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Ensuring the service quality of long-term care provided through competitive markets: The experience of care workers' training in Japan

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Discussion Paper No. 831

**ENSURING THE SERVICE QUALITY OF
LONG-TERM CARE PROVIDED THROUGH
COMPETITIVE MARKETS:
THE EXPERIENCE OF CARE WORKERS'
TRAINING IN JAPAN**

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February 2012

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Ensuring the Service Quality of Long-Term Care Provided through Competitive Markets: The Experience of Care Workers' Training in Japan

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Abstract

Ensuring the service quality of long-term care provided through competitive markets is a major concern among the governments of OECD members. The public officials in these nations recognise the importance of care workers' training to address this issue. However, most of them have hesitated to introduce comprehensive training due to financial constraints. Analysing the experience of Japan, this paper reveals that governments can ensure the financial sustainability of care workers' training by aiming at the best possible long-term care.

Key words: Long-Term Care, Quality Assurance, Care worker's training, Japan, The United States

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Introduction

Providing long-term care for older people (hereinafter, long-term care) through competitive markets is inherently problematic (Lipsky, 1980; Nyman, 1994; Wiener et al, 2007; Donabedian, 1987; Hansmann, 1980). On one hand, governments of the Organization for Economic Co-operation and Development (OECD) member nations cannot afford to respond directly to today's long-term care service needs. The bureaucratic model that led to an adherence to prescribed procedures has experienced rapid changes in society (Thomas, 2006). In this context, non-government sectors are more flexible and specialized in the service field. Nonetheless, long-term care service provision through competitive markets tends to leave the users vulnerable to the profit-driven whims of private-sector providers. Unlike choosing a grocery store that can be easily replaced by others, the choice of necessary long-term care providers, such as nursing homes, greatly influences people's quality of life. In fact, a great number of elderly people have suffered from unsatisfactory care for decades in the competitive market of care for the elderly (OECD, 2005).

A common cause of unsatisfactory care is the lack of care workers' training. The OECD (2005) surveyed twelve selected member nations' public officers. All of them answered that "recruiting and training capable and skilful care workers" was a policy concern (Table 1). Nonetheless, what makes this issue difficult to tackle is that comprehensive care worker training can be quite costly, as the necessary number of care workers has been rapidly increasing in this aging era. The market nature of profit maximisation prevents service providers (e.g., nursing homes) from making such expenditures. Governments clearly need to intervene in this matter by partly/fully covering such expense. Yet, governments may not be able to afford sustaining such an increasing expense, particularly in current economic climates.

This paper, therefore, examines the provision of long-term care service through competitive markets, considering care workers' training as a critical factor in ensuring quality of care. Two research questions guide the empirical research:

1. How does care workers' training enhance the quality of aged care services?
2. How can governments finance the cost of care workers' training?

To this end, the empirical study is divided into two parts. The first part investigates the effect of care workers' training. The second part examines the financial sustainability of the training.

Table 1. Policy Concerns about the Quality of Nursing Home Care

Group of issues mentioned	Countries
Recruiting and retaining an adequately educated and skilled workforce; improved qualification of staff	Twelve countries that replied to this question
Implementation or further development of a quality assessment and monitoring system	Austria, Korea, United States
Co-ordination of care service	Canada, Hungary, Germany
Building quality and amenity	Hungary, Japan
Other supply constraints: downward pressure on fees/inadequate fees paid to providers; lack of enough time for staff	New Zealand, United Kingdom, Korea (shortage of government subsidies)
Access to broader range of services, more differentiation	Norway, Austria (number of short-stay units)
Other mentioning of “top concerns” (country specific)	Use of physical restraints (Japan); Number of liability claims; lack of liability insurance for long-term care (United States)

Note: Data are based on replies from national administrators to the following question: “What are the top three concerns in your country in terms of quality of institutional care?”

Source: OECD (2005: 69)

Methods

The first part of this paper compares the cases of Japan and the United States, as these are the only nations that impose minimum training requirements for care workers nationally. Then, the second part examines the case of Japan.

Overview of Care Workers’ Training

Many nations have already realized that the improvement of care workers’ skills and qualifications is significant to ensuring quality of care. As mentioned earlier, public officials commonly raise insufficient training for care workers as a policy concern.

In reality, care workers’ training has been seriously overlooked in most countries. In fact, only the United States and Japan have imposed national minimum training requirements for care workers. All other countries have yet to define fully who care workers are, because care institutions in these countries can hire anyone to provide long-term care¹.

In the United States² and Japan, on the other hand, training is required to be a care worker. Compare the situation to driving a car. One does not need a driver’s license to drive a car on private property, but a license is required to drive on public roads and it is illegal otherwise. Likewise, everyone in the United States and Japan can provide long-term care to family members, friends, and others casually. Without required training, however, one cannot provide long-term care through ‘public channels’, which is Medicaid long-term care facilities in the United States³ and the universal long-term care insurance scheme in Japan. It is illegal.

¹ “Care worker” mentioned here does not include medical staff such as medical doctors and nurses.

² Some states do not require any training for the category of Personal and Home Care Aides.

³ In the United States, all long-term care facilities, including for-profit and non-profit ownership, are required to register with the local governments (state governments in most cases). Therefore, “public channels” here does not mean public institutions only.

Yet, the United States and Japan have very different approaches toward care workers' training. The training in the United States is concise and focuses on exercising proper care and protecting care workers from their potential job risks, including injury. In Japan, on the other hand, the training is comprehensive and focuses on understanding care recipients in order to recognize their detailed care needs.

Definition of Care Worker

Table 2 reviews the definitions of care workers in the United States and Japan. Although they have different names, their tasks are similar. They mainly give Activities of Daily Living (ADL) supports to care recipients at care facilities (i.e., nursing homes) and in recipients' homes.

The roles of Nursing Aides and Assistant Nurses are, however, slightly different due to the difference of long-term care systems in the two nations. In the United States, Nursing Aides, Home Health Aides, and Personal Home Care Aides are called Direct-Care Workers. They all work mainly in long-term care industries. In Japan, on the other hand, Nursing Assistants mainly work at hospitals, not in long-term care industries, though Certified Care Workers and Trained Home-Helpers mainly work at long-term care industries⁴.

The difference is rooted in the definition of 'long-term care' in these countries. As Figure 1 shows, the means-tested long-term care scheme is uniquely in charge of long-term care in the United States. In Japan, on the other hand, long-term care exists across three different schemes. Whereas the universal long-term care insurance scheme covers elderly-related conditions only, medical-related long-term care and disabled-related long-term care are covered, respectively, by the universal healthcare scheme (i.e., hospitals) and the universal disabled care scheme (i.e., disabled care facilities).

⁴ Certified Care Workers and Trained Home-Helpers also work at later-mentioned disabled care facilities.

Table 2. Definition of Care Workers in the United States and Japan

The United States (Direct-Care Workers)	Japan (care workers)
Nursing Aides generally work in nursing homes, although some work in assisted living facilities, other community-based setting, or hospitals. They support residents' ADL, such as eating, dressing, bathing, and toileting. They also perform clinical tasks such as range-of-motion exercises and blood pressure readings.	Assistant Nurses generally work in hospitals, although some work in institutional care (i.e., nursing homes). They support patients' (residents') ADL, such as eating, dressing, bathing, and toileting. They also perform clinical tasks such as range-of motion exercises and blood pressure readings.
Home Health Aides provide essentially the same care and service as nursing assistants, but they assist people in their homes or in community settings under the supervision of a nurse or therapist. They may also perform light housekeeping tasks such as preparing food or changing linens.	Certified Care Workers "provide appropriate advice and coordination as well as personal care to cope with physical and/or mental situations of those who need help in daily life, based on professional knowledge and skills". (Certified Social Workers and Certified Care Workers Law of 1987)
Personal and Home Care Aides ⁵ may work in either private or group homes. In addition to providing assistance with ADL, these aides often help with housekeeping chores, meal preparation, and medication management. They also help individuals go to work and remain engaged in their communities. Consumers directly employ and supervise a growing number of these workers.	Trained Home-Helpers "are registered under the exclusive qualification name of THH ⁶ " (Enforcement Order Article 3-1(2), Long-Term Care Insurance Law). The tasks include a) "care services" such as the assist of eating, bathing, clothing, and moving; b) assisted housekeeping such as cooking, laundry, cleaning, and shopping; c) mental care for care recipients and their family; and d) care advice for care recipients' family members (National Trained Home-Helper Council, 2010).

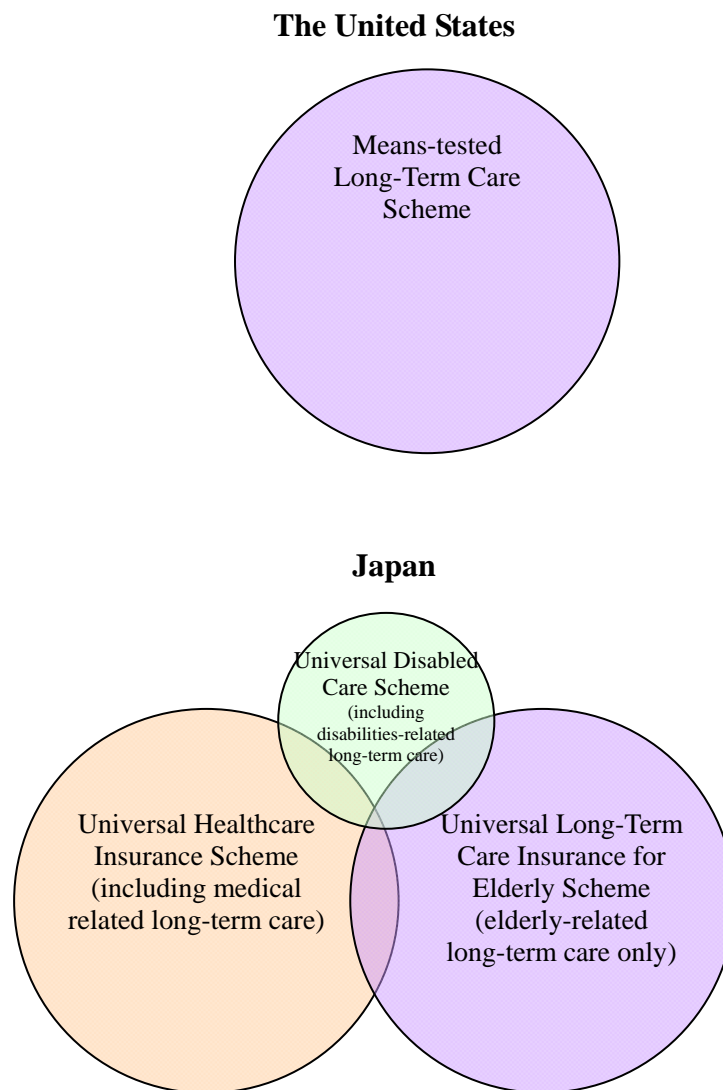
Note: ADL indicates Activities of Daily Living.

Source: Bureau of Labour Statistics (2010)

⁵ They have many titles, including personal care attendant, home care worker, personal assistant, and direct support professional (the latter work with people with intellectual and development disabilities).

⁶ Although THH is a prefectural license, the required qualifications (training) are designated by the Ministry of Health, Labour, and Welfare.

Figure 1. Differences in Long-Term Care Schemes in the United States and Japan



Part 1: Results

Much Longer Training Hours in Japan

The minimum training hours required to be a care worker in Japan is much higher than the required number of hours in the United States. Table 3 summarises the required training hours in the two nations. The required training hours for a Certified Assistant Nurse and a Certified Care Worker in Japan are, respectively, 1,890 and 1,800⁷

⁷ Concerning Certified-Care Worker, the required training can be replaced by 3 years of on-the-job training at certified care facilities. In that case, however, candidates have to pass the national examination in order to clarify that the candidate has completed the equivalent of the required training.

hours, whereas that of their counterparts in the United States is only 75. The difference is indeed about 24 times. The training of a Trained Home Helper in Japan involves 500 hours (150 for level 2 qualifications), whereas the training hours of the US counterpart is 75. This time, the difference is not as significant, but Japanese training hours are still nearly six times (or twice in the case of level 2) greater than are those in the United States.

Table 3. Required Training Hours in Japan and the United States

	Japan	The United States
Position	Certified Assistant Nurses (CAN) Certified Care Workers (CCW), Trained Home Helpers (THH)	Direct Care Workers (DCW)
Required hours of training	CAN: 1,890 hours CCW: 1,800 hours TTH: 500 hours (Level 2: 130 hours)*	75 hours (including 16 hours clinical training)

Source: Welfare and Medical Service Agency (2010b) and Bureau of Labour Statistics (2010).

Certainly, in the United States, many state governments add extra hours of training to the federal minimum requirement. In fact, 27 states and Washington D.C. require extra hours training. Among them, in 12 states and Washington D.C. the training hours go up to 120 hours in total. In Japan, on the other hand, the training hours usually do not differ by prefectures, although Assistant Nurse and Trained Home-Helper are prefectural licenses (Certified Care Worker is a national license).

Nonetheless, there is an enormous difference in the number of required training hours between the United States and Japan. Moreover, the minimum requirement in Japan is under consideration to expand in order to respond to diversifying care needs, including dementia care. In fact, the training hours of Certified Care Workers have increased recently from 1,500 to 1,800 in 2009. In addition, the training hours of Trained Home Helpers have increased from 250 to 500 and qualifications for level three Trained Home-Helpers, requiring 50 hours training, were abolished in 2009⁸. Level 2 Trained Home Helpers are now encouraged to complete a total of 500 hours of training. Furthermore, the licenses of Trained Home-Helpers, together with Certified Assistant Nurses, fall under criticism that the training hours are too short. According to the minutes of the Ministry of Health, Labour, and Welfare (1996; 2008a: 9), many policy makers propose to abolish both licenses, in which case current license holders would be required to upgrade to Certified Nurse⁹ and Certified Care Worker, respectively. In the United States, the minimum requirements have not changed for some time, although

⁸ The license expired in April 2009.

⁹ Certified Nurse requires 3,000 hours training and national exam.

some researchers propose to increase the training hours (e.g., Li and Ziemba, 2009).

Two Phases of Training Content

In both the United States and Japan, the purpose of the training is to acquire the necessary skills and attitudes toward care recipients to provide good quality care. There are, overall, two phases to achieve success. The first phase focuses on conducting requested physical supports safely. This is the focus of the training in the United States. The second phase focuses on picking up potential care needs and responding to them. This is necessary, especially when providing care for the elderly with dementia. The Japanese training is at this stage.

Phase 1: Case of the United States

To be able to respond to visible care needs, the first phase of training focuses on basic attitudes and physical skills. The attitudes trained here involve basic legal/ethics matters, human rights, and communication. They are considered as somewhat common sense in the profession. However, the skills trained in Phase 1 are rather specific. They include basic medical-related skills and transfer techniques. Since care recipients tend to be frail, basic medical-related skills are always necessary in case of emergency, though care workers are responsible only for first aid and not for medical treatment. As for transfer techniques, the training in Phase 1 includes not only giving a smooth support, but also protecting care workers' health. Throughout the ADL supports, care workers often need to lift care recipients. Although the weight of care recipients widely varies, care recipients are much more delicate and often heavier than, for example, the materials at a construction site. In fact, Direct-Care Workers have the highest injury rate among occupations in the United States (Zontek, Isernhagen, and Ogle, 2009). Back injuries, especially, are very common¹⁰. The training in Phase 1, therefore, covers basic attitudes and skills for visible care.

The majority of the training content in the United States can be classified into either basic attitudes or skills. Table 4 indicates the content of the training in the United States. Concerning Nursing Aides, resident rights belongs to basic attitudes, whereas clinical training, basic nursing, personal care, and basic restorative are about skills. Certainly, mental health, social service, and care of the cognitively impaired may be exceptions, but overall the content belongs to Phase 1. As for the case of Home Health Aides/Personal and Home Care Aides, information regarding personal hygiene is about attitude. Safe transfer techniques, reading and recording vital signs, infection control,

¹⁰ In Japan, about 70% of care workers suffer from back pain (MHLW, 2008b).

and basic nutrition indicate the skills.

Table 4. Training Content in the United States

Title	Content	Hours
Nursing Aides	Clinical training	16
	Other skills	59
	<ul style="list-style-type: none"> - basic nursing - personal care - mental health and social service - care of cognitively impaired - basic restorative - resident right 	
	Total	75
Home Health Aides/ Personal and Home Care Aides	Covered area:	75
	<ul style="list-style-type: none"> - Information regarding personal hygiene - Safe transfer techniques - Reading and recording vital signs - Infection control - Basic nutrition (+ 16 hours Practical training*) 	
	Total	75

Note: * is required in many states.

Source: Bureau of Labour Statistics (2010)

Phase 2: Case of Japan

Aiming at picking up potential care needs, Phase 2 training emphasises the mental aspects of care and communication. As a significant number of care recipients suffer from dementia and other cognitive impairments, many care needs are invisible. Elderly people may require help to go to the bathroom, an assist to change their position in bed, or support to change their clothes. If they cannot properly deliver their will due to their cognitive conditions, such needs can be easily overlooked. In order for care workers to recognize these potential needs, they must understand elderly peoples' mentality and communicate effectively with them.

This not only helps care recipients, but also protects care workers' health. Care work is, indeed, a very mentally draining task, because care recipients' mental statuses tend to be unstable. As most care recipients are living in the last stage of their lives, they inevitably face fear of death while in care. According to Kübler-Ross (1969), there are usually Five Stages of Grief as a pattern of adjustment to human death. These are denial, anger, bargaining, depression, and acceptance. This means, at each stage, care recipients can be very emotional and care workers must face and deal with these dramatic reactions while giving care. The survey of Kawamura (2008) reports¹¹ that about 28 percent of care workers receive "physical and verbal abuse from care recipients"; this is a significant work concern. In such an environment, it is very important - for both care recipients and care workers - that care workers are capable of dealing with such

¹¹ The survey was conducted in Japan, but it is thought that the concern was shared in the United States and other countries because the core workers' tasks are quite similar.

emotions by communicating with care recipients effectively.

The focus of the Japanese training has shifted to this in Phase 2. Table 5 shows the required training content for Assistant Nurses, Certified Care Workers, and Trained Home-Helpers. As in the training of Assistant Nurses, the mental aspect of care recipients is covered by several subjects such as Psychology of the patient, Psychiatric nursing, and Psychiatric nursing (practice); a total of 175 hours are spent on those issues. Moreover, in order to understand care recipients further, the practical subjects have special focuses on recipients' groups such as adult/elderly and mother and child. A total of 595 hours of training are devoted, specifically, to adult and elderly care in order to understand their particular needs and issues. In the training of Certified Care Workers, these aspects are more clearly emphasised (Table 6). Besides practical training, many subjects deal with understanding human mentality. Topics include human dignity and independence, human relationships and communication, understanding society, leadership and human relations, social studies, communication skills, understanding dementia, understanding disabilities, and mental and physical structures. Indeed, 460 hours, about 26% of the total training, are spent on such matters¹². Comparing this to the previous version of training content, the difference is clear.

Table 7 indicates the required Certified Care Workers' training, in effect prior to 2009. The focus of the training was "practical skills" rather than dealing with mental aspects of care. There were only three mental-related subjects: social welfare of the physically and/or mentally disabled, psychology of the elderly and disabled, and mental health. The training duration was only 120 hours, about 8% of the current total requirement. The focus on Phase 2 is also clear in the training of Trained Home-Helpers (Table 8). Most subjects, besides the practical part of the training, deal with understanding care recipients and their mentalities. Understanding the mission of life support and dignity of care recipients, understanding dementia, communication, and skills on care provision are typical examples of such subjects. In sum, the focus of Japanese training is on understanding and communicating with care recipients. This is how Japan trains care workers to identify potential care needs.

¹² As for the selective subjects, each training hour is calculated by the total hours divided by the number of subjects (i.e., $x=120/6$).

Table 5. Required training of Assistant Nurses in Japan

Subject		Type	Hour
Basic	Language arts	Lecture	35
	Foreign language	Lecture	35
	Other general education	Lecture	35
Basic special	Human body function and structure	Lecture	105
	Diet and nutrition	Lecture	35
	Medicine and nursing	Lecture	35
	Illness	Lecture	70
	Infection and prevention	Lecture	35
	Care and ethics	Lecture	35
	Psychology of patient	Lecture	35
	Structure of healthcare and social welfare/ Nursing and law	Lecture	35
	Basic nursing		
Special	General consideration of nursing	Lecture	35
	Basic nursing skills	Lecture	210
	General consideration of nurse practice	Lecture	70
	Nursing for adult/ Nursing for elderly	Lecture	210
	Nursing for mother and child	Lecture	70
	Psychiatric nursing	Lecture	70
	Nursing practice		
	Basic nursing	Practice	210
	Nursing for adult/ Nursing for elderly	Practice	385
	Nursing for mother and child	Practice	70
	Psychiatric nursing	Practice	70
Total			1890

Source: Welfare and Medical Service Agency (2010b)

Table 6. Required Training of Certified Care Workers (from 2009)

Subject		Hour
Human and Society	Understanding humans	Human dignity and independence
		Human relationship and communication
	Understanding society	Understanding society
	<i>Selective subjects</i>	1. Life science studies
		2. Mathematics and logical thinking on human relation and social life
		3. Basic life skills (e.g., life culture, and living skills)
Care		4. Leadership and human relations
		5. Social studies (sociology, political science and economics)
		6. Various social welfare scheme
	Basic care	180
	Communication skills	60
	Life support skills	300
Mental &	Care process	150
	Comprehensive care workshop	120
	Care practice	450
	Understanding dementia	60
	Understanding disabilities	60
	Mental and physical structure	120

Source: Welfare and Medical Service Agency (2010b)

Table 7. Required Training of Certified Care Workers (prior to 2009)

Subject	Type	Hours
Introduction to social welfare	Lecture	60
Social welfare of the elderly	Lecture	30
Social welfare of the physically and/or mentally disabled	Lecture	30
Rehabilitation	Lecture	30
Practical skill of social work	Lecture	30
	Seminar	30
Practical skill of recreation instruction	Seminar	60
Psychology of the elderly and disabled	Lecture	60
Introduction to domestic science	Lecture	60
Nutrition and cooking	Lecture	30
Practical training of domestic science	Practice	30
Introduction to medicine	Lecture	60
Mental health	Lecture	30
Introduction to care work	Seminar	60
Practical skill of care work in general	Seminar	120
Practical skill of care work (according to each disability type)	Seminar	120
Practical training of care work	Practice	450
Supervision of practical training of care work	Seminar	60
General education	Lecture	120

Source: Welfare and Medical Service Agency (2010b)

Table 8. Required Training of Trained Home-Helpers

Subject	Type	Hours
Understanding the mission of life, support and dignity of care recipients	Lecture/ Seminar	30
Understanding the system and services available for frail elderly and disabled people	Lecture/ Seminar	30
Understanding the disease and disability of frail elderly and disabled people	Lecture/ Seminar	30
Understanding dementia	Lecture/ Seminar	30
Communication and skills on care provision	Lecture/ Seminar	90
Skills on life supports and housekeeping	Lecture/ Seminar	30
Collaboration with medical and nursing staff	Lecture/ Seminar	30
Social welfare skills on care	Lecture/ Seminar	30
Planning and assessment for life support	Lecture/ Seminar	30
Ethics and tasks as care worker	Lecture/ Seminar	30
Practical training of care work	Practice	140

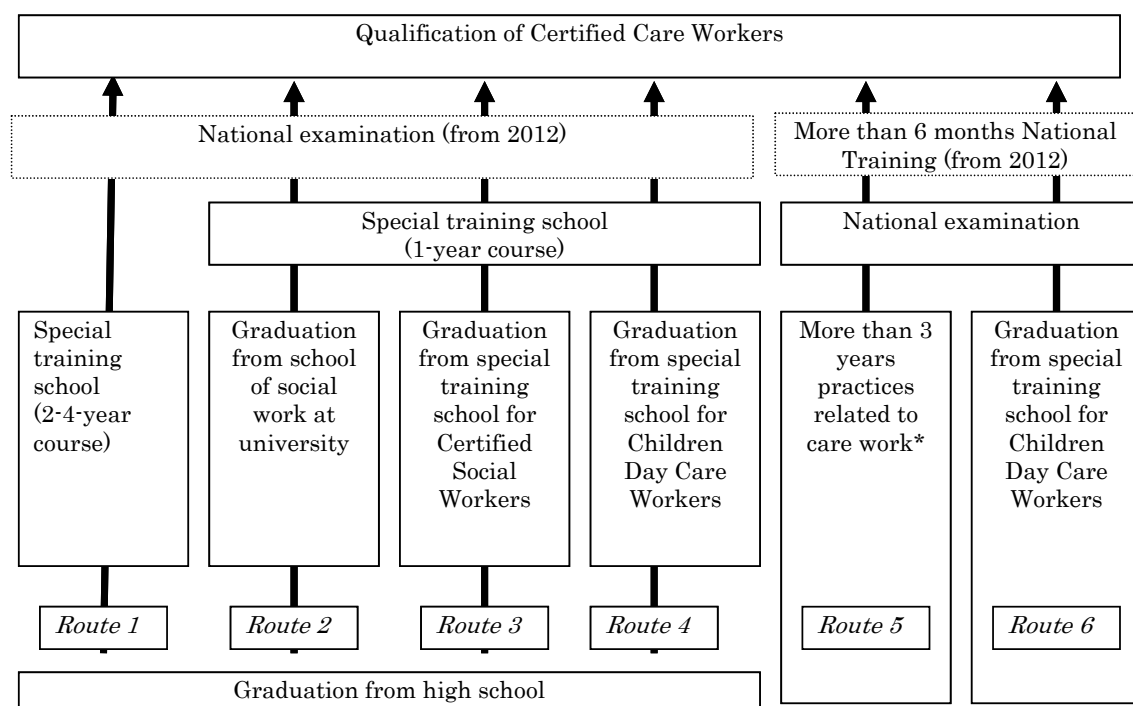
Source: Welfare and Medical Service Agency (2010b)

License Examination

Whereas the completion of the training usually means qualification for the license in the United States, training completion in Japan may only indicate qualification for a license exam. First, the Japanese Assistant Nurse candidates (i.e., those who complete the required training at designated institutions) must pass the prefectural exam to get the license. The examination for Trained Home-Helpers is to be abolished, but the level 2 exam, which allows the successful candidate to skip a part of the required 500 hours of training, will remain. The exam for Certified Care Workers,

however, is implemented universally¹³. As seen in Figure 2, there are now six routes to be a Certified Care Worker and the exam will soon be implemented in all routes. In addition, the exam is not just a formality process. The subjects range widely (Table 9) and only half of the candidates pass the exam every year, as shown in Table 10¹⁴.

Figure 2. Six Routes to be Qualified as a Certified Care Worker



Note: The step in the dotted boxes is to be implemented in April 2012.

* “Practices related to care work” here means on-the-job training through the non-licensed part of nursing home tasks, such as cleaning rooms and cooking meals for care recipients.

Source: MHLW (2010a)

Table 9. Subjects of Certified Care Worker Exam

Paper Exam
<ul style="list-style-type: none"> - Compendium of Social Welfare - Elderly Care - Disabled Care - Rehabilitation - Social Welfare and Care Support Skills - Organising Recreation Activities - Psychology of Elderly and Disabled people - Domestic Science - Medicine - Mental Health - Compendium of Care Work - Care Skills - Care Skills on Various Occasion
Practical Exam (corresponds to the paper exam, especially the subject of “Social Welfare and Care Support Skills”)

Source: MHLW (2010a)

¹³ Until 2012, the exam will have been only for the candidates in route 5 and 6.

¹⁴ The exam is an absolute evaluation, not a comparative assessment.

Table 10. Exam Pass Rate of Certified Care Workers (2006-2010)

Year	Examinee	Successful Examinee	Successful Ratio
2010	153,811	77,251	50.2%
2009	130,830	67,993	52.0%
2008	142,765	73,302	51.3%
2007	145,946	73,606	50.4%
2006	130,034	60,910	46.8%

Source: MHLW (2010b)

Part 1: Discussion

Care Workers' Training Contributes to Ensuring Quality of Care with Two Phases

The purpose of Part 1 was to investigate how care workers' training ensures quality of care. Analysing the cases of the United States and Japan has provided theoretical evidence that care workers' training has two phases and that both are respectively useful to ensure quality of care. Whereas Phase 1 standardises the care quality of addressing overt needs by ensuring proper care attitudes and physical skills (e.g., transfer techniques), Phase 2 enables care workers to respond to potential care needs by teaching different aspects of care recipients' mentalities and training communication skills to recognize, address, and discuss potential care recipients' needs.

Part 2: Results

Challenge to the Sustainability of Care Workers' Training

An empirical concern is that the care workers' training may not be sustainable. In the case of Japan, while the population of care recipients is expected to continue to increase, the content of training has become more comprehensive. Can Japan keep this pace for the next decade of an aging society?

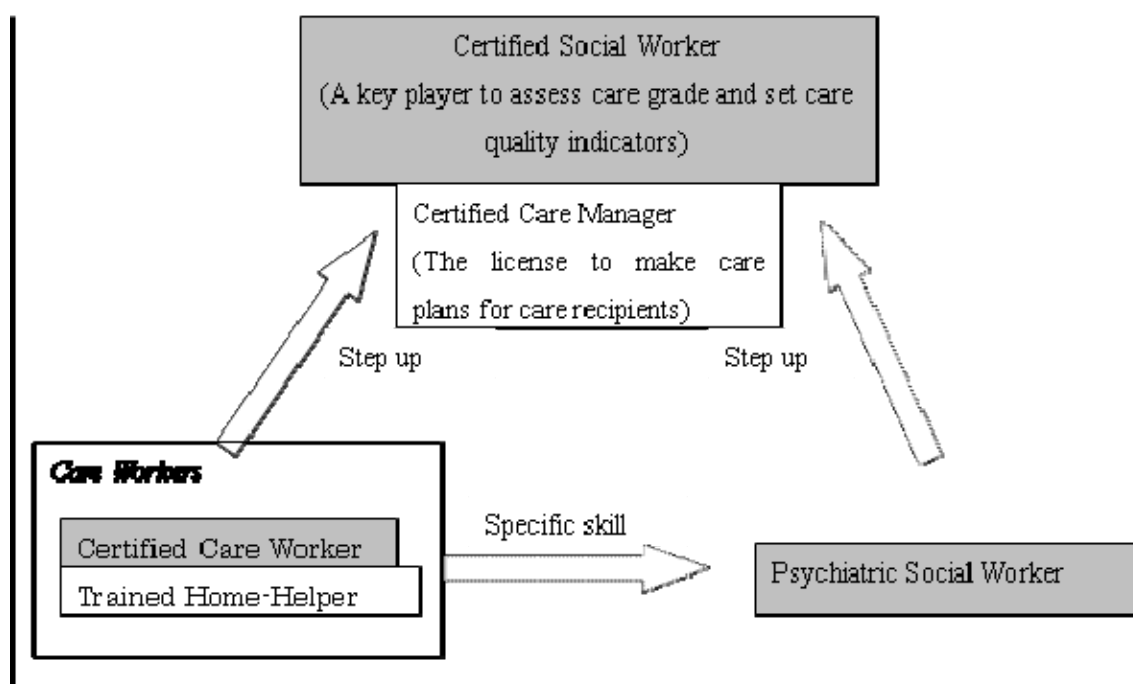
Certainly, a part of the answer may be influenced by some unique factors of the Japanese aged care system. The care workers are highly motivated. In Japan, the experience as care worker is a necessary step to be a policy maker in the field of care. Starting as a care worker, there are certain career steps necessary to be involved in policymaking (Figure 3). In addition, compared to other countries, the salaries of care workers are good and expected to increase progressively¹⁵. As a result, despite the demanding training requirements in Japan, the care workers' labour shortage issue is not as serious as that in the United States and many other countries. In fact, whereas the United States relies on immigrants for 23% of care workers¹⁶ (PHI, 2010), the

¹⁵ Unlike the cases of other countries, the care workers' salary in Japan is designated by law and is nearly equivalent to those of public officials. For reference, the care workers' salary in the United States is so low that more than 41 percent of the care workers' households rely on some kind of public benefit, such as food stamps (PHI, 2009).

¹⁶ PHI defines immigrants as those who are born outside the United States.

immigrant-dependent ratio in Japan is nearly zero¹⁷. This might certainly be because of the language barrier of Japanese but, as seen in Table 10, the number of license applications (i.e., examinees) has increased.

Figure 3. Career Steps of Care Workers in Japan



Note: Coloured box indicates a national license, whereas a white box means a prefectural license. Both licenses are, however, interchangeable with meeting the requirements. For example, Trained Home-Helpers are eligible to apply for Certified Social Worker qualification; Certified Care Workers can apply for Certified Care Manager qualification.

Nonetheless, one must consider the government's motivation to train care workers. Even if care workers are motivated in Japan, it is costly for the government to train the candidates for care workers and to maintain the long-term care system. Certainly, to ensure quality of care is an important task of governments, along with the objective of OECD: "achieving the highest sustainable economic growth and employment and a rising standard of living in member countries." Particularly, however, it may be that Phase 2 training, shown in the case of Japan, is too much of a burden on governments.

¹⁷ Certainly, the Government of Japan gave 3-4-year training scholarships to 208 Indonesian candidates for the Assistant Nurse/Certified Care Workers program in 2008 as "the first trial" to accept foreign labour in the field. In the following year, 2009, the government also gave similar scholarships to 280 Filipino candidates for the Assistant Nurse/Certified Care Worker program. However, as of November 2010, none of them has yet received these licenses. In Japan, there are about 382,000 Assistant Nurses (MHLW, 2006), 81,000 Certified Care Workers, and 31,000 Trained Home Helpers (MHLW, 2009). Estimates suggest that almost all of them are Japanese natives.

Government Motivation to Train Care Workers

Phase 2 of care workers' training can be sustainable. Indeed, the training has had great spill over effects on care-related industries in Japan. This section analyses the mechanism, investigating the case of Japan.

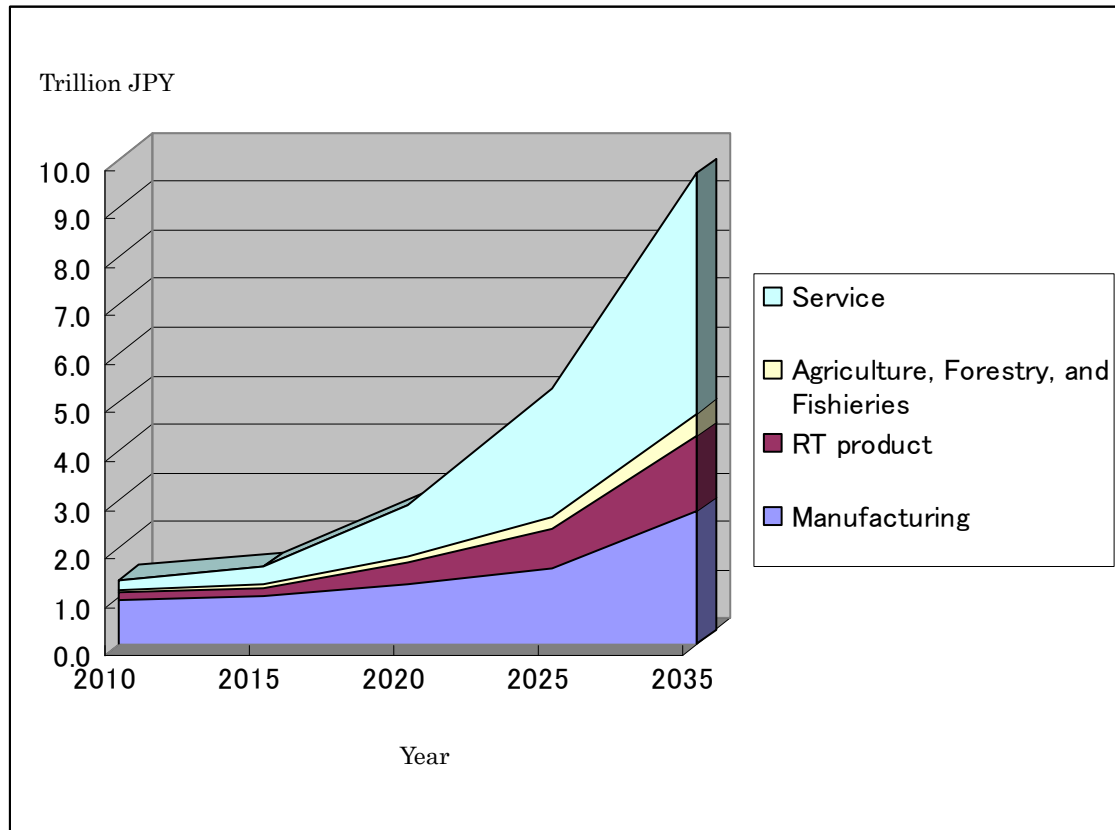
Long-Term Care in Economic Growth Strategy

As explained earlier, the purpose of Phase 2 training is to pick up potential care needs. In economics or/and business terms, this can be rephrased as 'market research.' The government of Japan, particularly the Ministry of Economy, Trade, and Industry (hereinafter, METI), draws growth strategy utilising the care workers' skills of picking up potential care needs.

With this strategy, the livelihood support robot used in the long-term care industry has great potential. The livelihood support robot means the robot that helps humans in long-term care, housekeeping, and in the safety and comfort of daily living (AIST, 2007). According to Japan Society for the Promotion of Machine Industry (2008), the market for the livelihood support robot can be expanded to 1,453.4 billion yen (institutional use: 901.2 billion yen [11.2 billion USD]; home use: 552.2 billion yen [6.9 billion USD]) by 2030.

The government of Japan recognises this potential. In 2010, the research of the Ministry of Economy, Trade, and Industry, Japan (METI) revealed that the future growth of the Japanese robot industry is expected to rely heavily on service uses (Figure 4). The livelihood support robot will be a core division of service use in the near future (Table 11). Certainly, METI does not provide the clear definition of the livelihood support robot "Service" in Table 11. Yet, if it includes "Long-Term Care," "Room cleaning," "Transportation (business use)," "Transportation (home use)," "House-keeping support," and "MIMAMORI communication" in the table, the sales of the livelihood support robot is, in 2035, to increase up to 1.9807 Trillion Yen which occupy about 20 percent of the total 9.7 trillion yen (121 billion USD), Japanese robot industry.

Figure 4. Overall Japanese Robot Industry Market Prediction (2015-2035)



Note: RT indicates Robot Technology

Source: METI (2010)

Table 11. Japanese Robot Industry Market Predictions (2015-2035) (Detailed)

Division			Predicted Market Scale (Billion yen)				Calculation
Major Division	Middle Division	Small Division	2015	2020	2025	2035	
Manufacturing	Conventional industrial robot	-	936.5	1,052.4	1,092.6	1,102.7	Pattern 2
	Next-generation industrial robot	Assembly robot (Automobile)	32.4	99.2	239.3	798.8	Pattern 4
		Robot cell (Electric machine)	32.9	104.8	248.8	827.9	Pattern 4
Robot Technology (RT) product	RT electric appliance/ home equipment	-	92.8	285.9	488.0	557.9	Pattern 5
	RT automobile	-	50.9	103.3	208.3	737.0	Pattern 5
	RT ship	-	15.9	28.1	44.4	72.9	Pattern 5
	RT railway	-	2.5	4.6	7.4	12.8	Pattern 5
	RT construction machine	-	14.9	29.8	57.6	175.0	Pattern 5
Agriculture, Forestry, and Fisheries	Agriculture	Land-use agriculture	1.1	2.3	7.3	27.6	Pattern 5
		Garden firming/ facility firming	0.9	3.9	15.0	92.7	Pattern 4
		Daily firming/ animal firming	10.2	29.4	49.8	58.8	Pattern 3
		Agriculture logistics	27.3	60.3	81.2	85.8	Pattern 3
	Forestry	-	1.7	8.4	30.4	87.2	Pattern 4
	Fisheries/ aquaculture	-	5.4	16.8	41.7	114.2	Pattern 4
Service	Medical care	Operation support	4.3	13.6	31.7	53.4	Pattern 3
		Pharmaceutics support	6.5	21.0	38.3	41.4	Pattern 3
	Long-Term Care	Self-support	13.4	39.7	82.5	220.6	Pattern 4
		Care support	3.3	14.6	41.4	183.7	Pattern 4
	Healthcare	Fitness	137.6	146.1	157.6	181.7	Pattern 3
		Health monitoring	5.4	16.1	44.0	148.0	Pattern 3
	Room cleaning	-	2.2	12.7	54.1	428.7	Pattern 3
	Security	Machine security	21.0	61.0	124.9	268.9	Pattern 5
		Institutional security	1.7	21.0	70.3	163.2	Pattern 4
	Receptionist	-	0.2	0.9	3.9	46.5	Pattern 3
	Delivery	-	0.7	3.0	13.2	81.1	Pattern 3
	Transportation (business use)	-	5	116.2	619.0	675.9	Pattern 3
	Heavy-duty support	-	1.5	4.3	12.0	229.9	Pattern 3
	Food industry	Food handling	17.9	67.5	143.2	164.0	Pattern 3
		Food processing	8.1	30.5	79.3	174.3	Pattern 3
	Logistic	Palletizer/ depalletizer	21.2	41.0	86.5	152.3	Pattern 2
	Examination/ maintenance	House	4.6	9.8	15.7	21.3	Pattern 1
		Social infrastructure	21.6	103.8	218.8	180.5	Pattern 4
	Education	-	11.9	24.3	36.1	45.0	Pattern 1
	Amusement	-	21.1	35.7	57.6	122.2	Pattern 1
	Rescue	-	0.8	6.0	29.1	67.0	Pattern 1
	Prospecting	-	1.7	7.3	25.7	81.1	Pattern 3
	Transportation (home use)	-	2.1	49.8	265.3	289.7	Pattern 3
	Hobby	-	22.3	71.6	1498.5	215.7	Pattern 1
	House-keeping support	-	-	-	15.7	85.8	Pattern 3
	MIMAMORI/ communication	-	0.3	1.1	3.6	34.1	Pattern 3

(Table 11 continued)

Division			Predicted Market Scale (Billion yen)				Calculation
Major Division	Middle Division	Small Division	2015	2020	2025	2035	
Robot Total			1,599.0	2,853.3	5,258.0	9,708.0	
Livelihood Support Robot (occupancy rate in the total)			31.7 (2%)	250.2 (8.8%)	1,109.9 (21%)	1,980.7 (20%)	

Note: Author indicates the livelihood support robot in bold face. The last row is added by Author. The original source describes the number in increments of 100 million, but this table shows the number in increments of 1 billion. The term *MIMAMORI* is hard to translate, but roughly, it means “to stand watch over frail elderly and/or small children and to offer help when necessary” in English.

Methodology: The prediction is calculated by the logistic curve model formed by the adoption number, household adoption rate, replacement cycle, and price transition of the anagogic (in terms of price and utilisation) product in the past market of each division.

- Pattern 1: stochastics of the existing stochastics data
- Pattern 2: stochastics based on the existing market performance
- Pattern 3: stochastics based on the model curve of the anagogic robot
- Pattern 4: stochastics based on the market needs
- Pattern 5: stochastics based on the model curve of the anagogic RT product

Source: METI (2010)

The government has heavily committed to the promotion of the livelihood robot that collaborates with care workers. The commitment originally began with the METI’s policy of the “21st Century Robot Challenge Program” in 2001, a year after universal long-term care insurance was implemented. Since then, the focus on the livelihood support robot has grown stronger. In 2009, the government set up the action plan to back up their activities (Table 12).

Table 12. Action Plan to Promote Livelihood Support Robot by Government of Japan

2009-	The livelihood support robot project by METI (1.6 billion yen)
2010-2011	Introductory Period <ul style="list-style-type: none"> - Safety check (METI) - Risk assessment (METI) - Test at care facilities (METI, MHLW) - LTCI system maintenance for robot introduction (MHLW) - Test at special ward (e.g., Tsukuba-city)
2012-2013	Primary introduction <ul style="list-style-type: none"> - Test of care worker robot (e.g., power suite) (METI, MHLW) - Power suite test with normal healthy subjects (METI) - Planning of mobility-robots (related Ministries)
2014-	Major introduction through B2B (Business to Business) market <ul style="list-style-type: none"> - Implementation of robot-use promotion policy (MHLW) - Setting up robot assessment agency (METI) - Implementation of the telecommunication system for robot use (MPMHAPT)

Note: MPMHAPT means Ministry of Public Management, Home Affairs, Posts, and Telecommunications.

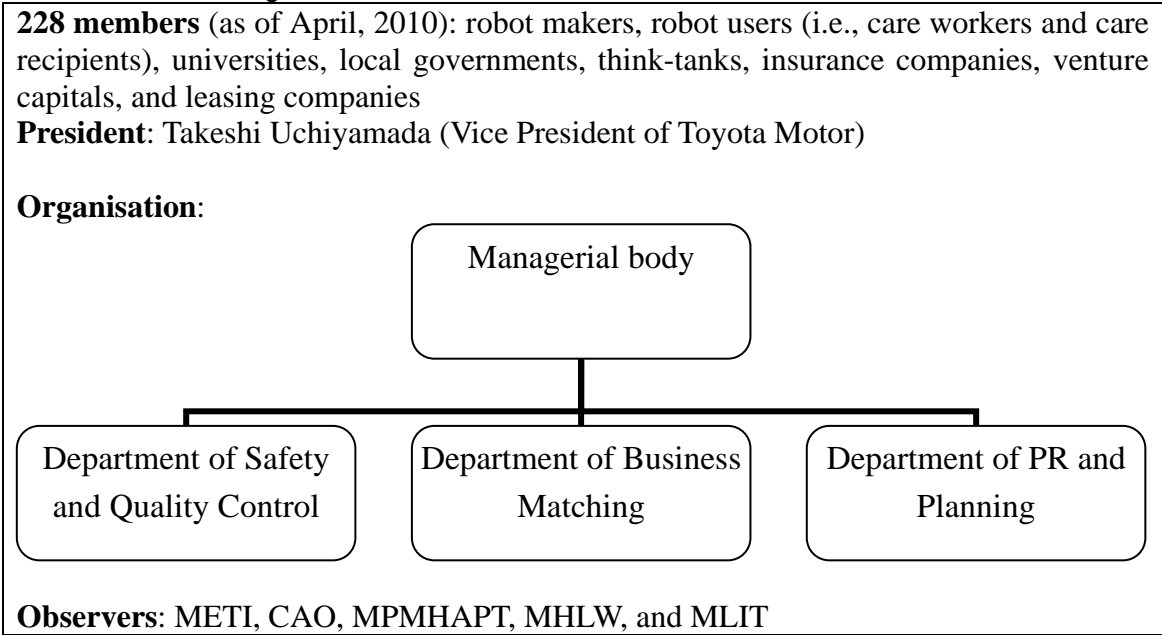
Source: METI (2010)

Research and Development

The experiences of well-trained care workers in Japan are greatly utilised in the research and development of the livelihood supports robot. First, robot makers, robot users (i.e., care workers and care recipients), universities, local governments, think tanks, insurance companies, venture capitals, and leasing companies have formed a collaborative body named the Association of Robot Business Promotion. The

association offers the members various collaborative opportunities such as business matching (Figure 5). Furthermore, the New Energy and Industrial Technology Development Organization (NEDO), a government agency, supports the establishment of ethical and safety guidelines (NEDO, 2008). Collaborating with robot makers and universities, the National Institute of Advanced Industrial Science and Technology (AIST) conducts research in Tsukuba city, a special word of long-term care. Many universities, especially, take advantage of their care worker training functions on their campuses. As mentioned in Route 2 in Figure 2, some universities hold care workers' training schools, called Care Worker/Social Worker School. Since the needs of long-term care have been increasing, today 179 universities have such schools within their campuses (Table 13). As many of the teaching staff at the schools have care worker experiences¹⁸, it is very convenient for the researchers in these universities to utilise the detailed needs of long-term care in their research.

Figure 5. The Association of Robot Business Promotion



Note: METI: Ministry of Economy, Trade, and Industry

CAO: Cabinet Office

MPMHAPT: Ministry of Public Management, Home Affairs, Post, and Telecommunications

MHLW: Ministry of Health, Labour, and Welfare

MLIT: Ministry of Land, Infrastructure, and Transport

Source: METI (2010)

¹⁸and/or they have a very close relationship with care workers.

Table 13. University with Care/Social Work School in Japan

Area	Number of Universities with Care/Social Work Schools
Hokkaido	8
Tohoku	13
Kanto	55
Koshinetsu	6
Hokuriku	2
Tokai	21
Kinki	34
Chugoku	16
Shikoku	6
Kyushu	16
Okinawa	2
Total	179

Source: Welfare and Medical Service Agency (2010a)

Robot Utilisation Cases

Because of robot business promotion, many livelihood support robots have come into service. After many years of research and development, some have begun to grow in popularity and others are starting to be involved in overseas export. With these successes, many companies have accelerated their investment in the development of the livelihood support robot.

Case 1: Robot Suit HAL (Hybrid Assistive Limb)

Robot suite HAL, developed by Yoshiyuki Sankai at Tsukuba University, can assist the wearer's movement. Bioelectric sensors attached to the skin monitor signals transmitted from the brain and control the robot suit (Sankai, 2006). With this suit, care workers can easily lift care recipients because care recipients have enhanced physical capabilities.

Collaborating with Tsukuba University and NEDO, Cyberdyne Inc¹⁹ released the robot suit in the market in 2010. According to Yomiuri Online²⁰, as of the 20th of August 2010, HAL had already been introduced by 37 hospitals and nursing homes in Japan. The article also refers to the half-paralysed elderly who can ascend stairs, wearing HAL.

¹⁹ A venture company founded by Yoshiyuki Sankai, who developed the robot suit.

²⁰ Online version of Yomiuri newspaper.

Image. Robot Suit HAL



Photos up: HAL for the use of disabled
Photo down left: Walking with HAL
Photo down right: Care giving with HAL
Source: NEDO (2010)

Case 2: Therapeutic Robot PARO

The therapeutic robot, PARO, developed by AIST, is designed to have positive psychological effects on the people attracted to it because it reacts to the people and/or develops its character as the people take care of it. According to AIST (2006) and Wada, Shibata, Musha & Kimura (2008), interacting with PARO improves brain function, as measured and analysed in the brain waves of elderly patients with cognitive disorders. Robot therapy with PARO, therefore, may mediate or prevent cognition disorders.

The use of PARO may also enhance quality of care. That is, the use of PARO makes it possible to implement a humanistic method of care giving. Takanori Shibata, Senior Research Scientist at AIST says, “Elderly people with dementia, especially if their condition is severe, may get agitated and violent, and be unable to settle down. Previously, such patients were sedated, and even now, that is sometimes the case in Europe and America. In Japan, such patients are sometimes physically restrained. If such patients have contact with PARO, however, they often settle down almost immediately, smile, and feel good. Although the use of PARO may not be 100% effective, it has no particular side effects” (Diginfonews, 2010).

In Japan, as of 2010, 1,300 PARO robots had already been released, and the

sales had been extended to overseas. Care facilities in Denmark and other European countries have started to introduce PARO. PARO is expected to be sold in the United States in 2010, as PARO was certified as a medical product by the Food and Drug Administration (FDA) (Diginfonews, 2010).

Image. Therapeutic Robot PARO



Source: Wada *et al* (2008)

Not just research institutes or venture companies research the livelihood support robot. Major Japanese companies such as Toyota Motor, Honda Motor, Fuji Heavy Industries, Panasonic, Mitsubishi Heavy Industries, Toshiba, Fujitsu, NEC, Yasukawa Electric, and Hitachi have also developed livelihood support robots. Among them, Panasonic aims at 100 billion yen (about 1.25 billion USD) service robot sales in 2015 (Impress Watch, 2009). In addition, in 2010, another major technological company, Canon, announced its entry into the service robot business (Yomiuri News Paper, 2010).

Part 2: Discussion

Possible Research Limitation

The motivation of the Japanese government cannot directly apply to that of other governments. Japan produces about 70% of the world's industrial robots (METI, 2009: 174). It may be unique for Japan to have robots as its basic industry.

However, the idea of synergizing care workers' training to ensure quality of care and market research for future industries is applicable to other markets. As in the field of long-term care, all OECD member nations are facing rapidly increasing aging populations. All markets related to the elderly, not just the robot one, are very promising; it is worth conducting 'market research' while providing the best possible long-term care through comprehensive care workers' training.

Conclusion

Identifying two phases of care workers' training, this paper first supported the significance of care workers' training for ensuring the quality of long-term care. This paper also found that governments could ensure the sustainability of care workers' training by aiming at the best possible long-term care. Analysing the case of Japan, the research discovered that hidden care needs uncovered by trained care workers boosted the national economy. That is, the care workers' efforts to provide the best possible service elicited potential service needs and industries responded to those needs.

The impact of these findings projects on the discussion of increasing long-term care needs. For some time, increasing long-term care needs have been perceived rather negatively, because they create a litany of public expense. Highlighting the positive social effects of increasing long-term care needs, however, the experiences of Japan provide a mechanism to make the service provision sustainable. The more training of care workers, the more hidden needs uncovered. Then, the elicited needs boost the economy. Importantly, the collaboration among governments, long-term care providers, and industries benefit them all, bringing financial sustainability for governments, better care for providers, and new business for industry. Certainly, connecting elicited long-term care needs and the robot industry might be unique to Japan. However, the principle of a market economy that elicited needs to stimulate industrial activities is applicable to every market.

For further research regarding these findings, multidisciplinary research may be required. To strike a balance between market contestability and service quality assurance, research needs to include several views: economics and business, engineering, medicine (including long-term care and nursing), education, and public policy. The challenges – and the rewards – are, indeed, multidisciplinary.

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