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# Elderly care in the society 5.0 and *kaigo rishoku* in Japanese hyper-ageing society

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**Abstract** The Japanese demography is drastically changing. It has seen a rapid increase in the elderly population and a decrease in the birth rate. This caused Japan to be a hyper-ageing society. Japanese's first Baby-boomers who were born in 1947-1949 are now entering old age. Elderly care is a major problem in Japan. Children and careworkers for elderly parents are scarce. Therefore, the second Baby-boomers (born in 1971-1974) aged 40-50 years old have guit working to care for their elderly parents. This situation is known as 'kaigo rishoku.' This study looked into the practice of elderly care in Japanese 5.0 Society. Society 5.0 is a concept developed by Japan. It is human-centred and technology-based. In society 5.0, robots and the internet play an essential role in human life. Therefore, we proposed a critical question: Can robots replace humans to care for the elderly in Society 5.0? This study used the qualitative method with a phenomenological approach and descriptive analysis. The results revealed that although robots can assist elderly care, due to the high cost, only a certain elderly can buy them. Therefore, in order for robots to become caregivers of the future, mass production is needed. Thus, robots can be marketed at relatively lower prices. However, sick elderly who live alone still need human assistance. On the one hand, technology helps human life in Society 5.0. On the other hand, the human touch is still necessary for elderly care.

**Keywords**: society 5.0; elderly care; Japanese elderly; Japan's Baby-boomers; caregiving robots

## INTRODUCTION

Japan is known as the country with the highest elderly population in the world. This situation can be seen from the high life expectancy of Japanese people (Adachi, Misato; Ishida, Ryo; Oka, 2015; Chen B, 2016; Kumagai, 1996; Muramatsu, N & Akiyama, 2011). In 2018, the life expectancy in Japan was 87.32 years for women and 81.25 for men (Statistics Bureau Japan, 2019). Based on data from the Centre for

Economic Information (Elsy, 2012), the life expectancy of Japanese in 1950-1955 was 62.1 years for men and 65.9 years for women. Over the next 68 years, life expectancy rose by 19.15 years for men and 21.42 years for women. In terms of the elderly as a person, high life expectancy will naturally cause them to live longer or be able to enjoy a longer life. On the other hand, with their long lives, the elderly will face various problems; one of them is the treatment they receive when they get ill.

Japan has the most significant number of elderly people in the world due to changes in demographics caused by reduced birth rates, the ageing of the first baby-boomers generation (born in 1947-1949), and increased life expectancy. The current generation of Baby-boomers is 72-75 years old. Increasing age also means increasing the possibility of suffering from old age and degenerative diseases (Achir, 2001).

There are three definitions related to ageing: 1) Ageing society, namely when 7-14 per cent of the population are aged 65 years and over, 2) Aged society that is when 14-21 per cent of the population are aged 65 years and over, 3) Hyper-aged society is when 21 per cent or more of the population are aged 65 years and over (Coulmas, 2007). A country is considered to have an ageing population (ageing society) if the elderly population reaches more than seven per cent of the total population. In the composition of the Japanese population, the elderly population in Japan reached 7.1 per cent in 1970 and continues to increase (Statistics Bureau Japan, 2019). Based on the 2009 statistical data (Statistics Bureau Japan, 2009), 21.5 per cent of the total population in 2007 is elderly aged 65 years old and over. In other words, in 2007, Japanese society was already categorised as a hyper-aged society.

The term ageing society or '*koreika shakai*' was frequently used in Japan from the mid-1980s until the early 1990s. This term was often replaced with '*korei shakai*' or aged society. The terms hyper-ageing society and aged society or '*chokoreika shakai* and *chokorei shakai*' emerged in the late 1990s. This technical term has entered public discourse, which proves that the Japanese began to think that they belong to an old society or old age (Coulmas, 2007). Demographic professionals realised earlier that problems would occur because of this condition, but they failed to understand the rapidity of Japan's transformation from a young society into an old one. In 1989, people aged 65 years and over made up 11.6 per cent of the total Japanese population. When the elderly population of 65 years and above reached 20 per cent, Japan was just one step away from transitioning from old society to beyond old age.

Based on data released in the Statistical Handbook of Japan 2019, the elderly population in Japan in 1950 was only 4.9 per cent of the total population and the number of children (0-14 years) was 35.4 per cent. However, in subsequent times, there was a drastic increase in the elderly population and a decrease in the birth rate. In 2018, out of 126,44 million of Japan's population, 35.58 million people or 28.1% were elderly people aged 65 years and over, while the number of children (0-14 years) was only 12.2%.

This number of elderly people continues to increase, and it is estimated that in 2060 the number of elderly people will reach 38.1%, while the number of children (0-14 years) will be 10.2%. Therefore, in Japan's hyper-ageing society, the problem of elderly care is a significant problem in Japan because of the reduced birth rate and the increasing number of elderly people.

A big question arises: who will care for the elderly amid the lack of children and residents? Changes in the Japanese population can be seen in Figure 1.



Figure 1. Changes to the Population Pyramid in Japan

Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare (Statistics Bureau Japan, 2019)

The problem of elderly care has become a social problem in Japan. Elsy (2012), in her book titled "The Dynamics of the Elderly in Japan", discussed elderly care in the Japanese family and community. She also studied a Survey of Elderly care. Among people aged 60 years or older, 44 per cent of male respondents and 66.5 per cent of female respondents had experienced caring for elderly people whose conditions were fragile. Men usually cared for their parents, while women cared for their husband's parents just like they took care of their own parents. Indeed, women's burdens are more substantial than men in terms of caring for their elderly parents. Elsy (2012) also emphasised the burden of women to care for the elderly in the family.

Atsumi (2013) argued that every year as many as 100,000 people were forced to quit their job to care for family members, including parents. Quitting work to care for family or elderly parents is known as '*kaigo rishoku'* ( $\uparrow$  護 離職). The age in which workers usually quit working to care for their parent ranges from 40 to 50 years old. The reason these people quit their jobs was because of the difficulty in managing the time between work and caring for parents (Kotobank, 2020). With the increasing number of elderly,

elderly care problems also rose due to the decreasing number of siblings, increasing percentage of single or unmarried people, and the phenomena of working husband and wife working or '*Tomobataraki*' are becoming more common. *Tomobataraki* has reduced the number of housewives who also play a role in caring for elderly parents.

From the workforce side, 40-50 years old is the age where someone occupies a vital position in the company and has gained much experience. If employees quit, it will affect the company. With the reduction in the number of children and the long-life expectancy, elderly care remains to be a major problem in Japan. With the lack of caregivers and the desire of children to care for their parents, *kaigo rishoku* is inevitable.

In principle, the Japanese highly respect their parents. In Japan's 'seniority-based society', a vertical principle society of 'honourable parents' holds the majority of high positions in government, business and professional organisations (Kumagai, 1996; Nakane, 1970). This mindset comes from Confucius's teachings about devotional piety. The Japanese government has also declared 15 September as the day of 'Respecting Old Age,' or *Keiro no Hi*. This is a national holiday that is celebrated every year to honour and respect elderly citizens (Kumagai, 1996). Since 2003, *Keiro no Hi* is held on the third Monday of September every year.

Traditionally, Japanese children have cared for their parents. The feeling of 'oyakoko' or obligation to one's parents has become a fundamental aspect of Japanese culture (Elsy, 2012). In addition, in Confucius philosophy 'chuukou itchi' (obedience and respect to seniors or parents) adopted by Japanese society from the Meiji era, the obligation of children to care for parents is more emphasised than the obligation of parents to care for children. Social responsibility that children must obey parents is taught in the concept of 'Shitsuke' (training or discipline) in family care. The patriarchal family system at that time was based on the doctrine of 'houon' (reciprocating) in Confucianism, which was a universal model in family life (Elsy, 2012).

The Confucius doctrine is very firmly embedded among the first generation of baby boomers in raising the second generation of baby boomers. The term refers to the Confucian notion of social debt to parents who care for the younger generation in their youth (Elsy, 2012). Therefore, the feeling of devotion to parents is still strong in the second baby-boomer, and *kaigo rishoku* is their way of caring for their sick parents.

Before World War II, *kaigo rishoku* might not have been thought of by children or parents in Japan. Traditionally, before World War II, the eldest son cared and looked for the elderly people in their old age in Japan. The family system at this time was known to be framed in the *'ie'* concept. The concept of *ie* illustrated the nature of the family, which took place through the father's lineage from generation to generation and becomes the core of the traditional family system. Befu (1971) compared the term *ie* with 'stem family' in English. In this system, the eldest son (*Chonan*) inherited the family assets. *Chonan* replaced his father's position after retiring as the *ie* chief (*kacho*) or head of the family to take care of the family business. After their retirement, parents lived with *Chonan* and were looked after by their daughter-in-law. After World War II, this concept was abolished. With *ie* concept abolished, children who initially lived with their parents and became farmers in the village went on urbanisation to the city and left their parents in the village. The city was considered attractive for young people because of the many factory and industrial developments (Elsy, 2012).

Over time, social and family changes occur in Japan. Many children who work in the city leave their parents in the village. Young people cannot bring their parents to live with them because of the busy life in the city and the expensive land and house prices. Most of them live in company dorms or in small apartments that are only fit for small families when they get married. This situation causes changes in the pattern of residence and family. This condition is also exacerbated by the decreasing number of children so that ill elderly parents become the responsibility of their children to care for them, which causes the *kaigo rishoku*.

The cost of treatment and welfare to care for the elderly in hyperageing society is a significant financial burden for Japan. In the 2016 fiscal year, national medical care spending totalled 42.1 trillion yen or 10 per cent of Japan's national income. Of this, the cost of medical treatment per person averaged at 332,000 yen. Meanwhile, medical costs for advanced elderly care were 15.4 trillion yen, or one-third of national medical care expenditure, and 3.93 per cent of national income. The cost of medical care per capita for elderly people averaged 934,547 yen (Statistics Bureau Japan, 2019).

To overcome the problem of elderly care amid population decline and hyper-ageing society, Society 5.0 launched by Japan can be the solution. Society 5.0 or also known as 'Super Smart Society' is expected to facilitate human welfare. Society 5.0 is expected to enable the availability of goods and services for people who need them at the right time and in the right amount, enabling people who can respond to a variety of social needs appropriately, enabling society where everyone can quickly obtain highquality services without being limited by differences in age, gender, region and language, and life that is full of enthusiasm and comfort (JSPS, 2016).

The Society 5.0 initiative stemmed from the problems the Japanese faced in creating a new economy and society by creating future policies. Japan faced the following problems, (1) population decline and industrial competitiveness, (2) super ageing society and the lack of women active participation women, (3) disaster, terrorism, and outdated infrastructure, (4) environmental problems and lack of resources and water. Society 5.0 provides solutions to these problems by creating a smart society that is not daunted by decreasing populations, communities where the elderly and women can play an active role, safe and secure communities in cyberspace and physical space, and communities that contribute to the global environment (Keidanren, 2016).

Gladden (2019) quoted from the Japanese Government that Society 5.0 would become an environment where humans and robots or artificial

intelligence (AI) coexist and work to improve the quality of life by offering specialised services for diverse users' needs. The use of intelligent robots is not only limited to manufacturing but also will play a significant role in areas such as communication and social assistance or work. Robots in Society 5.0 are made more sophisticated and do not wait for passive programming instructions from human operators. However, robots, AI, and other systems and devices from Society 5.0 can demonstrate an increased level of autonomy by proactively collecting data from the environment, making decisions, and providing services for humans.

Society 5.0 achieves a high degree of convergence between virtual space and physical space (real space). In the information society (Society 4.0), cloud services (databases) in cyberspace could be accessed via the internet. Whereas in Society 5.0, a large amount of information originating from sensors in physical space is accumulated in cyberspace. In the cyberspace, big data is analysed with artificial intelligence (AI), and the results are fed back to humans in physical space in various forms Fukuyama, 2018).

According to Fukuyama (2018), the rapid evolution of Information and Communication Technology (ICT) has brought drastic changes to society and industry. Digital transformation will create new values and become a pillar of industrial policy in many countries. In anticipation of such global trends, Japan launched Society 5.0 as a core concept in the 5th Basic Science and Technology Plan adopted by the Japanese Cabinet in 2016. Japan launched Society 5.0 as the core of 'Investment Strategy for the Future of 2017: Reforms to achieve Society 5.0.'



Figure 2. Society 5.0

Source: Realising Society 5.0 (2018)

The elderly health care solutions in Society 5.0 are (1) connecting and sharing information in the network between users of medical data, including medical checkup records and treatment and care records; (2) providing remote medical care practice services; (3) using AI (Artificial Intelligence) and robots in the care facility room to support community independence.

Effective medical care can be provided by connecting and sharing medical data spread across various hospitals. Remote medical treatment allows monitoring the health of the elderly from home without needing to go to the hospital. Therefore, the current research focused on robots as an elderly care solution in the Japanese 5.0 Society.

# METHODOLOGY

This study used a qualitative method with a phenomenological approach. Qualitative research is suitable to study certain settings that exist in real life (natural) to investigate and understand a phenomenon (Denzin, 2011). The reason for using the phenomenological approach in this study was because it was concerned with the life experiences of Japanese people aged 40-50 years who stopped working and took care of their elderly and sick parents.

Etymologically, phenomenology refers to the study of phenomena or how phenomena appear in a person's life. According to Titchen and Hobson, (Haryanto, 2012) phenomenology is the study of everyday human life in the social context in which the phenomenon occurs based on the perspectives of people directly involved in the experience.

Data collection techniques were done by documentation. Qualitative documentation was carried out by gathering books, journals, articles and others related to the research topic. Data from the *Kaigo Rishoku* phenomenon was taken from several Japanese online newspapers on the case of *Kaigo Rishoku*. The data was then analysed descriptively.

# **RESULTS AND DISCUSSION**

# Factors Causing An Increase In The Number of Elderly People in Japan

The ageing population in Japan is increasing rapidly, along with a decrease in the number of children. Based on statistical data in 2019, the number of elderly aged 65 years old and over in 1950 was only 4.9% of the population. The number of elderly was 28.1% of the total population in 2018. In other words, during the 68 years, there was an increase of 23.2% of the elderly population. In contrast, the number of children in 1950 was 35.4%, fall dramatically by 23.2% during 68 years to 12.2% in 2018. The number of Japanese elderly is estimated will reach 38.1% of the population in 2060. Japan is leading the super-ageing population in the world, followed by Korea 37.1%, Italy 33.4%, Germany 31.7% and China 30.5% (Statistics Bureau Japan, 2019).

The total population of Japan in 2018 was 126.44 million people. Japan occupied the 11th position of the most populous countries in the world. The total population of Japan expected to continue to fall in line with the decline in birth rates in Japan. From the 18th century to the first half of the 19th century, Japan's population remained stable at 30 million. After

the Meiji Restoration in 1868, Japan began to develop along with the drive to build a modern nation-state. In 1926, the population reached 60 million, and in 1967, that number exceeded 100 million (Statistics Bureau Japan, 2019).

However, Japan's population growth has slowed in recent years with a population change rate of around one per cent from the 1960s to the 1970s. Since the 1980s, Japan has experienced a sharp decline in population. The total population of Japan was 127.11 million, according to the Population Census in 2015. This number has decreased by 947,000 people compared to the previous Census in 2010. This indicated that Japan's population has declined since the start of the Population Census in 1920. In 2018, the population was 126.44 million, down 0.26 million from the previous year (Statistics Bureau Japan, 2019).

The population is ageing rapidly throughout Japan. Significant increases in the number of elderly people occur in several Japanese cities such as Tokyo, Kanagawa, Saitama and Chiba prefectures. The increase in the elderly in Kanagawa, south of Tokyo, projected to be 550,000 from 2015 to 2035. The increase in the elderly in urban areas expected to bring severe challenges in the future, including a lack of facilities and caregivers for the elderly. According to Kumagai (1996), three factors prompted the increase in the elderly population, (1) the decline in birth rates, (2) the existence of 2 generations of baby boomers, (3) the increase in the length of life.

Based on 2019 Statistical Handbook of Japan data, the birth rates in Japan continue to decline. In 1950, the TFR (Total Fertility Rate) or the average number of children born to a woman in her reproductive period was recorded at 3.65. That is, the number of children in a household in 1950 was around 3-4 children. In 1955, the TFR was 2.37, and in 1960, the TFR was 2.00. In 1975, the TFR began to decline to 1.9, and this decline continued. The peak was in 2005 when TFR became 1.26. With the continuing decline in the TFR, it means that there is no significant increase in the population. Conversely, it indicates a decline in population. This lack of birth rates causes many elderly people to live alone or only live with their partners in old age. Therefore, if one of the elderly couples were sick, the healthy one would be caring for them.

					Life expectancy at		
_	Rates per 1.000 population (1)				Total	birth	
Year	Live births	Deaths	Infant	Natural	fertility	(years)	
			Mortality	Change	rate (2)	Males	Females
1950	28.1	10.9	60.1	17.2	3.65	a) 59.57	a) 62.97
1955	19.4	7.8	39.8	11.6	2.37	63.60	67.75
1960	17.2	7.6	30.7	9.6	2.00	65.32	70.19
1965	18.6	7.1	18.5	11.4	2.14	67.74	72.92
1970	18.8	6.9	13.1	11.8	2.13	69.31	74.66
1975	17.1	6.3	10.0	10.8	1.91	71.73	76.89
1980	13.6	6.2	7.5	7.3	1.75	73.35	78.76
1985	11.9	6.3	5.5	5.6	1.76	74.78	80.48
1990	10.0	6.7	4.6	3.3	1.54	75.92	81.90
1995	9.6	7.4	4.3	2.1	1.42	76.38	82.85
2000	9.5	7.7	3.2	1.8	1.36	77.72	84.60
2005	8.4	8.6	2.8	-0.2	1.26	78.56	85.52
2010	8.5	9.5	2.3	-1.0	1.39	79.55	86.30
2015	8.0	10.3	1.9	-2.3	1.45	80.75	86.99
2016	7.8	10.5	2.0	-2.6	1.44	0.98	87.14
2017	7.6	10.8	1.9	-3.2	1.43	81.09	87.26
2018	7.4	11.0	1.9	-3.6	1.42		

Table 1. TFR Fluctuations in Japan

1) The infant mortality rate per 1.000 live births

2) The sum of the age-specific fertility rates from age 15 to 49 years old

a) 1950-1952 period

Source: Ministry of Health, Labour and Welfare (Statistics Bureau Japan, 2019)

Small family orientation was established in Japan due to the high cost of housing and children's education as well as increasing female workers. Besides, the majority of young people, especially women, want a single life. This tendency leads to a higher proportion of the elderly than young people.

In addition, the impact of 2 Baby-boomers generations in Japan (8.06 million born in 1947-1949, and 8.16 million born in 1971-1974) also contributed to the rapid ageing rate in Japan (Kumagai, 1996). Currently, the first Baby-boomers has reached 71-73 years old of age, and the second Baby-boomers 46-49 years. If the first Baby-boomers get sick, their children aged 46-49 will take care of them.



#### Figure 3. Pyramid of the Japanese population

Source: Statistics Bureau, MIC (Statistics Bureau Japan, 2019)

The life expectancy of Japanese people continues to increase and is faster than in other industrialised countries. Based on data from the Ministry of Health, Labour and Welfare, in 2017, the life expectancy of Japanese women is the highest in the world, at 87.3 years with men as the second highest after Switzerland at 81.1 years. The following is a table comparing the life expectancy of Japanese people with other countries in the world.





Source: Ministry of Health, Labour and Welfare (Statistics Bureau Japan, 2019).

Figure 4 showed that Japan is leading the world's longevity population. This high life expectancy predicted to continue growing in the coming years. Elderly care in long old age is a dilemma in Japan because longevity is often accompanied by a reduction in the number of births and population.

The long life span of Japanese people cannot be separated from the consumption of healthy food, proper sanitation, awareness of healthy living, and advances in medical science that contribute to a healthy Japanese society. The most common cause of death in Japan is malignant neoplasms (cancer) of 300.7 per 100,000 population, heart diseases (167.6 per 100,000 population), and senility (88.2 per 100,000 population) (Statistics Bureau Japan, 2019).

# Kaigo Rishoku Phenomena

Based on a survey conducted in Japan, in 2012, as many as 291 thousand Japanese worked while caring for families. Every year, around 10 thousand people quit their jobs to care for families. Therefore, there is an increase in the number of Japanese workers who quit their jobs to care for older people. As many as 60 per cents of people who quit their jobs were 40-50 years of age, of which 40 per cent were men (JCast, 2013). A National Post quoting news from Bloomberg entitled "Japanese baby

boomers struggle to balance care with elder care: 'Society needs a complete rethink'," reported that more than 100,000 people in Japan leave their jobs to care for their sick relatives each year, most of them remain unemployed (Bloomberg, 2015).

This phenomenon also happened to Akihiro Takano who resigned from the position of manager of a high-paying Tokyo department store at the age of 45 to treat his ailing father. After his father's death, he worked part-time while caring for his mother, who was in a weak condition. Nine years later, Takano spent the rest of his savings for his mother's funeral. Finally, he ran out of money and driven out of the family apartment of 30 years. In 2015, Takano was 60 years old, unmarried and alienated from his only brother. He once thought of committing suicide in difficult times of his life. In the interview, Takano said that the government did not have a system to deal with the *kaigo rishoku*. "We need to create a community where people can ask for help," said Takano (Bloomberg, 2015). In addition to the Takano case, there are many phenomena where a child must take care of his elderly parents. The next section of this research discusses various cases of *Kaigo Rishoku*.

The first case came from the online Yomiuri Shinbun newspaper article about a 40-year-old man living with his 70-year-old mother in Kyoto. He has experienced *kaigo rishoku* twice. His first experience was eight years ago when he was working in a food company, and his mother suffered from cerebral infarction (stroke). Although he really wanted to take care of his mother, he had to work from 8 am to 10 pm. Therefore, it was difficult for him to care for his mother. Finally, he quit his job. After that, he worked again at the shipping company by taking night shifts. He thought that even though his monthly income decreased from 400 thousand yen to 200 thousand yen, if added with his mother's pension, then he might be able to pay for her mother's medical bills.

However, in reality, he often worked overtime. He could not leave his mother in '*deisa-bisu*' (daycare service) at night. He also had to ask for help from a '*herupa*' (caregiver). When he returned from work, he was busy changing his mother's diapers and preparing food. Finally, his mother's condition got worse. He requested to shorten his work time, but his company refused. At that time, his company had not yet applied the leave to take care (*kaigo*). Finally, last year he decided to quit his job. Currently, he works part-time three times a week as cleaning staff with the monthly income around 50 thousand yen. His life is difficult, and he must receive welfare benefits or '*seikatsu hogo*.' He complained, "if you cannot work and take care of your parents all at once, everyone becomes unable to work in peace" (YomiDr, 2011).

The second case appeared in the weekly economy online news on 16-17 January 2013. The news revealed that around 30 male *kaigo* support groups from all over Japan gathered at a hotel in Kyoto. The theme of the activity was "*Keamen\*Samitto* JAPAN" (National Network Support for Male Caregiver). '*Keamen*' means men who do *kaigo* (caring for the family). One participant's mother from Nakano city, Miyazawa Hideo (54 years), was

diagnosed with dementia nine years ago. At that time, her company trusted Miyazawa to make product designs. Therefore, the temporary responsibility for caring for her mother was given to her father.

However, an old caregiver has limitations. Meanwhile, the person in charge who used to work at Miyazawa' company also stopped working because of *kaigo*. She said, "I know there is a leave system for *kaigo*, but the system cannot be implemented in the work environment." (Mochizuki, 2013). Finally, it took her one year to decide to quit their jobs. Although she had written her resignation letter, she has not submitted it. She repeatedly revised her letter. She finally submitted it to her superiors a year after she decided to quit. She thought about working near her home, but could not find a job. This year her mother passed away, and she lives alone with her father, who is also diagnosed with dementia. Now, she was worried, to whom would she ask for treatment when she needs treatment if her health condition decreased (Mochizuki, 2013).

The Third case. Besides Miyazawa, in the summit, there was a man who had quit his job to care for his sick mother. After quitting his job, he got another job near his home. To take care of his mother, he took *kaigo* leave. However, his colleagues could not understand his decision. Finally, he quit his job again. This man needed money for his mother's medical expenses, but he did not have a job. Many of the *kaigo rishoku* are relatively young, and they are worried about their lives in the future, generally about finding a permanent job (Mochizuki, 2013).

The fourth case. There were also cases where children wanted to take care of their parents secretly. A 40-year-old man living in Saitama worked for a courier company. Because he could not leave his mother alone at home, without informing the company, he brought his mother to sit in his truck while he was delivering goods (Mochizuki, 2013).

From these cases, it can be seen how caring for elderly parents is a significant problem in Japan. Increased life expectancy accompanied by a reduction in the number of children causes problems in the care of the elderly. Thus, many people quit their jobs to care for their parents. For this reason, a system that supports working and caring for elderly parents is needed.

# Elderly care in Society 5.0

According to the Japanese Cabinet Office, Society 5.0 is defined as a human-centred society that balances economic progress and resolves social problems with systems that integrate cyberspace and physical space. Society 5.0 proposed in the Fifth Basic Science and Technology Plan as the future society aspired by Japan. Society 1.0 was a hunting community that depended on nature, Community 2.0 was an agricultural society that implemented farming habits, Society 3.0 was an industrial society, and Society 4.0 was a society connected in technology and information networks. Meanwhile, Society 5.0 is a community group that applies human-centred technology based on community habits 4.0. Social reform (innovation) in Society 5.0 aims to achieve a forward-thinking society that

abolishes current stagnation, a society whose members respect each other, and a society where everyone can lead an active and pleasant life (JSPS, 2016).

Society 5.0 is a community formed concept based on the previous information network community. According to Castells (Ritzer, 2014), dominant functions and processes in the information age are increasingly organised around networks defined as a set of interconnected nodes. Networks are open, can be developed in a limited way, and can innovate without disrupting the system.

Castell divided the information technology paradigm into five essential characteristics. First, the technology that is reacted based on information. Second, because the information is part of human activity, technologies have a pervasive effect. Third, all systems that use information technology defined as 'network logic' that can affect various processes and organisations. Fourth, new technology is very flexible, able to adapt and change constantly. Fifth, the specific technology associated with information is integrated into an integrated system (Ritzer, 2014). Castell's view of the network society, especially information and computer flows, enabled the formation of Society 5.0 based on information society 4.0.

In the Japanese 5.0 Society, robots as elderly caregivers have become a phenomenon and reality. Over the past three years, robots have been instrumental in helping elderly care in Japanese nursing homes, as well as to be friends for the elderly. Japanese's expertise in AI technology had transformed the elderly care industry from humans to robots.

Based on the data, in 2025, Japan will need as many as 380,000 elderly caregivers due to the increase in elderly dementia. Therefore, the Japanese government had funded the development of an elderly care robot to fill the shortfall of 380,000 elderly caregivers—the difficulty of getting elderly caregivers making robots as elderly caregivers of the future. The rapidly increasing elderly population is an attractive market in marketing technology in the medical field. In addition to Japan, the robot industry was also targeting other countries that face demographic problems similar to Japan, namely Germany, China and Italy. METI (Ministry of Economy, Trade and Industry) estimated that the domestic industry would grow to 400 billion yen in 2035 when a third of Japan's population reaches the age of 65 years and over (Foster, 2018).

Japan started its 5.0 Society by making robots to be elderly caregivers. The Shintomi Nursing Home in Tokyo made international headlines because it hosted 20 models of caregiver robots in various shapes such as cute furry animals, young children, human-shaped humanoids, or lifting and walking robots. This project was funded by the government in 2013 and showed results after five years. These robots became friends with the elderly. Researches conducted by the Japan Medical Research and Development Agency showed that with robot care, elderly autonomy, social skills, mood, and communication increase along with a better quality of life. Japanese society also welcomed robots to help elderly care. This was

evident in the survey conducted by Orix Living, which showed that as much as 80 per cent of respondents aged 40 years were open to assistance by robot caregiver.

Japan developed various kinds of Japanese robots to help elderly care. Two types of robots can assist elderly care, either physically and psychologically. Robots that help physical care for the elderly are created to help sustain the physical abilities of the elderly, while robots that help with psychological problems maintain the psychological stability of the elderly. Several of these robots were (Foster, 2018).

*The Resyone* is an electronic maintenance bed can be converted into a wheelchair made by Panasonic. This robot has been sold since 2014. The selling price of this robot is 900,000 yen, and rental prices range from 40,000 yen/month.



Figure 5. The Resyone

Source: Panasonic

HAL (The Hybrid Assist Limb) Lumbar is a robot can be worn to reduce the risk of back pain for care workers in nursing places by reducing the burden on the lumbar area when helping the elderly. This robot is made by Cyberdyne Inc. and sold since 2015 at a rental price of 100,000 yen per month.

Figure 6. HAL Lumbar



Source: Cyberdyne

*Pepper* is a humanoid robot designed to interpret emotions through cameras and microphones. Pepper gave a response that can be adapted into interaction. This robot is made by Softbank Robotics Corp. Previously, most of these robots were used in stores to welcome guests and explain products. Now, this robot is also used in 500 nursing homes to play games, do routine exercises, and have basic conversations based on dialogue programs. Pepper can also move its arms and head. This robot has been on sale since 2015 at the cost of 198,000 yen plus a 25,000-yen monthly fee for three years of rental.



Source: SoftBank Robotics

Figure 7. Pepper



Source: Foster, 2018

Paro is a seal robot whose name stands for 'personal robot.' Paro serves as a therapy robot created by Intelligent System Co., Ltd. It has about 100 sensors, 10 CPUs and 8 motors throughout its body. Paro can respond to touch, speech and light by moving their heads, winking and playing tapes of Canadian seals. Created in 2005, Paro is widely used in nursing homes. The price is 400,000 yen in Japan, 5000 euros in Europe and 6000 USD in America.



Source: Intelligent System, 2019



Source: Paro Robots, 2014

Currently, these robots are widely used by Japanese elderly as a company for old age. Many elderly people live alone, and robots can be conversation partners that make their lives more enjoyable. However, various obstacles might hinder the spread of elderly caregiver robot. The main problem is the expensive robot costs, so not all elderly people can buy this robot. At present, these robots are only widely used in elderly care homes. Security issues and doubts about how useful and friendly robots are frequently asked questions.

Although robots have been widely used in nursing homes, according to Kimiya Ishikawa, managing director of the Tokyo Shintomi Nursing Home, so far the robot has not been able to reduce personnel costs and work hours. Today, robots in Shintomi nursing homes are used to improve the work environment, protect staff from injury, and make work safer. This is done to improve staff morale, bring peace of mind among staff, and make residents of nursing homes feel supported (Foster, 2018).

Communication technology has triggered the development of Society 5.0. Furthermore, information technology and computer networks have enabled the formation of Society 5.0. In this case, big data and the Internet of Things will turn into intelligence that touches every aspect of life. The Era of Society 5.0 will change habits and life in various aspects, such as health care, mobility, infrastructure, finance, technology, and others. With communication technology, doctors can perform long-distance medical services. Communication technology can also help the elderly to communicate with doctors without leaving home.

In elderly care facilities such as nursing homes, robots can help care workers who work physically and psychologically like. These robots include Resyone, HAL Lumbar, Pepper, and Paro. The elderly often have difficulty communicating with friends. With robots as conversation partners, the elderly will feel freer to talk and share their feelings without worrying about people's thoughts. This was revealed by the elderly who live in Shintomi nursing homes. This fact is in line with the aim of Society 5.0 where people can enjoy life as they should (Fukuyama, 2018).

# CONCLUSION

Care of the elderly in old age is a significant problem in Japan amid declines in population and an increase in the elderly. Japan does not have adequate elderly care resources, and children cannot be expected to care for parents. Even though *kaigo rishoku* is one solution for caring for the elderly, it cannot continue to be a solution. If life expectancy gets longer, then, in the end, the child and his parents will become older.

In Japanese Society 5.0, robots are expected to be a solution for elderly care amid the lack of caregivers. However, the cost of robots that are still expensive does not allow the elderly to buy or have a robot company at home. Elderly people who live alone and in poor health still need caregivers to provide assistance. However, the human touch is vital in elderly care. It cannot be replaced by robots. Therefore, to help care for the elderly in a rapidly increasing elderly population by 2060, Japan needs to invent new types of robots for elderly care.

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