% Dentists Brazil)	37.11	35.45	35.53	35.77	31.45	...
Nurses São Paulo (% Nurses Brazil)	28.67	28.33	28.57	28.67	27.19	...
Hospital São Paulo (% Hospitals Brazil)	12.96	12.62	12.33	11.67	11.47	11.29	11.34	11.20	11.16	11.01	10.90

Sources: Department of Information and Informatics of Unified Health System, Brazil; State System of Data Analysis Foundation, Brazil; United Nations, Human Development Report. Note. Three dots (...) indicate that data were not available or not found.

Japan and Brazil

Life expectancy in Brazil is expected to increase to 78.2 years for males and 84.5 years for females by 2050, similar to the current situation in Japan (Tables 1, 2). The fertility rate in Brazil decreased from 4.3 in 1980 to 2.2 in 2004, whereas in Japan, it decreased from 3.7 in 1950 to 1.3 in 2003. Thus, the population of persons aged 60 years or over in Japan increased rapidly from 7.7% in 1950 to 25.6% in

2003. In contrast, the population of elderly persons aged 60 years or over in Brazil increased slowly from 6.1% in 1980 to 6.3% in 2004, but it is estimated to increase to 24.7% in 2050.

The numbers of physicians and dentists per 1000 population are similar between the two countries, but the number of nurses is lower in Brazil (0.5 in 2000) than in Japan (5.1 in 2000). Also, the numbers of hospitals and

hospital beds in Brazil are much lower than the numbers in Japan.

Discussion

In 1990, the UHS with a single command in each regional sector was instituted by law 8080 of the Brazilian constitution, and the Ministry of Health with manager of union sphere was defined.⁹⁾ The system has four main directives: a) decentralization, b) one-way command in each regional sector, c) integrality of attendance, and d) community participation. Community participation is achieved through health conferences and health councils.⁹⁾ Each conductor under the UHS has to perform four main functions: a) formulation and planning of health policy, b) financing, c) coordination, control, management and assessment of the network/system and private or public conferences and d) direct delivery of health services.⁹⁾

From the data we obtained, it is clear that the population of Japan is changing to a population with a large number of elderly persons and small number of children (0-15 years of age) causing new demands for special health care. Moreover, the number of elderly persons who need health care over a long period is increasing and is expected to increase even further. Usually, family members had to look after the elderly and take responsibility for them. To adjust to the new demands, the Japanese social system has been changed to incorporate the "Kaigo Hoken System". Further reform and planning for future social change are also being considered.

The increase in elderly persons in Japan has been accompanied by a reduction in the fertility rate and a shift in life expectancy at birth. The public health expenditure as %GDP for elderly persons increased with the increase in the elderly population. The increase in elderly persons in Brazil has also been accompanied by a reduction in the fertility rate and a shift in life expectancy at birth; however, the public health expenditure as %GDP for elderly persons did not increase with the increase in elderly population.

An increase in the Japanese public health expenditure over time has been observed since estimation began in 1954. Several

explanations for the increase have been proposed, including more government investment in health care in response to the needs caused by the increase in the elderly population. In the case of Brazil, a national health insurance system like the one in Japan has not been established. The Brazilian government does not have a long term plan for health expenditure for the elderly population. However, considering the expected increase in the number of elderly people (as shown in Table 2) over the next several decades, it is assumed that there may be a need to increase the number of hospitals and hospital beds and the overall public health expenditure for the elderly population in Brazil.

Some studies conducted by Brazilian researchers have shown that elderly persons in Brazil are the most frequent users of health services.¹⁰⁾¹¹⁾ Nevertheless, there is no plan or investment within the UHS for the future increase in the elderly population in Brazil. There is one center for the elderly in São Paulo with some programs, but this is not enough. The numbers of physicians and dentists per 1000 population exceed the numbers in Japan, but this is not so for nurses. The number of nurses may have to be increased, a plan is needed to increase the infrastructures needed for the Brazilian elderly, and existing Brazilian health professionals may have to be prepared for health care services needed by the elderly.

In our present study, the health situations of Yamaguchi Prefecture, Japan, and São Paulo, Brazil, were compared. Findings were similar. São Paulo is one of the major regions for emigration from Japan, and many people from Yamaguchi Prefecture started a new life in São Paulo. São Paulo is a large city, and Yamaguchi Prefecture is a combination of urban and rural area. However, in the rural parts of Yamaguchi Prefecture, social support for health care has been introduced. Further investigation into cultural and health system differences between Japan and Brazil including Japanese emigrants is appreciated.

Conclusions

The data we obtained indicated that the

high number of elderly people prompted the Japanese government to introduce the the “Long-term Care Insurance System” named “Kaigo Hoken Seido”. In Japan, the public health expenditure as %GDP for the elderly increased with the increase in the elderly population. A similar increase in the public health expenditure may be needed in Brazil to improve accessibility of the increasing elderly population to health services. The number of nurses may need to be increased, a plan is needed to increase infrastructures needed for the Brazilian elderly, and existing Brazilian health professionals may have to be prepared for health care services needed by the elderly. To meet the needs of the rapidly aging population projected for Brazil, programs may be introduced within the centralized Brazilian UHS for improvement of the present status and future of the elderly population. Facilities for training and specialization to increase the number of professionals in gerontology may be needed. Attention should be given to data collection on elderly persons, which might be helpful for discussion about the problems of the elderly in Brazil and thus for future policy-making.

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