

Training Systems and Certification in Neurology and Neurosurgery in Japan

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Introduction

There are three authorised training systems for specialists in neurological diseases in Japan, for neurologists, neurosurgeons and paediatric neurologists. This Chapter reports on all three.

Neurologists

The Japan Society of Neurology (JSN) has a special training curriculum and authorization system for granting board certification to neurologists. The JSN's Special Board deals with the training curriculum and the qualifying examination.

This system was started in 1970, and the first Board Examination was held in 1975. The qualifications for taking the examination are:

1. More than four years' postgraduate clinical training, including at least one year's training in clinical neurology and two years' membership of JSN.
2. Training hospitals, while not yet designated, are expected to handle more than 100 cases of inpatients with neurological diseases per year, and have sufficient laboratory installations for neurological diagnosis, regular conferences on neurological diseases, and autopsy equipment.

3. Certified neurologists are expected to be able to diagnose and treat patients with common neurological diseases.

At least three years' training in clinical neurology is necessary to pass the Board Examination. Examinees are expected to be experienced in treating a minimum number of patients with the main neurological diseases (Table 1). The examinee must also present a summary of five main neurological cases, reports on patients they have seen personally.

The Board Examination consists of two written and one oral examination. One of the written examinations covers 150 multiple choice questions (MCQ); the other, 50 MCQ questions on image, including CT, MRI, EEG, EMG, histology etc. The oral examination is conducted by three examiners. To pass the examination, the examinee must score more than 60 out of 100 for each written examination, and receive pass marks from at least two examiners.

The total number of examinees has been about 300 a year during the past eight years. The rate of successful candidates varies from year to year, with an average rate of 57.9%, and an average number of about 110 a year - which indicates the difficulty of the examination (Figure 1). The numbers of authorised neurologists are increasing steadily, with a cumulative figure of 2,283 at present (Figure 2).

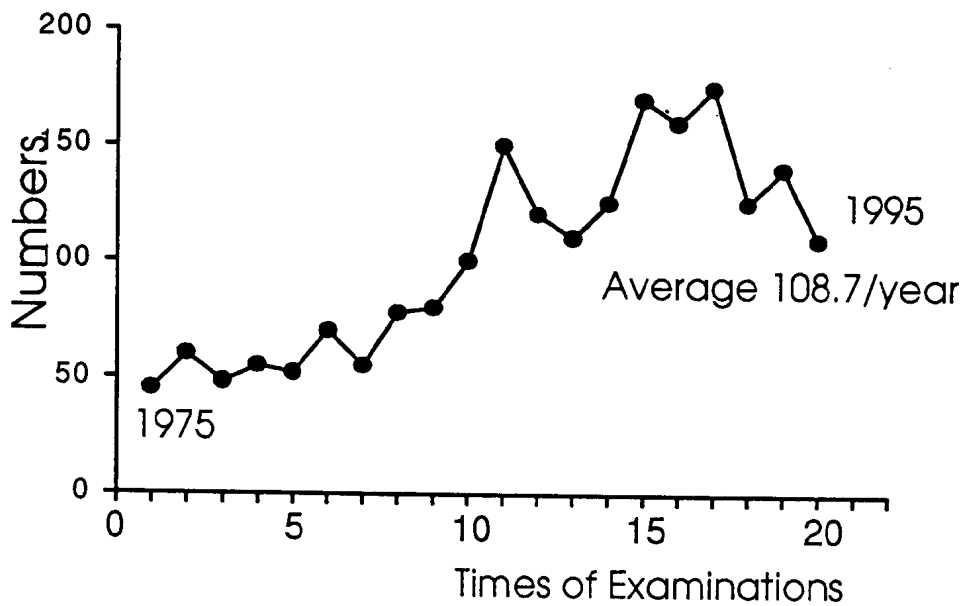
Table 1 - The minimum numbers of neurological patients to be board-eligible by the Japan Society of Neurology

1.	Cerebrovascular diseases	30
2.	Brain tumours (primary and metastatic)	5
3.	Infectious neurological diseases (meningitis, encephalitis, etc.)	10
4.	Degenerative diseases (Alzheimer's disease, Parkinson's disease, ALS*, SCD*, etc.)	30
5.	Demyelinating diseases	5
6.	Metabolic diseases	5
7.	Toxic neurological diseases	3
8.	Paroxysmal neurological disorders (epilepsy, migraine, etc.)	20
9.	Malformations	5
10.	Myelopathies	20
11.	Peripheral neuropathies	20
12.	Myopathies	20
13.	Neurological complications of other diseases	30

* ALS: amyotrophic lateral sclerosis

SCD: spinocerebellar degeneration

Figure 1- Annual numbers of newly certified neurologists



Note: The horizontal axis shows the time of examination first introduced in 1970. The average number is 108.7 per year.

Figure 2 - Cumulated numbers of certified neurologists - totalling 2,283

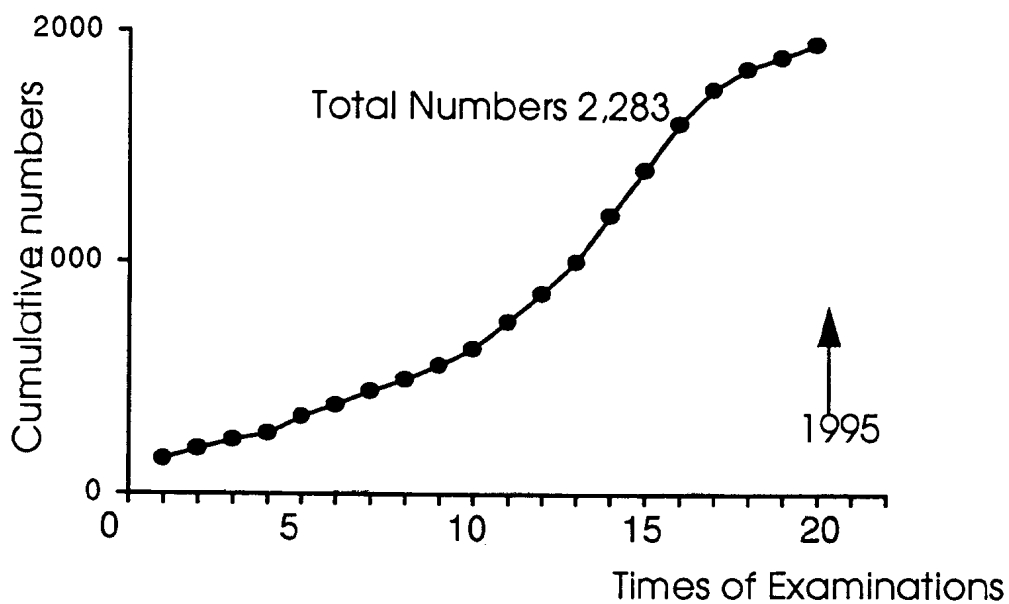
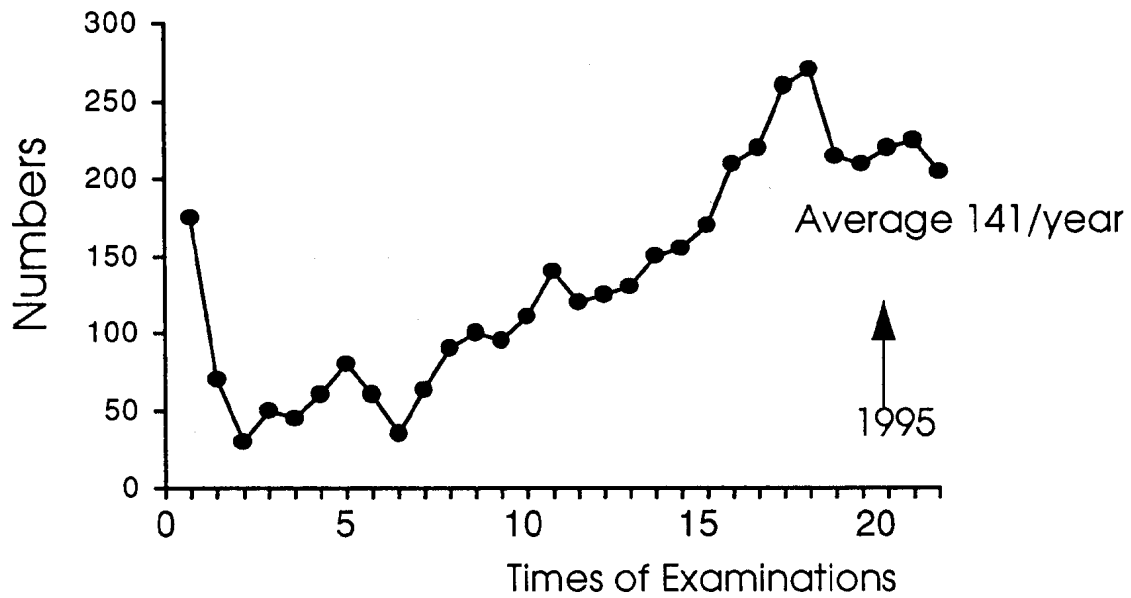
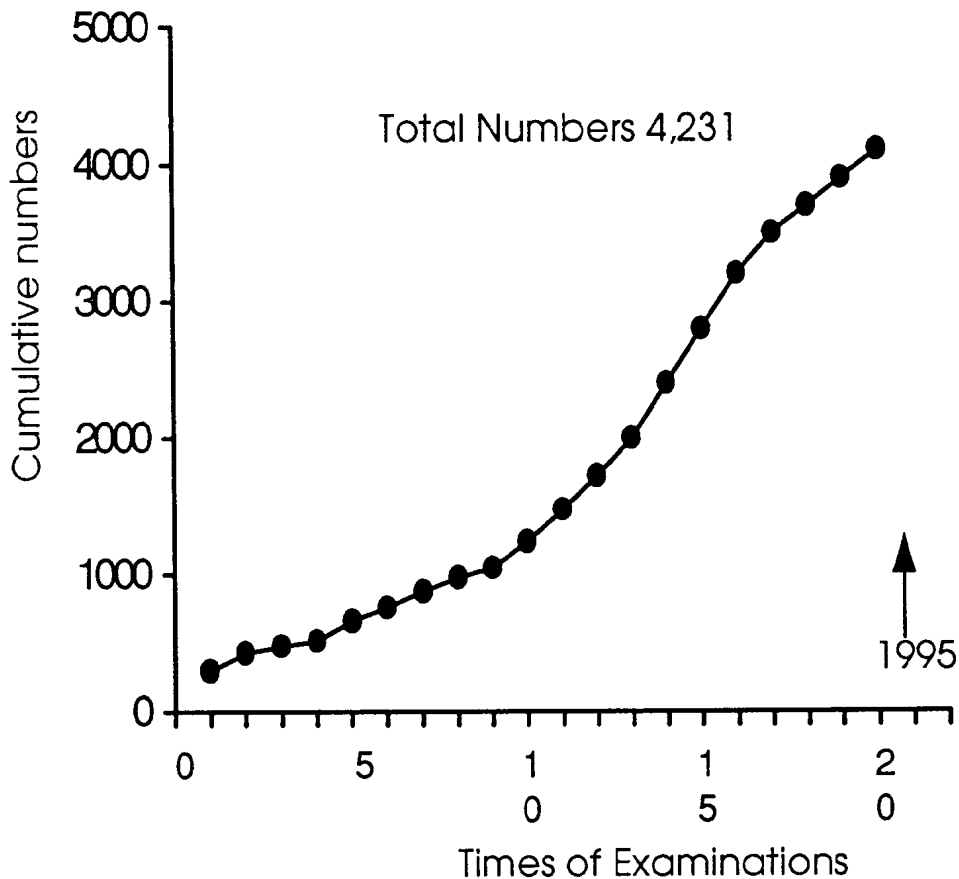


Figure 3 - Annual numbers of newly certified neurosurgeons



The average number is 141 per year

Figure 4 - Cumulated numbers of certified neurosurgeons - totalling 4,231



Neurosurgeons

The Japan Society of Neurosurgery has a certification system for neurosurgeons. It started in 1966, with the first Board Examination in 1967. This is the second oldest Board certification in Japan, behind anaesthesiology.

The qualifications for taking the examination are:

- more than six years' postgraduate training in clinical neurosurgery at authorised training hospitals, designated by the Society as having more than 100 neurosurgical operations a year, and at least two certified neurosurgeons
- the examinee should present a list of 100 personally operated cases.

The Board Examination consists of two written, and one oral examination.

Figure 3 shows the numbers of successful candidates each year, which indicates a steady increase until the 25th examination, and a slight decrease afterwards. The average numbers are about 140 per year. The rates of successful candidates have remained constant in the past 20, at an average of 65.7%. The cumulative number of authorized neurosurgeons is 4,231 at present (Figure 4).

Paediatric neurologists

The Japan Society of Paediatric Neurology started its system of authorising paediatric neurologists in 1991. The Board Examination is now at the preparation stage, and will be introduced in 1996.

Discussion

Board certification of medicine specialties is relatively new in Japan. It started first for anaesthesiologists in 1963, whose competence relies on distinct technical capabilities and clinical experience. The system was introduced because general surgeons practising anaesthesia often created problems due to their inability to use new and sophisticated devices. It was successful, and neurosurgery promptly followed suit.

However, when the Japan Society of Internal Medicine attempted to introduce a board certification, they encountered strong objections by the Japan Medical Association, representing the majority of general practitioners.

The Government was always reluctant to authorise certification systems, and refused to give any privileges - job guarantees, health insurance remuneration, or a monopoly on some highly technical practices - to certified physicians.

Nevertheless, the board certification systems have enjoyed much success.

The decline in general practice provoked concern among the public, especially in rural areas. The concept of a specialist in "home medicine" has been proposed, but

remains controversial - even though it is widely recognised as important for improving the nationwide system of primary care.

Young physicians are still highly oriented towards becoming specialists. However, some specialties are already "full", and discourage candidates (as seen in Figure 3 for neurosurgery). But, neurologists and paediatric neurologists are still in demand.

Research System and Funding for Neuroscience in Japan

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Keywords: Research system. Fund. Neuroscience. Japan

Introduction

In 1990, former US President George Bush promised increased support for brain research. That was really the dawn of the "Decade of the Brain" - which has since expanded all over the world. In Japan however, there was no actual movement supporting this initiative. Therefore, it is relevant to discuss briefly the situation regarding the research system and funding for neuroscience in Japan. The data presented here are collected largely in 1993.

Institutes and researchers

Research in the field of neuroscience is mainly performed at the university departments or university institutes. However, there are several non-university institutes where some neuroscientific research is actively conducted: the National Physiology Institute of the Ministry of Education, Science and Culture, Monbu-sho, MESC, the National Center of Neurology and Psychiatry, and the National Institute of Longevity Sciences, (the Ministry of Health and Welfare, Kohsei-sho, MHW), the RIKEN (the Science and Technology Agency, Kagaku-gijutsu-cho, STA) and the Electrotechnical Laboratory (the Ministry of International Trade and Industry, susan-sho, MITI).

Moreover, several local government authorities have their own research institutes with neuroscience sections, such as the Tokyo Metropolitan Institutes for Neuroscience Psychiatry and Gerontology, Osaka Bioscience Institute, etc. In addition, there are a few private institutes undertaking neuroscience research, such as Mitsubishi-Kagaku Life Science Institute.

Although it is difficult to know the exact number of neuroscience researchers in the field in Japan, there are estimated to be more than 3,000 researchers who are active neuroscientists. This is about a tenth of the number in the US.

Funds

There are no official figures available showing the funds spent on neuroscience research in Japan. Indeed, it is impossible to estimate the amounts which private companies, mostly drug companies, provide to the institutes.

However, it is possible to make some calculation by examining various reports and documents published by the Government. But the budgets shown here do not include salaries for full-time workers. Table 1 shows the funds from MESC to the neurosciences in 1993. Of the total budget of 992 billion yen for promotion of science and technology, 1,500 million Yen (approx. 2.3%) was shared between neurology and neuroscience. More than 75% of this amount was grants for priority areas, and among the selected projects were The Higher Function of the Brain, Pain Mechanisms, Mechanism and Protection of Neuronal Cell Death, Combating Ageing.

Table 1 - Budgets for promotion and science and technology, Ministry of Education, Service and Culture

	Total	Neurology and neuroscience (%)
Grants for specially promoted research	24.000	150 (0.61)
Grants for scientific research	472.000	200 (0.04)
Grants for priority areas	16.000	1.150 (9.40)
Total	512.000*	1.500 (0.30)

Million Yen, 1993

* 6.5% of all research-related budgets of MESC

Table 2 shows the funds from MHW towards the promotion of science and technology in general in 1993. Approximately, 1,000 million Yen (4.4% of the total budget) went to neurosciences. Some 60% of this amount was in grants for neurological and psychiatric disorders distributed through the National Center of Neurology and Psychiatry.

Table 2 - Budgets for promotion of science and technology, Ministry of Health and Welfare

	Total	Neurology and neuroscience (%)
Grants for research of selected intractable diseases	14.000	200 (1.4)
Grants for research on aging	9.000	200 (2.2)
Grants for neuropsychiatric disorders	600	600 (100)
Total	23.600*	1.400 (5.9)

Million Yen, 1993

* 37% of all research-related budgets of MHW

For MESC and STA, the funding of individual and grouped research projects is part of their administrative activities. The funding systems is similar to that in other developed countries in terms applications, evaluation and awarding grant.

Other Ministries and agencies entrust research and technical developments to outside individuals or groups. Their funds are mainly given to an established research group, and it is the chairman of the group who distributes the monies to the various researchers. He is responsible to the Ministry or agency, who select the group members, set the research aims, and report the results, usually on the annual basis.

This system characterises research collaboration in Japan, and is highly effective in promoting a specific project in a given timeframe.

The situation concerning funds from STA is shown in Table 3. Approximately 5.3% of the budget for science and technology was for neuroscience. However, nearly 77% of this went to researchers abroad, through an international fund named Human Frontier Science Program (HFSP). Most of STA's domestic funding for neuroscience was to RIKEN.

Table 3 - Budget for promotion of science and technology, Ministry of International Trade and Industry

	Total	Neurology and neuroscience (%)
AIST	124.700	170 (0.14)
HFSP	2.500	1.550 (62.0)
Total	127.200	1.720 (1.40)

Million Yen, 1993

* % of all research-related budgets of MITI

Finally, Table 4 shows the situation with MITI. Most of its support for neuroscience was for HFSP.

Table 4 - Budgets for promotion of science and technology, Science and Technology Agency

	Total	Neurology and Neuroscience (%)
ERATO	13.900	0 (0)
RIKEN	2.100	660 (31.4)
HFSP	2.300	2.270 (98.7)
Total	18.300	2.930 (16.0)

Million Yen, 1993

* % of all research-related budgets of STA.

The total amount of Government support for neuroscience research is incredibly small when compared with the support for cancer research.

However, in the last couple of years, the situation has become a little more favourable. For example, one neuroscience research group was selected as "the Centre of Excellence", and supported with large funding by MESC. A new project on molecular analysis of neural development and transmission was launched by STA. In addition, it should be mentioned that the Basic Law for Science and Technology was established at the end of 1995, making it possible for each Ministry to increase their budget for science and technology in general, including neuroscience.

The Prospects for Welfare for the Handicapped

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Keywords: Disability. Impairment. Welfare. Law for the welfare of physically disabled persons. National pension law.

Introduction

Japan's welfare services are not provided specifically for neurological diseases. But patients are entitled to them for impairments and disabilities caused by these diseases. Welfare is not cause-oriented, but consequence-oriented.

This Chapter reviews the current situation of physically disabled persons, and also outlines the welfare services for them.

Current situation

According to the survey carried out by the Ministry of Health and Welfare in 1991, there are an estimated 2,722,000 physically disabled persons aged 18 and over, and 81,000 under 18 in Japan.

The survey showed there were 1,553,000 (57.1%) with disability in their limbs, 358,000 (13.2%) with hearing and/or speech disorders, 353,000 (13.0%) with visual impairments, and 458,000 (16.8%) with internal disorders. Among those under 18, there were 48,500 (59.9%) with disability in their limbs, 17,500 (21.6%) with internal disorders, and 11,200 (13.8%) with visual impairments.

Some 63 percent of the physically disabled are 60 and over. The number of disabled persons increased by 309,000 in 1991, compared with the number surveyed in 1987 - because people with internal disorders affecting their bladder, rectum, small intestine and other internal organs were newly included.

Definition of physically disabled persons

The Law for the Welfare of Physically Disabled Persons defines physically disabled persons as "those who have physical disabilities listed in the annexed table of this Law, and who have the Physically Disabled Person's Certificate issued by the prefectural governors". This certificate indicates the severity of the carrier's impairment by Grades 1 through 7 (Table 1).

Assistance provider

Welfare service administration for physically disabled persons is implemented in Japan in accordance with national laws and regulations by prefectural and municipal governments (Table 2, Figure 1).

Welfare services for physically disabled persons

The measures taken for physically disabled persons before 1949 were mainly geared toward alleviating the poverty of those who were disabled, or to provide assistance to soldiers who suffered physical disability in war.

But since the Law for the Welfare of Physically Disabled Persons was enacted in 1949 and enforced in 1950, the Government has gone further, and expanded welfare services to everyone with physical disabilities (Figures 2, 3).

The major challenge in the field of social welfare for physically disabled persons is to create an environment in which they can live a normal life at home in their own communities.

This requires both promoting the government-provided social welfare services, and also implementing comprehensive measures to raise public awareness, improve health and medical services, increase education and employment opportunities, and provide a better living environment all-round.

Various Governmental agencies are involved in a wide range of activities to meet these objectives.

Pension insurance

The insurance system provides pensions to cover old age and disability. With the enactment of the National Pension Law in 1959, the entire population of Japan became eligible for coverage.

There are three types of basic pensions:

- the old age basic pension (available at 65, when insurance premiums have been paid over a period of 40 years). The monthly payment is 65,458 Yen from the beginning of 1995.

Table 1 - List of degrees of physical disability

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7
Visual Impairment	Visual acuity less than 0.01 with correction on International vision test Chart	Visual acuity less than 0.04 (bilateral)	Visual acuity less than 0.08 (bilateral)	1. Visual acuity less than 0.12 (bilateral) 2. Visual field diameter 5' or less of both eyes	1. Visual acuity less than 0.2 (bilateral) 2. Visual field diameter 10' or less of both eyes 3. Visual field defect more than 50%	Visual acuity less than 0.2 (bilateral), limited one eye less than 0.02 and the other of visual acuity less than 0.6.	
Hearing Impairment		More than 100 dBHL in each ear	More than 90 dBHL in each ear	1. More than 80 dBHL in each ear 2. Less than 50% on hearing intelligibility		1. More than 70 dBHL in each ear 2. One ear more than 90 dBHL, the other more than 50 dBHL	
Para-equilibrium			Difficulty of gait		Difficulty of fall under eye mask		
Voice, Speech and Language Disorders			No voice, no speech or no language	Difficulty of voicing, speech or language			
Upper Limb Impairment	1. Total function loss, bilateral 2. Amputation above wrist, bilateral	1. Severe function loss, bilateral 2. Amputation of five fingers, bilateral 3. Amputation above half length of humerus, unilateral 4. Total function loss, unilateral	1. Amputation of thumb and index finger, bilateral 2. Complete function loss of thumb & index finger, bilateral 3. Severe function loss, unilateral 4. Amputation of five fingers, unilateral 5. Complete function loss of five fingers, unilateral	1. Amputation of thumb, bilateral 2. Complete function loss of thumb, bilateral 3. Complete function loss of one of shoulder, elbow or wrists joint, unilateral 4. Amputation of thumb or index finger, unilateral 5. Complete function loss of thumb and index finger, unilateral 6. Amputation of three fingers including thumb or index finger, unilateral	1. Severe function loss of thumb, bilateral 2. Severe function loss of one of shoulder, elbow or wrists joint, unilateral 3. Amputation of thumb, unilateral 4. Complete function loss of thumb, unilateral 5. Severe function loss of thumb and index finger, unilateral 6. Severe function loss of three fingers including thumb or index finger, unilateral	1. Severe function loss of thumb, unilateral 2. Amputation of two fingers including index finger, unilateral 3. Complete function loss of two fingers, including index finger, unilateral 4. Severe function loss of two fingers including index finger, unilateral 5. Amputation of middle, third and little fingers, unilateral 6. Complete function loss of middle, third and little fingers, unilateral	1. Mild function loss, unilateral 2. Mild function loss of one of shoulder, elbow or wrists joint, unilateral 3. Mild function loss of hand and fingers, unilateral 4. Severe function loss of two fingers including index finger, unilateral 5. Amputation of middle, third and little fingers, unilateral 6. Complete function loss of middle, third and little fingers, unilateral

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	
Lower Limb Impairment	<ol style="list-style-type: none"> Total function loss, bilateral Amputation above half length of thigh, bilateral 	<ol style="list-style-type: none"> Severe function loss, bilateral Amputation above half length of tibia, bilateral 	<ol style="list-style-type: none"> Amputation above Chopart joint, bilateral Amputation above half length of thigh, unilateral Complete function loss, unilateral 1. 	<ol style="list-style-type: none"> Amputation of five toes, bilateral Complete function loss of five toes, bilateral amputation above half length of tibia, unilateral Severe function loss, unilateral Complete function loss of hip or knee joint, unilateral Abnormal shortness of one leg more than 10 cm or 10%, unilateral 	<ol style="list-style-type: none"> Severe function loss of hip or knee joint, unilateral Complete function loss of ankle, unilateral Abnormal shortness of one leg more than 5 cm or 6.7%, unilateral 	<ol style="list-style-type: none"> Amputation above Lisfranc joint, unilateral Severe function loss of ankle unilateral 	<ol style="list-style-type: none"> Severe function loss of five toes, bilateral Mild function loss, unilateral Mild function loss of one of hip, knee or wrists joint, unilateral Amputation of five toes, unilateral Complete function loss of five toes, unilateral Abnormal shortness of one leg more than 3 cm or 5%, unilateral 	
Bodily Dysfunction	No sitting balance	<ol style="list-style-type: none"> Difficulty of sitting or standing position Difficulty of standing up movement 	Difficulty of 100m gait		Difficulty of 200m gait			
Cardiac Disorders	Limitation of daily living (bedridden)		Limitation of daily living (indoor living)	Limitation of outdoor activities				
Renal Disorders	Limitation of daily living (bedridden)		Limitation of daily living (indoor living)	Limitation of outdoor activities				
Respiratory Disorders	Limitation of daily living (bedridden)		Limitation of daily living (indoor living)	Limitation of outdoor activities				
Bladder or Rectal Disorders	Limitation of daily living (bedridden)		Limitation of daily living (indoor living)	Limitation of outdoor activities				
Small Intestinal Disorders	Limitation of daily living (bedridden)		Limitation of daily living (indoor living)	Limitation of outdoor activities				

(Notes)

- In case a person has two impairments listed in the same grade, his grade is to be one grade severer, except that two impairments are specifically described as double impairments.
- In the categories of upper and lower limb, the person who has two impairments in grade 7 is considered as grade 6.
- In case a person has two impairments in different grades, his grade is to be decided upon the opinion of the Local Council for Social Welfare.
- *Amputation of finger* means amputation above IP joint of thumb, and above PIP joint of other fingers.
- *Function loss of finger* means the impairment below MP joint, and in case of thumb, opponant motion is included.
- The length of amputation stump is the practical length measured from underarm in upper limb, and from sciatic tuberosus in lower limb.
- The length of lower limb is to be measured from spina iliaca anterior superior to medial malleolus.

Table 2 - Rehabilitation measures carried out by the Ministries in Japan

Name of Ministries	Field	Content
Prime Minister's Office	Comprehensive coordination	General secretarial work as headquarters of promotion of measures of disabled persons
Ministry of Finance	Tax reduction and crediting (national tax)	Income tax, income tax credit Commodity tax, automobiles and others used by disabled persons Juridical persons tax, sheltered workshop for the physically disabled persons Tariff, technical devices and others specifically made for the disabled persons Inheritance tax, until reaching the age of 70 Donation tax, leaving a property in trust based on the contract of trust for special rearing of the disabled persons.
Ministry of Education	Special Education Higher Education, etc.	School for the blind, school for the hearing impaired, school for the physically and mentally handicapped Setting up special place for examination, providing attendants, etc.
Ministry of Health and Welfare	Social Welfare Pension, medical care	Welfare for physically disabled persons (and children), care for war veterans, and for the bereaved families Employees' pension, national pension, health insurance, etc.
Ministry of International Trade and Industry	Development of social welfare related technical devices	Research and development of various kinds of medical and social-welfare-related technical devices
Ministry of Transport	Discount of transportation fee Public transportation measures	Discount of transportation fee of railway, buses, and toll highways Altering railways and airways (for wheelchair access, and for the blind)
Ministry of Post and Telecommunications	Reduction and credit fees	Reduction and credit of National Broadcast Association TV fee, Free of Charge of braille mail, Reduction of usage fee of telephone machines
Ministry of Labour	Employment measures Industrial accidents Financial loans for purchasing technical devices	Promotion of employment of the physically disabled persons Vocational training of the physically disabled persons Insurance for the computerisation of industrial accidents Renting worprocessors, etc. for the blind
Ministry of Construction	Housing measures, public facilities measures	Public housing for the physically disabled persons, improving public buildings, and roads, prioritizing for getting into public housings Reduction of fees for using toll highways
Ministry of Home Affairs	Reduction and Crediting of tax (local tax)	Inhabitants' tax and income tax credit Enterprise tax related to massage and acupuncture for the severely disabled persons Auto tax for light mobiles and purchase of automobiles Property gain tax, fixed property tax, non-taxation, reduction and crediting of enterprise tax
Ministry of Police	Traffic safety measures	Setting up traffic signals for the blind for road traffic safety measures
Ministry of Justice	Bar examination	Providing law materials in braille for examination purposes

Figure 1 - Systems for welfare in Japan

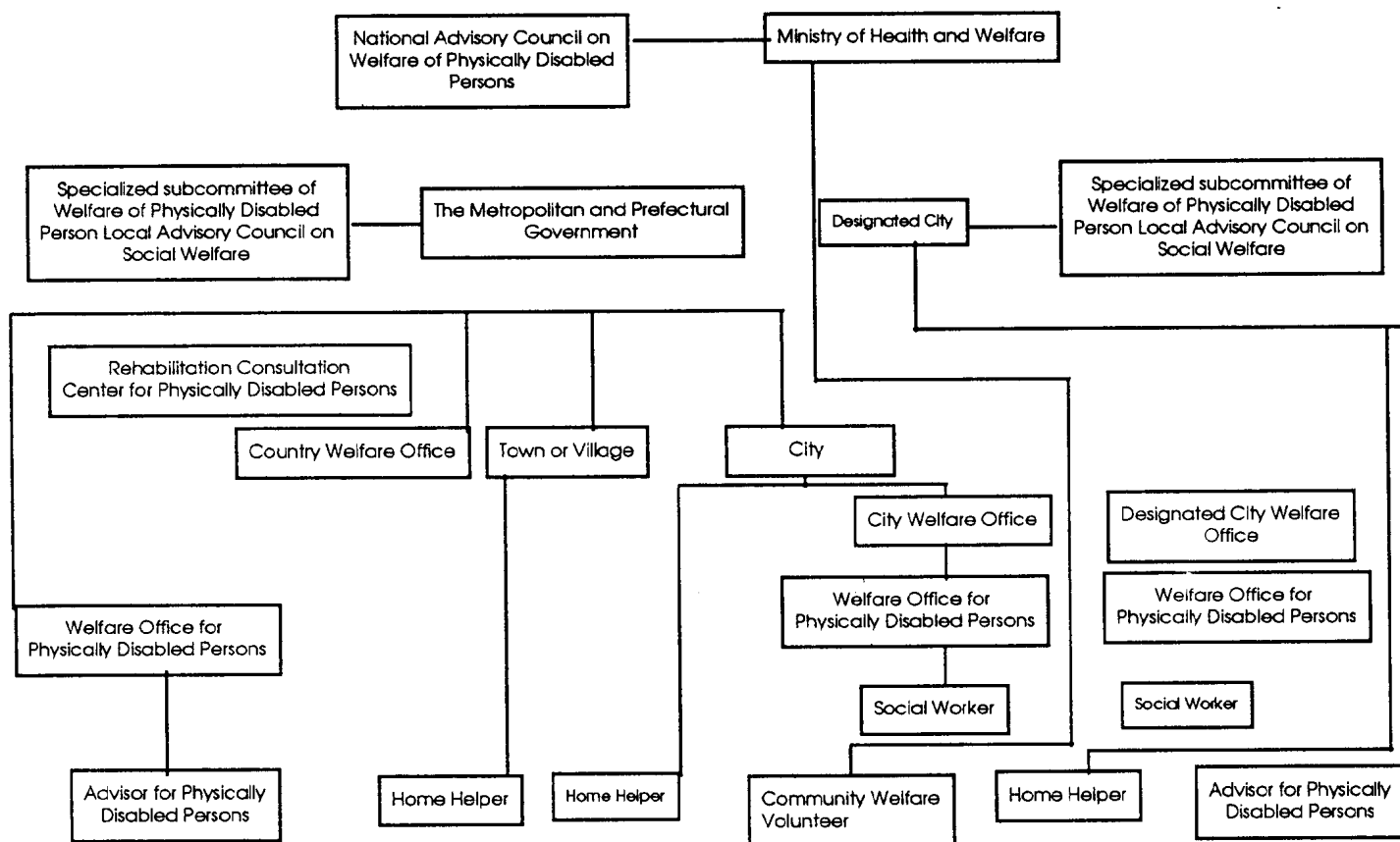


Figure 2: Outline of Welfare Measures for the Physically Disabled Persons - 1

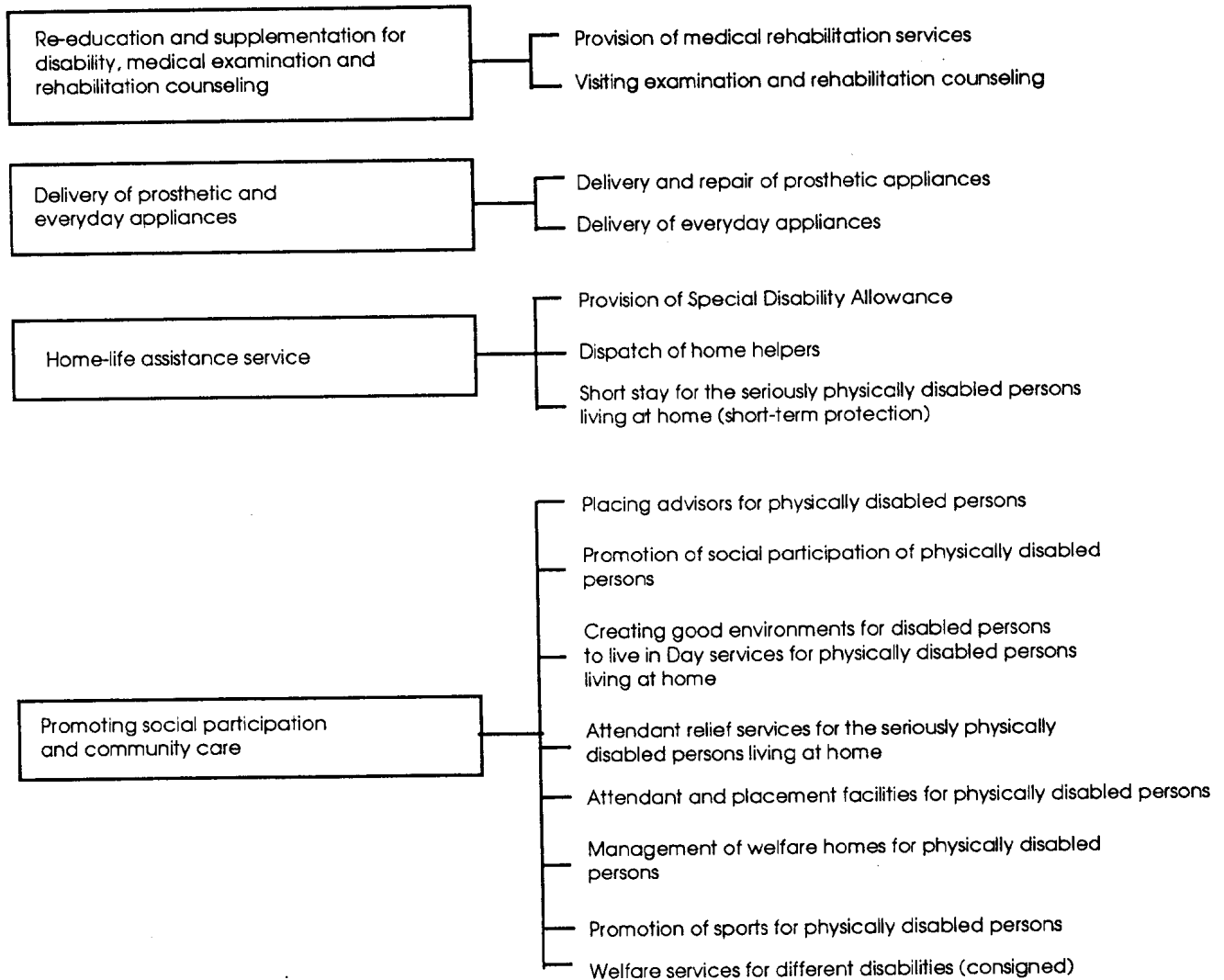
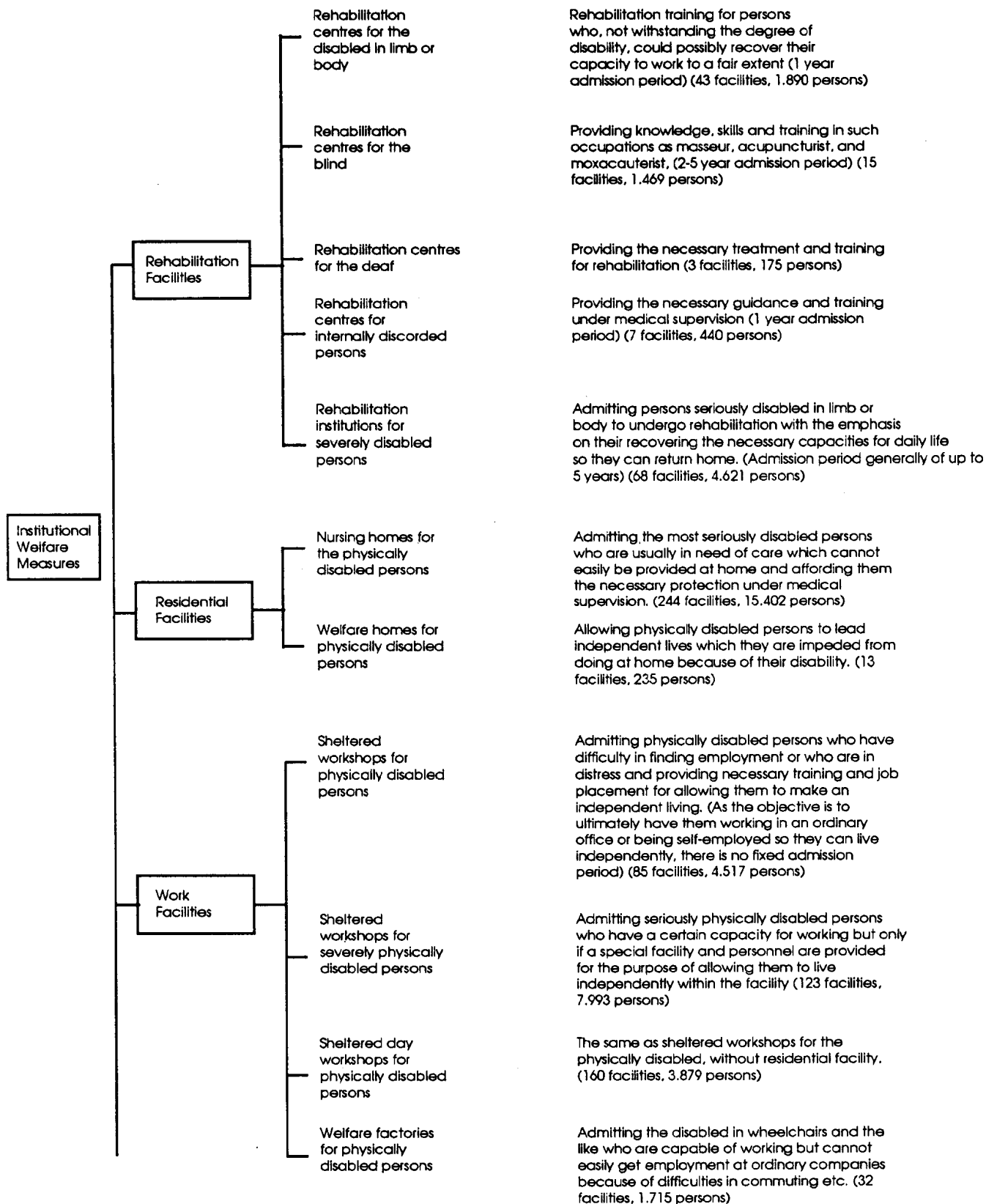
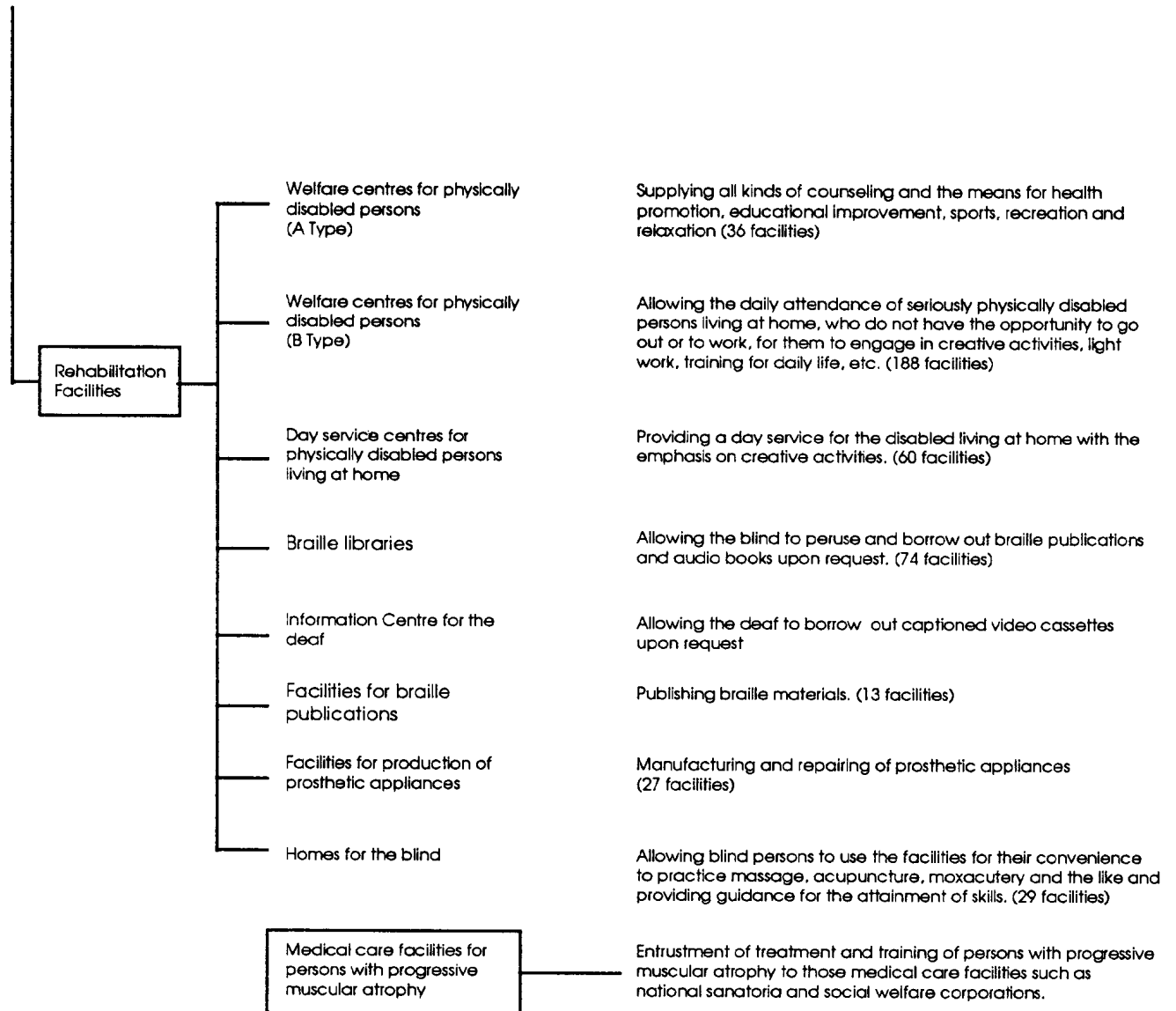


Figure 3: Outline of Welfare Measures for the Physically Disabled Persons - 2





N.B. The figures in brackets for facilities and persons are as of 1 October 1993.
 Source: "Social Welfare Facilities Survey". Statistics and Information Department,
 Minister's Secretariat, MHV

- the basic disability pension. The monthly amount varies depending on the degree of disability (it is 81,825 Yen for the 1st Grade. There are additional allowances for dependent children.
- the bereaved family basic pension (for children of the insured of 18 age or younger and the child's mother with the same means of living). The monthly payment is 65,458 Yen.

Public assistance

The public assistance system is designed to support needy families, and covers about 70,000 disabled persons.

Public assistance is provided to supplement the shortfall between the minimum income it is calculated a family needs - set according to the age, composition of the household, and the region of residence - and a family's actual income.

For example, the minimum living expenses for a person aged 35 with severe physical disability is 120,920 Yen. Additional support is provided to meet the expense of housing and medical services.

Conclusion

In Japan, The Long-Term Programme for Government Measures for Disabled Persons" was adopted following the United Nations Decade of Disabled Persons (1983 - 1992).

Under this programme - its theme is "Towards a Society for All" - the Government is promoting measures in eight basic policy areas: public awareness, education and nurture, employment and work, health and medical services, welfare, living environments, sports, recreation and culture, and international cooperation.

The Ministry of Health and Welfare has taken measures to promote disabled persons' independence and participation in society. They include: providing support services for persons with severe disabilities living in the community, improving communication methods for persons with visual and/or hearing disabilities, and making buildings and transportation accessible.

Some patients with neurological diseases are included in the category of physically disabled persons. But, the chronically ill, including patients with neurological diseases, also need more welfare services. This is a priority for the future.

The Present Situation and the Policy of the Tokyo Metropolitan Government for Neurological Diseases

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Keywords: Neurological diseases. Policy. Municipal Tokyo Government. Regional Service. Research

Introduction

In addition to the measures enacted and enforced by the national Government, there are additional measures introduced and funded by the prefectural governments. Japan has 47 prefectures, the Tokyo Metropolis being the largest.

Intractable diseases

Intractable diseases designated by the Tokyo Government

Neurological diseases are dealt with in the framework of the national Government's policies against "Intractable Diseases". Beginning with a system called "Public Payment of Medical Expenses for the Patients with Intractable Diseases" in 1972, the government has developed various measures for helping those patients (Chapter 39).

Intractable Diseases are defined as diseases for which there is no known etiology nor effective cure, whose courses are chronic and unstable with little prospect of recovery, and which require long-term care, and thus overburden the patients and their families, both psychosocially and economically.

In addition to the 38 Intractable Diseases designated by the national government, the Tokyo Metropolitan Government (TMG) has designated 17 additional diseases, and will add one more in 1995. Of the total 55 "Intractable Diseases" (as of January 1, 1995), 18 are neurological, shown in Table 1.

Table 1 - Registered patients with rare neurological Intractable Diseases, 30 June 1995, Tokyo metropolitan area

Diseases	Registered patients
Multiple sclerosis	428
Myasthenia gravis	817
Subacute myelo-optico-neuropathy (SMON)	165
Amyotrophic lateral sclerosis	175
Spino-cerebellar degenerations	723
Parkinson's disease	4,174
Primary amyloidosis	28
Ossification of the posterior longitudinal ligament	1,430
Huntington's chorea	27
Cerebrovascular moyamoya disease	384
Shy-Drager syndrome	33
Multilevel spinal canal stenosis	59
Lipidosis*	8
Phacomatosis*	398
Myotonic syndrome*	99
Progressive supranuclear palsy*	30
Mitochondrial encephalomyopathy*	36
Hereditary neuropathy*	8

* Designated by the Tokyo Metropolitan Government

Of these 18, 12 are nationally designated, and six are designated by TMG. The total number of patients with these diseases was 8,809 in June 1995. As shown in Table 1, Parkinson's disease accounts for the largest number, 4,174, among patients with neurological Intractable Diseases in Tokyo. The total number of the patients with any of the 55 Intractable Diseases (neurological, collagen, others) in Tokyo is approximately 63,000. About 15% of them have neurological disorders. TMG's policies for the Intractable Diseases include public payment for medical expenses, support for home care, establishment of medical institutes, promotion of survey and research.

Outline of the policies of the Tokyo Metropolitan Government

Besides nationally-based services, there are optional, additional prefectural services. This section discusses these policies.

Reduction of burden of medical expenses by public payment

In 1972, TMG began a system of public payment for medical expenses against Intractable Diseases. Medical expenses not covered by the national health insurance are subsidized through additional support by TMG.

A committee called "The Inspection for Confirming Intractable Disease Patient" assesses and acknowledges patients who are eligible to apply for this help. In the 1993 fiscal year, the subsidy for medical expenses was 5,989 million Yen for all Intractable Diseases. The subsidy for neurological diseases was 570 million Yen.

Support system for home patient with the intractable diseases

TMG makes various services available to patients with Intractable Diseases. The public health centres play a major role in coordinating them, and providing professionals to support home patients (Chapter 35).

Home nursing and consultation

TMG supports patients with Intractable Diseases and their families through providing consultation by visiting public health nurses from regional public health centres. Dietitians and physical therapists join the nurses when necessary.

In addition, clinical consultations by specialists are available, and rehabilitation programmes for patients with Parkinson's disease are provided at the public health centres.

Medical consultation for home patients

Patients who become immobile or bed-ridden have difficulties in visiting hospitals. TMG, in cooperation with the Tokyo Medical Doctors Association, sends medical teams of specialists, primary care physicians and nurses to visit them, about four times a year. Throughout Tokyo, 407 patients received this service in the 1994 fiscal year, and 368 (90.4%) were patients with neurological diseases.

Emergency hospitalisation of home patients with intractable Disease

This system enables home patients to be admitted temporarily to hospital, when their family care-givers cannot take care of them for any reason. The period of hospitalisation is basically one month, with an upper limit of three months. Ten beds are reserved for this purpose. TMG plans to keep one bed in each of the twelve health care areas.

In the 1994 fiscal year, 76 patients (69 with neurological diseases) used this service.

Medical equipment lending for home patients

TMG lends the home patients ultrasonic nebulisers and mechanical aspirators, combining this with the weekly home nursing service. In July 1995, about 200 patients benefitted from this service.

Subsidy for purchasing mechanical respirators

When a medical institution takes care of a patient kept under in-home mechanical ventilation, TMG partially supports the cost through a subsidy to purchase the respirator. This promotes a shift from hospital to home care of such patients.

Medical consultation for Intractable Diseases

Through a commission with Tokyo Medical Doctors Association, a team of medical experts, public health nurses and case workers give consultations on medical and nursing care to the patients and the family members once a month.

Emergency report system for seriously disabled home patient

The regional cooperation system quickly provides assistance to home patients, who live alone and are seriously disabled, when they fall into emergency situations. They can call for help by radio.

Seminars on medical and nursing care for the patients with Intractable Diseases

TMG holds seminars to provide the latest medical knowledge on the Intractable Diseases to physicians, nurses and public health nurses who are engaged in diagnosing, treating, nursing and advising home patients.

Research institutes, survey, etc

TMG has founded the

- Tokyo Metropolitan Neurological Hospital (300 beds), which specialises in treating and investigating neurological diseases
- Tokyo Metropolitan Institute for Neuroscience (TMIN), for basic and applied research activities in neuroscience and neurological diseases.
- Tokyo Metropolitan Institutes for Psychiatry, Gerontology, and Clinical Research, where neurology is also a major target of investigation.

TMG has conducted fact-finding inquiries into the situation of patients and medical institutions, and medical-sociological surveys on the patients and their family environments. These surveys have been used as basic material to develop policies for the Intractable Diseases. TMG also funds research work in medical schools and medical research institutes, on the diagnosis and treatment of the Intractable Diseases and on basic policies.

Some future actions

Measures against neurological Intractable Diseases include;

1. Improving home care system

This is the most important area requiring further effort. The socio-medical environment for home care for the patients is not yet secure enough. Since there are many neurological diseases that physically handicap patients, and eventually limit their activities in daily life, it is necessary to improve nursing services for home care. TMG is studying new measures for better support in home nursing care. There is a strong demand for reserved beds for emergency hospitalisation.

2. Increase the number of diseases approved as the Intractable Diseases.

TMG is making efforts to designate more diseases as intractable. Creutzfeld-Jacob disease will be designated in the 1995 fiscal year.

3. Countermeasures against natural calamities

In Tokyo, measures against natural calamities are an urgent priority. TMG is investigating how to deal with home patients with neurological diseases when a disaster strikes.

Century of the Brain in Japan

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Introduction

Understanding exactly how the brain works - the higher cortical function, cognition, memory, emotion, etc. - now represents one of the greatest challenges to science.

Neuroscience has made unprecedented progress based on the rapid advances in physiochemistry, life sciences and information science - as well as thanks to modern sophisticated technologies created by molecular genetics and noninvasive image analyses using MRI, PET and other techniques.

As a result, clinical researchers now have greater insight, and ability to explore pathomechanism, and to propose preventive measures and treatment of various "Intractable Nervous and Psychiatric Diseases" (Chapter 39).

However, the solution to the major brain-related medical and psychiatric problems remains difficult. The brain is composed of millions of neurons and glia, integrated into an enormous number of complicated networks. We have yet to unravel the brain's mysteries.

Brain research in the United States and Europe

The US Congress designated the decade beginning January 1, 1990 as the "Decade of the Brain" and the then President, George Bush proclaimed a national research project. This enthused both industry and society, and resulted in an increase in research funds.

Stimulated by the US initiative, the first five year plan for a "European Decade of the Brain Research" programme has been proposed in European countries.

Brain research in Japan

In Japan, there have been a number of active research projects into the brain. The majority have been accomplished by universities, national and private research institutions independently. The Government, in particular the Ministries of Education, Science and Culture, Health and Welfare, Science and Technology, and International Trade and Industry have expressed their strong support for promoting brain research in Japan.

Japan has also taken the leadership role in establishing the International Human Frontier Science Programme - which includes basic research into brain functions as one of its main projects.

One important point: because most of the research into the brain in Japan has so far been conducted independently in universities or institutions, it has not been carried out in a systematic manner.

The brain research programme provided by Ministry of Health and Welfare

The Ministry of Health and Welfare's brain research programme is the one most directly connected to the welfare of patients suffering from various nervous and mental disorders.

People are living longer the world over, but especially in Japan. Senile dementia is an urgent problem, academically as well as economically and socially.

In general, nervous and mental disorders are characterized by relatively early onset, protracted clinical course and difficulty in treatment. The number of hospitalised patients is reaching 300/100,000 population - higher than for other chronic diseases, e.g, three times more than cancer, and twice that for cardiovascular diseases.

National health expenditure reached approximately 20 trillion yen in fiscal 1991 - 20 % of which was spent on nervous and mental disorders. With total medical costs rising to 24 trillion yen in fiscal 1995, five trillion yen would be the cost of caring for patients with nervous and mental disorders. Overcoming these devastating disorders is imperative for economic reasons, as well as for relieving the pain and suffering of patients, and removing the social prejudice against them.

The strategic perspective of neuroscience in Japan

Neuroscience has only been an independent, integrated discipline in Japan since as recently as the 1970s. Unlike other biomedically oriented disciplines, it is not solely biomedical, but is at the intersection of biology, computer science, humanities, and sociology.

As in the US and Europe, neuroscience is the most rapidly growing area of research among all the sciences in Japan. This is confirmed by the annual increase in the number of scientific publications, demands on University courses and professional training in this area.

In the past, the complexities of the brain have defied scientific attempts at analysis. However, the explosive advances in some of the physiological sciences,

technologies and biological sciences have provided neuroscientists with new, badly-needed tools. The most important ones include molecular biologies, identifying the cause of the diseases at gene level, and noninvasive image analysis using MRI, MRS, SPECT, PET etc.

The priority now is to set up a strong framework to ensure that further research is conducted efficiently and productively. This will create a major breakthrough in the study of both normal and pathological processes of the brain. Indeed, both basic and applied research contribute to a better knowledge and understanding of how the brain functions. This is the basis for exploring new preventive and curative treatments of various nervous and mental diseases.

It is important to establish a nationwide research resource centre for both basic and clinical research. Its role should be to inquire into the mechanism of unknown nervous and mental disorders, maintain a constant flow of research resources, e.g, biopsied muscle specimens, autopsied materials, DNA of the patients - and make them available to researchers in Japan, and in other countries.

It is also essential to find the right animal models for human diseases. The most useful ones are those with an etiology identical to that of human disease. Of course, we should pay keen attention to animal models in naturally occurring mutants. But, based on the recent remarkable progress in molecular technology, we could now obtain genetic information on some of the human brain diseases at the DNA level. This technology has also made it possible to produce transgenic mice with human disease gene, or remove the specific gene responsible for the genetic human brain diseases.

The research budget needs to be increased. The total Government-funded research budget for neuroscience in Japan is estimated to be 4 billion yen. In the US, it is reported to be 60 to 100 billion yen annually. Similarly, whereas Japan has about 5,000 neuroscientists, there are 25,000 in the US. Thus, Japan is being left far behind the US in both research spending and the number of researchers.

At the same time, we need to create the right research environment to attract more young scientists.

Looking towards the future

The intellect and energy of well-trained scientists and research clinicians are essential to developing a new approach to identifying and explaining the mechanisms of diseases, and to treating them.

Of course, hardware is one of the necessary conditions for an attractive research environment. But software, or quality of research circumstances is more important in attracting young, promising scientists. A young scientist must be assured of reasonable financial security, as well as the intellectual satisfaction that comes during research.

Aspiring scientists also need to know there will be resources available to support their efforts.

Brain research is a subject of universal importance in the 21st century. Modern research in neuroscience is becoming more and more complex, requiring the collaboration of investigators all over the world.

To reach the final goal of the Century of the Brain, not only do we need individual research projects, which contribute their own unique, independent ideas: we also need to strengthen international collaborative studies by exchanging ideas and results.

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