

Part III Best practices and challenges

Chapter 4

Medical and nursing care system

Japan managed to keep the number of its COVID-19 deaths in proportion to the population to the lowest among major advanced countries in the world. What is often cited as a key factor behind such a performance was the nation's success in avoiding a collapse of the medical care system as was observed in Europe and North America, in particular Italy and New York. Also, novel coronavirus infections spread widely among residents of welfare facilities for the elderly in many Western countries, accounting for a large portion of their COVID-19 deaths, but such infections were contained to minimum levels in Japan.

On the other hand, many medical institutions and nursing care homes for the elderly in Japan lacked adequate supplies of personal protective equipment (PPE) and hand sanitizers for their staff, resulting in hospital-acquired infections at medical institutions and an outbreak of infection clusters at elderly care facilities. Fear of infection put severe stress on the medical professionals treating COVID-19 patients. The pandemic also sharply reduced the revenue of medical institutions as people refrained from seeing doctors with the spread of infection and hospitals treating COVID-19 patients had to postpone operations on patients with other illnesses.

It has been some time since Japanese medical institutions' delay in introducing common information platforms using information and communications technology was highlighted as an issue, and that issue added to the burden of medical staff coping with the pandemic. New systems were introduced to deal with the novel coronavirus, and regulations were eased on online-based medical examinations. However, these measures have yet to have a significant impact on resolving problems in the nation's medical service system.

In this chapter, we explore the reasons why Japan managed to avert a collapse of its medical and nursing care service systems in the face of the COVID-19 crisis, and examine issues in the medical and nursing care systems that have yet to be resolved.

1. Why Japan averted the collapse of the medical care system that hit many Western countries

1.1. Summing up the performance against first-wave infections

In the first wave of COVID-19 infections, Japan did not experience an explosive increase in infections or a collapse of the medical service system that hit many European and North American countries. At the beginning of September 2020, the United States had the world's largest number of deaths from the novel coronavirus disease at roughly 180,000, followed by 120,000 in Brazil and 60,000 in India. The number of casualties in Japan was far smaller at some 1,300.¹ Given that Japan has the world's most aging population – with the elderly accounting for 28 percent of the total – and that the fatality rate for COVID-19 is higher among elderly people, Japan's performance in combating the pandemic was not bad. Excess deaths are believed to have been kept to the range of dozens to a 100-plus figure at most.² Whether or how the delay in the treatment of patients of other illnesses such as cancer – as hospitals gave priority to dealing with COVID-19 – will affect the fatality or recurrence rates of those patients requires further analysis, but Japan performed well at least in dealing with the novel coronavirus disease.

“If the collapse of the medical service system is a condition in which patients with regular illnesses cannot be saved, I think we were fortunate enough to somehow avert that, although the situation was quite serious at some points,” said Yoshitake Yokokura, former chairman of the Japan Medical Association.³

1.2. Discouraging suspected carriers from seeing doctors

It is not easy to identify the reasons why Japan had much fewer deaths from COVID-19 in proportion to the population than in Western countries and very few excess deaths. That is the key to unlocking the mysteries of the “Japan model.” The government's Expert Meeting on the Novel Coronavirus Disease Control cited as one possible reason from the perspective of the medical service system the easy access to medical services under the universal health insurance system, the wide availability of public and private-sector medical institutions, and the high level of medical services maintained even in outlying regions of the country, which all contributed to detecting infection cases from the early stages of the outbreak.⁴

However, access to medical services was not necessarily easy from the beginning of the COVID-19 outbreak. On February 24, the expert panel said that constraints on equipment and manpower made it impossible to hold PCR tests for everybody, and that people who had cold-like symptoms or fever above 37.5 degrees for four days or longer should first call the consultation centers for “returnees and contact persons,” instead of immediately seeing doctors out of concern over being infected with the new virus.⁵

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Based on this statement by the expert panel, the government, at its February 25 meeting of its headquarters on COVID-19 response, unveiled a basic outline of measures dealing with the novel coronavirus.⁶ This policy aimed at preventing suspected carriers from immediately seeing doctors at medical institutions and, by urging them to first call the consultation centers, restricted their free access to medical services. There were two reasons behind the policy. One was the extremely tight capacity of PCR tests, due to problems in each stage of the testing process from consultation to collecting and transporting specimens, analysis and reporting of the results. The Health, Labor and Welfare Ministry needed to use this limited capacity in the most efficient way.⁷

The other reason was the experience of the novel influenza (A/H1N1) pandemic of 2009. After the first three cases were reported by the city of Kobe on May 16 that year,⁸ the municipal government launched a system for dealing with the infections, opening a consultation center for people who suspected infection, setting up special services at medical institutions for outpatients who had fever, and providing for hospitalization of people found to be infected. Then the consultation centers and the special sections at the hospitals were swamped with massive numbers of calls and visits by outpatients, causing panic among their staff that nearly broke down the system. A senior health ministry official said the trauma of the 2009 experience led the ministry to take steps not to repeat the same problems in the response to COVID-19.⁹

The criteria of “fever above 37.5 degrees for at least four days,” based on the knowledge at that time that fever from the novel coronavirus tended to last longer than in a seasonal flu, also had the effect of discouraging suspected carriers from immediately visiting medical institutions.^{10,11} Such measures helped reduce the number of people visiting hospitals for COVID-19 in the early phase of the spread of infection, thus preventing the breakdown of outpatient services at medical institutions and curbing the hospitalization of asymptomatic carriers and patients with mild symptoms.

1.3. Securing hospital beds

Beginning February 1, the novel coronavirus disease was treated as a designated infectious disease (equivalent to Category II disease) under the Infectious Diseases Control Law.¹² This designation empowered prefectural governors to recommend the hospitalization of people infected with COVID-19 and suspected patients (including asymptomatic carriers beginning on February 14)¹³ at medical institutions designated for treating infectious diseases. However, a gap emerged in the interpretation of this step. The health ministry did not intend to make hospitalization mandatory for all because COVID-19 was an “equivalent” of the Category II infectious disease. But the prefectural governments took the measure to mean that all patients and suspected patients needed to be hospitalized – just like patients of Category II diseases. Initially, therefore, patients and suspected patients were accommodated at beds for infectious diseases of hospitals

designated for treating infectious diseases.

Starting on February 9, as an ad hoc measure in view of the increase in the number of COVID-19 patients, patients and suspected patients were also accommodated at beds for other illnesses at hospitals designated for infectious diseases treatment, as well as at medical institutions not designated for such diseases.^{14,15,16,17} This resulted in asymptomatic carriers occupying beds at those hospitals. On April 1, the expert panel proposed creating an option of accommodating asymptomatic carriers at facilities other than medical institutions, along with having them recuperate at their homes.¹⁸

On April 2, the health ministry's COVID-19 headquarters decided that people who tested positive for the novel coronavirus and showing mild symptoms of the disease would now be accommodated at the seminar facilities of local governments or private-sector hotels – because it was anticipated that, when COVID-19 infections expanded further and the number of hospitalized patients increased, it would become crucial to secure enough medical resources for treating patients with more serious symptoms.¹⁹

The number of medical institutions designated for infectious diseases is limited. Hospitals treating patients of specified infectious diseases (four institutions with a total of 10 beds for treating infectious disease patients), medical institutions designated for Category I infectious diseases (55 institutions with 103 beds in total), those for Category II diseases (351 institutions with 1,758 beds, not including designated institutions with beds for tuberculosis patients) all combined came to 410 institutions with 1,871 beds across Japan.²⁰ It was obvious that beds at these hospitals would run out if the infection spread further.

The health ministry began to take steps to increase the supply of beds for patients of the novel coronavirus disease, including a new subsidy for medical institutions that secured beds for accepting COVID-19 patients²¹ and easing the procedure under the Medical Care Act for the approval of changes to personnel and beds at hospitals.²² Hospitals would not be accused of violating the law if they accommodated COVID-19 patients beyond the number of beds permitted under the legislation,²³ nor would they be punished with cuts to their medical service fees.²⁴ The ministry also curbed the hospitalization of new patients with illnesses other than COVID-19 at medical institutions designated for infectious diseases.²⁵ All these measures – and the fact that an explosive increase in novel coronavirus infections did not materialize – gradually eased the tight supply of hospital beds for COVID-19 patients.²⁶

1.4. Successful model of appropriate allocation of medical resources

When it was found out that a passenger who had disembarked from the cruise ship *Diamond Princess* on January 25 was infected with the novel coronavirus, the health ministry's Yokohama Quarantine Station had the ship anchor at the Yokohama port and began its quarantine. It was the first time that such a large-scale quarantine operation and

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measures against an infectious disease were carried out in Japan. Kanagawa Prefecture, which accepted large numbers of infected patients from the Diamond Princess at local medical institutions, used the experience to take various initiatives to deal with COVID-19 ahead of other prefectures. Under what came to be known as the “Kanagawa model,”²⁷ COVID-19 patients were divided into three groups according to the degree of seriousness of their symptoms, and three categories of hospitals – high-level medical care institutions, priority medical institutions and those cooperating with the priority institutions – were chosen to provide care for the patients.²⁸

Emergency rescue centers and hospitals offering acute phase medical care in the prefecture were designated as high-level medical institutions to treat patients requiring intensive care using ventilators and extracorporeal membrane oxygenation (ECMO) machines. Priority medical institutions set aside their wards to accept COVID-19 patients needing such care as oxygenation and intravenous drips, while “cooperation” hospitals took in patients whose PCR test results were not confirmed. Asymptomatic carriers who did not need medical care, as well as young patients with mild symptoms, were allowed to recuperate at their homes or stay at hotels. The model was thus designed to ease the burden on staff at medical institutions through a division of roles and concentration of functions. To support operations at these hospitals, doctors of the disaster medical assistance team (DMAT) were stationed at the prefectural government to secure functions to adjust the transport of patients. Noting that the battle against the novel coronavirus would be prolonged, Kanagawa Governor Yuji Kuroiwa urged all medical institutions in the prefecture to restrict or delay as much as possible nonurgent hospitalization or operations of patients with other illnesses so as to secure the medical staff manpower and hospital beds for COVID-19. The governor also requested the dispatch of medical and clerical staff to the priority institutions to assist their operations.²⁹

Meanwhile, the COVID-19 crisis exposed a lack of preparation for securing surge capacity at medical institutions in many prefectures – no arrangements had been made in advance to provide extra support in case of an explosive increase in infections. Lack of a mechanism to mobilize doctors in other fields to help those specialized in infectious diseases or a system to tap into the resources of hospitals other than those designated for infectious diseases, as well as poor preparations for local medical associations to play a role in times of crisis, contributed to the confusion in the early phase of the COVID-19 response.³⁰ A crisis response team to deal with a pandemic – similar to the DMAT for disaster response – should be established, and practical training must be held in each area based on a concrete scenario of an infectious disease crisis.

2. The medical care system under strain

2.1. Excellent intensive care that saved patients in serious conditions

Japan is deemed to maintain a very high level of intensive medical care by international standards. That proved true in its response to the novel coronavirus. Of the COVID-19 patients who received extracorporeal membrane oxygenation (ECMO) as of September 2, 144 had been weaned off ECMO, 60 had died, and 27 others were still receiving treatment. About 70 percent of patients were weaned off ECMO after a recovery in their condition³² – an excellent record compared with the global average (54 percent of COVID-19 patients were discharged following successful ECMO treatment as of September 8, although the timing for the evaluation is different).³³ Japan also performed quite well in weaning COVID-19 patients off ventilators in cases which did not require ECMO.³⁴ Such records show that the high level of Japan's intensive care treatment contributed a great deal to its success in containing the number of deaths from the novel coronavirus disease.

Problems were also exposed. When COVID-19 patients requiring ventilators sharply increased, the number of patients on ventilators was constantly close to the declared capacity, meaning there was always small leeway to accept more patients needing mechanical ventilation.³⁵ COVID-19 patients in grave condition requiring intensive care need to be treated in individual rooms. Each of the teams handling such cases consists of doctors, nurses and medical engineers not only with expertise in infectious diseases but well-versed in the use of ECMO machines, ventilators and other special equipment. To secure the manpower for treating serious COVID-19 patients, intensive care or regular medical services for patients with other illnesses have to be scaled down. It becomes difficult for hospitals to accept new patients requiring tertiary emergency care. That puts further constraints on medical services and, as a consequence, may trigger a collapse of the medical care system. When a hospital accepts a patient requiring an emergency operation, the doctors have to either put the operation on hold until an infection is ruled out, or perform the operation with the staff fully protected against the risk of infection.³⁶ It becomes impossible to accept an emergency patient unless the medical institution is sufficiently prepared, and the patient may be passed around from hospital to hospital in the area until his or her condition becomes critical.

Contrary to its good performance, Japan's intensive medical care system is not backed up by sufficient manpower. The nation has 1,850 doctors specialized in intensive care treatment – far smaller than the 8,328 in Germany. To provide intensive care for COVID-19 patients with serious conditions, you need to secure at least one-on-one care to protect staff against infection. Mechanical ventilation management of patients with serious respiratory failure requires a high level of skill, and it takes time to train the doctors, nurses and medical engineers involved. The number of Japan's hospital beds in

proportion to the population is above the average of Organization for Economic Cooperation and Development members, but its number of intensive care beds – 5.2 per 100,000 population – is below the OECD average of 12.0.³⁷ To achieve free access to medical services, Japan has allocated its medical resources throughout the country so that patients with moderate illnesses can receive treatment anywhere in the nation. However, its medical care system as a whole is vulnerable to collapse if it is confronted with a sudden surge in seriously ill patients requiring intensive care beyond certain levels.

2.2. Shortage of personal protective equipment and disinfection ethanol for medical staff

With the expansion of COVID-19 infections, the shortage of personal protective equipment (PPE) and other supplies for the staff at medical institutions was an increasingly serious problem. In early February, the Ministry of Economy, Trade and Industry began weighing steps to secure masks and disinfectant liquid. That was supposed to be the job of the Economic Affairs Division of the health ministry's Health Policy Bureau, but that division alone was not up to the task of procuring all the necessary supplies just as the whole ministry was kept busy dealing with the infections aboard the Diamond Princess. Following the February 14 Cabinet decision on the use of a reserve budget, efforts to beef up domestic production of those supplies were put into full swing.³⁸ Yoshitake Yokokura, chairman of the Japan Medical Association, filed a request with health minister Katsunobu Kato to expedite the efforts to cope with COVID-19, including increasing the stockpile and distribution of PPEs and disinfectants.³⁹ Concerned that the government's response was too slow,⁴⁰ Yokokura visited the Prime Minister's Office on February 27 and hand-delivered a request to Prime Minister Shinzo Abe for securing necessary medical equipment and supplies as well as their prompt distribution to institutions battling the novel coronavirus.⁴¹ However, confusion continued at those hospitals.

The Prime Minister's Office asked METI to take charge of securing the procurement of masks, disinfectant liquid, medical gowns, ventilators and so on.⁴² On March 9, a team comprising officials from the health ministry, METI and the Internal Affairs and Communications Ministry was set up to procure masks and other medical supplies (the so-called "mask team"), distributing them to medical institutions and nursing care facilities.

The mask team covered more goods and materials beginning in March and delivered PPEs secured by the government to medical institutions that needed them through prefectural governments. A health ministry notification served on April 7 urged medical institutions to carefully weigh against disposing of used high-performance N95 surgical masks, and notifications issued on April 10 and 14 recommended reusing N95 masks,⁴³ other types of surgical masks, long-sleeve medical gowns, goggles and face

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shields as exceptions to the regulations on their use. On April 15 and 16, Prime Minister Abe met with representatives of the manufacturers of PPEs and other medical gear to call on them to boost their output.⁴⁴

Abe told the April 24 meeting of the COVID-19 headquarters that the government planned to deliver 1.5 million N95 and other high-performance masks, 1.3 million medical gowns and 1.9 million face shields by the end of the month to medical institutions across the country running short of these supplies.⁴⁵ The health ministry began distributing medical supplies directly via its G-MIS (Gathering Medical Information System on COVID-19) system to hospitals with an acute shortage of such gear, while supplies were additionally distributed to other institutions that also requested them by way of prefectural governments.⁴⁶ However, delivery of gear continued to be too slow to promptly resolve the acute shortages among medical staff. In a survey taken in mid-April, 70 percent of doctors polled said they did not have enough PPEs and 60 percent complained of the shortage of disinfectant liquid. That slightly improved to 60 percent complaining of the shortage of PPEs and more than 40 percent of the lack of disinfectants in a survey taken two months later, but the medical professionals were still not provided with an adequate supply of PPEs, which put them under additional stress in combating the disease. They had to reuse the same masks for a week and wear garbage bags as substitute medical gowns.

Behind the acute shortage of PPE supply to hospital staff was the extreme difficulty in procuring equipment. It had never been anticipated that countries across the globe would engage in such a tight competition to get their hands on those supplies. Domestic stockpile of PPEs, in particular N95 masks, was so small because Japan relied heavily on imports from before the pandemic. Only small and medium-size manufacturers produced N95 masks in Japan, while their imports were delayed as China and other exporters like Malaysia, Vietnam and Indonesia curbed their shipments to prioritize supply to meet their own domestic needs. Most of the medical protective suits used in Japan were imported from China and Southeast Asia, as small Japanese manufacturers could not compete against the low-cost imports while larger domestic apparel makers stayed away from the production of such gear that required special techniques.

Japanese firms remained hesitant to build new production plants out of concern that they would be left with excess capacity once demand peaked out. According to a senior METI official, what held the key to winning the international competition over procuring the goods and materials needed for the fight against COVID-19 was budgetary allocation, in particular a guarantee that could be shown to the suppliers and trading firms brokering the transactions that the government would certainly purchase the supplies.⁴⁷

2.3. Economic support for medical institutions

Calls grew for extending government support for medical institutions, which suffered revenue losses as people refrained from visiting hospitals and seeing doctors with the spread of novel coronavirus infections, while hospitals also had to curb operations and examinations of patients with other illnesses to secure their resources for COVID-19 patients. In accepting patients of infectious diseases, hospital rooms for multiple beds needed to be converted into single-bed rooms, reducing the bed capacity of the institutions. Some hospitals were reluctant to accept COVID-19 patients out of fear of the risk of a vicious cycle in which an in-house infection could hit their staff, put them temporarily off the workforce and cut their bed occupancy ratio even further. Therefore, the government needed to provide economic aid to medical institutions to prod them into accommodating COVID-19 patients.

On March 26, four organizations of medical professionals jointly submitted a request to health minister Kato asking for support in coping with COVID-19. However, the amount of emergency grants to support the medical institutions included in the first extra budget for fiscal 2020 adopted by the Cabinet on April 7 was insufficient. Prime Minister Abe told a news conference on April 17 that the government would take steps to improve the working conditions of doctors and nurses combating COVID-19 by doubling the medical fees for their hospitals. On the same day, the health ministry decided to double the medical fees paid to institutions that accommodated COVID-19 patients with serious conditions.

Also, on May 1, the Japan Medical Association and four associations of hospital organizations jointly filed a request with health minister Kato for additional steps to financially support medical institutions. Citing the sharp decrease in both inpatients and outpatients at hospitals since April, the organizations asked the government to enable medical institutions to apply for advance payment of medical service fees based on the amount paid to them in the previous year – a special measure approved for hospitals that were hit by natural disasters – so as to save the institutions from possible bankruptcy and maintain health care services in the areas they were located. They also requested that financial aid from regional funds for supporting medical and nursing care facilities be flexibly extended so as to help not only hospitals dealing with COVID-19 patients but other institutions providing logistical support for the fight against the pandemic, and that the government take steps to boost the output by domestic manufacturers of gear to protect medical professionals from infection. Kato replied that the government could not compensate for the losses incurred by medical institutions but would try to cover their extra material and personnel expenses to cope with COVID-19 patients, suggesting that hospitals requiring immediate financing should get loans from the Welfare and Medical Service Agency.

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According to a joint survey held in May by hospital associations on the financial conditions of medical institutions,⁴⁸ the number of their inpatients and outpatients, which had been on a decline since February, plunged sharply in April, putting their management in dire straits. The impact was particularly severe among hospitals that accepted COVID-19 patients, despite the various extra steps taken to increase the medical fees paid to them. Based on the outcome of the survey, the associations called on the government and other quarters to extend financial support for hospitals. As a consequence, the second extra budget for fiscal 2020 featured an increase in the basic hospitalization fees in the calculation of medical fees paid to hospitals as well as an emergency support program for those institutions. On June 16, the government decided on financial aid for hospitals and their staff from the program. But the distribution of such aid at the prefecture level was delayed.⁴⁹

Government support for the management of medical institutions can be extended in the form of raising the medical fees paid to hospitals, subsidies and loans. Revisions to the medical fees cannot be applied retroactively – so they cannot make up for the past loss of revenue – but will increase the income of the hospitals beginning from the day the fees are raised, and can be raised uniformly for institutions across the country. But it takes time for subsidies adopted by the national government to reach the medical institutions since they also need to be approved by the assemblies of the prefectures in which they are located. Furthermore, the process of application and screening tends to delay the payment of subsidies. It is possible for the head of the local government to expedite the disbursement of subsidies as a priority with the consent of the local assembly. In that sense, the COVID-19 crisis presented a test case on whether the heads of local governments could act quickly to extend financial support for medical institutions in their areas.⁵⁰

2.4. Hospital-acquired infections that could not be prevented

At least 24 percent of the total deaths from COVID-19 in Japan as of late May were the result of in-house infections at medical institutions. A total of 1,028 people were infected with the novel coronavirus while they were hospitalized due to other illnesses, and 205 of them died. The fatality rate of COVID-19 patients who contracted the virus in nosocomial infections was fairly high at 20 percent.

In late March, a large-scale nosocomial infection of the novel coronavirus broke out at a key hospital in Tokyo, in which 214 patients, their relatives and hospital staff were infected and 43 of them died.⁵¹ On March 20, several patients and nurses at the hospital ran a high fever. PCR tests were given the following day to two of the patients, who tested positive two days later. When two others were found infected a day later, all of the hospital staff at the ward where the infection broke out were ordered to stay home. After nine more patients tested positive for the virus the following day, the hospital

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administered PCR tests on all of its patients and staff. It took at least nine days before all the results were made known – and it was during this period that most of the in-house infections at the hospital spread. Much of the infection occurred among the staff who had been called in as assistants to make up for the manpower shortage – and were thus not familiar with the work at medical wards. Half of the 43 patients who died of the infection had been hospitalized for treatment of blood diseases, while many of the others were receiving chemotherapy or were of advanced age.

In a news conference held after the hospital was reopened to outpatients, its president cited four factors that caused the nosocomial infections: First, when the in-house infections broke out, it was not yet clearly known that the virus could be transmitted via asymptomatic carriers, and because there were other causes that led inpatients to run a high fever or suffer from pneumonia, it took time for the hospital to suspect nosocomial infection. Since the hospital did not have the equipment to hold PCR tests on its premises, it took two to three days before the result for each test was made available, and the infections spread while the hospital was waiting for the results on all the patients and staff. Second, basic steps to prevent an in-house infection were not thoroughly followed. Third, the hospital staff were in close contact with each other when they ate together or took the breaks. Fourth, zoning inside the hospital was not adequately carried out. The president broke into tears as he talked about the hardship the hospital's staff went through as they fought the infections and the social prejudice to which they and their family members were exposed.

In-house infections broke out at another hospital – a key institution serving the local region – in mid-April, and it took about five weeks before it could resume normal medical services.⁵² PCR tests were given to 753 people, and 43 inpatients and staff at the hospital were found to be infected. According to an analysis by the health ministry's cluster team, the probability of the infections spreading from the hospital's ward exclusively for COVID-19 patients was low, and various other factors, such as close contact among members of the same team of staff causing droplet infection, infection among participants in conferences, and staff chatting while eating together in the break room, were deemed likely causes. Initially, the hospital had to rely on a private-sector testing firm to administer the PCR tests, which did not proceed smoothly, and it was only after it commissioned the National Institute of Infectious Diseases to administer the tests that they could be given to more than 100 cases a day. The infection was deemed to have been contained from April 28 onward, and the hospital gradually recovered its functions after its emergency rescue center was reopened on May 18.

These large-scale nosocomial infections that broke out in the early stages of the COVID-19 crisis were blamed on various factors – such as the lack of capacity to promptly administer PCR tests to a large number of people, the lack of knowledge on the nature of the novel coronavirus, including the risk of infection from carriers before they showed symptoms of the disease, and the difficulty of securing an environment to prevent close contact among hospital staff. The health ministry on March 17 published the first edition of its manual on treating COVID-19, which was updated twice on May 18 and

June 17 to reflect information from the hospital-acquired infections that subsequently took place and newfound knowledge on the disease.

On July 8, the Infectious Disease Surveillance Center of the National Institute of Infectious Diseases published a “checklist” for the outbreak of in-house COVID-19 infection at medical institutions. The number of hospital-acquired infection cases across the country has since declined, but such infections were not totally eliminated – as was shown by the outbreak in September of an infection cluster at a high-level medical institution that was supposed to have followed thorough preventive steps. This illustrates how difficult it is to prevent nosocomial infections of a virus that can be transmitted by carriers who have yet to show the disease’s symptoms.

3. Exposed delay in digitization of the medical care system

3.1. G-MIS

When Kanagawa Prefecture dealt with the COVID-19 outbreak aboard the Diamond Princess anchored at Yokohama port, a system showing the real-time information on beds open at local hospitals proved useful in transporting patients from the cruise ship.⁵³ On March 11, the prefectural government opened a special website on the effort to combat the novel coronavirus, through which it collected information about the operational condition of local medical institutions, the state of their medical equipment and materials, situations at COVID-19 consultation centers and outpatients visiting the hospitals for the disease, the number of infection cases and PCR tests held, and so on in an integrated manner – and shared part of the collected information with medical institutions, local public health and welfare offices as well as municipalities within the prefecture. The system was later developed jointly by the health ministry and the Cabinet Secretariat’s IT strategy office into the G-MIS (Gathering Medical information System on COVID-19) system covering the whole country.⁵⁴

On March 27, the health ministry served a notification addressed to the directors of public health divisions in prefectural governments, asking them to directly look into information about medical institutions in their jurisdiction. By collecting information on the operation of hospitals, the conditions of their beds and medical staff, and the medical equipment and supplies secured by institutions across the country, the system aimed at widely sharing data on the operational status of hospitals for use in adjusting the supply of masks and other medical gear and materials as well as the transport of patients. After G-MIS was put into full-scale use in May, new functions were added to the system, including one enabling hospitals running short of medical supplies to directly request the national government for an emergency distribution of supplies, as well as another monitoring the number of ventilators in use and the state of hospitals’ medical service for

outpatients. The government also kept track of the use of the Remdesivir drug on COVID-19 patients through this system.

In fact, however, the system was not immediately joined by all local governments across the country. As of May 26, 6,717 hospitals throughout Japan, or 93 percent of the 7,222 institutions targeted under the system, were registered on G-MIS. But the registration rate was much lower in some areas, such as Tokyo, where more than 20 percent of the hospitals were not registered because a similar system had already been run by the metropolitan government. As of September, medical institutions in Tokyo were still required to input their data into both of the systems, resulting in doubling the workload of their staff, who needed to cover a large number of items.⁵⁵

The Emergency Medical Information System (EMIS) was launched in 1996 as a system to build a medical service system in times of disaster, based on the experience of the Great Hanshin-Awaji Earthquake of January 1995. By building an information network among medical institutions, related medical organizations, fire defense and emergency rescue bodies, public health centers and municipal authorities, as well as a broader regional network connecting the national and prefectural governments, the system aims to gather and provide information about the activities of medical institutions inside and outside disaster-affected areas in times of disaster, and was intended to be used in dealing with an emergency over an outbreak of infectious disease. As novel coronavirus infections spread, the government naturally considered using EMIS. But when it was found that fixing the system to include entries such as the volume for each of the supplies needed to combat the infectious disease would take more than a month, the government decided to introduce the new G-MIS system.

3.2. HER-SYS

In the initial phase of the domestic COVID-19 infection, staff at public health centers had to make phone calls to find out where the infected patients were hospitalized, which added to the confusion at the frontline bodies combating the outbreak.⁵⁶ To reduce the workload of staff at public health centers as well as to expedite the grasp and sharing of information on the novel coronavirus, the health ministry developed the Health Center Real-time Information-Sharing System on COVID-19 (HER-SYS). The system aimed to enable doctors to file reports on new infection cases on their PCs and tablet computers, thus relieving the public health center staff of the work of manually inputting information on the reports that arrived in fax messages from medical institutions. The use of HER-SYS also made it possible for public health centers, other sections of local governments, medical institutions and others involved in dealing with the pandemic to promptly share information concerning infected patients. The health ministry began planning for the development of the system in March, started using HER-SYS at some public health centers on May 10, and introduced the system to all such centers throughout the country on May 29.

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However, the transition to HER-SYS was delayed at some local governments in large metropolitan areas, which had already launched their own systems to manage information about the novel coronavirus. Introduction of HER-SYS in these areas was also hampered^{58,59} by the ordinances for protecting personal information that had been set by the local governments to restrict the use of such information (since HER-SYS involved the use of personal information beyond the realm of national epidemiological surveillance based on the Infection Diseases Control Law⁵⁷).

Initially, the health ministry aimed at putting the new system in full operation across the country by the end of May. But as of July 22, the system was in use by 122 local governments, or only 79 percent of the 155 local governments that have public health centers under their jurisdiction across the country. Thanks to additional efforts by the health ministry to promote its use, the introduction of HER-SYS was completed in 153 of those 155 local governments as of August 11.⁶⁰ However, HER-SYS cannot be linked to the contact-tracing apps, the quarantine system and other systems such as G-MIS,⁶¹ while its use was said to impose a heavy burden on the staff of public health centers and medical institutions because they need to fill in so many input items. Its problems also included the inability to use the system's data aggregation function as of August.

3.3. Online medical examination

In Japan, medical examinations that did not involve a face-to-face exchange between the doctor and patient were long prohibited, as the Medical Practitioners' Act, in its Article 20, banned doctors from providing medical care, diagnosis or prescription without examining patients themselves. Clerical notifications issued by the health ministry in 1997 and 2015 slightly eased the regulations, but such deregulation barely changed practices at hospitals and clinics. In 2018, the health ministry set up a committee to discuss online-based medical examinations and in March crafted a guideline for the adequate implementation of such a practice, which introduced a rule that doctors basically need to hold face-to-face examination of patients visiting their hospitals or clinics for the first time with the disease. The April 2018 revision to medical service fees newly introduced fees for online examination of patients and "online medical management." However, these steps hardly promoted online-based medical services. Of some 21 million receipts for health insurance claims by medical practitioners in the four months from September 2018, only 39 were for online medical examination fees and 21 for online medical management fees.

With the spread of COVID-19 infections, Prime Minister Abe told the March 31 meeting of the government's Council on Economic and Fiscal Policy that it was important to promote online medical examinations in order to protect "not only patients but doctors and nurses on the frontlines of the battle against the novel coronavirus" from the risk of hospital-acquired infections, urging the Regulatory Reform Promotion Council to draw

up a deregulation of practices as an urgent step to cope with the emergency. The health ministry panel discussed online medical examination as a measure to contain COVID-19 infections and on April 2 came up with a draft policy that, as a temporary and exceptional measure, patients with a previous history of being treated at a given hospital for other illnesses could be given first-time examination of their new symptoms online. However, the task force of the Regulatory Reform Promotion Council noted that any measure with such a condition attached would be insufficient.⁶²

Eventually, the government, as part of the emergency economic package in response to the COVID-19 crisis unveiled on April 7,⁶³ decided to allow online examination of first-time patients irrespective of their previous history of being treated at a given hospital for other illnesses – but still as a temporary and exceptional measure. The health ministry on April 10 issued a clerical notification to lift the ban on online medical examination on first-time patients effective April 13. The Japan Medical Association consistently cautioned against allowing online examination of new patients even as COVID-19 infections spread. However, the health ministry ultimately brushed aside such objections for the sake of reducing the risk of in-house infections of medical professionals at hospitals.⁶⁴

4. How Japan's care homes for the elderly managed to avoid explosive spread of infection

4.1. High infection risk at elderly care facilities

One of the factors that increases the risk of COVID-19 patients falling into a serious condition and dying is the advanced age of patients.^{65,66} Among the elderly population, the infection risk and fatality rate are particularly high for those living in groups, such as residents of nursing care facilities. Many other countries suffered an enormous number of COVID-19 casualties among people living in nursing care facilities for the elderly. A total of 68,000 residents at 17,000 elderly care homes in the United States were estimated to have died of the novel coronavirus disease as of August 13. But COVID-19 deaths among residents of such facilities in Japan were far smaller – 79 as of May 8.

It is difficult to prevent infections among residents of elderly care facilities, where it is hard for residents to avoid the “Three Cs” of closed spaces, crowded places and close-contact settings. Multiple residents sharing a room, caregivers holding the elderly residents to help them move around, and many other occasions in which the residents and workers come in close contact with each other increase the risk of infection. Multiple caregivers assist one resident in changing clothes or taking a bath. For residents suffering from senile dementia, it is arduous to follow the measures to prevent infection

such as wearing masks or washing their hands. Once an infection breaks out in such a facility, the virus spreads quickly among residents and caregivers, and staff who had been in close contact with the infected are told to take time off from work. There were instances in which some workers at facilities where COVID-19 infections broke out were unable to send their children to day care centers due to social prejudice, while others were stopped by family members from going to work. The resulting shortage of staff can lead to the breakdown of care service at the facility.

4.2. Elderly care homes in Japan prepared against infection

There were infection clusters that broke out in elderly care homes in Japan, but the number of such cases was smaller than had been anticipated, resulting in a low COVID-19 fatality rate among residents of those facilities.⁶⁷ One reason cited for this result was that such facilities in Japan were used to taking precautions against infectious disease, taking steps every year to protect residents from seasonal flu. Each of the welfare and health care facilities for the elderly needing nursing care is required to set up a committee on measures against infectious diseases, and its activities are audited by the local government. Of these facilities, 87.6 percent have set up a committee solely in charge of measures to prevent infection, while 99.6 percent of them have prepared manuals for preventing infection. Of the steps listed in the manuals to be taken to stop infection in normal times, 98.2 percent of the facilities called for “washing hands,” followed by 92.3 percent for “wearing gloves” and “wearing masks” for 88.4 percent.⁶⁸ These indicate that elderly care facilities in Japan had been well prepared against infectious diseases since before the COVID-19 crisis.

4.3. Elderly care facilities following administrative instructions

The fact that staff at nursing care facilities adequately followed instructions from the health ministry also contributed to containing COVID-19 infections at those facilities. On January 31, the health ministry issued a clerical notification addressed to social welfare facilities including nursing care homes about dealing with the novel coronavirus,⁶⁹ urging staff at the facilities to deepen their common understanding of basic measures against infectious diseases based on a revised manual for such measures at nursing care facilities for the elderly. Another notification served on February 24 gave more specific instructions for the staff at those facilities, such as 1) taking steps to manage their workers' health including taking their temperature; 2) deciding on arrangements in case workers ran a fever; 3) restricting visits to residents except for urgent and unavoidable matters; 4) restricting hand-delivery of goods by commissioned vendors, and 5) keeping residents suspected of being infected in individual rooms. Isolating the whole

facility by severely restricting contacts with people from outside was an important measure in preventing the spread of infection from outside sources.⁷⁰

A senior health ministry official said these concrete instructions were given because the ministry recognized from the outset of the crisis the social importance of combating infection in elderly care homes.⁷¹ In fact, this notification was taken quite seriously among staff at those facilities, most of which were said to have immediately followed the instructions. While the number of domestic COVID-19 infections stood at 141 as of February 24, many of the care facilities for the elderly were already in crisis mode for the infection. The health ministry issued further notifications on March 6 and April 7, giving even more concrete instructions for preventing infection. According to the official, the April 7 notification was served as the ministry was in a very tense atmosphere right after the declaration of the state of emergency – and because it followed the outbreak of an infection cluster at a day-care service facility at the end of March.

4.4. Infection clusters that still hit elderly care facilities

On April 26, a nursing care facility for the elderly in Hokkaido found its first case of novel coronavirus infection – and had its first COVID-19 death four days later. In a large-scale cluster that subsequently hit the facility, a total of 100 people (76 residents and visitors and 24 workers) were infected. Officials from the health ministry's cluster team as well as a DMAT doctor were dispatched to the facility in early May to deal with the situation along with a local municipal government worker with a medical license.

The DMAT doctor was initially dispatched to arrange for the hospitalization of infected patients, but was also put in charge of infection control at the facility – whose staff were confused due to the lack of personal protective equipment and staff shortage – and contributed to calming down the infection. This case at the facility led to establishing a scheme in which officials from the local government and the health ministry's cluster team, along with DMAT doctors, would be deployed when an infection cluster broke out at an elderly care facility, gather information and take prompt measures to contain the infections. The measures against infection clusters at elderly welfare facilities were gradually improved through these experiences.⁷²

As mentioned above, Japan managed to contain the infections and deaths from the novel coronavirus at its elderly care facilities. Staff at nursing care facilities had been well prepared against infectious diseases through their responses to seasonal influenza each year, and the government and operators of those facilities worked together to prevent infections and tackled infection clusters. The declaration of the state of emergency in early April – just as elderly care facilities were being hit by increasing cases of infection clusters – led to a subsequent decline in community infections across the country and sharply reduced the outbreak of infection clusters at elderly care facilities in May.⁷³

5. Summary: Best practices and challenges

Japan was pushed to the brink of a collapse in its medical care system in some areas, including Tokyo, that had particularly large numbers of novel coronavirus infections, but somehow managed to overcome the crisis. The nation was able to keep its COVID-19 deaths and fatality rate lower than in European and North American countries. Factors cited as reasons behind this good performance include steps taken to prevent suspected carriers from rushing directly to medical institutions, based on a lesson learned from the experience of the novel influenza pandemic in 2009, an adequate allocation of patients and medical resources based on the “Kanagawa model” built on the experience of dealing with the outbreak aboard the Diamond Princess, and the information-sharing system built by Kanagawa Prefecture using information and communication technology serving as an effective model for others to follow. The nation’s excellent intensive medical care also served as a bulwark for containing COVID-19 deaths. Measures regularly taken at elderly care facilities to prevent infections also contributed to keeping the casualties down. Medical institutions and nursing care facilities, whose staff had constantly been trained against an infectious disease emergency, were able to quickly respond to the novel coronavirus crisis. After all, you cannot do more than you have been trained to do.⁷⁴

Issues were also exposed. In recent years, Japan had not experienced a nationwide spread of a new infectious disease, and the lack of such experience deterred sufficient progress in the efforts of the medical care system to deal with infectious diseases. This disaster-prone country developed the DMAT (disaster medical assistance team) system, which played key roles in the nation’s responses to a series of major disasters. DMAT teams contributed a great deal to the fight against the novel coronavirus. Now we need to build a new nationwide system, similar to DMAT, for mutual support in the efforts to combat an infectious disease crisis.

The COVID-19 crisis exposed ambiguities in the system for mutual support between doctors in a hospital – and between hospitals – and the roles of regional medical associations in times of a pandemic. Acute shortages in personal protective equipment and disinfectants caused considerable confusion at medical institutions and imposed a heavy burden on their staff. Increasing the stockpiles of medical supplies in case global competition breaks out for their procurement – and establishing a mechanism for promptly developing and producing supplies domestically in the case of an emergency – will contribute to preventing a collapse in the medical care system. The system that delays financial support for medical institutions at the prefecture-level, even after the policy has been adopted by the national government, needs to be fixed in favor of a more flexible scheme to meet emergency needs.

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The medical and nursing care service systems can easily collapse unless they have enough manpower, equipment and funds. It is an urgent challenge to build high-level medical human resources who can cope with new infectious diseases. It is impossible to train such personnel over a short period of time – much less after a new infectious disease has broken out. As health minister Kato put it, the COVID-19 crisis once again exposed the delay in digital transformation in the medical fields as a major challenge for the future.⁷⁵

Relevant ICT and legal systems must be developed to enable the whole nation to share medical and nursing care information and optimize medical and nursing care services for the public based on that information. Reforms must be steadily implemented for the future while paying enough attention to people on the frontline of those services. New forms of non-contact medical services in an era of coexistence with coronavirus – such as online medical examinations and medication guidance – should be reviewed but never be reversed. Finally, it should be noted that Japan's medical care system, such as its universal public health insurance, and the dedicated efforts of its medical professionals no doubt contributed to the nation's success in containing COVID-19 infections and deaths. We hope that further efforts are made to reform and develop the systems to prepare against new infectious diseases in the future.

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