Bioethical concerns of medical genetics

offer support as we wait patiently until they introduce the subject (weaving stories).

Methodology of clinical pragmatism

Philosophically anchoring a process to be shared with other people, such as families and medical professionals, around the value judgment of a patient involves an important thought process called doubt-inquiry in pragmatism[8]. This can be broadly formulated as follows.

1. Antecedent conditions for inquiry—uncertain situation that creates doubt.

A confusing situation occurs in which a matter that had been progressing smoothly suddenly becomes stuck, leaving the person uncertain as to what action to take.

2. Setting up the problem

The problem is recognized as a problem, and the inquiry begins.

3. Modeling of problem-solving—formation of a hypothesis concept

Acknowledge that a hypothesis formed by inference is fallible (i.e., capable of being wrong). Be aware that there is always room for modification. This awareness, called provisional warranted assertability, helps prevent self-righteousness and dogma.

From the viewpoint of clinical pragmatism, respect for the patient's autonomy, for example, would mean that, while maintaining the central importance of the patient's value judgment, the patient shares the context specific to his or her case with family and medical professionals. The principle is embodied in the process of creating the narrative together in that shared environment. The methodological pillar in clinical pragmatism is the doubt-inquiry process. We can safely say that critical theoretical points of clinical pragmatism encompass the following.

1. Fallibilism: acknowledge and be constantly aware that each person has a unique experience, thus our understanding of facts and value judgments may contain errors (e.g., preconceived notions, prejudices, and fallacies).

2. Pluralism: even if our value judgment differs from that of others, do not confute the other's judgment from the point of objective truth; rather, try to achieve mutual recognition without coercion through dialogue from the perspective of tolerance as opposed to indifference.

3. Inquirism: value a continuous process by which we can approach the ideal limit as in a mathematical asymptotic line, without being trapped by the idea that no value exists or by science.

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[8] F.G.Miller, J.J.Fins, and M.D.Bacchetta, "Clinical Pragmatism: John Dewey and Clinical Ethics," *Journal of Comtemporary Health Law and Policy*, 3 (1996) 27-51; F.Miller, J.Fletcher, J.Fins, Clinical Pragmatism: A Case Method of Moral Problem Solving, in *Introduction to Clinical Ethics*, UPG, 1997.

Bioethical Concerns of Medical Genetics: Global Standards and Japanese Consideration of Culture and Value

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Abstract

To comprehend bioethics of genetic medicine two viewpoints are crucial; the first is based on global insight, such as the UNESCO Declaration. In the second, bioethics depends to a great degree on the culture and the values of the people living in each country. Japanese is known to have a rather unique culture and civilization according to the words of Watsuji, Nakamura and Huntington. The unique features reflected in Japan are heteronomy rather than autonomy, seeking for harmony rather than conflict, and a scrupulous or conscientious need to maintain a good relationship. The features can be traced to the influence of Japanese history and the geographical limit of an island country. Another factor to be considered is the paucity of the experience of major genetic diseases, such as cystic fibrosis and haemoglobinopathy in Japan. Such a characteristic and situation may have an influence on decision making related to the medical genetics, which, to a degree, are different from those of other countries.

Keywords: genethics, culture of Japan, reprogenetics, newborn screening, genetic information

Introduction

"Geneticisation" coined by Abby Lippman [1] is a heuristic tool that can help to refocus the moral debate on implications of new genetic knowledge towards interpretational relations, the power of medicine, the cultural context and social constraints, rather than emphasizing issues as personal autonomy and individual rights [2]. Genetic diseases provide diverse reactions depending on the culture the people belong to. Felix Konotey-Ahulu said: *"I was born in the Krobo tribe with extra digits at birth in Ghana. Had I been born a few miles southeast across the Volta River, there would have been great rejoicing because local tribesmen had it that I was destined to be rich. If my mother had given birth to me a few miles northwest beyond the hills, I would not have been here to write to you—I would have been drowned soon after birth. Fortunately the Krobo was neutral about extra digits."*[3] Thus, it is necessary to consider a relationship between genetic disease itself and the public reaction to it.

A more important influencing factor to public perception is education of genetics and the incidence of the genetic diseases in the country they live in. In Japan, major genetic diseases, such as sickle cell diseases, beta- thalassaemia, cystic fibrosis, and haemochromatosis seen throughout the world, are

really uncommon. This fact, accompanied with insufficient programs of education about human genetics at schools possibly resulted in a confusion or diverse reactions among persons, when the decision-making is called for the issues dealing with genetic situation.

In Japan, there was an active discussion in relation to the statement of "prevention is not eugenics" which had been introduced by the WHO guidelines in 1995. Dorothy Wertz and her associate prepared the guideline in which they introduced the effort of dramatic reductions of the incidence of beta-thalassaemia in Cyprus and Sardinia resulting from individual/couple choice [4]. Otherwise, health care costs of these countries will be highly elevated and cause a most serious condition. Individual / couple choices include avoiding conceptions, using donor gametes or using prenatal diagnosis followed by genetic abortion to avoid birth in case of an affected child. If most couples were to make the same choice, an overall outcome could be a reduced population frequency of disorder, but it does not justify a "eugenics" label. However, people involved with the disability movement and even some geneticists in Japan were against the above statement, insisting that "prevention in genetics is eugenic". To most people, eugenics means a social program imposed by the state. Such a program should not be accepted, since it denies human freedom, devalues some human beings, and falsely elevates the reproductive status [4].

The modern dilemma in the genome era must be discussed most carefully to seek general agreement approving genetic privacy according to each national sentiment. The purpose of this essay is to discuss the current guidelines in Japan and the attitudes of Japanese about medical genetics, as well as how the Japanese traditional culture influences the concept.[1] "Time and place" as the key words to comprehend bioethics Tetsuro Watsuji, a Japanese philosopher, argued in his book that the principle of ethics depends on the mutual relationship between people and the society they belong to. However, the moral principle (natural law), such as respect for human rights and dignity, prohibition to expose people to danger, to avoid risk and to maximize the benefit will be accepted as a universally applicable rule. The concept of ethics must change depending on the era and the culture (civilization) in the situation, when (time) or where(place) the individuals lived [5].

When the concept is adapted to a health care system," time and place" could be the key words to grasp or to realize the biomedical ethics (ethical, legal and social implication; ELSI). The idea of "time" as a key word is well illustrated in the Helsinki Declaration where the statements had been revised regularly every few years until now (since 1964). For example, the guidelines for using a placebo in the clinical trial for new drug development, which was not included in the Declaration of the first edition, is described in detail in the most recently revised guidelines [6]. The meaning of "place" as a key word for comprehending ELSI which can be explained by the fact, for example, that the legal situation for repro-genetics such as the fetus's condition (when the fetus has a severe genetic abnormality) for the reason of selective abortion, pre-implantation diagnosis for severe genetic diseases and using surrogate mothers for infertility are different even in the European countries of which the basic religious faith is Christianity. Selective abortion because of an abnormal fetus's condition is approved in England, France and the USA, but not in Germany where the fetus's condition, which had been previously approved, was prohibited since 1995. Pre-implantation diagnosis is approved in England, France Span, the Netherlands, Norway and Sweden, but not in Germany, Switzerland, Canada, Australia, and Ireland. A surrogate mother used for infertility is approved in many states in the USA, but not in France and Germany. In France, surrogate mothers were once accepted and even at times recommended prior to 1984.

Especially in the area of genetic technology, such as pre-implantation diagnosis, even within the limit of western values, there is a distinction between the debates in Germany and the USA suggesting that in Germany the focus is on whether certain things should be done and in USA on how they should be done. [7] In Japan selective abortion because of fetus's condition and surrogate mother are not approved. In the case of pre-implantation diagnosis, it is necessary to approve minutely every case by the Ethical Committee of the Japan Society of Gynecology and Obstetrics. (Note 1).

However, it is important to note the basic distinction between legal norms and ethical norms. Michel B Vallotton and his associate expressed: *"While the former (legal) are founded on the latter (ethical), there is no necessary one to one correspondence between each legal and ethical norm. A law may be regarded as unethical by some people (e.g. a law prescribing the death penalty for certain crimes) and likewise, an ethical norm may be regarded as unlawful in a country (e.g., one involving female genital mutilation).Thus it cannot be expected that ethical guidelines which translate ethical principles into the form of recommendations (rather than of strict norms), will always coincide with legal prescriptions"* [8].

Traditional thought and value in Japan

It is said that basic thought of modern bioethics is rooted in the European philosophy found in the 18th to 19th century, like deontology by Immanuel Kant, utilitarianism by John Stuart Mill, and communitarianism by George Wilhelm Friedrich Hegel. The basis of all philosophies, however, is Christian faith [9]. Then, the most important question for Japanese, at present, is what the cultural basis or traditional value adopting on ELSI will be in Japan. Even though the traditional value in Japan seemed to be influenced by Americanized ways of thought in recent times, the very profound area of our own thinking pathway or traditional value will be unchanged over the coming 5 decades. If so, we will need to develop, as shown in our history, "cycles of importation of external cultures" and ''indigenization"

of cultures through replication and refinement, inevitable turmoil resulting from exhausting the important and creative impulse, and eventual reopening to the outside world [10].

Historically, Japan was the first Asian country to adopt Western technology on a large-scale basis. Dorothy Wertz and her collaborator summarized Eastern Ethics, as follows: *"Although Western Ethics is based on rights and principles and Asian ethics is based on caring and relationships, often the practical outcomes of the two approaches are similar. Experienced Western genetic counselors know that they cannot base their practice entirely on individual rights and autonomy. In fact, in the U S, the National Society of Genetic Counselors (1993) has a Code of Ethics based entirely on relationships rather than on principles. Conversely, Western principles of non-maleficence, beneficence, and justice are implicit in the Confucian ideal of humanness. The difference between Asian and Western ethics lies principally in the amount of credence given to the autonomy, privacy, and rights of atomized individuals"* [11]. On the other hand, Samuel Huntington expressed another view as follows, which is more acceptable for me. *"Some scholars combine Japanese and Chinese culture under the heading of a single Far Eastern civilization. Most, however, do not and instead recognize Japan as a distinct civilization which was the offspring of Chinese civilization, emerging during the period between A.D.100 and 400".* He classified Japanese civilization (including culture) as being very unique and one of the nine civilizations in the present world [12].

Yasushi Haga had a similar view for the Asian civilization and culture, which will be classified into two types named as "concavity culture" and "convexity culture" according to his idea. And Japanese culture belongs to the former culture, and China and Korea located in the Eurasia continent fit in the latter culture [13]. By the interpretation I have made the character trait of our concavity culture as being ambiguous heteronomy rather than autonomy, disciplined, loving harmony rather than conflict, trying indirect or suggestive expression rather than a direct expression avoiding to injure a partner, and scrupulous or conscientious to keep a good relationship, whereas that of convexity culture is autonomy, assertive, insisting on one's own idea, self-governing and self-assertiveness. The difference is possibly dependent on the geographical location, the climate and the history we have had so far.

In the book named "A history of the development of Japanese thought", Hajime Nakamura discussed the Japanese philosophical thought under three categories, such as 1) esteem for human nature, 2) the spirit of harmony or concord (j. wa 和), and 3) concept of law.[14] The basic or main discussion among these three categories was rooted in the Constitution of Prince Shōtoku (574-622), which was believed to be prepared by Prince Shōtoku himself based on his unique thought including the comprehensive concept of Buddhism, Confucianism and traditional Japanese thought [5, 15]. When the Constitution is carefully studied, "wa" (j. 和)idea may include various elements, such as sympathy, empathy, agreement, collabouration, solidarity in addition to harmony and concord [16]. Actually, "wa " is a part of the letter of "Hei-wa"(j. 平和), that means "peace" when translated to English. The principle of Buddhism summarized as humanitarianism (love of others), moral self-reflection and tolerance had much influence upon the Japanese way of thinking, although a part of the original form of Buddhism had been arranged into a different style somehow after Buddhism had been brought over to Japan from China in ancient times.

The love of others in its purest form is called "benevolence" (Sanskrit: matrim karuma), which is the fundamental idea of Buddhism, and this was also the basic thought with the Constitution of Prince Shōtoku [5]. He emphasized "harmony" or "concord" in human relations, as written within the first article of Constitution: "Above all else esteem concord (wa); make it your first duty to avoid discord." This sentence is very similar to "wa" idea in Confucianism where it was said," Of the things brought about by rites, harmony (wa) is the most valuable." [17] In another section of Confucianism, it was said that *:"For where there is even distribution there is no such things as poverty, where there is harmony (wa) there is no such things as under-resourcing and where there is stability there is no such things as overturning."* [18], indicating mutual support or corporation, which might be a prototype of "solidarity" (Note 2). The Constitution of Prince Shōtoku denounced the absolute rule and stressed the necessity of discussing things with others, as stated in Article X: "Discussion on important matters should in general not be made by one person alone. They should be discussed with many others".

Nakamura speculated as follows: *"Actually Japanese society developed from small localized farming communities under a temperate cultural climate. The Japanese did away with nomadic life early on, and settled down to cultivate rice fields. People living on rice must inevitably settle permanently in one place. In such a society families continued on, from generation to generation and individuals were closely bound to each other, forming an exclusive human community. Thus an individual who asserts himself will hurt the feelings of others and then do harm to himself. The Japanese learned to adjust themselves to this type of familial society, and created forms of expression suitable for life in this situation".* [14] Possibly, the fact that Japan is an insular state and no invasion has occurred as well as no despoliation by foreign countries has been experienced since the beginning of the country, is another factor to keep such a "closed community". Whereas, people in the countries located in the Eurasia continent like China and Korea had great migrations and where one race conquered another, only to be conquered by still another. In such society, struggles for existence were based not on a mutual trust but relied on rational plan and a stratagem in their history. Nakamura said that even today there is a strong tendency within the Japanese social structure to settle closely around such tutelary gods and local deities. This tendency is deeply rooted in the people and has led to their attitudes, such as 1) acceptance

of actuality (acceptance of natural human qualities, spirit of tolerance, cultural stratification, weakness of the sprit of direct criticism), 2) tendency to emphasize a particular social nexus (emphasis on human relations, human relationships of greater importance than the individual, closed character of sects and cliques) and 3) non-rational tendencies (non-logical tendencies ,weakness in ability to think in terms of logical consequences, intuitional and emotional tendencies, lack of ability to form complex representations) [14]. This conclusion corresponds to Haga's description of "concavity culture", as described above [13].

Development of Genethics in Japan

Ethical guidelines of medical (genetic) research and testing

The first step of development of biomedical ethics in Japan was "importation" of the American concept of bioethics (ELSI) to our health care systems. Some of them, such as obtaining informed consent and searching for a second opinion in the clinical practice situation seemed to be successfully accepted, although sometimes people in Japan feel a sense of confusion and a sense of discomfort in several situations, such as brain death for organ transplantation, telling the truth (such as about malignancy) to the patient directly, abortion because of an affected fetus, decision making only by himself /herself (autonomy) especially in case of the minor (such as pregnancy or drug addiction) [19], passive euthanasia, issues of the treatment for severally impaired newborn and so on.

For Japanese who have a tradition to consult relatives to make decisions, autonomy, though it is understandable as a principle itself, seems to present a wide array of impediments for implementation. Nevertheless, many guidelines, including the Ethical Guidelines for Human Genome Research (2001,2004,2005, and 2008), the Ethical Guidelines for Epidemiological Research (2002, 2005 and 2007), the Ethical Guidelines for Gene therapy (2002, 2004), the Ethical Guidelines for Clinical Research (2003, 2004) have been established on the basis of international or global ethical norms by the Ministry of Education Culture, Sports, Science and Technology (MECST), the Health, Labour and Welfare Ministry (HLWM) or the Ministry of Economy, Trade and Industry (METI). All guidelines were revised in the years above, as shown in brackets. In the first Ethical Guidelines for Human Genome Research in 2001, the use of an anonymous sample was the basic idea and the use of an anonymous but coded sample was an exception if anything, whereas in the revised Guidelines in 2004, this relation was reversed in every aspect of the guidelines and also the realistic meaning, since the Personal Information Protection Law became effective in 2004. Minor revisions were implemented in 2005 and 2008.

The international ethical guidelines from UNESCO [20], CIOMS [21], Development for Economic Co-operation and Development(OECD) [22] and WHO [23] should play an important role in the clinical and experimental research involving human subjects even within our country, since the Japanese government or Science Council of Japan is tightly linked with these international bodies. Otherwise, the international collabouration study, such as International Conference of Harmonization for new drug development, could not be performed. Fundamentally there are no differences among all of these guidelines. However, attention is required in connection with "genetic exceptionalism", which was coined by Thomas Murray in 1997.

Genetic exceptionalism is the belief that the particular nature of genetic information gives rise to greater risk or particular risks that are different from another health related risk [24]. This idea brings about discussion of the nature of genetic information and genetic privacy. At present, "Ethical, legal and social aspects of genetic testing: research, development and clinical application" (2004) from European Union [25], "Pharmacogenetics ― Towards improving treatment with medicines" (2005) from CIOMS [26] and "Pharmacogenetics" (2005) from Nuffield Council on Bioethics [27] expressed a negative opinion, saying "genetic exceptionalism" to be inappropriate. UNESCO, however, mentioned nothing about the issue directly in "International Declaration on Human Genetic Data" (2003), rather supported the concept of genetic information being special in comparison to ordinary clinical information, saying 1) they can be predictive of genetic predispositions concerning individuals; 2) they may have a significant impact on the family, including offspring, extending over generations, and in some instances on the whole group to which the person concerned belongs, 3) they may contain information, the significance of which is not necessarily known at the time of the collection of the biological samples, 4) they may have cultural significance for a person or group [20]. Recently, OECD (2006) said that concerning the nature of genetic information, participants of the OECD workshop did not reach a consensus on the discussion of genetic exceptionalism [28].

In Japan no conclusion or comment was agreed upon, as to whether genetic exceptionalism became acceptable or not. Support of the idea regarding genetic information is similar to UNESCO's declaration.

Several perspectives of genetics in Japan

Genethics for newborn screening

In 1977, newborn screening (NBS) was started in Japan, nationwide. A guideline for NBS was prepared in 1998 in Japan, according to the classical principle of Wilson-Jungner proposed in 1968 from WHO [29]. In Japanese guidelines it was said that: 1) informed consent should be required from the parents participated in the screening, 2) residual blood spots should be used only for the purpose contributing to the scientific progress and under an anonymous condition [30]. This was proposed according to the statement of "there should be an agreed policy on whom to treat as patients" in the classical guideline [29]. However, in the US, NBS have been performed on a mandatory basis without an informed consent, except in only

three states.[31] There were several reasons to have the test performed without informed consent, such as, not being convenient to require informed consent or informed refusal from the participating parents, and NBS should be acceptable for parents since NBS is no doubt suitable for bioethical principles; maximizing benefit and minimizing risk for newborn infants [31,32]. Such reasons seemed to be acceptable only when NBS was limited to PKU and congenital hypothyroidism since these diseases are completely treatable resulting in an improved condition and give us a highest cost/effectiveness and cost/benefit, as were reported [31]. However, things have changed since MS/MS was introduced in the way of NBS, where 54 diseases (core: 29, secondary: 25) including 6 classical diseases like PKU were targeted for the screening [33]. At this moment, Thomas H Murray and Virginia A Moyer expressed major concerns, because natural history of the newly added diseases are poorly understood and cost / effectiveness and cost/ benefit of these diseases are not yet clear, and despite these situations, NBS was performed in all these diseases without informed consent and thus with a mandatory basis [34,35].

In 2008, the Bioethics Committee of the President expressed the views in the White Paper for those issues [36], where they proposed 1) NBS should proceed according to the classical principle proposed by Wilson-Jungner [29], and 2) the other diseases after MS/MS had been introduced should be proceeded only after obtaining informed consent (not mandatory) and should be intended as a pilot study. In Japan several institutes have performed screening with MS/MS in addition to the 6 classical diseases at this time, as a pilot study and by obtaining informed consent from the participating parents. Fukushi reported that 98.7% of the parents (total number 64,835) agreed to participate in the MS/MS pilot study from 2005 to 2009 in Sapporo.[37] Contents of the informed consent included agreement for performing the screening test and keeping the residual blood specimens to reuse for other studies, such as creating a DNA bank.

Our NBS system has been strictly controlled by regulating guidelines, especially after MS/MS had been introduced. Another issue should be discussed is for those diseases which are untreatable even if found by NBS. In 1975, National Research Council Committee for Inborn Error of Metabolism insisted that NBS be considered when the effective therapy is available and NBS will then bring about substantial public benefit In the latter option the Council Committee proposed three conditions: 1) to the infant (to provide management and support even when direct treatment is unavailable), 2) to the family (to inform subsequent reproductive decisions), and 3) to society (to provide knowledge of the true range and incidence of the condition) [38]. This means, in some cases such as DMD or fragile X syndrome, NBS will be performed not for the early treatment of the screened infant itself, but only for the information to be used for the next round of reproduction decision making. This condition will be unacceptable from the viewpoint of original principle of NBS [23,29] and also by overall Japanese sentiment. Nevertheless, it is said that DMD will be the most interesting future target of NBS by the Center of Disease Control and Prevention in US [39].

Japanese attitudes to repro-genetics

In 1988 the maternal multiple-marker tests measuring alpha-fetprotein, estriol and chorionic gonadotoropin in maternal serum during early gestation (by amniocentesis) had been established for screening the fetus for Down syndrome,18 trisomy and neural tube defects in the UK [40]. The test has been recommended for pregnant women under 34 years of age by the American Academy of Pediatrics and American College of Obstetrics and Gynecology in 1997 (pregnant women over 35 years of age are recommended to have amniocentesis) [41], and actually 60% of the pregnant women received an explanation of the test at the survey conducted in 1990 within US (Baltimore) [42]. In 2007, the UK National Committee recommended screening for Down syndrome, as a Policy Recommendation [43].

No such recommendation has been proposed by any Academic Society in Japan, although the multiple-marker tests are available in Japan produced by several commercial clinical examination laboratories since 1992 [44]. In 1999, the Executive Committee for Triple-Marker Testing set up by HLWM recommended that 1) very careful correspondence is required for offering such a test, since at that time even doctors did not understand clearly that the test is a risk assessment and not a diagnostic test and 2) the test should not be available as “a screening program for chromosomal abnormalities for the fetus”, in the same manner as NBS [45], since termination of pregnancy is clearly not “therapy” in the usual sense of the word. Another point is, as described above, the fact that a selective abortion because of an abnormal fetus’s condition is not officially approved in Japan. Already a very similar recommendation was proposed from the Japanese Society of Human Genetics in 1998.

In Germany, similar to Japan, the screening program in prenatal care on a population basis is not actively promoted and is not to be found on the policy agendas of professional and scientific association [46]. In our survey only 4% of pregnant women above the age of 35 underwent amniocentesis in the survey which covered more than 80% of all women in Japan in 1997 ～ 1998 [47] In France, more than 60% received the same test in 1984 already [48]. In order to know what people think about repro-genetics, we did a small survey, in which it became clear that most Japanese are reluctant to give a definite answer in the decision making process. For example, 38.1% of Japanese, 0.5% of Chinese, and 3.7% of Panamanian choose the answer of ”neither agree nor disagree” for the statement “A pregnant woman should have prenatal diagnosis, if medically indicated by factors of her age and family history”. (Note 3) This will be a typical attitude of “concavity culture”, as previously discussed, showing ambiguous behaviour, heteronomy rather than autonomy. Even in the Guideline for Genetic Testing in Japan (2000), it is said that “prenatal diagnosis should be performed only upon request from the couple who have understood the implications of the test”, indicating that the test

must be performed after a couple's agreement, but not by the pregnant woman's decision alone [49].

Fundamentally, repro-genetic decision making is a very private matter. It will depend on the case in which the mother (family) is concerned, and the decision will change from case to case, even in the same family. General discussion such as "prenatal diagnosis is acceptable or not" will not give us a significant conclusion. Receiving a prenatal diagnosis and the acceptance of selective abortion must be discussed independently, although these are correlated with each other.

According to Richard K Zimmerman, even if 79% and 58% of the people said they accept prenatal diagnosis for genetic diseases, only 22% and 20% agreed to have a selective abortion when the fetus is affected, in African Americans 13 and in Caucasian Americans, respectively [50].

Kirstin Finn Schwant said that: "the ability to know prenatally whether or not a child will have a birth defect may raise difficult questions for some Christians. If a baby is born with a chromosomal abnormality, most people feel obligated to love and take care of the child. Should that belief change when a fetus is prenatally diagnosed with a chromosomal abnormality? Perhaps the parents feel that preventing the birth of the child is the most loving decision. On the other hand, the couple may decide to continue the pregnancy, believing that God will provide the strength required to take care of such a child. What they believe about God can shed light on such a choice" [51].

Another factor for receiving the abortion will be the severity of the affected babies. Japanese clinical geneticists agreed to perform selective abortion in cases of anencphaly (90.0%), Trisomy13 (77.6%), severe spina bifida (69.0%), achondroplasia (53.6%), Trisomy 21 (42.9%), Huntington disease (42.1%), XXY (30.1%),cleft lip and palpate (5.8%), and those figures are slightly less than the results surveyed in the USA and in Germany [52]. In the case of male patients with ornithine transcarbamylaze deficiency (sex linked inherited disease), the mutations of Ser192Arg and Arg126Gly resulted in an early onset of the disease with a severe prognosis, while the mutations of Arg40His and Arg129 His had a late onset type with a favourable prognosis when found and treated in the early age [53]. In the tow male cases with the former mutations (one with Ser192Arg, one with Arg126Gly), the pregnancy was terminated by the parent's decision. On the other hand, in three male cases with the latter mutation (two with Arg40His, one with Arg129His) the pregnancy was continued after giving a positive result of the prenatal diagnosis, and medical treatment immediately after birth resulted in normal development. The children are over 10 years old right now and under dietary control. [54]

Protecting genetic information

HLWM stated "Guidelines for Protecting Personal Information with Healthcare Provider" based on "The Personal Information Protection Law" in 2004. In those guidelines they said that "UNESCO's Declaration on Human Genetic Data" and "Guideline for Genetic Testing" prepared by the Japanese Genetics Related Societies in 2003 [49] should be followed for protecting private genetic information, since the information is very sensitive and when disclosed, the person involved and his or her relatives will have possible risks and discrimination [54]. The Japanese Association of Medical Science (JAMS) decided to take the same position. Both HLWM and JAMS were not originally intending to establish their own set of guidelines concerning the genetic information. The basic idea of the Guidelines of Genetics-related Societies of Japan was rooted in UNESCO's Declaration on Human Genetic Data stating that genetic data (information) possessed several natures such as 1) unchangeable for life long, 2) being inherited by the posterity, 3) containing predictive information for genetic disease, 4) sharing the information with relatives, and 5) having risk factors with an insurance contract, employment or stigmatization [49]. There is another possibility which brings up the unexpected fact, such as a different parent-child relationship could be realized accidentally by gene analysis within the family (the element of surprise).

Actually, based on these characteristics, George Annas expressed the genetic information is especially sensitive and personalized, as "future daily" as he coined. He and his associate had proposed a model "Genetic Privacy Act" for protecting genetic information, when "Genome Project" was funded jointly by the Department of Energy and NIH, with many other government agencies world wide, and private biotechnology companies [55]. Every state in the USA has its own regulation or legislation in terms of protecting genetic information, although the definition of genetic information is different from state to state; Some states target only DNA data and other states include family history for genetic information [56]. Murray asked: "*What, if anything, makes genetic information different from other health-related information? Can it, in concept and in practice, be singled out? Regardless of whether it really is different from medical information, are there characteristics of genetic information or for society into which it will flow that should lead us to act as if it were different?"* [57] He criticized Annas's idea as a "genetic exceptionalism", since, "genetic information is neither unique nor distinctive in its ability to offer probabilistic peeks into our future health", according to his words [56]. After a long discussion, he concluded that he supported a weaker form of genetic exceptionalism, since: *"genetic information is sufficiently distinctive from other forms of information that it ought to receive greater privacy protection".* Another assertion by Murray is that genetic exceptionalism promotes genetic determinism or genetic reductionism, which is most unacceptable since this thinking is complicit in genetic discrimination [24]. Recently, a definition of "genetic information" has become more confused in legal theory [56], even in scientific meaning, since the information of monogenic disease, such as a

Huntington disease gene is evidently different from that of polygenic common disease, such as coronary disease and allergic disease, in terms of a penetrance and predictive ability of the involved gene (Note 4). Generally, incidence of monogenic diseases is very small, while the type of the diseases is more than 10,000, carrying the possibility of severe symptoms. Although the number is limited, some of them are treatable, such as PKU. The genetic information, therefore, should be classified into several different groups and the more important is our attitude to genetic knowledge rather than the knowledge itself. Another aspect is how a lay person will react to such different sort of genetic information. If the people speculate that genetic testing is useful for their clinical management, such as pharmacogenomics or pharmacogenetic testing, they will be delighted to accept it, whereas they may feel danger in the possibility that the results will be misused for genetic discrimination (Note 5). They will, therefore, not accept the testing. In conclusion, there is considerable difficulty in discussing various genetic factors. Regardless of whether genetic exceptionalism is acceptable or not, we should maintain a code of confidentiality so as to protect the individual genetic information as closely as possible.

Genetic privacy - Right to know and right not to know - Privacy and autonomy in medical genetics

Words corresponding to “rights”, “personality”, and “privacy “ expressing the basic idea of humanity in Japanese language were actually created in Japanese as new loanwords or used as “phonogram” without translation during the Meiji period or after World War. The word “privacy (leave me alone)”, “puraibashi （j. プライバシー）” in Japanese is one example [52]. The idea of privacy has said to be developed possibly after the room first became locked. The structure of the room in a traditional building in Japan was made simply of a sliding paper door; “fusuma” (j. 襖) and “shouji “（j. 障子） and no key were used. Eiichiro Ishida coined the word “kagi-no- bunnkakenn “（j.鍵の文化圏）, meaning “the cultural sphere represented by key society”, in which, he said, countries in the Eurasian continent such as China and Korea, but not Japan are included [57]. Such thought is very similar to the idea of “concavity culture” and “convexity culture”, as discussed previously by Haga. [13] Anyway, only after World War, when a locked room became popular inside a building for the general population, the idea of privacy became to be realized in Japan. Actually, privacy itself was developed as a right of autonomy or right to be alone while making a decision. The elements of “genetic privacy”, in this context, is composed of protecting personal genetic information by confidentiality, autonomous decision making about genetic issues and the right to know/not to know in terms of the genetic information. In 2004, the Personal Information Protection Law was enforced in Japan. Genetic (personal) information is now protected by this law, on the basis of the Constitution, the 13th article *“All people shall be respected as individuals. Their right to life and the pursuit of happiness shall, to the extent that it does not interfere with the public welfare, be the supreme consideration in legislation and in other governmental affairs.”* In the USA, a right of privacy has been imported by interpretation into the Constitution itself [58]. It has been stated in the 4th Amendment: *“protects Americans in their belief, their thoughts, their emotions and their sensations. They [the framers] conferred as against the Government, the right to be let alone-the most comprehensive of rights and the right most valued by civilized men”* (1928, p. 478-479).

After further information protection laws, including the Health Insurance Portability and Accountability Act(HIPAA), has come into force, the Senate and the Lower House of congress approved the Genetic Information Non -discrimination Act (GINA) (Note 6) enacted in 2008 to prohibit discrimination on the basis of genetic information (clinical record is not included) with respect to health insurance and employment [59]. They said, *“Although genes are facially neutral markers, many genetic conditions and disorders are associated with particular racial and ethnic groups and gender. Because some genetic traits are most prevalent in particular groups, members of a particular group 17 may be stigmatized or discriminated against as a result of that genetic information.”* [59] Sharing the genetic information with relatives Ruth Chadwick said that there are at least four central concepts in the right to know/not to know debate: autonomy, confidentiality, privacy, and solidarity [60], and Ann Sommnerville and Veronica English add communitarianism as another concept [61]. Concerning the right to know especially in genetics will have two situations, in which the first is to know one’s own genetic information, and the second is to know the genetic information not of himself/herself, but about the relatives. Both are closely related. Concerning the first situation, Rosamond Rhodes argues: ”if I have an obligation to learn what I can when genetic information is likely to make a significant difference in my decisions and when the information is obtainable with a reasonable effort, I do not have the right to remain ignorant. From the recognition of my own autonomy, I have a duty to be informed for decision-making.” [62] As the result, autonomy, in the case of genetic knowledge, means that people have a moral duty to know about their genetic disorders in order to be free and autonomous [62,63]. However, this argument seems to be too strong to insist, as it is, since people also have the right not to know as the moral philosophy [60]. Although there is an assumption among heath care professionals and lay people that it is generally better to know than not to know one’s own genetic information, the low uptake rate of pre-symptomatic testing for Huntington’s disease, estimated at only 10-20%, can be seen as a challenge for this assumption [61]. The information of Huntington’s disease has a specific situation, since the disease is unpreventable and untreatable, even so, these data indicate that a considerable number of the population at risk does not wish to know of their own genetic status. The UNESCO Declaration of Human Genome and Human Rights Article talks about the individual deciding whether or not to be informed of the results of a genetic examination [19]. In the second indication, when A has a right to know about

his/her own genetic information, and another person B, who knows A's genetic information, the question is whether or not B should have the responsibility to tell the information to A. Thus, in view of the relevance of the information to others, the question arises as to whether they are morally entitled to make this decision.

In many situations, we can only tell the information which could help to prevent serious harm to the health of the individual, and this will be possible only within a family or relatives, or through a health professional, since genetic information should be confidential. Human genetics is concerned with direct biological relationships and the transmission of certain traits or susceptibilities within families. The family is at the core of communitarian concepts or solidarity of mutuality, responsibility for others and inter-dependence. We should carefully consider that individuals recognize the risks and harms for others close to them when they have certain information. Confidentiality is one of the cornerstones in medical genetics, but this is not an absolute duty. Stephan Eriksson said that where there is a moral demand to inform biological relatives, telling the information to them is neither a paternalistic line of action, nor does it undermine the autonomy of the relatives [62]. As one of the bioethical principles we have a duty of warning the third party. The General Medical Council of UK said; *"disclosure may be a necessary in the public interest where a failure to disclose information may expose the patient, or others, to the risk of death or serious harms"* [64]. Based on this concept, in the Guideline for Prenatal Diagnosis and Genetic Testing in Japan in 1995 [65], we said as follows. *"If the sharing of information with another specific person (family member at present or future) will avoid serious injury to that person, if necessary to seek the consent of the subject to reveal that information, and even if agreement cannot be obtained, if it is judged necessary the obligation of confidentiality can be broken. Such an exception must be made following the judgment of the responsible ethics committee, not by the counselor. Therefore, in our opinion, in such cases, the committee, not a single counselor, will decide if disclosure of the information to the relatives should be made."* In 2003, we provided further details of this issue and described them below [49];

"Disclosure of Genetic Test Results

1. The rights of examinees to know or not to know the test results should be equally respected.

2. When disclosing genetic test results, the wishes of examinees to have results disclosed or to refuse them to be known should be respected. Individual genetic information gained from testing must be subject to confidentiality, and therefore fundamentally should never be disclosed to relatives or any third party without obtaining permission from examinees themselves. Even when the examinees agree to open individual genetic test results, these results should be protected from access by employers, health insurers and schools." …

"6 The tests must be disclosed to relatives with the examinees' consent. In case of refusal by examinees, disclosure to their relatives may still be possible if all the following conditions are met. However, decisions for disclosure in such cases should not be made on the sole judgment of the directing physician, but should be made within the jurisdiction of an institutional review board, whose decision should be final. (1) When the results can be utilized as useful information for the prevention and treatment clinically, (2) When judging that disadvantages which relatives may suffer can be preventable by the disclosure, (3) In cases where, even after repeated explanation to examinees, disclosure consent has not been given, (4) In cases where requests for disclosure have come from relatives, (5) When judging that examinees will not suffer discrimination, even if results are disclosed to relatives, (6) In cases where disclosure can lead to diagnosis, prevention and /or treatment of a particular diseases in relatives."

We have had much discussion concerning the above item (4), since in the previous Guidelines made in 1995 this specific item was not included. A point was that even if the information is very useful for preventing a "disadvantage for relatives", there is a possibility that the informed relative may insist the right not to know and brings a legal claim, because of the broken confidentiality of the patient. Maria Bottis was one such case which made the case against disclosure of the genetic information to the relatives without their request, introducing a special case. (Note 7)[66]. ASHG introduced another case, where the court asserted that duty for warning the family in case of genetic carcinoma is limited to the patient only, and not the physician in charge (Note 8) [67].

Another issue which must be discussed is how to define "disadvantage to the relatives". This might depend on the values of the people involved. Dorothy Wertz and her associate proposed another case; *"there could be a temptation on the part of geneticists to include a wide variety of disorders under the heading of "treatable", even if treatments are not especially effective, leading to the danger of unwarranted breaches of confidentiality. There are also disorders that are not treatable but could be prevented in future generations if prospective parents become aware in time."* [68] However, an expectation for prospective parents to have the "best" alterative available, a healthy child is said to be considered as a contestable presumption. *"First, it takes for granted that a disabled child is always the worse scenario. Secondly, it assumes that families with disabled children will always be more burdened (emotionally and economically) than other families. Thirdly, it presumes that the world would benefit more than the birth of a non-disabled individuals in some cases."* [69] Therefore, it remains unclear as to whether or not we have a duty to tell the information without the consent of the patient and without the request from the genetic relatives in such a case (actually untreatable, only useful for repro-genetics decision making), although it is agreeable that the patient has a moral duty to share the genetic information between the relatives. There is still a possibility that genetic relatives will refuse to be informed, depending on their values.

In contrast to the WHO guidelines [68] we decided to make case decisions within the ethical committee, not an individual genetic counselor. The Committee should decide whether the patient's genetic information will be disclosed to the genetic relatives without the consent from the examinee. Wertz and her associates support our idea in some cases, saying that *"using an ethics committee as an intermediary decision body may be an effective solution, especially if the geneticist is facing a problem where he or she would search out a second opinion. This may also be provided through a system of ethical consultation."* [68]. Our idea depends on the "wa" idea, as discussed above; *"Discussion on important matters should be generally not made by one person alone. They should be discussed with many others"* [14]. The actual reaction must be discussed. In the survey asking geneticists in Japan; "Patients should tell their relatives the results of their own genetic tests if they are relevant to the relatives' health or reproduction", 38% of the respondents agreed, 20% disagreed, and 42% neither agreed nor disagreed [51]. This result suggests that almost half of geneticists had a typical attitude of "concavity culture", as discussed above [13], showing ambiguous behaviour, heteronomy rather than autonomy. This is probably due to non-rational tendencies (non-logical tendencies, weakness in ability to think in terms of logical consequences) of Japanese as discussed previously by Nakamura [14], or they understand the moral duty of sharing the genetic information with genetic relatives is most desirable, but they hesitate to decide by his or her own idea.

Another comment will be that the ethical committee adopts Western bioethics, at least, in formal approaches and a professional statement, while some geneticist may have another consideration. As to the legal countermeasure, only Australia approved such in a Private Legislation Amendment 2006, saying *"permits use of disclosure of genetic information about an individual to a genetic relative in circumstance where the genetic information may reveal serious threats to a relatives' life, health or safety, but not necessary an imminent threat." And "This amendment will ensure a medical practitioner is able to disclose genetic information to genetic relatives where there is a serious risk to the health of genetic relatives."* [70] However, no guidelines are available to proceed with the law at present.

Attitudes to Medical Genetics in Japan in the Future

It was claimed that people in Japan have a desire to hide rather than to open the fact of having a genetic disease within their family, because the genetic disease is rare and negatively thought of in a "closed society", where people are conscious of eyes of a stranger. They are possibly afraid of genetic discrimination, when the genetic information becomes public [71, 72]. The survey using the multiple choice format was administrated to health care providers, lay persons, and family members of the patients with genetic disease (mostly Duchenne muscle dystrophy). [73] The question was: *"what is your impression about "genetic disease"?",* and the answers obtained are shown in Table 1.

Table 1 Reaction to the question "What is your impression about "genetic disease"?".

	Health care providers (n=712)	*Lay persons (n=637)*	*Family members (n=140)*
1) Prefer not to disclose, if I have patient(s) of genetic disease in my family	9.3 (%)	8.3 (%)	12.5(%)
2) I have a concern, if the family of my partner has some genetic disease	37.0(%)	34.9(%)	39.0(%)
3) Afraid to give birth to a baby with genetic disease	63.8(%)	55.4(%)	51.5(%)
4) Would like to live without worry about genetic disease	39.2(%)	40.4(%)	43.4(%)

Among the three groups, statistically no difference was observed.

In contrast to the previous statements, a small number of the participants "prefer to hide, if I have the patient(s) with genetic disease in my family", and almost half of the family members "would like to live without worry about the disease". This result may be related to the activity of the patients and their supporting organizations, which have developed into more than 50 organizations in Japan up to now. Possibly the "wa" (j. 和) idea being the soul of solidarity became evident in this field. A relevant education for those involved with medical genetics including ELSI is insisted by many authors so far [74] and this will open the doorway to a community without genetic discrimination and prejudice, not completely but to a sufficient degree. Challenge to public engagement in genetic science and technology is also essential to solve the issues we faced in genethics [75].

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Notes

1. In Japan the Eugenic Protection Act, under which those with mental disabilities were possibly sterilized by force, was repealed in 1995. Instead, new Maternal Protection Act was passed in 1996 where abortion is legal, if continuation or delivery possibly may cause considerable harm to maternal health for either physical or economic reasons. The Ethical Committee of the Japan Society of Gynecology and Obstetrics approved 143 cases of preimplantation diagnosis, in which Duchenne muscle dystrophy, habitual abortion due to balanced translocation (the most cases), adrenoleukodystrophy and OTC deficiency were included.
2. Solidarity has three essential features, according to Gefenas; the first, solidarity as a group concept presupposes sufficient emotional bonds among the members of the group. Secondary, it is also essential that the group be united by common goals and/or ideals. Thirdly in order to reach the same goal, members of the group are committed to sacrifice some of their own welfare (or even their life in extreme circumstances), which in itself is a sign of emotional involvement. (Gefenas E: Social Justice and

Solidarity. In *Bioethics in a European Perspective*. Edited by ten Have H and Gordijin, B. Kluwer Academic Publisher. Dordorecht. 2001.p 2069).

3. Unpublished data. To understand the public opinion concerning the issues related to genetic health care the survey was conducted in Japan (n=280), China (n=202) and Panama (n=202) in 2008 to 2009.

4. The person carrying Huntington disease gene develops the symptoms without exception in the future, while the person carrying BRCA1 gene will suffer from breast cancer at the rate of 4 times higher than that of the non-carrying person. Note 3. Unpublished data. The numbers of people who participated in the survey are 280 in Japan, 202 in China, and 218 in Panama (performed in 2008～2009) No difference was found among healthcare givers and lay persons in every country.

5. Genetic discrimination is defined as; discrimination against an individual or against members of that individual's family solely because of a real or perceived difference from the normal genome of that individual. Genetic discrimination is distinguished from discrimination based on disabilities caused by altered genes.

6. In GINA, genetic information includes information about: a person's genetic tests, genetic tests of a person's family members up to and including fourth-degree relatives, any manifestation of a diseases or disorder in a family member, and participation of a person or family member in research that includes genetic testing, counseling, or education.

7. Sophie has a genetic form of breast cancer linked to the BRCA1 gene. Cure is possible and a mastectomy is the most effective measure to be taken. Sophie has two sisters, Katie and Sally. Katie is phobic about needles and hates hospitals. Sally is depressive and has recently discovered that she is pregnant. Sophie does not want to tell her sisters about her disease, but should Sophie's doctor inform the sisters, even though the knowledge might have an adverse implication for their lives?

8. The American Society of Human Genetics (ASHG) Social Subcommittee for Family Disclosure introduced the case of a daughter of the mother suffering from medullary thyroid carcinoma. "She sued her mother's attending physician because 1) her mother's diagnosis is one that is hereditary carcinoma, 2) this situation reflects a duty to warn 24 the mother that her children might be at risk and that they should be tested,3) had she been tested, she would have taken preventive measures, and 4) her condition would have been preventable. The court ruled, on the basis of state law protecting the confidentiality and pursuant to prevailing standard care, the physician had a duty to warn the mother －but not the daughter. The court noted that "to require the physician to seek out and warn various members of the patient's family would often be difficult or impractical and would place too heavy a burden upon the physician".

References

1] Lippman A (1991) Prenatal genetic testing and screening: Constructing needs and reinforcing Inequities'. *American J Law & Medicine* 17:81-83.

2] ten Have HAMJ (2001) Genetics and culture: The geneticisation thesis. *Medicine, Health Care, Philosophy* 4:259-304.

3] Weatherall DJ (1995) The New Genetics and Clinical Practice. 3rded.Oxford University Press. Oxford pp347-348

4] Wertz DC, Fletcher JC, Berg K (1995) Guidelines on Ethical Issues in Medical Genetics and Provision of Genetics Services. WHO pp3-4

5] Watsuji T (1962) *Nihon Rinri Sisoushi (History of Japanese ethical thought)* Iwanami Shoten, Tokyo pp9-10 (in Japanese)

6] World Medical Association: *Declaration of Helsinki.* 59th (2008)

7] Bhardwaj M (2006) Looking back, looking beyond: revisiting the ethics of genome generation. *J Biosci* 31:167-176.

8] Vallon MB, Rodolfo S, Feraley T, Fluss SS, Idänpään-heillilä JE, Matsuda I, Peterson H, Rantanen J,van Deleden JJA, Vayena E (2009).: *International Ethical Guidelines for Epidemiological Studies.* COMS/WHO p. 23-24.

9] Beauchamp TL, Childress JF (2001) *Principles of Biomedical Ethics*, 5th ed, Oxford, Oxford University Press. pp. 337-384.

10] Huntington SP (2003) *The Clash of Civilizations and the Remaking of World order.* Simon & Schster, New York, p94.

11] Wertz DC, Fletcher JC Berg K (2003*).: Review of Ethical Issues in Medical Genetics.* WHO p5.

12] ibid 10, p. 45

13] Haga Y (2004) *Nihonjinrasisa No Kozou (Structure of Japanese characteristic).* Taishukan, Tokyo pp. 39-42. (in Japanese)

14]. Nakamura H (1967) Problems of Japanese philosophical thought. in *A History of the Development of Japanese Thought.* Kegan Paul London. p. 240-255

15] Supra note 14, pp114-124.

16] Matsuda I (2004) *Seimei-rinri noto (Note concerning Biomedical Ethics: Dialogue to Wa thought).* Nihon-hyoronnsha. Tokyo.pp46-47 (in Japanese)

17] Confucius (1979). *The Analects* (translated by D.C.Law). Penguin Book, p. 61.

18] ibid 17, p138.

19] Matsuda I, Onishi S (2003) Attitude of healthcare professionals in clinical care of children in Japan. *Eubios J Asian International Bioethics* 13:186-189.

20] The United Nations Educational, Scientific and Cultural Organization (2003) *International Declaration on Human Genetic Data.* General Conference.

21].Council of International Organization of Medical Science (CIOMS) Working Group (2005). *Pharmacogenetics. Towards improving treatment with medicines.* CIOMS/WHO.

22] Organization for Economic Co-Operation and Development (OECD). *Creation and governance of human genetics research databases* (2006). pp.132-133

23] Wertz DC, Fletcher JC Berg K.(1998) *Proposed International Guidelines on Ethical Issues in Medical Genetics and Genetic Services.*

24] Murray TH (1997) "Genetic Exceptionalism and 'Future Diaries' : Is Genetic Information Different from Other Medical Information?" In *Genetic Secrets: Protecting Privacy and Confidentiality in the Genetic Era*, ed. Rothstein MA. Yale University Press. New Haven. Conn. pp. 60-73.

25] European Union (2004) *Ethical, Legal and Social Aspects of Genetic Testing: Research, Development and Clinical Applications.* pp.34-35.

26] ibid 21, p142.

27]Nuffield Council Bioethics (2003) *Pharmacogenetics, Ethical Issues.* p. 6.

28] ibid 22, p132.

29] Wilson JMG, Junger G (1968) *Principles and practice of Screening for Disease. Public Health Paper* No.34. Geneva. WHO

30] Ethical Committee (1998). Guidelines for Newborn Mass-Screening in Japan. *J Mass-Screening*. 8:S1-2. (in Japanese)

31] American Academy of Pediatrics (2000) Serving the family from birth to medical home. A Report from the Newborn Screening Task Force. *Pediatrics* 26 106:383-427.

32] Therrell BL, Johnson A, Williams D (2006) Status of newborn screening programs in the United States. *Pediatrics* 117:S212-S252.

33] Watson MJ, Llyd-Puryer MA, Mann MY, Rinald P, Howell RR (2006) Newborn Screening: Toward a Uniform Screening Panel and System. *Genet Med:* 8, 1s-250s.

34] Baily MA, Murray TH (2008). Ethics, evidence, and cost in newborn screening. *Hastings Center Report*.38:23-31.

35] Moyer VA, Calonge N, Teutsch SM, Botokin JR, on behalf of the United States Preventive Services Task Force (2008) Expanding newborn screening: Process, policy, and priorities. *Hasting Center Report*. 38:32-39.

36] The President Council on Bioethics (2008) The Changing Moral Focus of Newborn Screening. An Ethical Analysis by the President's Council on Bioethics.
37] Fukushi M (2009) personal communication, 2009
38] National Academy of Sciences: National Research Council Committee for Study of Inborn Errors of Metabolism (1975) *Genetic Screening Programs, Principles, and Research.* Washington, D.C.
39] Therrell BL, Adams J (2007) Newborn screening in North America. J. Inherit Metab Dis. 30:447-465.
40] Wald NJ, Cuckle HS, Densem JW et al (1988) Maternal serum screening for Down syndrome in pregnancy. *Br Med J* 297:883-887.
41] American Academy of Pediatrics and American College of Obstetrics and Gynecology (1997) *Guidelines for prenatal care:* 4th ed. p79
42] Bernhardt BA, Geller G, Doksum T, Larson SM, Roter D, Holtzman NA (1998) Prenatal genetic testing: Content of discussions between obstetric providers and pregnant women. Obst Gyne 91:648-655.
43] Fetal Anomaly Screening Program- Screening for Down's Syndrome (2007) UK NSC Policy Recommendations. 2007-2010: Model of Best Practice.
44] Matsuda I (2004). Japan. In *Genetics and Ethics in Global Perspective.* Edited by Wertz DC, Flecher JC. Kluwer Academic Publishers. Dordrecht. pp. 251-261.
45] Health Science Council for State-of-The-Art Technology discussing Prenatal Diagnosis (1999) "Viewpoint for Maternal Serum Maker Testing".
46] Nippert I, Wolff G(2004) *Germany*. Supra note, 44 pp. 223-234.
47] Matsuda I, Suzumori K (2000) Prenatal genetic testing. *Community Genet* 27, 3:12-16.
48] French National Consultative Ethical Committee for Health and Life Sciences (2003) *Opinions, recommendations Report* 1984/1998, pp. 295-298.
49] Genetic Medicine Related Society: Guideline for Genetic Testing. (2003) http//jshg.jp/
50] Zimmerman RK. Tabbarah M, Nowalk MP.et al (2006) Racial differences in beliefs about genetic screening among patients at inner-city neighbourhood health centers. *J Nat Med Assoc* 98:370-377.
51] Schwandt KF (1998) Personal stories: Case from genetic counseling. In *Genetic Testing Screening. Critical Engagement at the Intersection of Faith and Science*. Edited by Roger A Willer. Kirk House Publishers Minneapolis, p. 44.
52] Shinoki E, Matsuda I (2005) Changes of bioethical perspective of Japanese clinical geneticists about repro-genetics during 1995-2001. *Advances In Bioethics* Volume 8, edited by Takahashi T. pp. 85-112
53] Matsuda I, Tanase S (1997) The ornithine transcarbamylaze (OTC) gene: mutations in 50 Japanese families with OTC deficiency. *Am J Med Genet* 71:378-384.
54] Guidelines for Protecting Genetic Information with Healthcare Provider (2004) Section 10, *The Handling When Utilizing Genetic Information for the Clinical Practice.* (in Japanese)
55] Annas GJ, Glantz LAH, Roche PA (1995) Grafting the genetic privacy act: Science, policy, and practical consideration. *J Law Med Ethics*. 23:360-365.
56] Rothstein AR (2005) Genetic exceptionalism legislative pragmatism. *Hastings Center Report.* 35; 27-33.
57] Ishida E (1969) Nihon Bunkaron (Discussion about Japanese Culture) Tikuma shobou, Tokyo pp136-138. (in Japanese)
58] McGleenan T (1997) Rights to know and not to know: Is there a need for a genetic privacy law? In *The Right to Know and the Right not to Know.* Edited by Chadwick R, Levitt M, Schickle D. Avebury. Aldershot. pp. 43-53.
59] Genetic Information Nondiscrimination Act (2008)
60] Chadwick R (1997) The philosophy of the right to know and the right not to know.In *The Right to Know and the Right not to Know.* Edited by Chadwick R, Levitt M, Schickle D. Avebury. Aldershot. pp. 13-22.
61] Sommerville A, English V(1999) Genetic privacy: orthodoxy or oxymoron? *J Med Ethics.* 25:144-150.28
62] Rhodes R (1998) Genetic links, family ties and social bonds; rights and responsibilities in face of genetic knowledge. *J Med Philosophy* 3:10-30.
63] Erickson S (2004) Should results from genetic research be returned to research subjects and their biological relatives? *TRAMES* 8:46-62.
64] General Medical Council (1995) *Confidentiality*. London: General Medical Council. p 18.
65] Japan Society of Human Genetics (1995) *Guidelines for Genetic Counseling and Prenatal Diagnosis.*
66] Bottis MC (2000) Comment on a view favouring ignorance of genetic information: confidentiality, autonomy, beneficence and right not to know. *Euro J Health Law* 7:173-183.
67] ASHG Statement (1998) Professional disclosure of familial genetic information. *Am J Hum Genet* 62:474-483.
68] ibid 11, pp. 50-52
69] ibid 25, pp. 59-60
70] *Privacy Legislation Amendment Bill* 2006. The Parliament of the Commonwealth of Australia.
71] Strazar MD, Fisher NL (1996) Traditional Japanese culture. In *Cultural and Ethic Diversity. A Guide for Genetics Professionals*. Edited by Fisher NL. Johns Hopkins University Press. Baltimore. pp98-112.
72] Okura K, Kimura R (1989). Ethics and medical genetics in Japan. In *Ethics and Human Genetics:* Across-Cultural perspective. Edited by Wertz DC. Fletcher JC. Springer-Verlag. Heidelberg. pp294-316.
73] Matsuda I (1998) ELSI for genetic diagnosis. In *Report of The Japan Ministry of Health and Welfare: Establishment of Molecular Diagnostic System and DNA Bank for Neuromuscular Disorders.* Edited by Nonaka I. pp. 75-109. (In Japanese)
74] ibid 11, p16-20.
75] Suda E, Macer D, Matsuda I (2009) Challenges to public engagement in science and technology in Japan: experiences in the HpMp project. *Genomics, Society and Policy*. 5:40-59. 29.

Three levels of discourse on human reproductive cloning in Japan

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Abstract

This paper reviews three levels of discourse on human reproductive cloning (HRC) in Japan: everyday life, fundamental theory, and public policy. In addition to articles with headlines on HRC in the *Asahi Shimbun* newspaper, 224 publications were found on HRC and categorized by publication year, author specialties, and contents. Contents of 100 publications were assigned to the following categories: cultural differences, acceptance of HRC, aversions to HRC, arguments against HRC (human dignity, safety, diversity of the gene pool, discrimination, children's feelings, and religion), rebuttals and utilitarian arguments, arguments concerning regulation, and ethical principles, including the right to healthcare and children's rights and welfare. An opinion poll and public policy were also reviewed. Bioethics on HRC in Japan is primarily based on Western ethics and is communitarianistic, but some arguments are traditionally anti-anthropocentric and vitalistic. Public policy does not seem to reflect bioethical principles, but instead reflects practical needs.

Key words: human reproductive cloning; Japan; ethics; three levels.