

## Preamble

This series of technical briefs from Japan does not provide a prescription for making healthcare policies. Rather, it is meant to provide a systematic approach to healthcare policy formulation and simultaneously illustrate the complexity and dynamics of how healthcare policies affect each other. The intention is to provide a theory and concept of how our predecessors tackled the health issues of their time by understanding the dynamics at work.

Japan showed remarkable improvement in its health indicators over the years following World War II. However, arguably all of the seeds for this improvement had been established in Japanese society by the premodern era.

## The NINE Topics

We carefully chose topics that would illustrate that 1) many of the factors affecting the development and success of healthcare policy implementation have their origin decades, even centuries in the past; 2) many healthcare policies are interrelated, affecting each other's implementation and outcomes; and 3) the best method for improving healthcare policy development and implementation is by cultivating experts in policy formulation who have an intimate understanding of the issues. The topics highlighted in this series are shown in the table below:

<p><b>1. [Water coverage and infant diarrhea]</b> – The premodern origins of water sanitation as a means of preventing childhood illness [Access to potable water and good sanitation is universal in Japan. Historically, since the introduction of modern waterworks, water quality management and sanitation have been considered a priority in public health, and laws have been instituted to ensure a high standard of water quality. Improvements in water supply and quality management contributed greatly to the rapid decline of childhood diarrheal diseases and infant mortality rate.]</p>
<p><b>2. [Maternal and child health checkup programs and the Maternal and Child Health Handbook]</b> – Healthcare screening for maternal and child health using the Maternal and Child Health Handbook and follow-up system [There are many health check-up programs in Japan which are supported by legislation and funded publicly to ensure sustainability. These programs are multisectoral and are designed to service large populations. The MCH handbook ensures continuous record-keeping across MCH programs at the individual level and plays an important role in connecting the various health check-up programs]</p>
<p><b>3. [Newborn screening in Japan: more than 40 years of experience]</b> – Newborn screening programs to facilitate the identification and treatment of rare pediatric diseases. Controversies surrounding cost-effectiveness and access in clinical management Nationwide newborn screening (NBS) for congenital metabolic and endocrinological diseases was launched as a model project in Japan in the 1970's. Various diseases caused by inborn errors of metabolism are now targeted by NBS to enable better medical management through early detection. The adoption of cutting-edge analytical techniques is also improving the cost-effectiveness of the screening program.]</p>
<p><b>4. [Social welfare system for persons with disabilities and children in Japan]</b> – Social care system for patients with disabilities using handbooks to facilitate access to a wide range of public and private services [Laws governing services provided for people with disabilities in Japan have evolved over many decades and under various legal frameworks. A disability handbook system, and social welfare services cover the three categories of disability including physical, mental and intellectual disabilities. The amount and type of services provided is determined based on a detailed classification scheme. Initiatives towards community care are being advanced while the need for institutionalized care remains]</p>
<p><b>5. [Health financing system for children]</b> – Pediatric health care financing using co-payment to maintain optimal health care access [The Japanese healthcare system is paid for by national health insurance, and all patients, including children, pay a percentage of medical expenses incurred. Children with specific diseases are eligible for public medical expense benefits. The level of financial support for infants and children vary across local governments.]</p>

**6. [Reproductive Health/Rights and Family Planning in Contemporary Japan]** – Japanese responses to ethically challenging issues surrounding contraception, abortion, antenatal screening, and patient survival [The current abortion policy in Japan is the result of a challenging process involving a series of national debates among various stakeholders. Despite its legalisation under certain conditions, induced abortion has continued to decline. Contraception in Japan is managed primarily through the use of male condoms while fertilization treatments are now highly advanced and widely accessible.]

**7. [Achieving excellent perinatal health with a moderate cesarean section rate]** – Achieving low maternal mortality with minimal intervention among healthy pregnant women [Japan has achieved remarkable success in reducing maternal and infant mortality while maintaining a low cesarean section rate. This success is due to a host of factors including universal access to skilled healthcare, Japan's universal health insurance coverage and medical culture, the attitude of pregnant women, their family, and society regarding childbirth, and laws limiting medical malpractice litigation. In this regard, Japan has much to offer the world in terms of its experience in resolving healthcare issues and strategies for meeting future healthcare challenges.]

**8. [How Japan achieved one of the lowest neonatal mortality rates in the world]** – Achieving low perinatal mortality with minimal disability in very low birthweight/ preterm infants [Neonatal outcomes have improved in Japan through the unique management of very preterm infants in the NICU, collaboration between neonatologists and obstetricians, and linkage with the private sector for the development of life-saving devices. With very low rates of intraventricular hemorrhage and necrotizing enterocolitis, Japan has one of the lowest neonatal mortality rates worldwide.]

**9. [Maternal and Child Nutrition]** – Maternal and child nutrition: From food vouchers to the school lunch program for low-income populations as a priority in education and social policy [Nutrition programs targeting various life stages, including pregnancy, infancy, childhood, and adolescence, have been institutionalized in Japan for many decades. Backed by laws, each program remains functional and adaptable to changes in the nutritional needs of the Japanese people.]

## How to use the examples

We do not recommend that other nations copy Japan's healthcare policies or attempt to apply them without due consideration of the context specific to each nation. All the health policies described above have their own context and history. No individual can be credited with developing any of the policies single-handedly, nor has any single era seen the fruition of all our past efforts. In short, the policies described here represent the result of a gradual change; nothing can be achieved overnight. Moreover, a huge amount of information has not been described in the briefs due to limited space. However, we recommend the following steps when using the information presented here:

- Step 1: Identify the priority health issue(s) in your country.
- Step 2: Read the brief most relevant to the health issue(s) for your country.
- Step 3: Initiate a dialog on the topic with your Japanese counterpart.
- Step 4: Analyze the issue(s) you have identified in your country and consider the dynamics involved.
- Step 5: Identify upstream issue(s) to work toward practical solutions to the fundamental issues specific to your context.
- Step 6: Formulate model / pilot policies before attempting widescale implementation.

## Key messages

- Policy development and implementation are a continuous process conducted by a team of professionals.
- Understanding the dynamics of relevant factors and their effect on the process of policy formulation and outcomes is key to success.
- Japan is ready and eager to share its successes and failures in healthcare policies for women's and children's health with the rest of the world.



## Executive summary

- In Japan, the government department in charge of hygiene management has continuously been involved in managing the waterworks. This has led to the current emphasis on water-quality management in water-supply projects in public health.
- Improvements in water-supply distribution and management are a significant factor in the decline in the infant mortality rate and infant diarrheal diseases.
- Since water-quality management is costly, it needs to be appropriately reflected in the government's fiscal plan.

## The History of Waterworks in Japan

The oldest waterworks in Japan were constructed in the 1500s to draw water into a castle located in present-day Kanagawa Prefecture. Water was supplied mainly for drinking and was cleaned by filtering through coal and sand. Afterwards, a water system was constructed in Edo, the site of present-day Tokyo, during the regime of Shogun Ieyasu Tokugawa. With spring water as the source of the water system, a natural river was used to channel the water to a sluice gate and distributed it to various quarters of the city. In addition to being used for drinking, the water was used for irrigation in the outskirts of the city. The water carried and distributed through the natural downward flow was drawn into clean water wells located in various places for pumping. People drew the water at wells using buckets and other similar devices. In all of these waterworks, the water was collected from a source that was suitable for drinking, then conveyed and distributed within a castle town via the natural downward flow of the river. This system was used even after the Meiji Restoration (1868). The modern waterworks that are currently in place were introduced for the first time in Yokohama (in 1887), followed by the three urban prefectures and five port cities of Hakodate (1889), Nagasaki (1891), Osaka (1895), Tokyo (1898), and Kobe (1899). Other major cities followed suit.

## Water-supply distribution, \*the number of patients with waterborne communicable diseases, and infant mortality

The dissemination of waterworks was directly responsible for a significant decline in the cholera epidemics that began in the late 1800s. On the other hand, both the number of patients with waterborne communicable diseases affecting the digestive organs and the number of infant deaths remained high (Figure 1). However, after the introduction of chlorination into the waterworks of Tokyo in 1921, the number of infant deaths declined substantially. Although the number of patients with waterborne communicable diseases increased between

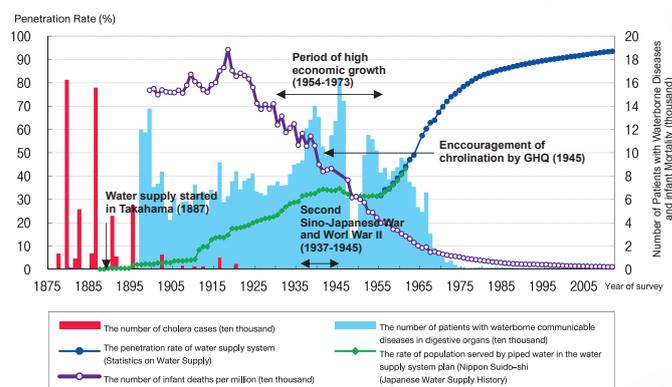


Figure 1. Water-supply distribution rate, number of patients with waterborne diseases, and infant mortality rate

Source: Water Resource Department and Disaster Management Bureau, Ministry of Land, Infrastructure Transport and Tourism, Water in Japan, "<http://www.mlit.go.jp/common/001044443.pdf>

1941 and 1945 when accurate statistics could not be collected due to the war, the number of patients markedly decreased after chlorination of the water supply was promoted by the GHQ (General Headquarters: 1945–1952), which was established by the Allied powers and led by the American government. Furthermore, in the Livelihood Improvement Program that began in 1951, employees of the prefectural government, the so-called life-improvement promoters, encouraged residents to adopt hygienic practices that led directly to improvements in public health. This initiative also included improving water-supply and wastewater processing facilities, which contributed to drastically improved the health of impoverished farmers.

\*In Japan, the distribution of the water supply is measured by its availability to the entire population of the country whereas in other countries, water distribution is measured locally.

## Number of Infant Deaths by Gastrointestinal Infectious Diseases

Until around 1950, diarrhea was the main cause of death in infants under one year old. However, the number of infants who died from gastrointestinal infectious diseases greatly decreased with the introduction of a clean water supply. Although gastritis, duodenitis, enteritis, and colitis (including diarrhea) were the top-five causes of infant deaths up until 1973, they were excluded from the top-ten causes of infant death by 1978. From the late 1960s until the early 1970s, the GDP per capita in Japan (1,200–3,000 USD) was equivalent to the GDP of six current ASEAN members (2016). In low-income countries, the preventative interventions, including water hygiene,

breastfeeding, complementary foods, and nutritional supplementation, including zinc and vitamin A, have had a significant impact on reducing infant deaths from diarrhea (Figure 2). This demonstrates that widespread availability of clean water is a significant factor in decreasing the number of infant deaths from diarrhea. Other contributing factors include improved living conditions and hygiene, all of which have worked together synergistically to deliver our current high standard of public health.

## Water-Quality Management

Water-quality management has been considered important since the early modern period in Japan. In Japan, the government department in charge of hygiene management has continuously been involved in managing the waterworks. This has led to water-quality control being emphasized in waterworks projects as one of the fundamental elements of sound public hygiene. As the Japanese population rapidly increased as a result of economic growth, the poor quality of the water sources due to domestic wastewater became a major issue and increased the need to preserve the integrity of the water supply. In response to this challenge, sewage treatment plants were brought up to a higher standard, and industrial wastewater-processing facilities were established. In 1970, the Water Pollution Control Law was passed to battle pollution. Along with the Pollution Control Public Works Cost Allocation Law, the Water Pollution Control Law improved the filtering of industrial wastewater. Because it is costly, an adequate budget needs to be allocated to water-quality management by the government. In addition to such measures, the Japanese government has instituted water-quality criteria that are strict even by the standards of the WHO, the EU, and the US. For this reason, Japan has maintained a level of water quality that has made it one of the few countries (of which there are about 15) where one can safely drink water from the tap.

## References

The History of 100 Years of Waterworks and 50 Years of Water Sewage in Utsunomiya City, I. The Water Supply of the World and of Japan; the Origin of Sewage [http://www.city.utsunomiya.tochigi.jp/\\_res/projects/default\\_project/\\_page\\_001/013/818/kinensi06.pdf](http://www.city.utsunomiya.tochigi.jp/_res/projects/default_project/_page_001/013/818/kinensi06.pdf)

Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS, and the Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet* 2003; 362: 65–71

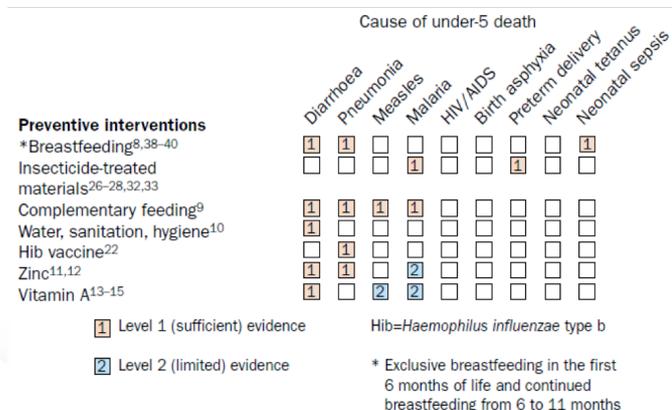


Figure 2. Interventions aimed at reducing mortality in infant under 5 years old due to major causes of deaths and their respective evidence levels

## Executive summary

- *Health checkup programs in Japan are supported by legislation and are publicly funded, thus ensuring their stability over time.*
- *Health checkup programs in Japan are multisectoral, being supported by various ministries and professional bodies rather than a single system. In this way, they are designed to cover a large population.*
- *The MCH handbook ensures continuous record keeping of health checkup results at the individual level and plays an important role in connecting the various health checkup programs.*

There are various health checkup schedules for women and children in Japan. They include antenatal (ANC) checkups for pregnant women and postnatal care within one month of delivery; an infant health checkup; a health checkup for children at the time of school enrollment; and annual checkups for students of all ages. These health checkups do not merely serve to determine the presence or absence of diseases and disorders but also function to link early detection of diseases and disorders with appropriate treatment. They also include various aspects of psychological health and physical fitness, with the aim of promoting overall wellness and healthy lifestyles.

The health checkup systems currently existing in Japan have a long history, dating back to 1939 when infant medical examination was first introduced. Routine maternal health checkups were introduced in 1942 while health checkups at the time of school enrollment and for students of all ages started in 1958. These health checkups, supported by various ministries and professional organizations, are required by laws, such as the Maternal and Child Health Law and the School Health Act. Since their enactment, these laws have been revised and updated to adapt to the changing health needs of the general population. For example, the focus of the checkup items has moved from prevention and treatment of acute infections to identifying risk factors for chronic and lifestyle diseases, child developmental delays, and psychological dysfunction, thus reflecting current healthcare needs.

The items in the various health checkups have also been changing according to the current prevalence of diseases and the social and health problems of today. For example, maternity health checkups, previously intended as a form of welfare support for low-income households, have been updated to target various maternity-related health

problems. Under the current law, all pregnant women in Japan are entitled to at least 14 publicly funded maternity health checkups. All newborns are entitled to free health checkups at 3–4 months, 1.5 years, and 3 years of age provided by each municipality.

In addition to providing health checkups during pregnancy and the immediate postpartum period, maternity and infant health programs aim to:

- prevent chronic diseases
- screen for congenital metabolic diseases
- provide psychological support during pregnancy and child rearing
- detect developmental disorders early
- prevent psychological disorders and child abuse

Although the core items and procedures in the health checkups are standardized on the basis of existing regulations, local health services can freely add checkup items from a set of options. In this way, health care services can provide a health checkup tailored to the needs of the respective region.

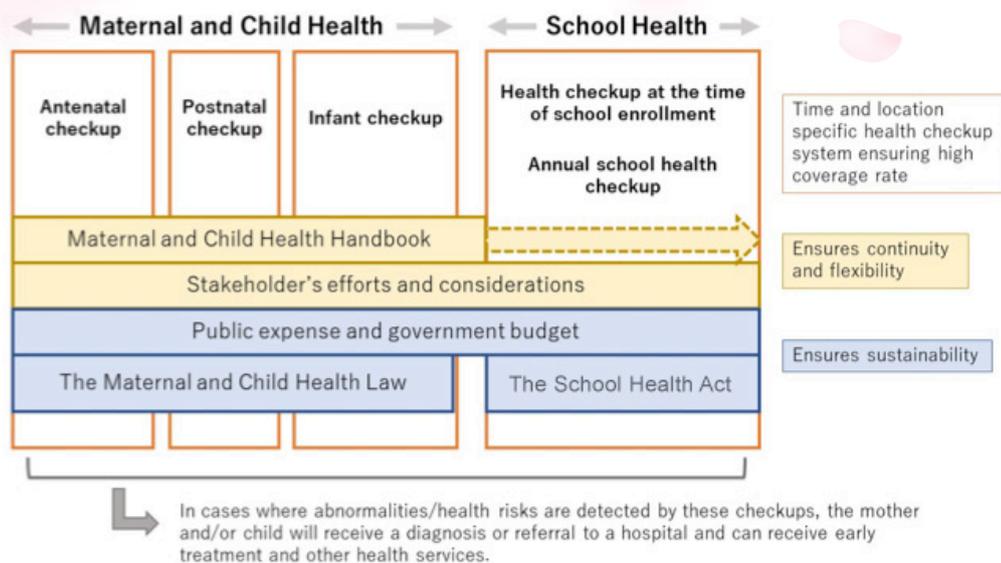
Generally, health checkups at the time of school enrollment are implemented by each municipal governments' Board of Education while the principal of each school is responsible for organizing and implementing the annual health checkup for all the students. The items on the annual health checkup for students include physical fitness tests, a questionnaire on infectious and chronic diseases, preventive measures against lifestyle diseases, early detection of child abuse, and information to improve children's overall quality of life. These school health checkups are useful for screening for health risks as well as for problems children may experience in adapting to school life and inculcates the practice of health monitoring in students. The value of the Japanese health checkup system is further enhanced

by its high coverage rate. Once pregnant, women receive health check vouchers for ANC checkups upon submitting a notice of pregnancy at the municipal government office. Official statistics in FY2016 show that 92.6% women submitted a notice of pregnancy before 11 weeks' of gestational age, and more than 99% of pregnant women submitted it before delivery. The coverage of infant health checkups at 3-4 months, 1.5 years, and 3 years was 95.6%, 96.4%, and 95.1%, respectively, in FY2016. Furthermore, school health checkups at elementary and junior high schools cover almost 100% of children, thanks to the compulsory education policy. This continuity and high coverage of health checkups in Japan allows for the identification of current and future health needs based on the current prevalence of diseases.

Although health checkups for women and children in Japan appear to flow seamlessly from pregnancy through school age, in reality there is little systematic coordination between the programs. Furthermore, health checkups are based on time and location (e.g., at a childbirth facility, health center, pediatric medical institution, school, or work

place) rather than on the life cycle of individuals. In spite of this limitation, improvements have been made over time to harmonize health guidance with management at the individual level throughout the life cycle.

One of the tools that have played an important role in ensuring continued health guidance at the individual level is the Maternal and Child Health Handbook (MCH handbook). Items recorded on the MCH handbook include all medical examination and health checkup results for mother and child from pregnancy until the child is 6 years old. The MCH handbook can be used by the mother and child regardless of their location. Thus, even when mothers cannot visit their primary healthcare provider while undergoing various health checkups, the results of their health checkup are still recorded in the MCH handbook, ensuring continuity of care. In this way, both health care professionals and family members can access the results of health checkups and examinations they have received and monitor the progress and growth of their child.



## Executive summary

1. Newborn screening (NBS) for inherited diseases of the metabolism and endocrine system is one of our showcase projects in the field of child health. However, the cost-effectiveness of NBS for certain diseases such as amino acid disorders and galactosemia in Japan was inferior to that in the West because of the much lower frequency of these diseases here.
2. In Japan, a new way of measuring thyroid stimulating hormone (TSH) levels in newborn dried blood specimens was developed and now forms a part of NBS for congenital hypothyroidism (CH). The high frequency of CH and the availability of safe and cheap medication to prevent mental retardation have also encouraged the use of NBS to detect other target diseases.
3. Tandem mass spectrometry (MS/MS)-based methods have improved the ability of NBS to detect congenital disorders related to the metabolism of various types of acid such as fatty acids. The marked increase in the total frequency of target diseases has improved cost-effectiveness, and we expect great progress in preventing sudden death in children caused by these disorders.

## 1. Brief chronicle of newborn screening (Table 1)

Newborn screening (NBS) is part of our public health care program and was introduced to prevent mental retardation caused by phenylketonuria (PKU), an inborn error of amino acid metabolism discovered by Dr. Ivar Følling (Norway) in 1934. In 1951, Dr. Horst Bickel of Germany reported that a phenylalanine-restriction diet could improve the symptoms of PKU. As a result of this discovery, it was decided that NBS would be necessary if dietary treatment were to be started before symptoms appeared in children carrying the gene for this disease. This goal was achieved in 1960 by Dr. Robert Guthrie (USA), who developed a bacterial inhibition assay method, which involves collecting a blood specimen using a filter paper, drying it, and then placing it in a culture medium containing bacteria that require phenylalanine to grow. The method has now been replaced by tandem mass spectrometry (MS/MS)-based microanalysis, which was successfully used for the first time in the 1990's to analyze amino acids and acylcarnitine species (certain compounds produced in organic acid and fatty acid metabolism) in newborn dried blood specimens (DBS), thus enabling NBS for several types of genetic defect in the metabolism of amino acids, organic acids, and fatty acids.

## 2. Introduction and development of NBS in Japan

Over the years, NBS in Japan has been expanded with the aim of preventing the onset of a larger range of diseases. A pilot study of NBS using the Guthrie test was started in 1966, and a nationwide NBS program targeting 3 amino acid disorders (PKU, maple syrup urine disease, homocystinuria) and

galactosemia was begun in 1977. In 1975, a radioimmunoassay method for measuring thyroid stimulating hormone (TSH) in DBS was developed in Japan, and in 1979, congenital hypothyroidism (CH) was added to the list of diseases screened for in NBS. Around 1990, the radioimmunoassay was replaced by the enzyme-linked immunosorbent assay (ELISA), which enables 17-hydroxyprogesterone (17-OHP), a steroid hormone produced by the body, to be measured in DBS. Thanks to this development, NBS for congenital adrenal hyperplasia (21-hydroxylase deficiency) was started in 1989. In 1997, a pilot study on expanding NBS using MS/MS was undertaken and formed the basis of a national public health program established in 2013. The pilot study screened 1.95 million newborns, and the total frequency of the target diseases was 1/9,000. The current NBS protocol is as follows:

1. Approximately 1 million newborns are screened yearly at 38 local laboratories.
2. DBS sampling is scheduled for the 4th or 5th day after birth.
3. The MS/MS-NBS core panel includes:
  - 5 amino acid disorders (including 2 urea cycle disorders)
  - 7 organic acid disorders
  - 5 fatty acid disorders
4. Other target diseases are:
  - Galactosemia (types I and II): (detected by a colorimetric assay using galactose dehydrogenase and alkaline phosphatase)
  - CH: ELISA for TSH
  - Congenital adrenal hyperplasia: ELISA for 17-OHP

The clinical symptoms of the target diseases and their frequency in Japan are shown in Table 2.

### 3. Principal target diseases of NBS in the West

The cost-effectiveness of NBS for inborn errors of metabolism depends strongly on the frequency of the individual target diseases. CH is the 'ideal' target disease in NBS because its frequency is very high regardless of ethnicity and because mental retardation resulting from this disease can easily be prevented by giving the patient levothyroxine, a safe and cheap oral medication. Among Caucasians, PKU and medium-chain acyl-CoA dehydrogenase (MCAD) deficiency are detected by NBS at a frequency of about 1 in 10,000–20,000 births. We know for a certainty that PKU patients who adhere to strict diet that contains little phenylalanine can expect to have completely normal development. MCAD deficiency is a fatty acid disorder that causes acute hypoglycemia even in apparently healthy infants and little children and often leads to severe neurological after-effects or in the worst cases, sudden death. The symptoms of this catastrophic disease can be prevented by frequent feeding and, when they do occur, they can be treated using intravenous glucose.

### 4. Impact of NBS on child health in Japan

In Japan, the frequency of PKU (1/58,000) is highest among the 5 amino acid disorders, and that of MCAD deficiency (1/110,000) is highest among 5 fatty acid disorders, but both are far lower than in Caucasians. However, in 2000 the first case of MCAD deficiency was detected in Japan. Since then, the number of patients with MCAD deficiency has exceeded 100, more than 80% of whom were diagnosed after nationwide MS/MS-NBS was started. As a result, the number of symptomatic patients has almost stopped increasing.

Carnitine palmitoyltransferase (CPT) II deficiency is apparently a more serious disease in Japan where it is responsible for many cases of severe neurological dysfunction and sudden death. In contrast, most Caucasian patients with this disorder exhibit only myopathic, or muscle-related, symptoms caused by a common mutation which gives rise to the mild version of the disease. We newly found promising criteria through the extended pilot study, which provided the foundations for a nationwide NBS for CPT II deficiency in 2018.

Although the frequency of 9 of 21 target diseases is below 1/500,000, the MS/MS method has clearly contributed to establishing a cost-effective NBS system in Japan.

**Table 1. Brief chronicle of newborn screening (NBS) in Japan**

1934	Dr. Ivar Følling (Norway) discovered phenylketonuria (PKU) as a cause of mental retardation.
1953	Dr. Horst Bickel (Germany) proved that PKU symptoms could be improved by a phenylalanine-restriction diet.
1960	Dr. Robert Guthrie (USA) developed a screening test for PKU using a bacterial inhibition assay method, the so-called "Guthrie test".
1963	NBS started in several US states.
1966	A pilot study of the Guthrie test for PKU started in Japan.
1977	Nationwide NBS targeting PKU, maple syrup urine disease, homocystinuria, and galactosemia was started in Japan.
1979	NBS for congenital hypothyroidism was started in Japan.
1988	NBS for congenital adrenal hyperplasia (21-hydroxylase deficiency) started.
1990s	Tandem mass spectrometry (MS/MS)-based methods for NBS were developed in the USA.
1997	A pilot study of MS/MS-NBS was started in several areas of Japan.
2014	Nationwide MS/MS-NBS was started, with the core panel including 3 amino acid disorders, 2 urea cycle disorders, 7 organic acid disorders, and 4 fatty acid disorders.
2018	CPT II deficiency was added to the MS/MS-NBS core panel.

**Table 2. Clinical symptoms of diseases targeted in newborn screening and their frequency in Japan**

	Frequency	Acute symptoms	Chronic symptoms
Amino acid disorders (5 diseases in total)	1/27,000		
Phenylketonuria	1/58,000		Mental retardation
Maple syrup urine disease	1/670,000	Encephalopathy	Mental retardation, Failure to thrive
Homocystinuria	1/800,000		Mental retardation, Epilepsy
Urea cycle disorders (2 diseases)	1/240,000	Encephalopathy	Mental retardation, Failure to thrive
Organic acid disorders (7 diseases)	1/22,000	Encephalopathy	Mental retardation, Failure to thrive
Fatty acid disorders (5 diseases)	1/44,000	Encephalopathy, Rhabdomyolysis, Sudden death	
Galactosemia type I	1/2,000,000		Liver dysfunction, Cataract
Galactosemia type II	1/1,000,000		Cataract
Congenital hypothyroidism	1/3,000–4,000		Mental retardation
Congenital adrenal hyperplasia	1/16,000	Shock	Virilization

## Executive summary

- 1. The log book System: The Japanese government provides disabled persons with a log book after due certification of the person's disability. By presenting the log book, a disabled person can receive various services such as public transportation discounts and medical cost subsidies efficiently.*
- 2. Distribution of welfare services: The amount and type of service provided are determined using a detailed classification scheme to ensure that the available welfare resources are distributed fairly.*
- 3. System centering on facilities: While initiatives to deinstitutionalize care are being pushed forward, the need for facility-based support remains.*

## Welfare for persons with disabilities

### The log book System

In Japan, disabilities are divided into the physical, mental, and intellectual categories, for each of which the government issues a different log book. A person applying for a log book is required to submit a diagnosis or statement by the designated physician certifying the patient's disability in accordance with regulations. By obtaining a log book, a person with a disability gains access to various resources and benefits in both the public and the private sectors in accordance with the type and severity of his or her disability. These include exemption from taxation, eligibility for benefits, public transportation discounts, and medical cost subsidies when receiving treatment under the national health insurance system. Although the services available using the log book differ by municipality, in general the log book enables care to be provided simply and seamlessly.

### System centering on facilities

The Japanese Constitution, established in 1946, clearly delineates the basic human rights of persons with disabilities and describes the responsibility of the state to support such persons. Although the confinement of persons with mental disabilities within private residences was allowed before World War II, after the war, policies aimed at providing appropriate, professional care for such individuals at specialized facilities were formulated. Construction of large-scale care facilities began in the 1960s and '70s in various parts of Japan, with each facility capable of accommodating several hundred patients. In the 1980's, however, the idea of 'normalization' or the view that community care for disabled persons is preferable to internment in a large-scale facility, began to

gain acceptance worldwide. Following this global trend, Japan also later began transitioning toward smaller-scale facilities and local community support. However, some parents have demanded care for their disabled children at facilities capable of providing lifelong support in the event of their own death or incapacitation. There is thus still a need for facility-based support, not only as an insurance system for family caregivers, but also for access to comprehensive healthcare available at these facilities and the prevention of social isolation which persons with disabilities may suffer in the community.

### The current welfare service and its characteristics

The Services and Support for Persons with Disabilities Act, established in 2012, did not mandate that facilities operate around the clock; rather, its aim was to enhance community care using local social resources as the mainstay of support for disabled persons. The disability support classification of an applicant is conducted based on a detailed interview and a statement by a physician. The types of services available include nursing care and training, consultation services, and the payment for prosthetics, etc. Individuals with a physical, intellectual, or mental disability, developmental disability, an intractable disease or higher brain dysfunction are eligible to receive help under this system. The 2016 revision of the bill also stipulated that support be provided to children with a disability who require an artificial respirator or other medical care on a daily basis. The number of such patients is currently on the rise due to progress in medical technology, which has increased the survival rate of severely disabled individuals.

# Children’s Welfare

## Daycare

During the Meiji Era (1868–1912), child care centers where farm- or factory-workers could leave their children were established across Japan. Furthermore, based on the belief that “education is important, especially for poor children,” a number of philanthropists created a daycare center to house children living in urban slums. In addition to teaching hygiene and healthful lifestyle habits, initiatives to involve the children’s family, including home visits, were launched.

In 1947, daycare centers became the standard form of child welfare facility. The children admitted into daycare centers were those who needed looking after daily for such reasons as their parents’ employment situation. These care-based facilities clearly differed from kindergartens, which are educational institutions. In the 1970s, budget cuts to social welfare increased due to the oil crisis and curbed the expansion of child care facilities. However, as the decline in childbirth rates began to take on serious dimensions in the 1990s, childcare policies helping parents to balance work and childrearing began to be promoted instead. Although these policies consisted of social welfare services for low-income households, the majority of the service recipients today are double-income households. The role of the childcare center has now expanded to meet the needs of the middle and wealthy classes. The fiscal strategies and the

response of the government both at the national and municipal levels have not yet caught up with the ever-increasing demands for childcare resulting from the increase in the number of working women.

## Foster care

The Japanese government provides a foster care service for children (those under 18 years of age) who do not have a guardian or who are receiving inadequate care from their guardian. As of 2017, the total number of children under the age of 18 across Japan who required foster care was estimated to be 45,000; over 80% of these are currently being cared for at a foster care facility. The most common reason for taking these children into foster care is parental abuse. About half of these children experienced abuse by their parents for the first time before entering foster care. Necessary measures have been implemented to help children deal with the trauma of abuse, such as employing a psychotherapist at each facility to provide appropriate treatments.

In 2010, the UN’s Committee on the Rights of the Child recommended that Japan provide a domestic environment in foster homes or small-scale groups. Currently, such a goal has been set, through scaling down children’s foster care facilities and promoting foster families. However, the budget allocated for family care, including childcare and family allowances, is smaller in Japan than in the West. Nonetheless, locations supporting child welfare continue to do their best within their limited budgets to guarantee the healthy growth and development of children.

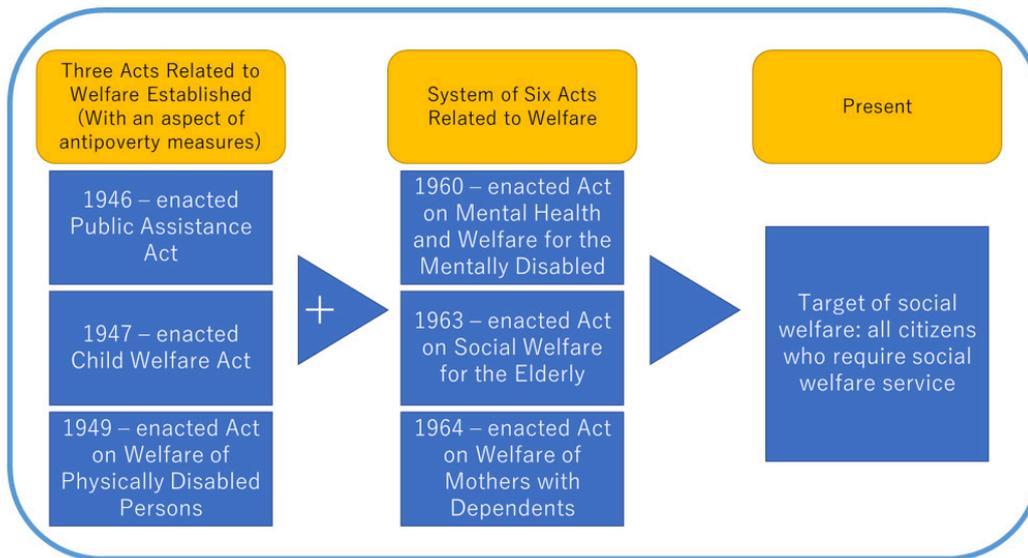


Figure. Expansion of the Japanese social welfare system

## Executive summary

Japan has a unique social health insurance program which is famous for its universal health coverage and is one of the principal factors contributing to the low mortality rate.

While Japan's national health insurance and health care services are in many ways unique to the Japanese context, aspects of this system can be successfully adopted by other countries through:

- Strengthening health care-related infrastructure
- Providing appropriate guidance and supervision to policy-holders
- Providing public health services at affordable costs based on the cultural context of each country

It is essential for the success of any such program to meet these priorities in the proper sequence; merely setting up the infrastructure and providing services, for instance, is insufficient to ensure the accessibility and quality of health care.

### Social health insurance in Japan

The Japanese health care system is financed by statutory health insurance and taxes. All insured individuals must pay a premium which is determined by their level of income. On the other hand, the insurance coverage and deductible are the same regardless of the payer's financial status. Japanese universal health coverage is mandatory, and all citizens and legal foreign residents are required to enroll. The national health insurance system covers almost all medical needs. There is no alternative relationship between social and private health insurance in Japan.

### Provision of medical care

In Japan, *clinics* and *hospitals* are chiefly distinguished by the number of hospital beds. Even small facilities can provide inpatient care, and large hospitals normally offer outpatient care. Over 80% of hospitals with twenty or more beds, and over 95% of smaller facilities, such as clinics, with fewer than twenty beds, belong to the private sector. While most medical services are provided by such private facilities, the national health insurance still pays for most of the costs for services that patients receive at these centers.

The medical expertise of the health care workers does not differ between private and public facilities even if their individual employment status, such as general practitioner or hospital physician, does. Physicians are free to open their own clinic and usually have enough experience in hospital practices. This seamlessness has helped to achieve a consistent and reliable level of health care quality and uninterrupted access to services.

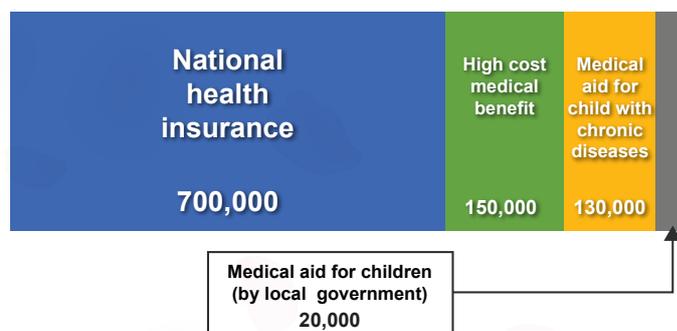


Figure. The ratio of medical expenses expenditure  
(ex. Total medical cost = 1,000,000 yen, self-payment = 0 yen)

### Insurance benefits and out-of-pocket expense

Public medical insurance provides in-kind insurance benefits. As a rule, a patient will bear 30% of the total medical expenses as the standard deductible.

- **Expensive medical care benefits**  
National health insurance covers a portion of out-of-pocket expenses according to income.
- **Public medical expense benefits**  
Depending on the income and health status of the patient, public medical expense benefits are available to further reduce costs to needy patients.
- **Tax relief**  
Filing returns for refund, when paid significant amount of medical expenses.

### Public medical expense benefits for children

As a rule, in Japan all patients, including children, are required to pay for part of any medical expenses they incur. Children with a specific health condition can receive public medical expense benefits to offset higher fees.

- **Medical aid for premature infants**  
Medical benefits for premature infants with a birth weight less than 2000 g reduces the total medical expenses for special care by up to 10% depending on the family's income.
- **Medical aid for children with potential disabilities**  
Medical aid is also available for children less than 18 years old with a physical disability. Families in the higher income brackets are not eligible.
- **Medical aid for specific chronic diseases**  
Japanese national health insurance also offers help to patients with so-called "intractable diseases."
- **Medical aid for children with specific chronic diseases**  
Children with chronic diseases need long-term treatment. The maximum fee payable by the patient is calculated on the basis of the income earned by the chief income earner in the household.
- **Pediatric care by the local government**  
Financial support including benefits for the care of infants and children differs across local governments and is determined by the age of the patient.

### Medical Aid for Children with Specific Chronic Diseases

("Syouni-mansei-tokutei-shippei-taisaku" or "Shouman" for short)

The *Shouman* program is a national medical aid program for children with chronic diseases, including the most severe forms.

As of 2018, the number of target diseases exceeded 800. To justify inclusion of a disease in the list of target ailments, supporting clinical findings must be submitted to a huge disease registry which records more than 100,000 cases each year.

### Pediatric care by local governments

The Japanese health care system offers additional benefits for pediatric care in the form of local subsidies paid through funds

allocated by each municipality from resident tax revenue. The variations in patient eligibility across municipalities in terms of target age, amount of benefits, and income requirements (due to differences in the fiscal burden of local governments) still pose a serious challenge to health care accessibility.

### The history of child medical aid by local governments

In the 1960's, Japan achieved universal health coverage, but the medical benefits provided were much inferior to those available today. Many local residents had to pay 50% of their medical expenses.

Sawauchi village in Iwate prefecture pioneered local government funding of child medical aid as an adjunct to the national health insurance. Sawauchi was an impoverished, isolated, and underdeveloped mountain village where people were known to die from treatable diseases due to the unaffordability of medical care, even after the introduction of national health insurance. Villages contacted physicians only when they needed a death certificate. The infant mortality rate in Sawauchi was the highest in Japan. To change this deplorable state of affairs, the village mayor decided to create a fund for medical expenses using local revenue. In 1961, he helped to establish a pediatric medical aid program to provide residents with 'free' medical service for the first time in Japan. The infant mortality rate of Sawauchi village reached zero in 1962, creating shock waves throughout Japan. Since 1964, other municipalities have followed Sawauchi's lead by funding medical benefits using local financial resources. Now, all local governments have some form of medical aid for children as an adjunct to the national health insurance coverage.

Most importantly, the medical aid program alone could not have achieved the zero infant mortality rate; Sawauchi village also created the physical infrastructure allowing access to hospitals and promoted health education and guidance among all its residents.



## Executive summary

- The current abortion policy in Japan is the result of a challenging process involving a series of national debates among various stakeholders.
- Despite its legalization under certain conditions, induced abortions have continued to decline.
- Contraception in Japan is managed primarily through the use of male condoms.
- Assisted reproductive technology and fertilization treatments are now highly advanced and widely accessible.

### 1. Abortions, the Eugenic Protection Law, and the Maternal Body Protection Law

The history of the abortion policy in Japan is relatively unique due to Japan's geopolitical history and population policy following the Second World War. Induced abortions were first legalized in Japan in 1948 with the enactment of the Eugenic Protection Law in contrast to industrialized Western countries, which legalized abortions in the 1970's in the wake of the women's liberation movement. The provisions of the Eugenic Protection Law allowed for both induced abortions and sterilization for eugenic reasons. Following its enactment, the number of legally induced abortions increased dramatically (Figure 1) due mainly to the fact that induced abortions were the primarily means of reducing family size (Norgren 2001; Sato and Iwasawa 2006).

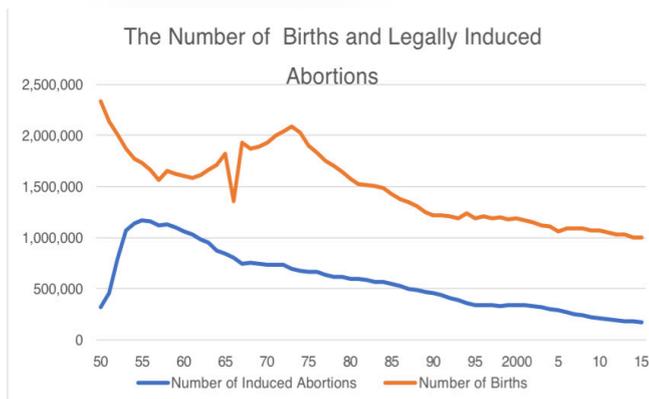


Figure 1. Number of Births and Legally Induced Abortions in Japan  
(Source) National Institute of Population and Social Security Research 2018  
<http://www.ipss.go.jp/syoushika/tohkei/Popular/Popular2018.asp?chap=4&title1=%87W%81D%8Fo%90%B6%81E%89%C6%91%B0%8Cv%89%E6>

The Eugenic Protection Law was amended in 1996 to remove its eugenics-related rationale and is now called the Maternal Body Protection Law. Under this law, induced abortions are performed only on demand before the 21st week of pregnancy and are to be performed by a physician in a medical facility exclusively designated for this purpose by the local medical association. According to the statistics of the Ministry of Health, Labour and Welfare, the number of abortions done

in Japan began to decline from 1955, reaching a record low in 2015 ([https://www.mhlw.go.jp/toukei/youran/indexyk\\_2\\_1.html](https://www.mhlw.go.jp/toukei/youran/indexyk_2_1.html)).

### 2. Contraception in Japan

While abortions played an important role in limiting family size in post-war Japan, contraceptive use is not widespread in contemporary Japan compared to the rest of the world (Figure 2). It took many decades for Japan to approve the use of oral contraceptive pills in 1999, making Japan the very last nation among the United Nations' member states to do so. Researchers argue that the slow acceptance of contraceptive use might be due to the fact that Japan legalized abortions more than 20 years earlier than most of the other developed countries, thus reducing the demand for contraceptive use (Tsukahara 2014; Norgren 2001).

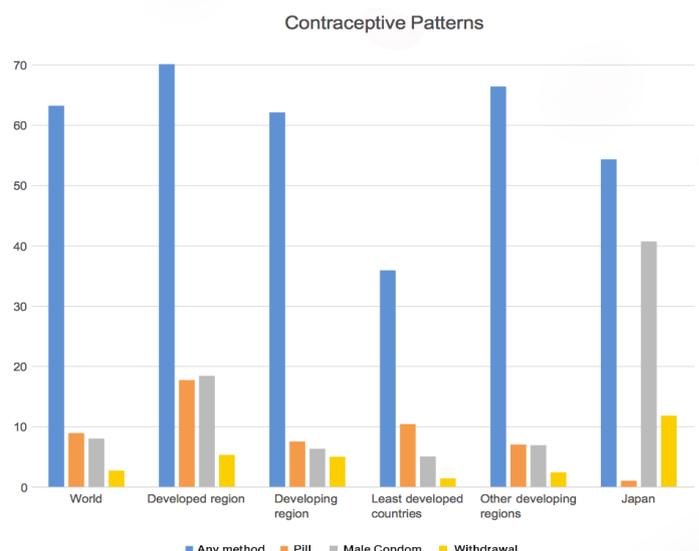


Figure 2. Contraceptive Patterns from a Comparative Perspective  
(source) United Nations World Contraceptive Patterns 2015  
<http://www.un.org/en/development/desa/population/publications/family/contraceptive-info-chart-2015.shtml>

Several reasons have been given to explain the slow acceptance of oral contraceptives in Japan. Foremost is the conservatism of Japanese society. The public was concerned that the pill might cause grave damage women's body. Legislators debating the bill expressed concerns about women's "irresponsible sex" (Matsumoto 2005) while women's groups also opposed the approval of the pill (Norgren 2001). Physicians with a vested interest in continuing abortions also expressed concerns over the potential adverse effects of the drug and the spread of sexually transmitted diseases.

Thus, in Japan, use of the male condom and withdrawal before ejaculation are the most common contraceptive methods (Figure 2), and oral contraceptives accounts for only 4.2 % of family planning methods nationwide (Japan Family Planning Association 2017). While the proportion of legally induced abortions across all reproductive age groups is relatively low in Japan, according to a survey by the Japanese Association of Obstetrics and Gynecology (2003), the main reason for induced abortions in women under 20 years of age (13.6% in 2001) was the reliance on male condom use (93.5%). Currently, male condom use accounts for more than 80% of family planning methods chosen by women (JFPA 2017).

### 3. Assisted Reproductive Technology (ART) and Fertility Treatment

In recent years, Japan has seen an increase in advanced maternal age and a decrease in the number of births. This has led to more demand for assisted reproductive technology (ART) and fertility treatments, such as in-vitro fertilization (IVF), intracytoplasmic sperm injection, embryo transfer, and frozen-embryo replacement, which are now highly advanced and widespread in Japan. IVF treatment was conducted for the first time in Japan in 1983, and since then

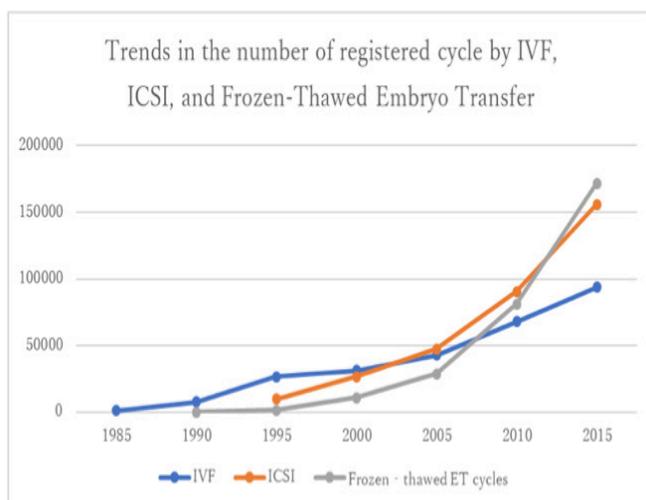


Figure 3. Trend in the number of registered cycle by IVF, ICSI, and Frozen-Thawed Embryo Transfer (source) The Ethics Committee of The Japan Society of Obstetrics and Gynecology <https://onlinelibrary.wiley.com/doi/full/10.1002/rmb2.12074>

Japan has experienced a rapid increase in ART cycles (Figure 3). According to the Japanese Society of Obstetrics and Gynecology (JSOG), the number of children born as a result of this procedure has continued to increase each year, reaching fifty thousand annually in 2015 and accounting for one out of 19.7 births (Saito et al 2018). The artificial insemination with the husband's sperm (AIH) and artificial insemination with donor sperm (AID), both of which were conducted in Japan for the first time in 1948 and 1949, respectively, are also common.

While fertility treatment is highly advanced, widespread, and legal, the cost of treatments including ART, AIH, and AID is not covered by the national health insurance and patients are required to pay the full cost unless subsidies are available from the local government (prefectural and municipal). There are also ethical and legal issues concerning children's right to know their origin, and calls for legal reform in these areas have been increasing.

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## Executive summary

- Japan has achieved excellent perinatal health with a moderate cesarean section rate.
- The factors enabling this are Japan's medical insurance system, its medical culture, and the attitude of pregnant women, their families, and society in general regarding childbirth.
- A decrease in the number of malpractice claims is also thought to have contributed to maintaining the cesarean section rate at an optimally low level.

The cesarean delivery method is indispensable for saving the life of the mother and child when vaginal delivery is not feasible. However, cesarean sections also carry the risk of complications. For this reason, a cesarean delivery is recommended only when medically justified. In some nations with a remarkably low cesarean section rate of 4 to 6%,<sup>1</sup> women who need a cesarean section are presumably not receiving the procedure. At the other extreme, the cesarean section rate in some nations exceeds 50%,<sup>1</sup> suggesting that women who do not require a cesarean section are undergoing the procedure.

In Japan, 19.7% of the roughly 1 million annual deliveries are cesarean sections.<sup>1</sup> This rate is somewhat lower than the average cesarean section rate of the Organisation for Economic Co-operation and Development member states (28%).<sup>2</sup> Meanwhile, the maternal mortality rate (3.7 / 100,000 births) and the neonatal mortality rate (0.9 / 1,000 births) in Japan are considered among the lowest worldwide<sup>3</sup>, demonstrating that good perinatal outcomes are being achieved despite a low cesarean section rate (Figure 1). These facts importantly illustrate the appropriate and efficient use of medical resources. How has Japan been able to achieve such remarkable outcomes?

One of the reasons is thought to be the health insurance system. Almost all (99%) childbirths in Japan occur in

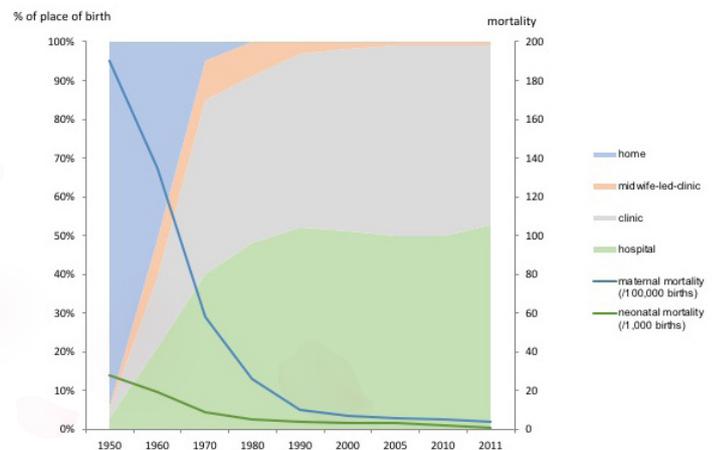


Figure 2. Maternal mortality, neonatal mortality, and place of birth in Japan (Data source: OECD. Stat, Health status, Maternal and infant mortality [https://stats.oecd.org/#], Vital statistics of Japan [https://www.mhlw.go.jp/toukei/list/81-1a.html ])

a hospital, with deliveries at midwife-led-clinics and the woman's home comprising only 1% or less of the total (Figure 2).<sup>4</sup> Uncomplicated, low-risk deliveries are normally performed in a relatively small hospital while high-risk deliveries with maternal or fetal complications are performed at a well-equipped general hospital. Pregnant women are referred by, and transported from, small hospitals to general hospitals and vice versa as necessary. If any abnormality occurs during a pregnancy or delivery, medical intervention is administered promptly. Although Japan is well-known for its universal health insurance coverage, antenatal care and delivery are not covered by health insurance, as pregnancy and childbirth are considered to be physiological phenomena. (However, part of the antenatal care and delivery costs is reimbursed to the patient by local governments and health insurance societies.) On the other hand, the health insurance system covers the cost of any medical care needed. This applies to the cesarean section, which is regarded as a form of medical intervention and therefore a procedure requiring medical justification. Conversely, for cases in which a caesarean section is deemed unnecessary, health insurance cannot be used to cover the cost. In Japan, types of medical treatment available in the private sector that are not covered by health insurance are narrowly circumscribed, in effect virtually eliminating purely

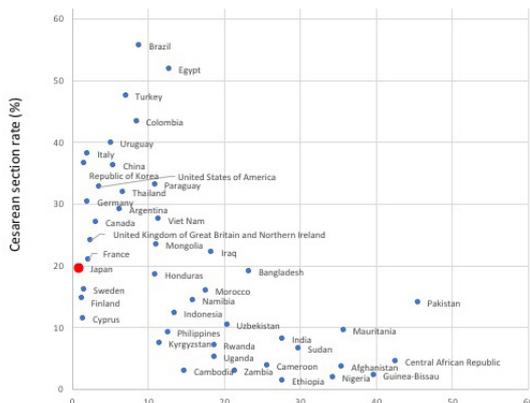


Figure 1. Cesarean section rates and neonatal mortality rates by country (Data source: Global Health Observatory indicator views, Births by caesarean section, Data by county [http://apps.who.int/gho/data/node.imr.WHS4\_115?lang=en], OECD. Stat, Health status, Maternal and infant mortality [https://stats.oecd.org/#], )

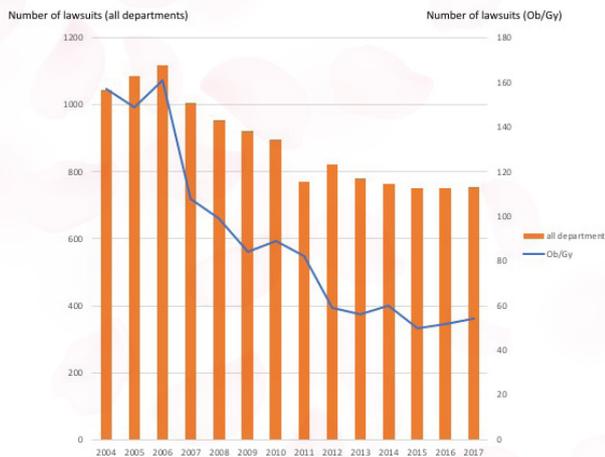


Figure 3. Lawsuits related to medical practice (all departments and obstetrics/gynecology) (Data source: Materials of supreme court [<http://www.courts.go.jp/saikosai/iinkai/izikankei/index.html>])

elective cesarean sections with no valid medical justification. Thus, in Japanese medical culture, the practice of choosing either a cesarean section or natural delivery based on the requirements of each case has become a normative practice promulgated among health care professional throughout the nation.

Another reason for the low cesarean section rate in Japan is thought to be the cultural value placed on natural (vaginal) delivery by pregnant women, their families, and medical staff including obstetricians and midwives. Of course, the cesarean section is accepted as a matter of course if medically required, but in an uncomplicated pregnancy, the pregnant woman and her family alike view vaginal delivery as the ideal delivery method. In countries with a problematic rise in cesarean sections, this procedure is reportedly performed for the sake of various non-medical reasons (e.g., the desire to give birth on an auspicious day). On the other hand, a cesarean section is almost never performed only for these reasons in Japan.

Medical malpractice litigation has been given as another factor underlying the increase in the cesarean section rate in some nations. The risk of litigation is a source of great stress for obstetricians and increases the likelihood that unnecessary medical procedures including cesarean sections will be performed. Obstetrics was regarded as highly vulnerable to medical malpractice litigation in Japan. In 2004, an obstetrician was arrested and prosecuted for the death of a pregnant woman undergoing a cesarean section in a very difficult case of placenta previa complicated by placenta accreta. The arrest of this physician incited protest and criticism from medical organizations in various quarters, providing impetus to the legal community to make more appropriate judgments in cases of medical accidents. Furthermore, The Japan Obstetric Compensation System for Cerebral Palsy was established in 2009 to compensate families promptly for the economic burden of caring for children suffering from severe cerebral palsy incurred during delivery, to prevent or promptly resolve legal disputes, and to improve the quality of obstetric medical care. Thanks to these efforts, the number of obstetrics-related malpractice suits in Japan has been on the decline in recent years (Figure 3).<sup>5</sup> Creating an environment in which medical practitioners can work without the fear of medical malpractice litigation is also believed to contribute to the avoidance of unnecessary cesarean sections.

The level of perinatal care and the optimal cesarean section rate in Japan, which are among the best worldwide, are thus seen as arising from Japan's health insurance system, the medical culture, values of the general public, judicial system, implementation of safety measures, and various other factors. Of course, Japan still faces many challenges, such as the shortage of obstetricians. Nonetheless, it would seem that Japan's health care system has much to offer the world in terms of its experience in resolving issues of national health care and in its strategies for meeting future healthcare challenges.

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3. OECD. Stat, health status, maternal and infant mortality
4. Vital statistics of Japan
5. Materials from the Supreme Court of Japan

## Executive summary

- Japan has one of the lowest neonatal mortality rates in the world in addition to lower rates of intraventricular hemorrhage and necrotizing enterocolitis than other developed countries.
- Japan has achieved this low neonatal mortality rate through a superior regionalized perinatal system; collaboration between pediatricians, obstetricians, and industries (e.g., manufacturers of medical devices); high quality of nursing care; benchmarks based on national neonatal databases; and an unique Japanese management method for very preterm infants.

### A: Outcomes of Neonatal Care in Japan

- Japan has one of the lowest neonatal mortality rates in the world (Figure 1). In particular, it has a much lower mortality rate for extremely preterm infants than other developed countries. The mortality rates are 64%, 37%, and 15% for infants born at 22, 23, and 24 weeks of gestation, respectively.
- The main cause of neonatal deaths is congenital anomaly (Figure 2). Death due to prematurity is less frequent in Japan than in other countries due to superior perinatal management.
- In addition to the lowest mortality rate, Japan has the lowest rates of severe intraventricular hemorrhage and necrotizing enterocolitis although it has a high rate of retinopathy of prematurity than other developed countries.
- Not only does Japan have the highest survival rate of very low birth weight (VLBW) infants, the neurodevelopmental impairment rate among VLBW infant survivors in Japan is slightly lower or at least comparable to those of other developed countries (e.g., Sweden, USA) (Figure 3).

### B: How Japan accomplished one of the lowest mortality rates in the world

- Good perinatal system and regionalization
  - » Regular prenatal visits for close monitoring of pregnancy and fetal state (once every 4 weeks until 23 weeks of gestation, once every 2 weeks during 24–35 weeks of gestation, and once a week after 36 weeks of gestation)
  - » Change from home births to institutional births at clinics or hospitals
    - Home births accounted for >95% of deliveries in 1950, 50% in 1960, 4% in 1970, and 0.2% in 2016 with an infant mortality rate of 60, 31, 13, and 2 per 1000 live births, respectively.
  - » Key health policies of the Japanese government in the 1960s
    - Universal health insurance coverage (since 1961) provides all citizens with easy access to medical care and has accelerated the development of medical facilities across Japan.

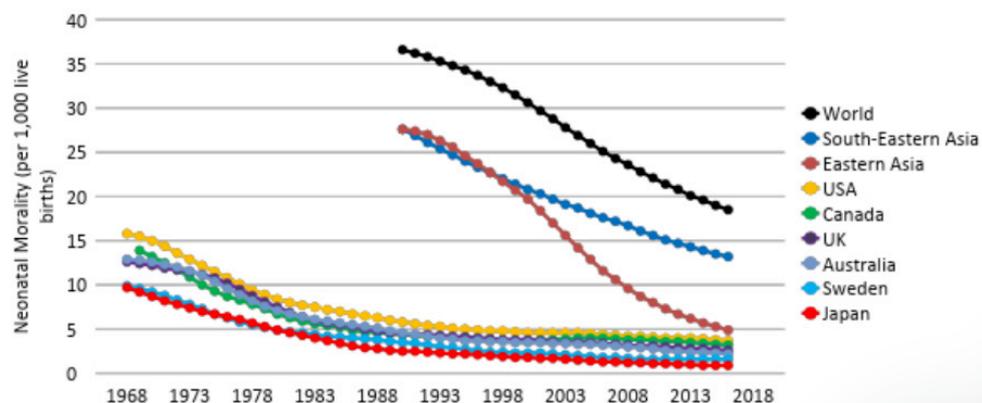


Figure 1. Neonatal mortality (per 1,000)

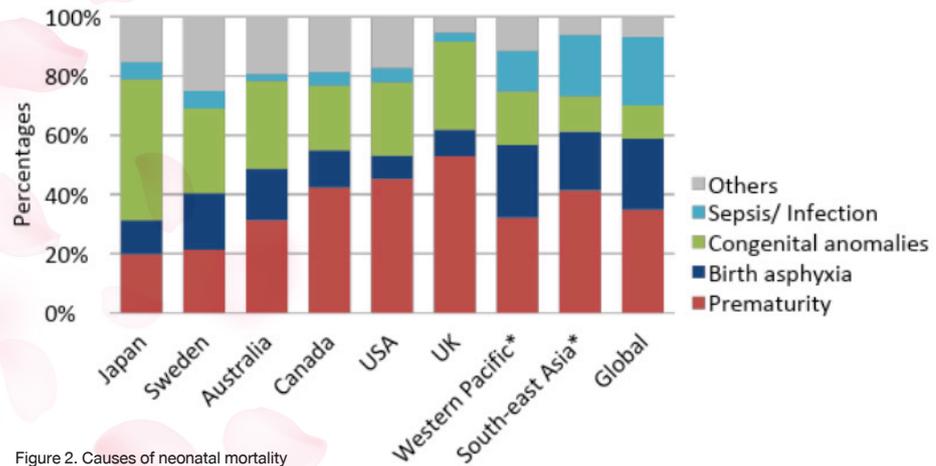
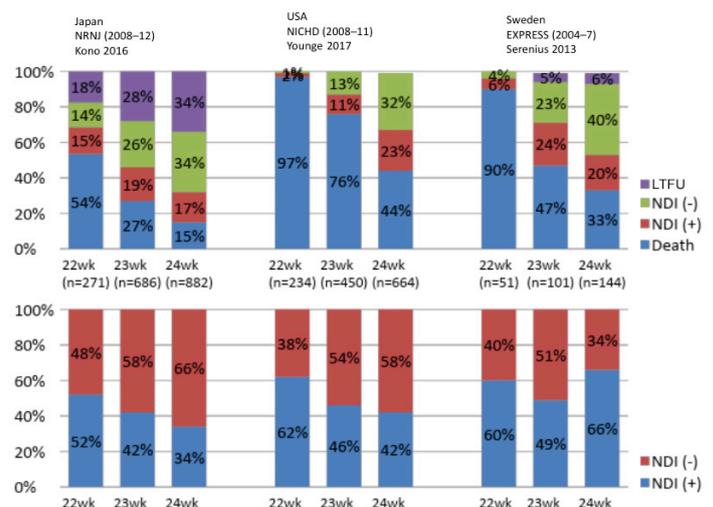


Figure 2. Causes of neonatal mortality

- The Maternal and Child Health Law (1965) promoted (1) health guidance and (2) medical checkups for all pregnant women (prenatal), mothers, and infants (postnatal), (3) the distribution of maternal and child health handbooks to pregnant women, and (4) medical and financial support for premature infants.
- » Change from postnatal neonatal transfer to prenatal maternal transfer for high-risk pregnancies
  - Neonatal transfer just after birth accounts for <5% of VLBW infant births.
  - The Japanese government has promoted the development of large tertiary NICUs with high-risk obstetric and maternal-fetal intensive care units. Standalone children's hospitals without obstetric units are discouraged.
- Good collaboration between pediatricians (neonatologists) and obstetricians
  - » Collaboration in the Japan Society of Perinatal and Neonatal Medicine since 1965
- Database of the Neonatal Research Network of Japan including data on VLBW infants for benchmarking NICUs
  - » Each NICU is aware of its strengths and weaknesses as well as its ranking relative to other NICUs in terms of mortality and various morbidities.
- Japan's management of very preterm infants
  - » Basic management
    - Persistent and close observation of newborns by nurses and neonatologists
    - Active use of breast milk, avoiding formula especially for very preterm infants
    - Maintaining body temperature with high humidity and minimal handling during the initial 72 hours after birth
  - » Close monitoring of intraventricular hemorrhage by brain ultrasound performed by neonatologists
- » Close monitoring of PDA and circulation by functional echocardiography performed by neonatologists
- » Distinctive nutritional management with early breast milk feeding, avoiding formula use, regular glycerin enema use (1–3 time per day) to accelerate the passage of meconium, and use of probiotics.
- » Close monitoring and early detection of bacterial infections using C reactive protein
- Specialized high-quality nursing care in the NICU
  - » Gentle and minimal handling of extremely preterm infants
  - » Paying attention to the positioning of infants
  - » Neonatal nursing society since 1991
- Invention of new devices in a collaboration with industries for improving neonatal outcomes
  - » Pulse oximetry by Takuo Aoyagi in cooperation with Nihon Koden Co.
  - » Transcutaneous bilirubinometry by Itsuro Yamanouchi in cooperation with Minolta Co.
  - » High-frequency oscillation ventilation by Katsuyuki Miyasaka in cooperation with Metran Co.



LTFU = Lost to follow up  
NDI = Neurodevelopmental impairment

Figure 3. Deaths and neurodevelopmental impairment of extremely preterm infants

## Executive summary

- *Child nutritional care in Japan provides support to children at various points in their early life: during pregnancy and at infancy, childhood, and school age. Special focus is placed on providing adequate nutrition during early life (including the first 1000 days after conception) as well as on cultivating favorable lifestyle habits at the school age with the aim of teaching children health management skills and an understanding of good nutrition for life-long optimal health.*
- *Many studies on child nutrition enrolling large swaths of the population have produced robust scientific results. Also, the Maternal and Child Handbook is used to keep a detailed record of any interventions the mother and her child receive during pregnancy through early childhood, and school meals and nutritional education have been integrated into the educational system.*
- *For each new project designed to promote maternal and child nutritional health, laws were created to provide an infrastructure on which to base the system, and improvements were gradually implemented over time. Thus, even as the particular aims of nutritional education or intervention have changed with the times (from the period of post-war food shortages to the current era of obesity and lifestyle diseases), the core system still continues to adapt to new needs and function well, allowing these basic services to be provided stably.*

## Policies regarding pregnant women and toddlers

### Maternal and Child Handbook

The Maternal and Child Handbook was introduced in 1942 following the passage of a Ministry of Health and Welfare Ordinance. With the establishment of the Child Welfare Act in 1947, it became an integral part of the maternal and child health framework. Even now, this handbook remains an important part of the maternal and child health monitoring system; each woman is eligible to receive the handbook and thus again access to the comprehensive health care services provided in this framework by reporting her pregnancy to the municipal government.

When use of this handbook became official during the Second World War, it was linked to the distribution of hygiene products and foods (sugar, milk, etc.) so that mothers-to-be and their infant could obtain both the knowledge necessary to minimize complications during and after pregnancy and the necessary products to maintain their health even during the trying wartime years.

In 1999, long after the wartime distribution system was scrapped and when the challenge of preventing future obesity was becoming recognized, the importance of breastfeeding during childhood was added to the handbook as an update.

## Infant Nutrition Survey and the Lactation and Weaning Support Guide

The “Infant Nutrition Survey” conducted decennially by the Ministry of Health, Labor and Welfare since 1985 aims to obtain basic information to improve the dietary habits of infants and provide breastfeeding/weaning support. In 1995, the “Reformed Weaning Basics” guidelines were created based on the findings of this survey, offering important advice to mothers on how to support lactation and introduce solid food—that is, what kind of food is appropriate for an infant and how mothers should start their infant on solid foods to maintain a good nutritional balance through the first 1000 days of life.

## Policies regarding school-aged children

### School Meal System

Over 90% of schools (>99% for elementary schools) in Japan provide a full school lunch consisting of a main and side dish, bread or rice, and milk. As the school enrollment rate is high in Japan, this system has not only served as an effective way of providing appropriate nutrition to children but has also contributed to nurturing health management skills for later life.

The guidelines for determining the nutritional content of school meals are set out in the “Standards for School Lunch Service,” and the purchase, storage, preparation, and delivery of the ingredients and meals are managed by the “Standards for School Meals and Sanitation Management” system. In addition, the Government School Lunch Law (1954) sets out the purpose of providing school meals, procurement of the government budget for this purpose, and government subsidies available for creating and maintaining a food processing facility (kitchen) at each school, all of which have led to the standardization of the school meal system. The school meal system contributed to preventing child malnutrition in the post-war years and continues to be a useful tool in the battle against childhood obesity several decades after its inception.

Thus, the school meal system is not only a reliable source of nutrition for children but also serves as a tool for educating children about nutrition; food culture, production, distribution, and consumption; and nutritional self-management skills including preparing food, cleaning up afterwards, maintaining dietary hygiene, and even proper manners while eating.

## Cooking Class

In Japan, home economics is a compulsory subject for grades 5 and 6 of elementary school and middle school (2 classes per week). Cooking class is a standard feature of home economics, and for this reason, most elementary and middle schools have a large teaching kitchen. Home economics was introduced during the Second World War with the aim of cultivating the skills necessary for domestic life. However, even now, when times have changed, the knowledge and skills children gain through taking this class enable them to maintain good health after adolescence when eating habits can easily become irregular or unhealthy.

During elementary school, home economics teaches children basic activities related to food preparation, such as washing, cutting, and cooking (boiling and stir frying) ingredients; seasoning food; setting the dining table; and cleaning tableware. Average 6th-graders are required in home economics to prepare lunch with rice, fried eggs, steamed vegetables, soup, and fruit for dessert, which they then enjoy with their classmates. In junior high school, they are taught to master cooking simple everyday meals so that they can become full-fledged cooks as adults.

