Recommendation

# Establishment of a Permanent Organization to Prevent and Control Infectious Diseases

July 3, 2020

Science Council of Japan

Second-Department Subcommittee for a national program proposal

to prevent and control large-scale infectious diseases

This recommendation compiles and publishes the results of deliberations of the Subcommittee for a national program proposal to prevent and control large-scale infectious diseases

Subcommittee for a national program proposal to prevent and control large-scale infectious diseases

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# Summary

## 1. Background

We would like to extend our sincere condolence to those who died of COVID-19 and their family members.

On March 6, 2020, the Science Council of Japan made public the Statement from its Executive Board, entitled "A Request on Measures Against Coronavirus Disease 2019 (COVID-19), and Future Activities of Science Council of Japan." Following this statement, we prepared this recommendation on the basis of the results of a review regarding the COVID-19 epidemic of this year and discussions on the organization which is necessary to control and prevent large-scale or critical infectious diseases, referring to exemplary cases in the United States and other countries. Our review covered administrative responses, including the dissemination of appropriate information to the public and measures to address the social and economic impact of countermeasures, as well as collaborative activities in various academic fields and cooperation among industry, government and academia.

## 2. The current status and major problems

The COVID-19 epidemic reminded us of our country's inadequate resilience to new infectious diseases and raised a number of issues, including how to deal with infectious diseases and their associated social and economic consequences.

Particularly problematic to deal with were the following points: ascertainment of asymptomatic patients and their management; analysis of the current status of viral testing and health and medical care systems, and establishing necessary systems; countermeasures against the infectious agent and its infection routes; coping with the unprecedented social and economic consequences of those countermeasures, and dealing with anxieties and mental strains regarding current and future lives; defamation and discrimination as human rights' issue; the judgement of targeted countries/areas and the period of immigration restrictions; and cruise ship quarantine.

## 3. Necessary measures, organization, system, and human resource development

The National Institute of Infectious Diseases, Japan, made it clear that a new wave of epidemic is sure to come in the wake of the current one. The G20 Dialogue Forum for the Science and Research Community (S20), which was held in conjunction with G20 Germany 2017, pointed to the need of strong short-and long-term strategies based on scientific evidence to fight against infectious and non-communicable diseases that pose threats to human welfare and global health.

To take infectious-disease countermeasures without delay at the time of an emergency that may occur in the future, the government of Japan needs to establish a permanent specialized organization

and develop the necessary laws and systems in non-emergency/normal times. In addition, prefectural governments should establish a governor-led commanding organization and an advisory board consisting of experts in order to take necessary measures against infectious diseases, including large-scale and critical infectious diseases, and develop human resources, working together with the national government, starting in non-epidemic times.

## 4. Recommendation

### (1) The Cabinet Office should establish the Infectious Disease Prevention and Control Committee (a tentative name) as a permanent organization

In order to prevent and control large-scale and critical infectious diseases, it is necessary to establish the Infectious Disease Prevention and Control Committee (tentative name, hereinafter referred to as the "IDPCC") as a permanent organization, and build a system to prepare for emergencies starting in normal times. The IDPCC will examine the current status of health and medical care provided to the public, the safety measures taken for health and medical care personnel, and other activities considered necessary in view of scientific and professional knowledge, starting from normal times. On the basis of results obtained from such analyses and scientific knowledge, the IDPCC will formulate necessary measures from a fair and neutral standpoint, and provide advice to the Cabinet. The IDPCC is made up of experts in public health, clinical and basic medicine related to infectious diseases. Under the IDPCC, specialized working groups shall be established. If necessary, working groups including experts in the economic, social and legal fields will also be established. When an emergency response is deemed necessary, the IDPCC shall in principle envisage several scenarios and present a recommendation (recommendations) to the Cabinet on the basis of these scenarios.

Regardless of the nature of the Committee as an administrative body, it would be easier to avoid the adverse effects of vertical division of ministries and agencies by establishing it as a permanent organization in the Cabinet Office. The IDPCC shall also be responsible for the control of infectious diseases other than large-scale and crisis infections. The accumulation of experience and information on various infectious disease countermeasures from normal times is expected to enhance its ability to respond to large-scale and critical infectious diseases.

At the same time, a permanent post should be created in the Cabinet. This person should have responsibility at the political level to combat infectious diseases, keeping in close cooperation with the IDPCC. On the basis of the recommendation(s) presented by the IDPCC, the Cabinet should take responsibility to make policy decisions on specific measures, and take infection control measures infectious diseases countermeasures in a unified manner. It is important to take systematic measures by consolidating the chain of command and disseminate information to the public. In addition, flexible measures tailored to local conditions should be implemented. To that end, prefectural governors should be given as much discretion as possible so that they can make their own decisions on the basis of regional characteristics, the prevalence of infectious diseases, and health and medical care systems.

In recent years, there has been a succession of natural disasters in Japan. Dealing with infectious diseases among evacuees at the time of disaster can be considered as an important task for the IDPCC. In preparation for a complex disaster, the IDPCC should also collaborate with relevant organizations such as the Central Disaster Management Council.

**(2) A permanent organization should be established in the prefecture.**

A permanent organization of experts should be established to advise prefectural governors on infectious disease control. This committee of experts should include the director of the health center, academic experts on various aspects of infectious diseases, and representatives of local medical associations and major medical institutions. At the same time, each prefecture should establish a permanent prefectural infectious disease control headquarters (tentative name), headed by the governor and consisting of prefectural personnel in charge of crisis management and disaster prevention, health and welfare, and economic policy to deal with large-scale and critical infectious diseases. At the discretion of the prefectural government, other infectious disease measures, such as measures against infectious diseases in the event of a large-scale disaster, will be included. In addition, the spread of the epidemic across prefectures should be taken into account in advance, and cooperation among neighboring prefectures should be prepared. The main tasks of prefectural headquarters are to prepare for the threat of large-scale and critical infectious diseases during normal times, and to prevent and control infectious diseases, including large-scale and critical infectious diseases, and to develop human resources.

**(3) Strengthening of the system**

From the viewpoint of research promotion, human resource development, emergency responses in case of an epidemic, the structures of organizations dealing with infectious diseases should be strengthened and upgraded. In particular, the national government should establish an infectious disease data center and store all domestic electronic data related to basic research, epidemiology and clinical medicine of the infectious diseases. In addition, by making such data available to a wide range of relevant researchers, an environment that promotes open science should be created.

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## 1.Background

We would like to extend our sincere condolences to those afflicted by COVID-19 and to their family members.

On March 6, 2020, the Science Council of Japan made public the Statement from its Executive Board, entitled "A Request on Measures Against Coronavirus Disease 2019 (COVID-19), and Future Activities of Science Council of Japan." Following this statement, we prepared this recommendation on the basis of review results regarding the COVID-19 epidemic of this year and discussions on the organization, which is necessary to prevent and control large-scale or critical infectious diseases, referring to exemplary organizations cases in the United States and other countries. Our review covered administrative responses, including the dissemination of appropriate information to the public and measures to address the social and economic impact, as well as collaborative activities in various academic fields and cooperation among industry, government, and academia.

This recommendation covers infectious diseases in general, but particularly infectious diseases that cause large-scale epidemics in large parts of the country (large-scale infectious diseases). It also includes infectious diseases that are only prevalent in a particular area, but that are widespread in that area and have a high fatality rate or can cause serious disability (critical infectious diseases).

In this recommendation, during a time when an infectious disease epidemic threatens the life and health of the people, is imminent, or a time when an epidemic occurs and an emergency response is required is called an emergency, while other times are called a non-emergency.

## 2. Current situation and problems

According to the results of an analysis of the COVID-19 epidemic in Japan by the National Institute of Infectious Diseases (hereinafter referred to as the "NIID")[1], several clusters occurred in various parts of Japan, which were caused by a virus strain that spread in Wuhan, China, in early January, and subsequently disappeared. Although the first wave of the epidemic from China was successfully contained, the subsequent wave of the epidemic in Japan was most likely caused by the spread of virus strains introduced by imported cases via Europe and the United States into the country [1]. The epidemic subsequently expanded, and on March 19, the Government's Expert Panel on COVID-19 indicated that an explosive surge in cases could occur in the future [2].

Since late March, the epidemic has been spreading, mainly in the Tokyo and Kansai metropolitan areas. On April 7, the Japanese government declared a State of Emergency in seven prefectures, and on April 16, it expanded the number of areas covered by the epidemic to include all of Japan. However, nosocomial infections subsequently broke out in medical institutions across the country, leading to a

situation where "medical collapse has already occurred in some areas."[3]

In this year's COVID-19 epidemic, there were particular difficulties in the following points: 1) ascertainment of asymptomatic carriers and their management; 2) analysis of the current status of viral testing and medical care systems, and establishment of necessary systems; 3) countermeasures against the infectious agent and its infection routes; 4) coping with the unprecedented social and economic consequences of those countermeasures, and dealing with anxieties and mental strains regarding current and future lives; 5) defamation and discrimination as human rights issues; 6) the judgement of targeted countries/areas and the period of immigration restrictions; and 7) cruise ship quarantine. Most of these points are mentioned in the recommendations of the Government Expert Panel on COVID-19 [4]. We hope that a full-scale review by the national government will deepen the discussion further. The discussions here focus on the need for the establishment of national and prefectural organizations in charge of infectious disease control, as proposed in this recommendation, and related matters.

**(1) Identification of the infected cases**

The National Epidemiological Surveillance of Infectious Diseases (NESID) has not been able to identify asymptomatic carriers, which are common among cases infected with the novel coronavirus, and the identification of infected cases has required RT-PCR testing*[1] for virus detection (hereinafter referred to as "PCR testing"). In Korea and Taiwan, PCR testing was aggressively used from an early stage to identify infected cases, but it was pointed out that the development of testing system took time in Japan [5].

**(2) Tests**

Initially, the Ministry of Health, Labour and Welfare (MHLW) limited PCR testing to those who met criteria such as symptoms, contact history, and travel history (the officially announced medical basis for this was not entirely clear). As a result, there were many cases where PCR testing was not available even if the physicians considered them necessary [6].

Since March 6, PCR testing was covered by the National Health Insurance and could be performed by private laboratories [7]; however, the number of PCR tests other than administrative tests did not increase as much as expected [8]. The reasons for this are twofold: a human resource issue and material issues. The human resource problem is a paucity of technicians who can perform PCR testing [9]. The material problems are in the number of medical facilities with necessary equipment for testing, and a scarcity of institutions with testing equipment that performs most tasks automatically. In addition, the

high overseas dependence of reagents for testing, combined with the increasing demand for PCR testing overseas, was a factor causing insufficient supply of reagents in Japan.

The Tokyo Metropolitan Medical Association judged it necessary to strengthen the PCR testing system to prevent the collapse of medical care and set up 12 PCR testing centers in Tokyo by April 30 so that PCR tests could be performed with referrals from family physicians. It is reported that they plan to increase the number of locations, securing personnel with the help of members of the association, and collaborating with municipalities [10,11].

**(3) Understanding of current epidemic trends**

Since March, the number of infected cases with unknown routes of transmission has reached a non-negligible level, and the Government's Expert Panel on COVID-19 pointed out that the necessary PCR tests should be carried out promptly and that "from now on, an investigation to understand the infection situation in Japan as a whole is also necessary."[2] However, in Japan, inadequate investigation systems to conduct large-scale screening by PCR testing and ~~a~~ sample surveillance made it impossible to carry out surveys to determine regional infection rates, leading to doubts about the real state of infection and criticism of the inspection and surveillance systems [12].

**(4) Medical care delivery system**

In Japan, the medical care system required for a large-scale infectious disease epidemic was not yet in place, and in this year's COVID-19 epidemic, a medical collapse became a realistic issue. With regard to the medical care system, while there are concerns about the existing system, such as the number of beds, the continued designation of COVID-19 as a designated infectious disease has led medical institutions to isolate asymptomatic carriers or mildly ill patients, which may have prevented a rapid response to patients with moderate to severe conditions who require oxygen therapy. Although the initial decision to designate COVID-19 as the equivalent of a Class II Infectious Disease may have been reasonable, it is necessary to verify whether the government and the medical site responded adequately when the infection spread~~,~~ and hospitalization increased.

Korea Centers for Disease Control and Prevention keep track of all domestic COVID-19 patients and coordinate the allocation of them to in-patient medical institutions and convalescent facilities for those with minor illnesses [13]. In Japan, the coordination of in-patient medical institutions was carried out by Public Health Centers and other organizations, but the number of patients waiting to be hospitalized increased due to problems such as the inability to coordinate across entities and prefectures. In addition, the MHLW, in a notice dated April 2, stated that "in principle, even if the PCR test is positive, patients with minor illnesses should rest and recuperate at home,"[14] but subsequently changed their policy after the occurrence of deaths due to acute exacerbation of illness in patients with minor illnesses under home treatment so that asymptomatic carriers and patients with minor illnesses

should basically recuperate in lodgings under the health care of physicians or others [14]. Furthermore, outbreaks of nosocomial infections ranging from a few dozen to a hundred people in several hospitals across the country [15] suggest that the establishment of specialized outpatients and the allocation of hospitals and wards (infectious disease responses and the others) were not done properly and quickly. The following factors can be pointed out as background to these problems:

1) There was no comprehensive medical care delivery system in place in the event of an emergency, such as cooperation of medical institutions by function in addition to logistical support for medical personnel;

2) Inadequate bases for calculating the number of required hospital beds for designated infectious disease medical institutions and infectious disease cooperating hospitals;

3) The amount of compensation for keeping vacant beds in normal times is low[*2];

4) Overall, there was a shortage of personnel to set up a dedicated specialized outpatient clinic of COVID-19;

5) The response capacity of Public Health Centers and local Public and Environmental Health Institutes in the control of infectious diseases was not qualitatively or quantitatively sufficient to deal with large-scale infectious diseases; and

6) Inadequate involvement of medical universities in provincial areas, especially medical schools, in the event of a large-scale or critical infectious disease outbreak.

**(5) Prevention of nosocomial infection**

Hospitals across the country ran out of rubbing alcohol and personal protective equipment (surgical masks, plastic gowns, etc.). As a result, the risk of infection associated with responding to coronavirus-positive patients with inadequate personal protective equipment has led to a heightened sense of anxiety among healthcare professionals [3]. It was reported that similar problems also arose in nursing homes and other welfare facilities [16]. Some countries have restricted private rights to ensure necessary medical resources. In our country, the Declaration of a State of Emergency made such measures possible, but by the time of the Declaration, it was already difficult to secure sufficient medical resources, as mentioned above.

To prevent nosocomial infections, "the risk of infection should be reduced by detecting subclinical patients by PCR testing in all outpatients and inpatients, and by taking appropriate protective

measures." However, it was not possible in Japan, where PCR testing systems were inadequate [3]. In the PCR test for the novel coronavirus, about 30% of infected patients have negative test results (its sensitivity is estimated to be about 70%) [3], so even in patients with a negative test result, the need to consider the possibility of infection has placed a heavy burden on medical institutions.

**(6) Countermeasures against infection transmission**

Since transmission from asymptomatic carriers cannot be ignored in COVID-19, it was necessary to impose a certain range of behavioral restrictions on the entire population. This was a situation that exceeded the assumption of the Infectious Diseases Control Law, which is based on measures such as compulsory treatment of those who have developed a disease. On February 25, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) issued a notice requesting boards of education nationwide to consider school closings temporarily for the entire region in the event of an infected case being confirmed at a school. Later, some areas such as Hokkaido and Osaka City have decided to close schools altogether [18, 19].

On February 26 Prime Minister Abe called for a voluntary refrain from holding and attending large-scale events, and on February 27, a nationwide temporary closure of all elementary, junior high, and high schools and special needs schools to control the situation without any legal basis, according to the press [20]. The Prime Minister stated in the Budget Committee of the Diet (House of Representatives) which was held on February 28, 2020 that he "judged that it would be better to do it pre-emptively and made the decision uniform throughout the country."[21] The revised Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response (hereinafter referred to as the "Act on Special Measures"), which was enacted on March 13, made this type of measure legally possible, but referring to Government Expert Panel opinions on March 19 [2], the MEXT only provided "guidelines" for the closure and reopening of schools, leaving the decision to each establishment [22]. After the Declaration of a State of Emergency on April 7, the public was asked to refrain from going out, and commercial facilities, where a lot of people tend to gather, were asked for to suspend business.

While infected case-tracking and contact verification apps were developed and utilized in some countries, the development of the systems in our country has been slow and has not been able to utilize it for cluster analysis. In April of this year, from the perspective of privacy protection and transparency, evaluation of the app specifications has begun on the basis of the Personal Information Protection Law, the Administrative Personal Information Protection Law and others. A trial run of the app, which manages the contact data of each user on his or her device, started on June 19 [23, 24].

**(7) Quarantine**

According to an analysis by the NIID, the spread of the infection was almost contained by border measures against visitors and returnees from China, but it is estimated that after March, when the epidemic began to spread in Europe and the United States, responses to visitors and returnees from Europe and the United States (border measures, quarantine, etc.) were inadequate [25, 26].

The quarantine of the Cruise Ship Diamond Princess was a difficult mission that required both preventing the infectious disease from entering the country and ensuring the safety of the crew and passengers. Even though the containment effect has been given a certain amount of credit [27], it is hard to say that the overall response, including ensuring the safety of the crew and passengers, was well received internationally [28].

**(8) International Cooperation and Collaboration**

The Joint Statement of Academies of Sciences and Medicine issued in April 2020 [29] stated as follows: "International cooperation and information sharing in all of these dimensions will be particularly critical in countries and regions where the public health and health care infrastructure is not adequate, where the disease is yet to fully impact, and where social, economic and health conditions indicate extreme vulnerability to rapid spread of the disease and weakness of response capacity." Going forward, developing regions such as Africa, Asia, and Latin America will face a particularly challenging situation [29].

Social distancing of residents is not possible when the poor live in dense urban slums and other areas. Also, even clean water, let alone disinfectant solution, is not readily available in some areas. If an outbreak of respiratory or gastrointestinal infection occurs in such an area, the epidemic will spread quickly, and it will be difficult to prevent and control the infection. In today's world, where the international movement of people and goods is flourishing, it is difficult to prevent the spread of an epidemic from distant areas even if one country can contain them. For the control of infectious diseases, more international solidarity is essential.

**(9) Discrimination and relevant issues**

The virus is invisible. People are afraid of what they cannot see, and much more so when no effective treatment or vaccine has been developed, which amplifies the anxiety and fear among people. For this reason, people tend to view infected cases, or the people or objects involved with infected cases as visible enemies, and to keep them away from daily life, and to discriminate against them to gain a temporary sense of security [30]. The preamble to the Infectious Diseases Control Law states, "in Japan there was groundless discrimination or prejudice against patients suffering from leprosy, acquired immunodeficiency syndrome (AIDS), and other infectious diseases, and those suffering from similar illness in the past. The Japanese public must take these facts seriously and apply them as a moral lesson

for the future."

As the coronavirus ravaged the country, there were cases of discrimination not only against patients and those around them, but also against the essential workers who support the "Stay at home" and their families, as well as medical professionals and their families who treat patients in difficult situations. The Board of Directors of the Japanese Society of Disaster Medicine issued a statement, calling on society to "never allow criticism based on prejudice or preconceived notions to be made, and ask society at large to take measures which will ensure that one does not have to worry about compensation in the event of a health hazard." [31]

Not only prejudice and discrimination inflict irreparable wounds of division on society, they adversely affect the behavioral history investigations of infected cases, and keep a lid on the truth, which in turn leads to the spread of infection. If people do not cooperate in publicizing the sources of infection and routes of transmission to prevent slander, prejudice, and discrimination on social networking sites, it will be difficult to take infectious-disease countermeasures using information and communication platforms. Fear is a necessary emotion to protect oneself, but it is necessary to increase the public's infectious disease literacy starting from normal times to "properly" fear it.

**(10) Risk communication**

This year's COVID-19 epidemic has caused intense stress and fear among the population due to the negative information on the lack of a cures or vaccine, in addition to information on post-infection clinical courses and infection spread forecast. On top of that, it has been pointed out that due to anxiety about life and income, loneliness, and discrimination produced by the measures to counter the sources and routes of infection, such as the requests of outing restraint and business suspension, people tend to be overly cautious as a group, not knowing which factors are causing the anxiety most strongly among them [32]. Communication should be based on an understanding of the psychological states of people.

The International Health Regulation (IHR) Joint External Evaluation (JEE) conducted an external evaluation of our country's capacity to prevent, detect, and respond to public health incidents during February-March 2018. In this evaluation, Japan received a low rating in risk communication, and it suggested that Japan "Conduct a strategic review of the risk communication coordination mechanisms to enhance existing structures, ensure strategic framing and coherence in communication messaging, as well as training of dedicated personnel specialized in risk communication." [33] While the Japanese government's public health risk communication problem cannot be improved with a single recommendation, the government should consider appointing people with specialized knowledge and training and experience in risk communication as public information officers.

**(11) Impact on national and socio-economic life**

Due to the coronavirus ravages, many workplaces in contact with people were closed to prevent

infection, resulting in the deprivation of employees' livelihoods and increased social instability. The requests of outing restraint and business suspension restrict constitutional rights such as freedom of movement and freedom of business. To be sure, even constitutional rights can be unavoidably constrained for the "public welfare." If the constraint is well-founded in light of its purpose and justified as a balanced instrument, it does not violate the Constitution. The Act on Special Measures clearly states that even if the freedoms and rights of the people are restricted by implementing measures against the pandemic influenza and new infectious diseases, "they must be the minimum necessary" (Article 5). Although the Declaration of a State of Emergency is not legally enforceable, society's sympathetic pressure to "comply with the request of the National Government" has created a situation in which the "request" is de facto enforceable.

The actual blow to small and medium-sized businesses, such as restaurants, was so severe that it destroyed the very foundation of their survival. It is undeniable that the absence of a provision for compensation for loss from requested business suspension in the Act on Special Measures was a heavy price to pay, and this is why the remedial measures took a back seat. After the Declaration of a State of Emergency, it became an urgent task to provide prompt and appropriate support to those whose livelihoods were made difficult by the infectious disease measures, and to small and medium-sized enterprises and individual businesses which ran into financial hardship, as pointed out [34,35].

Furthermore, the failure of the National government to specify conditions for ending the Declaration of a State of Emergency has increased public anxiety and dissatisfaction. A number of academic societies expressed concerns about the health effects caused by decreased physical activity and increased psychological strain, which are consequences of outing restraint, and child mental and physical abuses created by increased or worsened mental stress [36,37].

"Social distancing" has become a way of life from the point of view of controlling sources of infection and routes of transmission, and it is now a situation where people feel that getting together is a risk in itself. Most schools were forced to close after the Declaration of a State of Emergency. Some schools offered distance learning, but not all students or students' homes had access to it (equipment, communications equipment, and communication costs). Many universities responded by lending equipment to students and providing them with financial support, but there was a gap in learning opportunities between students who were able to take distance learning and those who were not. In preparation for a new COVID-19 epidemic in the future, measures to advance Society 5.0, such as the development of infrastructure for distance learning and telework, are required.

People are able to communicate with others in a direct gathering, without depending on anything [38]. It is the foundation of democratic politics that "contact and communication with people, touching the various things of society as one chooses, is of decisive importance for one's survival as a human being."[39] If humanity cannot escape infectious diseases in the future, the challenge will be to create an environment that guarantees the freedom for "people to come together" while combating infectious

diseases.

Measures should be taken by the Cabinet leadership to address such issues. We do not believe that the permanent organization proposed in this recommendation should be directly responsible for dealing with this issue, but we would like to point out here, albeit briefly, that these are important issues that concern life and livelihood.

### 3. Necessary measures, organization, system, and human resource development

The COVID-19 epidemic revealed our country's insufficient resilience to new infectious diseases and raised several issues, including how to deal with infectious diseases and their associated social and economic impacts. The NIID is certain that a new wave of epidemic is coming [1]. The G20 Dialogue Forum for the Science and Research Community (S20) pointed to the need for strong short- and long-term strategies based on scientific knowledge to combat infectious and non-communicable diseases that are threats to human welfare and to global health [40].

#### (1) Necessary measures

The Act on Special Measures enacted on May 11, 2012 required the heads of designated administrative organs and local governments to stockpile, maintain, and inspect the necessary supplies and materials, starting from normal times. Prior to this, the MHLW's 2009 Report on the Comprehensive Conference on Countermeasures against the Influenza A/H1N1 (hereinafter referred to as the "Influenza Countermeasure Report"), released on June 10, 2010, already pointed out that the system should take into account the limits of the effectiveness and feasibility of countermeasures of so-called waterfront measures and school closures, which are to prevent the spread of infectious diseases. It proposed to prepare multiple options for countermeasures in advance, considering health impacts, including not only the infectivity but also fatality, and to make flexible decisions as to which measures to be taken, judging situations appropriately."

It also made a number of important recommendations on a wide range of measures, including PCR and other testing systems, information collection overseas, strengthening information dissemination functions, domestic information dissemination systems and government’s responsibility for them, health and medical care delivery system, control of nosocomial infections, and the development and securing of vaccines [41].

In the current COVID-19 epidemic, an emergency situation arose with inadequate responses to the issues pointed out in this Report and insufficient system development and configuration requested in it. The following is a brief supplementary explanation of the key issues identified in the Influenza Countermeasure Report in light of today's situation, and a summary of the major new issues that have emerged.

**i. Identification of the infected cases**

It is necessary to establish a system for identifying infected cases and to legislate and develop a surveillance system, assuming large-scale and critical infectious diseases with many asymptomatic pathogen carriers and patients with minor illnesses. Specifically, a surveillance system that integrates surveys such as the National Epidemiological Surveillance of Infectious Diseases of the Infectious Diseases Control Law and the National Epidemiological Surveillance of Vaccine-Preventable Diseases should be created.

For new infectious diseases, the development of antibody and antigen assay systems is urgently needed. In an emergency situation, measurement systems developed domestically and internationally need to be rapidly evaluated and disseminated to the field for infection prevention and clinical diagnosis. Therefore, a system to promptly perform the appropriate review is necessary. In the United States, in the FDA, apart from the normal review process for in vitro diagnostics, there is a quick and simple review system called EUA (Emergency Use Authorization), which enables rapid distribution of in vitro diagnostic measurement systems [41]. Budgets such as subsidies should be set aside to promote the development of efficient measurement systems for new infectious diseases.

**ii. Development of medical care delivery system for infectious diseases**

To prevent nosocomial infections, to protect community health care, and to provide infected patients appropriate treatments without waiting, it is necessary to establish a system that builds collaboration within and between regions, and coordinates medical care (e.g., allocating patients to hospitals) appropriately, securing personal protective equipment, and examining by-function medical care systems, including the role of all medical care institutions in the region or medical area. To that end, the following are necessary: i) to reexamine the required numbers of beds for infectious diseases stipulated in the regional medical plans; ii) to compensate for vacant beds to secure a certain number of beds, starting from normal times; iii) to secure financial resources such as reimbursement for treatment of infectious diseases; iv) to stockpile medical resources systematically; v) to establish priorities for the use of medical resources in emergencies; and vi) to set up dedicated outpatient services.

**iii. Information collection, transmission and sharing using ICT**

The national government should take a lead in establishing a data center on infectious diseases to collect accurate statistics and highly reliable information on outbreaks and deaths of infectious diseases in a timely and appropriate manner and disseminate this information domestically and internationally. The center should also quantify the information, calculate its reliability score, and

make it public. It is also necessary to legislate the establishment of an organization to collect the following information efficiently: news on infectious diseases in various languages distributed in each country; information on infectious diseases transmitted by local governments (information to protect residents and prevent infection, and basic information such as the number of infected people, tests, hospitalizations, seriously ill patients, deaths, and available hospital beds, as outcomes); and writing on websites. At the same time, information should be disseminated to the world using automatic translation technology to build an international platform for mutual cooperation on infectious diseases. It is also necessary to have a function that automatically converts information on infectious disease epidemics outside the country from other languages to Japanese so that the public can refer to it without any language barrier.

The sharing of medical information is also important. For example, scientists are posting genetic data on a website called "Nextstrain" for the novel coronavirus, and for the first time in an infectious disease epidemic, genetic information is being tracked in near real time [43]. As a result, it is possible to track the evolution and spread of the virus in considerable detail and in near real time. In addition, such data should be made available to a wide range of researchers who need it and an environment that promotes open science[*3] should also be created.

**iv. Preservation of records**

Detailed records of the response to a large-scale or critical infectious disease, regardless of the success or failure of the response, are an asset to humanity [44,45]. A public record-keeping system should be put in place so that records of national and local government measures and responses can be kept in a form that can be used by future generations and contribute to the formulation of evidence-based policies. The content of the information and messages issued by national and local governments can change over time. A record should be kept at the aforementioned data center so that the rewritten contents can be verified. There should also be a system for keeping records with the government and independent bodies in case the entity issuing the information has no intention of keeping records (including a history of changes). Information in media such as newspapers, television, and magazines, as well as social networking services, is also important. The method used by Collier (formerly of the National Institute of Informatics) and his colleagues is instructive, in which they mined websites in Asian countries periodically, and produced geographical mapping of the number of information containing a set of keywords [46]. While collecting much of the information in the private sectors may be left to research institutions and non-profit organizations, government needs to provide convenience to such institutions.

**v. Discrimination, etc.**

When it comes to discrimination, there is a need to have a system in place to challenge discourses that promote prejudice; to prevent prejudice and discrimination from spreading, the WHO points out that influencers and communities need to engage socially influential people to challenge discourses that promote prejudice [47]. Before that, it is important to improve the literacy of infectious disease among the people in normal times and to create a society where slander and discrimination do not occur.

**vi. International collaboration, cooperation and support**

It is necessary to develop international collaboration and information sharing with foreign institutions and organizations that are taking advanced measures and with departments in charge of infectious diseases in Far East Asian countries. It should also be considered to train researchers and administrative officials at advanced institutions in foreign countries so that they can build networks with foreign researchers and administrative officials and receive direct advice and guidance in case of an emergency. An explosion of infection in developing regions of the world, including Africa, Asia, and Latin America, is a particular concern in future [29].

There is a need to strengthen international cooperation, collaboration, and support, such as signing support agreements with countries that need support to combat infectious diseases.

**vii. Other**

In addition, the following measures are also necessary:

1) Therapeutic drugs: Expediting the emergency drug approval process through using special approvals and early conditional approvals*[4];

2) Vaccines--After the development of a vaccine against the novel Coronavirus, until mass production is possible, consider which populations should be prioritized for vaccination, and promote domestic production and stockpiling to enable an adequate vaccine supply;

3) Telemedicine (online medical care) --Development of high-quality information and communication infrastructure to prepare for prolonged communication time and cyber-attacks on users' IP addresses;

4) Quarantine--A quarantine system and guidelines should prepare for the handling of a large number of people while taking into account the risk of infection and health management of passengers and crew members;

5) Overseas activities and responses--A system for collecting information on overseas infectious disease epidemics, providing information to Japanese people (and their families) living in epidemic areas, responding in terms of health and medical care, and evacuating Japanese people and their families from infected areas and countries; and

6) Promotion of research--promotion of research on microbiology, immunology, pathology and therapeutics of infectious diseases (elucidation and examination of the timing and duration of infectivity, changes in viral status in the environment, e.g., residual duration, exacerbation factors, and the possibility that antibody-dependent enhancement of infection [48] known to occur in some animal coronaviruses in humans) and securing budgets for grants, etc.

It should be noted that countermeasures against sources of infection and routes of transmission, and risk communication are particularly important issues and are mentioned in the Influenza Countermeasure Report. However, it is difficult to briefly state here how to solve the problems identified in the current situation and problems chapter. We would like to leave the consideration to the organization proposed by this recommendation. In addition, the pros and cons of taking enforceable measures against sources of infection and routes of transmission, as well as support and relief for the needy and businesses in financial difficulty caused by infectious-disease counter measures, are important issues. Since this proposal does not fall under the jurisdiction of the national organization in charge, the national government should set up a separate committee to study the measures.

**(2) Necessary organizations and systems**

In the 2020 COVID-19 epidemic the Cabinet decided on January 30 to establish the government's Novel Coronavirus Response Headquarters headed by the Prime Minister of Japan. The headquarters was designated as the "government headquarters" as stipulated in Article 15, paragraph 1 of the Act on Special Measures on March 26.

The Headquarters took measures with the input of the Government Expert Panel on COVID-19 set up on February 14. However, considering that the first case of infection was reported in the country on January 16 and the quarantine of a large number of crew and passengers on board the Cruise Ship Diamond Princess had begun on February 3, it must be said that the establishment of the Government Expert Panel on COVID-19 came too late. In Taiwan, the first report of infection was made on 11 January, but the Government Expert Panel was set up on 5 January. In Japan, the National Government declared a State of Emergency for Pandemic Influenza and New Infectious Diseases after listening to the Advisory Committee on Basic Response Policy*[5] in April. On the other hand, the national government announced on February 27 that it would "request all primary and secondary schools across

the country to close temporarily," but this was not included in the recommendations of the Government Expert Panel on COVID-19, which was pointed out to have left questions about the consistency of the policy on measures."[18]

Countermeasures against the COVID-19 epidemic were carried out through the MHLW, the Ministry of Economy, Trade and Industry (METI), the MEXT, and other agencies. Initially, the Minister of Health, Labour and Welfare played a central role in the countermeasures. After the establishment of the Office for the Promotion of Countermeasures against Novel Coronavirus Infection in the Cabinet Secretariat on March 23, the Minister in charge Economic Revitalization coordinated relevant ministries and agencies and prefectural governments on countermeasures against the infectious disease, including economic measures. From mid-April, the Minister in charge Economic Revitalization, who concurrently served as Deputy Director General of the Novel Coronavirus Countermeasures Division and Minister of Special Missions in the Cabinet Office, played a spokesperson role for infection control measures.

Regarding the COVID-19 of 2020, if the national government had predicted domestic outbreaks at the time when the epidemic expansion in Wuhan, China was reported, necessary measures -- including the establishment of supporting systems for the local governments to respond promptly -- could have been taken much earlier. However, for organizations and systems that were hastily established, it was difficult to take necessary measures with proper timing, revealing the importance of training, network construction, system building and reinforcement, and necessary legislation starting from a time prior to the epidemic. Collecting information from local sites was also reported to be insufficient [49]. For development of partnership and collaboration between national and local governments and to construct and maintain case ascertainment systems and health care systems, it is necessary to establish a permanent organization that conducts scrutiny and examinations assuming emergencies, enacting necessary legislations, and simplifying administrative procedures in emergencies, from a time prior to the epidemic.

Considering those points, the national government should establish an Infectious Disease Prevention and Control Committee (tentative name, abbreviated as IDPCC), consisting of experts in public health, clinical medicine, and basic medicine related to infectious diseases, as a permanent body to construct a system that formulates countermeasures against infectious diseases from an academic perspective in normal times and provides advice on the necessary system development. Based on this advice, the national government will develop an action plan to combat infectious diseases. The IDPCC should advise the government to review their plans as necessary. Consideration should be given to a system whereby the IDPCC receives reports from the government on the implementation of the plan, including the stockpiling of medical resources. As a permanent body, it is expected to gain experience in a variety of infectious disease countermeasures to enhance its response capabilities. The IDPCC should, when it determines, on scientific grounds, that an epidemic of infectious diseases is imminent

(i.e., in an emergency), quickly decide the necessary measures on the basis of predetermined criteria and provide necessary and appropriate advice to the central and local administrative bodies. In addition, given the significant social and economic impact of infectious-disease countermeasures, there is a need for prompt inter-agency cooperation. Therefore, it is necessary to overcome the vertically divided administration to support the function of the Cabinet as a command center and to facilitate the necessary coordination. To make decisions quickly, the members of the IDPCC should be of an appropriate size and a secretariat structure should be developed. As natural disasters continue to occur in Japan, the IDPCC should establish a system of cooperation with disaster management organizations such as the National Disaster Management Council to prepare for complex disasters [51].

There are various options for establishing the IDPCC as an administrative body. Emergency countermeasures against infectious diseases must cover a wide range of areas, and, to avoid the adverse effects of a vertical division of ministries and agencies, a Government Council could be set up in the Cabinet Office to provide expert knowledge from a third party's perspective. A committee could be set up as an External Bureau. Such a standing committee could be ad hoc, timely, appropriate, proactive, and effective in the exercise of its powers. Alternatively, a Council could be established as a "Council on Important Policy" to enable a comprehensive examination of important policies*[6], which would question the very nature of Japanese society post Corona. Article 15 Paragraph 1 of the Act on Special Measures stipulates the establishment of the government's novel coronavirus response headquarters in the event of an outbreak of pandemic influenza and other infectious disease pandemics. However, since it is merely a temporarily installed "special body," measures to make it permanent are also worth considering. Regardless of which of these options is adopted, it is necessary to establish an organization that advises a comprehensive response to infectious diseases, including the development of a normal-time medical care delivery system.

The infectious disease countermeasure of the IDPCC can be itemized as follows:

1) Prevention of domestic invasion, prevention of epidemics and prevention of their spread;
2) Identification and control of infected cases and patients, understanding of national and international epidemics, and prediction of epidemics;
3) Improvement and strengthening of the system for testing for pathogens, systematic stockpiling of medical resources, and provision of medical care for infectious diseases and their systems;
4) Protection of the safety, health, and welfare of health and medical personnel;
5) Development, production, and stockpiling of diagnostic and therapeutic drugs and vaccines;
6) Countermeasures against sources of infection and routes of transmission;
7) Information dissemination on risk communication and prevention of social anxiety and discrimination, etc.;

8) Protection of Japanese people and their families in areas of high prevalence outside of the country (including provision of health and medical information and supplies, evacuation from the country, etc.);
9) International cooperation, collaboration, and support;
10) Promotion of the training and development of researchers and technicians in infectious diseases;
11) Strengthening of the organization for infectious disease countermeasures;
12) Promotion of basic, clinical, and public health research (including securing subsidies);
13) Collaboration with disaster prevention organizations such as the National Disaster Management Council to prevent infection among evacuees in the event of a complex disaster such as an earthquake or typhoon;
14) Cooperation and coordination between the public, private, and academic sectors at the national level;
15) Planning of activities related to the above;
16) Exchange of information with prefectural experts and the field; and
17) Advice and business support to local administrative bodies.

To take countermeasures against infectious diseases, including large-scale and critical infectious diseases, prefectures should establish a permanent organization, headed by the governor and consisting of prefectural officers in charge of crisis management and disaster prevention, health and welfare, and economic policy (Prefectural Headquarters for Countermeasures against Infectious Diseases, tentative name; hereinafter referred to as the "Prefectural Headquarters"). For emergency-time counter measures, the national government should give the prefecture governments, which are closer to the epidemic on the ground, acceptably large executive authority so that they can implement flexible measures that take local situations into account. In the United States, state governments are given enforcement authority over public health measures [52]. Each prefecture will set up its own prefectural headquarters. However, considering the spread of infectious diseases beyond prefectural borders, cooperation between neighboring prefectures in terms of health and medical care support systems and others should also be considered. In addition, a system should be in place to enable a prefectural government to request the IDPCC for its medical support coordination from neighboring prefectures.

To take the necessary measures in an emergency, voices from the field need to be heard both in epidemic and non-epidemic times. Exchanging opinions and information with local scientific experts and health authorities, the IDPCC needs to build networks on the basis of collaboration between and within regions, and supply necessary guidance and support for human resource development, and provide advice and coordination to the national and prefectural governments regarding system development and human resource development. It is also necessary to construct a system that allows

for appropriate coordination between the public, private, and academic sectors during normal times, and to take necessary measures quickly in the event of an emergency. The network described above should encompass the public, private, and academic sectors.

In thinking about local infectious disease responding organs, the countermeasure policies taken by Osaka and Hiroshima Prefectures will be helpful. The case of Hiroshima Prefecture is a pioneering example, realizing prefectural headquarters functions by organizing concerned parties to prepare emergency plans, in normal times, and by making necessary coordination in case of an emergency.

Countermeasures against infectious diseases in Osaka: In 1999, the tuberculosis incidence rate rose nationwide, and a tuberculosis emergency was declared. Osaka City, which has the highest tuberculosis incidence in the country, has clarified its chain of command and put in place the following measures against infectious diseases: i) system building for specialist personnel to dedicate themselves in infectious disease responding activities; ii) functional integration of Osaka Health and Welfare Center and Osaka City Research Institute for Environmental Sciences and Public Health (currently, Osaka Health and Safety Infrastructure Institute; iii) flexible responses, considering local circumstance and using resources in Nishinari Ward, where incidence rate is particularly high; iv) joint appointments of administrative office physicians and surgeons, and v) annual analysis and evaluation of infectious disease information, etc.

In 2001, the "Basic Guidelines for Tuberculosis Control" were formulated to reduce the incidence of tuberculosis by half in 10 years, and the target was achieved. In this year's COVID-19 epidemic, the City Public Health Center serves as the command center, and the city health bureau, health research institute, and district office support the structure. The City Public Health Center, together with the MHLW's cluster countermeasures team, successfully prevented the spread of a COVID-19 cluster in Osaka City. This system, in which the command center and the working organization are linked, is useful as a reference for practical countermeasures against infectious diseases.

Infectious disease countermeasures in Hiroshima Prefecture: The Hiroshima Center for Infectious Disease Control (Hiroshima CDC), established in 2013, is an organization that functions as a command post for infectious-disease countermeasures, consisting of the government (including the National Institutes of Health), universities, experts, local medical associations, and other medical professionals [55], and countermeasures against the COVID-19 epidemic this year were carried out smoothly through collaboration and cooperation among the three parties.

There are calls for the creation of an organization in Japan with functions similar to those of the Center for Disease Control (CDC) in the United States. The CDC is a huge organization with an annual budget size of about US$800 billion and about 14,000 employees as of 2017 [56]. In addition to covering diseases other than infectious diseases, it also plays a variety of roles in the security field. It is not practical to establish such an organization immediately, given the situation in Japan.

In Japan, there are already institutions such as the NIID and Public Health Centers that conduct research, treatment, and duties on infectious and non-infectious diseases. It is necessary to review the existing organizations and systems, referring to examples in the United States and other countries, and to strengthen them so that the relevant organizations can fully demonstrate their functions, and to establish a system to prepare for emergencies by establishing organizations in the national and prefectural governments to carry out necessary activities for infectious disease countermeasures, starting from normal times. On the other hand, it is necessary to assess the risk of non-communicable diseases such as lifestyle-related diseases and mental stress, which may increase with the request of outing restraint as a countermeasure against infectious diseases and the proposal of a new way of life, and to take appropriate preventive measures and responses. In the future, consideration should be given to establishing an organization to lead a comprehensive non-infectious disease response, including health promotion and mental health. In addition, the development of ICT infrastructure to enhance resilience to infectious diseases needs to be urgently improved, which will be proposed separately.

**(3) Expertise required for the Committee for Prevention and Control of Infectious Diseases (IDPCC)**

Infection control measures require not only specialists in the prevention and therapeutics of infectious diseases, but also specialists with cross-sectional knowledge and experience in a wide range of fields. It is difficult to synthesize the knowledge of experts across disciplines, when experts are hastily convened for a meeting in an emergency. For this reason, the IDPCC, which should be established as a permanent body, should have a system whereby experts in the relevant fields can have the necessary discussions, starting from normal times. Therefore, the committee needs to establish an advisory body of experts (e.g., specialized working groups) to consider individual topics and incorporate the results of their investigations and discussions. The specific theme should also include projections of socio-economic impacts and countermeasures that have emerged as a result of countermeasures against COVID-19.

To ensure a fair and neutral judgment based on scientific findings, experts who give advice on national and prefectural infectious disease countermeasures should not be held accountable for the results of specific infection control measures implemented on the basis of a policy decision by the Cabinet. There needs to be a system that makes it clear that infectious disease countermeasures have been undertaken by Cabinet decision and leadership. For this purpose, the Cabinet should establish a permanent post at the political level with responsibility for infectious disease countermeasures, and work on countermeasures against infectious diseases in a centralized manner based on the advice of the IDPCC. The IDPCC should build a trustful relationship with the Cabinet, in case of an emergency, by close communication such as exchange of information on infectious disease countermeasures, starting from normal times, so that the Cabinet can make appropriate decisions promptly. In addition,

while it is only natural to keep minutes of discussions at the IDPCC and its subordinate bodies, and of the decision-making process, the dissemination of information as a committee needs to be centralized. For example, if the IDPCC were to hold a press conference, it could be that only representatives would attend. Alternatively, consideration should be given to having public relations officers with training and experiences in risk communication to take responsibility for public relations based on their expert knowledge.

In cases where an emergency response is considered necessary, such as when the situation changes by the hour, the concept of deep protection shall be taken into account, and, in principle, multiple scenarios shall be assumed, and a proposal shall be presented based on them.

It should be noted that deep protection means that multiple measures have been taken. Consideration should be given to having a system which has a single committee of a small number of experts to approve the proposed measures (the approval committee) and two independent subcommittees to propose measures ("planning subcommittee," a tentative name), which independently formulate measures and make recommendations to the approval committee, which in turn provides the Cabinet with its recommendations. The Cabinet then decides on the necessary measures and the Prime Minister gives instructions and orders to each ministry. The reasons for creating more than one independent subcommittee are as follows: i) directing multiple subcommittees to develop countermeasures is expected to produce better ideas thanks to competing effects; ii) appropriate selection of subcommittee members can be expected to bring different perspectives to the discussion; and iii) it is more likely that the anonymity of the countermeasure planners can be maintained if the committee that prepared the countermeasures in question presented, even if the list of members of the subcommittees and the minutes of each subcommittee is made public.

An organization independent of the government is also needed to obtain opinions from various perspectives on countermeasures against large-scale and critical infectious diseases, as well as to gather information on the responses of central and local government agencies and to verify the content of such countermeasures. It is desirable that the Science Council of Japan, in cooperation with the Federation of Japanese Medical Societies, establish such an organization, and as part of its task, verify the following points after the outbreak of a large-scale or critical infectious disease, and publish the results at an appropriate time and in an appropriate manner:

1) Response by national and local governments;
2) Medical care delivery system;
3) Status of information dissemination on the prevalent situation in Japan;
4) Consistency between the WHO recommendations and Japan's measures; and
5) Status of international cooperation and collaboration.

**(4) Strengthening of the current system**

The ability of current local health administration to respond to problems has been declining due to i) a shortage of human resources; ii) bypassing commands and orders due to a decline in the authority of medical doctors; iii) a decline in inspection functions due to the outsourcing to the private sector; and iv) a disregard for the need for training. Drastic improvements are required.

In addition, in the event of a large-scale or critical infectious disease epidemic, it may be difficult for administrative agencies alone to respond, so the national and prefectural administrative agencies need to work together with medical institutions, universities, research institutes, and private laboratories to build a support system.

**1) Strengthening Public Health Center functions**

**a. Strengthening the authority of health department directors.**

In the current integrated organization (Department of Health and Welfare, and Department Environment), Public Health Center directors are often positioned under the clerical officers and have virtually no decision-making authority in terms of personnel, finances, public relations, etc. Therefore, it is difficult to take prompt measures in terms of health crisis management based on medical and scientific judgment. A chain of command needs to be revamped. The Association of Public Health Center directors plays an important role in interlinking Public Health Centers across the country. Such linkages can be of great help in an emergency. However, because it is a voluntary organization and has no legal position, it is bound by the administrative framework and cannot exert sufficient power. There is a need for legal backing (legislation) of the Association of Public Health Center directors so that it can participate in discussions with the national government and stakeholders, representing Public Health Center directors, who are officials of the prefectural government.

**b. Securing human resources**

Regarding the recruitment and development of human resources in the field of public health, not all municipalities necessarily have the financial wherewithal to do so, and not all Public Health Centers have a full-time director. In 10% of the nation's Public Health Centers, one director serves as the director of more than one center. There is an urgent need to secure and develop human resources for Public Health Center operations, and it is necessary to clearly position this as a responsibility of the national government or the prefectural governors.

**c. Training of health department physicians, etc.**

Many of medical doctors and technicians in Public Health Centers have practical experiences in dealing with infectious diseases, but continuous training is necessary to maintain and improve their

competence. A program to train infectious disease specialists should be established in graduate schools in the field of social medicine in collaboration with the social medicine specialist system. In collaboration with the Field Epidemiology Specialist Training Course (FETP-J) of the NIID and the Infectious Disease Crisis Management Specialist (IDES) Training Program of the MHLW [55, 56], personnel in charge of infectious disease countermeasures should undergo training that emphasizes field epidemiology. Credits should be transferred with degree programs of universities and research institutes. Students also should be sent to overseas research institutes.

Using the certified specialist system of the Japan Board of Public Health and Social Medicine, regional programs for training infectious disease specialists should be established. Note that the Japanese Association of Public Health Center Directors are located in eight blocks: Hokkaido, Tohoku, Kanto, Koshinetsu-Shizuoka, Tokyo, Tokai-Hokuriku, Kinki, Chugoku-Shikoku, and Kyushu-Okinawa. Through this program, infectious disease specialists should be trained in each prefecture. In normal times, they should be assigned to prefectural offices and administrative agencies such as Public Health Centers and local Public and Environmental Health Institutes. It is also necessary to conduct personnel exchange with the NIID, the National Institute of Health Sciences, and the MHLW on a regular basis to maintain and improve their capabilities. In the event of an emergency, an infectious disease response team led by such experts (see below) will be available to respond, so that an appropriate response can be implemented quickly.

**2) Infectious Disease Control Team**

The Disaster Medical Assistance Team (DMAT) was created after the Hanshin-Awaji Earthquake [57]. In addition, the Japanese Society of Environmental Infectious Diseases established the Disaster Infection Control Team (DICT) to support countermeasures against infectious diseases in response to a series of large-scale disasters in recent years [58]. Based on the lessons learned from the Great East Japan Earthquake, the Disaster Health Emergency Assistance Team (DHEAT) was institutionalized to assist the affected municipalities by other local governments [59]. This has the role of supporting public health management, including infection control measures, in case of a disaster. It should be considered whether the MHLW should establish a DICT equivalent, or whether DICT of the Japanese Society for Environmental Infectious Diseases should provide on-site activities and guidance at the request of the MHLW. In addition, the IDPCC should consider setting up infectious disease control teams consisting of experts in the prevention of infectious diseases in eight regions (Hokkaido, Tohoku, Kanto, Koshinetsu, Tokai-Hokuriku, Kinki, Chugoku-Shikoku, and Kyushu-Okinawa, for example, taking into account the movement between regions). The Infectious Disease Control Team (assuming a size of 4-5 people) will conduct epidemiological investigations and provide guidance on measures to prevent the spread of infectious diseases in

accordance with local conditions in the event of a cluster outbreak or a request for assistance from medical institutions. Furthermore, a cooperative system with DMAT, DICT and DHEAT should be established to prepare for complex disasters.

Infectious disease epidemics often start in a small number of areas. Support to endemic areas by infectious disease control teams consisting of Public Health Center staff in non-endemic areas would be useful. However, since employees of Public Health Center are local government employees belonging to the prefectures and municipalities (prefectures, ordinance designated cities, core cities, etc.) where the Public Health Center is established, it is necessary to establish a system that enables them to work beyond their affiliation to fulfill the above duties in the event of a health crisis.

To establish a network of infectious disease control teams and a training system, consideration should be given to improving the system, such as establishing secretariats in each of the eight regions mentioned above. To establish a system of cooperation and collaboration with universities and medical associations on a prefectural basis, the full support of related organizations (especially prefectural medical associations and universities) is necessary.

**3) Public Health Center Support Team**

A support team (Public Health Center support team) should be created as an external organization for Public Health Center operations to support Centers in dealing with infectious diseases. There are a wide range of infectious disease response tasks that do not necessarily require medical expertise, such as assisting management (command and order), coordinating work and clerical work, transporting specimens, and transporting patients. In addition to recruiting volunteers, the Public Health Center or the secretariat of the infectious disease control team should play a central role in training personnel by qualification, in normal times, so that they can convene a team in case of an emergency.

Students of health care universities and vocational schools should also be considered as candidates. Among retirees, "alumni" who have worked in Public Health Centers should also be utilized.

**4) Human resource development**

There is a need to train human resources to diagnose and treat infectious diseases. Compared to other countries, Japan has fewer infectious disease specialists (1,564 as of January 2020), so the establishment of a clinical infectious disease department in university medical schools to train specialists should be considered [62]. It is also essential to train medical technicians who have the necessary skills for clinical and medical examination.

The departments of the NIID should be expanded and a system and information network should

be established to promptly analyze and simulate infectious disease epidemics by investigating the incidence of patients and infected cases in cooperation with prefectures in emergency. The department should also be responsible for forecasting other infectious disease epidemics, such as seasonal influenza, and the data used in forecasting epidemics should be made available to the public to the extent possible. Moreover, simulations and training should be conducted in response to requests from foreign countries. Additionally, for quarantine, it is necessary to recruit and train personnel to negotiate with other countries, and to explain and respond smoothly to foreign nationals stopping for quarantine.

**5) Development of infrastructure for telemedicine**

Each communication carrier should be required to investigate transmission quality assurance for telemedicine, line-quality assurance and a special fee system for medical use so that communication quality does not deteriorate due to the patient's communication environment. There is also a need to accelerate the development of medical technologies that do not involve the risk of infection by mediating communication, such as remote imaging and remote surgery. An industry-government-academia joint mechanism for the practical application of new telemedicine should be created. Further technological and infrastructure development should be promoted for the perpetuation of telemedicine.

**6) Develop an information collection system overseas**

The duties and locations of the embassy and consulate medical officers should be reviewed and the system overseas should be improved so that they can collect information on the possibility of a large-scale or critical infectious disease epidemic in their areas of work in cooperation with local embassy staff and civilians, and share this information with relevant national agencies. It is also necessary to create a network between the IDPCC and medical officers to facilitate information exchange during emergencies, and to keep that network functioning, since normal times.

## 4. Proposal

### (1) The IDPCC should be established as a permanent organization in the Cabinet Office.

The COVID-19 epidemic of 2020 revealed the problems in policies for dealing with infectious diseases in this country. In order to prevent and control large-scale and critical infectious diseases, it is necessary to found the IDPCC as a permanent organization, which will examine the current status of the provision of health and medical care to the public, the security of health and medical personnel, and so on in a fair and neutral manner based on academic and professional knowledge, starting from normal times. On the basis of review results, it should formulate necessary measures, and provide necessary advice to the Cabinet. The IDPCC shall, in principle, envisage multiple scenarios and present countermeasures to the Cabinet, assuming these scenarios when the situation changes from moment to moment or when an emergency response is considered necessary. It is expected that the IDPCC will also be responsible for countermeasures against infectious diseases other than large-scale and critical infectious diseases. That will improve its response capabilities by accumulating experiences and information on various infectious disease countermeasures, since normal times.

Whatever the nature of the IDPCC as an administrative body, we believe that establishing it in the Cabinet Office will help avoid the adverse effects of vertical division of ministries and agencies. The Cabinet will make policy decisions on specific infectious disease countermeasures on the basis of the draft plan presented by the IDPCC. There should be a permanent post in the Cabinet responsible for the countermeasures against infectious diseases at the political level, with close coordination with the IDPCC and centralized political responsibility for the countermeasures against infectious diseases under the Cabinet. It is important to take systematic measures by consolidating the chain of command and disseminate information to the public. At the same time, prefectural governors should be given as much discretionary power as possible to make their own decisions based on regional characteristics, the prevalence of infectious diseases, and health and medical care systems, in order to implement flexible measures based on local conditions.

Taking countermeasures against infectious diseases is a political issue of the first order that affects the economic and social life of the people in general. Measures must be taken under the responsibility of the Cabinet, with a review of the overall lives of the people by the leadership of the Prime Minister. Therefore, in the future, consideration should be given to making infectious disease control a key policy of the Cabinet. In recent years, there has been a succession of natural disasters in Japan; and the countermeasures against infectious diseases in times of disaster are an important task of the IDPCC. In preparation for a complex disaster, the IDPCC should also collaborate with relevant organizations such as the National Disaster Management Council.

The purpose of the IDPCC is to protect the lives and health of the people from the threat of infectious diseases, and its main task is to review and advise on the following matters from time to time:

1) Prevention of domestic intrusion of infectious diseases, their outbreak and their spread;
2) Identification and control of infected cases and patients, understanding of epidemic situations at home and abroad, and epidemic forecasting;
3) Improvement of the system for pathogen testing, systematic stockpiling of medical resources, and provision of infectious-disease medical care and system building for it;
4) Protection of the safety, health, and welfare of health and medical care personnel;
5) Development, production, and stockpiling of diagnostic and therapeutic drugs and vaccines;
6) Countermeasures against sources of infection and routes of transmission;
7) Risk communication, and dissemination of information on prevention of social anxiety and social discrimination, etc.;
8) Response to Japanese people and their families in areas of epidemic outside the country (including provision of information and supplies, evacuation from the country, etc.)
9) International cooperation, collaboration and support;
10) Promotion of the training and development of researchers and technicians in infectious diseases;
11) Strengthening of the organization for infectious disease countermeasures;
12) Promotion of basic, clinical, and public health research, including securing research grants;
13) Collaboration with disaster prevention organizations such as the National Disaster Management Council to prevent infection among evacuees in the event of a complex disaster such as an earthquake or typhoon;
14) Cooperation and coordination between the public, private and academic sectors at the national level;
15) Planning of activities described above;
16) Information exchange with Prefectural Infectious Disease Countermeasure Expert Committees and liaison and coordination among Prefectural Expert Committees; and
17) Giving advice and operational support to local administrative bodies.

The IDPCC is composed of experts in public health, clinical medicine, and basic medicine related to infectious diseases, and should be organized under specialized working groups. If deemed necessary, working groups, including experts in economics, sociology, and law will also be established. These working groups are responsible for planning infectious disease countermeasures from an academic standpoint, supporting the development of systems and human resources, and providing guidance on emergency drills.

The IDPCC should form a specialized working group of experts for each topic. It should discuss and approve what is prepared by the working groups and give advice to the Cabinet on the countermeasures against infectious diseases, in normal times. In addition, the criteria for setting measures to be taken in an emergency should be prepared in advance from normal times. The system

should be able to take measures without delay through a unified chain of command.

When the IDPCC judges that an infectious-disease epidemic is imminent on academic grounds (i.e., in an emergency), it sets up a countermeasure planning sub-committee composed of members from the specialized working groups to deliberate on the necessary countermeasure plans, and to advise the Cabinet on the results of the discussion.

In addition, two independent countermeasure planning subcommittees will be set up to formulate countermeasures against infectious diseases, when new countermeasures need to be decided in an emergency. The establishment of two independent sub-committees will increase the following possibilities: (1) better proposals can be prepared due to the competitive effect, (2) proper selection of the sub-committee members can be expected to bring different perspectives to the discussion and (3) the anonymity of the countermeasure planners can be maintained.

The IDPCC does not have jurisdiction over measures based on the Declaration of a State of Emergency under the Act on Special Measures, matters related to the administrative procedure simplification (excluding those related to measures against infectious diseases), which accompanies such measures, and economic measures.

**(2) A permanent organization should be established in the prefecture**

A permanent organization of experts to provide advice to prefectural governors on infectious disease countermeasures (tentative name: Prefectural Infectious Disease Countermeasure Expert Committees; hereinafter referred to as "Prefectural Expert Committees") should be established. Prefectural Expert Committees should include Public Health Center Directors, experts in public health, microbiology, etc., members of prefectural medical associations in charge of public health and infectious diseases, heads of designated medical institutions for infectious diseases and cooperating medical facilities for infectious diseases, and experts in clinical medicine, nursing, and clinical examination of infectious diseases. The Prefectural Expert Committee has a role to advise the prefectural government on the development of infectious disease countermeasure plans by cooperating with the IDPCC, since normal times and examining the standards for setting emergency countermeasures. In the event of an emergency, it gives advice on the implementation of measures.

For the purpose of countermeasures against large-scale and critical infectious diseases, prefectures shall establish a permanent organization (Prefectural Infectious Disease Control Headquarters, tentative name), headed by the governor and consisting of prefectural officers in charge of crisis management and disaster prevention, health and welfare, and economic policy. (hereinafter referred to as the "Prefectural Headquarters"). At the discretion of the prefectural government, other infectious disease measures, such as those in the event of a large-scale disaster, will be included. In addition, the spread of the epidemic across prefectures should be taken into account in advance, and cooperation of medical support systems among neighboring prefectures should be considered. The system should be

able to request the IDPCC to coordinate medical support among prefectures if necessary.

The main duties of the Prefectural Headquarters are to formulate infectious disease countermeasure plans for the prevention and control of large-scale and critical infectious diseases, and to develop human resources, preparing for the threat of large-scale and critical infectious diseases, during normal times. The opinions of the Prefectural Expert Committees should be heard in the development of infectious disease control plans. The main duties of the Prefectural Headquarters are as follows:

1) Prevention of epidemics and prevention of their spread;
2) Identification of infected cases and patients, understanding of domestic and international epidemics, and prediction of epidemics;
3) Development and strengthening of inspection systems, systematic stockpiling of medical resources, medical care provision and systems;
4) Protection of the safety, health, and welfare of health and medical personnel;
5) Countermeasures against sources of infection and routes of transmission (including requests to the local community to limit their actions, etc.);
6) Risk communication, and dissemination of information on prevention of social anxiety and social discrimination, etc.;
7) Training of researchers and technicians in infectious diseases;
8) Measures to prevent infection among evacuees in the event of a combined disaster such as an earthquake or typhoon;
9) Cooperation and coordination between the public, private, and academic sectors in the region; and
10) Planning of activities related to the above.

**(3) Strengthening of the system**

The administrative bodies involved in the countermeasures against infectious diseases should be strengthened and their functions upgraded from the perspective of promoting infectious disease research, training human resources, and taking emergency measures in the event of an epidemic. Since Japan's system for storing, managing, and publishing data on infectious diseases is inadequate, the national government should take responsibility for establishing a data center and storing electronic data (basic, epidemiological, and clinical data) on all infectious diseases and infectious disease countermeasures in the country. Such data should also be made available to the wide range of researchers, and an environment promoting open science should be created.

**Notes**

*1. A technique for estimating whether or not RNA is present in a specimen by using RNA in the specimen as a template to prepare DNA using reverse transcriptase (RT) and then detecting the DNA using polymerase chain reaction (PCR) to identify a specific RNA with high sensitivity. Since coronaviruses are RNA viruses, the presence or absence of coronaviruses in the specimen can be estimated by this method.

*2. Compensation for health care institutions that keep their beds open to receive patients --the Japanese national standard is 16,190 yen per bed. --Some prefectures have set up their own system that exceeds the national standards as a countermeasure to the COVID-19 epidemic.

*3. To use information and communication technology and to promote diverse ways of conducting science by sharing research results, including data, not only with researchers in specific organizations and fields, but also with researchers who need them.

*4. Special approval; approval based on evidence from countries with approval systems comparable to Japan

Conditional Early Approval: approval based on limited evidence obtained in a clinical trial.

*5. It shall serve as an advisory body on the declaration of pandemic influenza or another emergency. The Director-General of the Headquarters for Pandemic Influenza Control (the Prime Minister) presents a draft public notice to determine to the Advisory Committee on Basic Policies on Influenza and Other Emerging Influenza Measures, and asks it whether or not the requirements for a pandemic influenza or other emergency situation are met. If the Commission makes a professional assessment that the requirements of a pandemic influenza or other emergency are met, it decides to declare a state of emergency.

*6. The Cabinet Office is charged with assisting the Cabinet in the affairs on important policies (Article 3, paragraph1 of the Act for Establishment of the Cabinet Office). In cases where it is particularly necessary to unify the policies of each administrative department, the Cabinet Office may establish a Minister of State for Special Missions who takes charge of the relevant affairs (Article 9, paragraph 1). For the purpose of contributing to the planning, drafting and general coordination of such policies, the Prime Minister or the Chief Cabinet Secretary may establish an organization (called) " the Council on Important Policies," dealing with such policies through a consultation among the ministers concerned and persons with relevant knowledge and experience, etc. (Article 18 of the Act).

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