Part I What is the "Japan model"?

Chapter 1
Epidemiological assessment of Japan's response to the novel coronavirus disease and Japanese people's behavioral change compared to other countries around the world

The "Japan model" is defined in this report as the Japanese government's approach aimed at controlling the spread of the novel coronavirus disease and limiting damage to the economy without taking legally enforceable measures to restrict people's movement, but instead by a combination of behavioral change measures, which were centered on requests for self-imposed restrictions on outings and temporary business closure without imposing penalties, and individual case tracing as part of a cluster-based approach.

Under this Japan model, the nation managed to keep the mortality rate for COVID-19 in proportion to population (per 100,000 population) low among the major developed countries. Japan's aging rate is by far the highest in the world. Given that the mortality rate for this infectious disease is particularly high among the elderly, and even if Japan had one of the highest mortality rates in the East Asia-Pacific region, it would seem that the outcome of this approach was not a failure.

This chapter will look at what kind of epidemiological perspectives and findings were used in deciding and implementing the Japanese government's responses and measures, and their consequences. To prepare for the next wave of the pandemic, this chapter will also aim to focus on analyzing and evaluating the cases of the epidemiological factors that were effective and the cases that left problems for the future.

1. Preface

1.1. Japan succeeded in keeping the mortality rate low in proportion to population despite high population aging rate

In the six months from January to June 2020, Japan managed to keep the mortality rate for COVID-19 low without forcible lockdowns. The number was limited to 8 per 1 million people as of July 17.[1] It was lower than the median of 173 countries around the world, being one tenth of that of the Western nations (Figure 1). It was also the lowest among the Group of Seven countries,[2] and the fourth lowest in the Group of 20 nations following China, South Korea and Australia.[3]

On the other hand, Japan ranked the third highest after Indonesia and the Philippines among the 25 countries in the East Asia-Pacific region. However, considering that Japan has the highest aging rate[4] of 28% in the world (Figure 2) and the mortality rate for this infectious disease is particularly high among the elderly, Japan's efforts, including measures to protect the elderly, cannot be deemed a failure.

Figure 1: Boxplot of mortality rate for the novel coronavirus disease in the seven regions of the world
(Compiled by the author based on data from Worldometers)

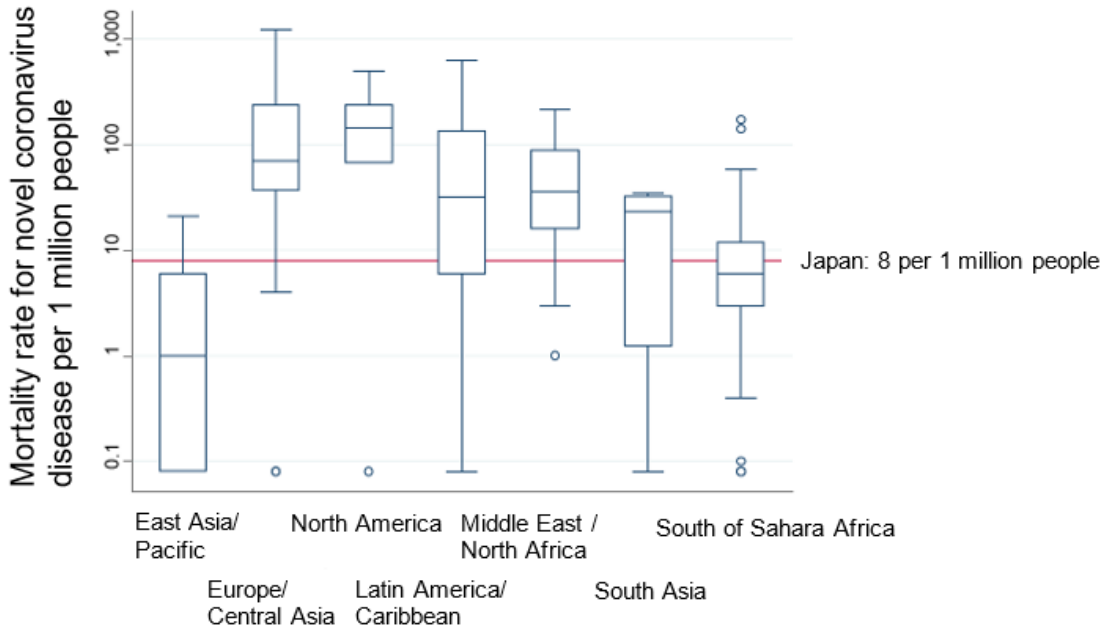
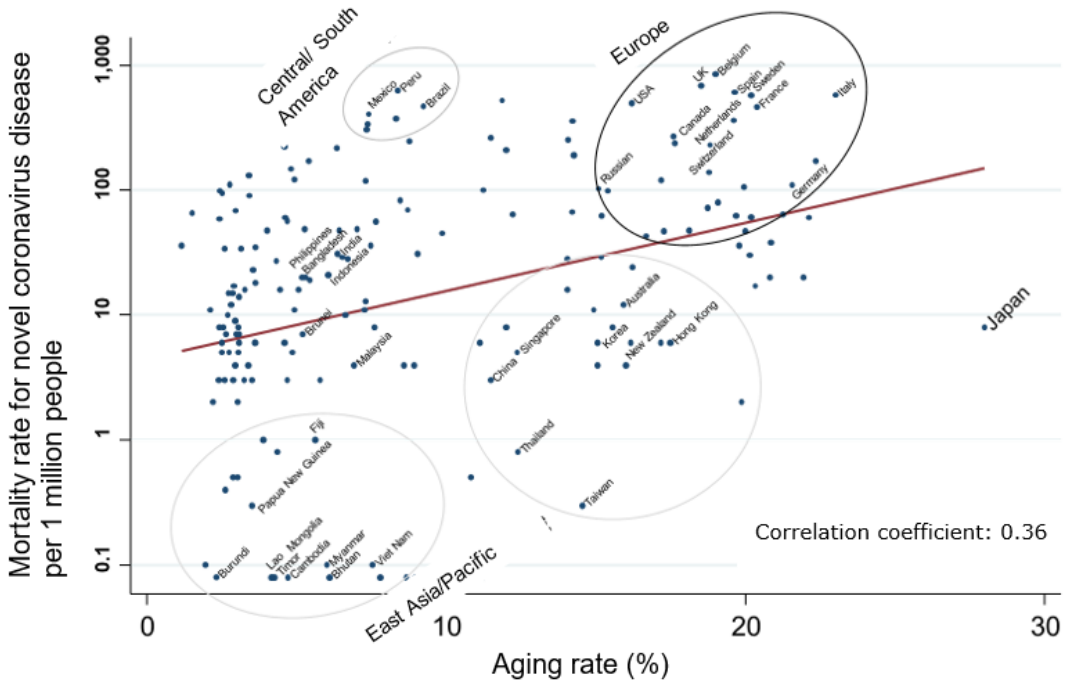


Figure 2: Scatter diagram on the relationship between population aging and mortality rate
(Compiled by the author based on data from Worldometers and the World Bank)



On February 24, the government's Expert Meeting on the Novel Coronavirus Disease Control, in its first assessment "Ways to realize basic policies for the novel coronavirus disease control," said that "The biggest objective of COVID-19 countermeasures from now on is to slow the spread of infection and reduce the number of deaths and cases that may develop severe symptoms as much as possible." From a medical point of view, the ultimate goal was to reduce the mortality rate in proportion to the population. Reducing the number of COVID-19 patients with severe conditions and slowing down the spread of infection would ultimately lead to a reduction of the death rate (mortality rate) from novel coronavirus infection per 1 million people. As far as this point is concerned, it can be said that Japan received a passing grade.

1.2 Japan's economy barely holding up and keeping society stable due to nonbinding "soft lockdowns"

From the early stages, Japan pursued a two-pronged approach – "minimizing the impact on social and economic functions while maximizing the effect of preventing the

spread of infections." The government avoided strong restrictions on economic activities like the measures adopted in many Western countries and elsewhere, such as city blockades and orders for temporary business closure for a wide range of industries. Instead, it sought cooperation from its citizens through "soft lockdowns" that included requests for people's behavioral change and for refraining from holding large-scale events as well as shortening business hours.

Japan's gross domestic product fell 0.6% in the January-March period from the previous quarter and dropped 7.9% in the April-June quarter (-2.3% and -28.1% on an annualized basis), but succeeded in keeping the GDP decline smallest among the G7 nations. Japan also managed to keep the rate of decline below the average of other G20 economies. During this period, by drawing up large-scale first and second supplementary budgets, the Japanese government implemented both fiscal and financial measures to ease the shocks from disappearing demand.

The impact of the measures has yet to become clear, but Japan's unemployment rate only increased slightly to 2.9% (in May), 2.8% (in June) and 2.9% (in July) from the level before the COVID-19 outbreak (2.2-2.4%). Though the number of suicides, which is said to be directly proportional to the rise in the unemployment rate, seemed to be on the rise in July and August and it needs to be monitored carefully (Year-on-year figures: up by 2 people in July, up by 246 people in August), the number actually declined in the period between February and June (down 4 people in January, 164 in February, 115 in March, 326 in April, 289 in May, 96 in June).[5]

At this point, it is still too early to determine if the government's objective of minimizing socio-economic damage has been achieved. But as for the first half of 2020, the period covered in this project, the economy was sustained and social stability maintained.

1.3. The purpose of this chapter: To epidemiologically analyze the responses and measures by the Japanese government

On May 25, when Prime Minister Shinzo Abe lifted the state of emergency, he said that Japan's efforts had been successful and declared it the "power of the Japan model." By deliberately announcing the experience of Japan as a "Japan model," he sent a positive message both at home and abroad that Japan could continue to use this model and deal with the pandemic. On the same day, Tedros Adhanom Ghebreyesus, director-general of the World Health Organization, highly praised Japan's response by saying, "[Japan's] death toll is low. Japan is successful."[7] Internationally, Japan's case has been perceived to a large extent as successful.

But what is the "Japan model?" While the whole world was trying to respond to the same challenges, were there initiatives unique to Japan? Were there any special

measures that made it possible for Japan to somehow contain the spread of the disease? And if there is a "Japan model," can it be a universal one that can be applied to the rest of the world? If a full-fledged second wave hits, can it bring about the same result as this time?

It is rather difficult to give a correct answer epidemiologically at this moment. It is because there are not enough substantial epidemiological data available, and the crisis is still ongoing. Nevertheless, with some assumptions, it is possible to posit a hypothesis of what the "Japan model" was.

First, in this report, the "Japan model" is defined as the Japanese government's approach aimed at both slowing the spread of infection and limiting damage to the economy without imposing legal restrictions on people's movement, but instead by combining individual case tracking as a cluster-based approach and behavioral change measures that focused on self-restraint and business closure requests without penalties.

This chapter aims to look at what epidemiological perspectives and findings led to the government's actions and measures and their consequences. To prepare for the next wave of the pandemic, the main focus will be to analyze and evaluate the epidemiological factors of cases that were effective and cases that left behind future issues.[8]

2. Government's assessment of the "Japan model" and criticism from overseas

2.1 Assessment by the Japanese government and the expert panel

On May 25, Prime Minister Abe made the following remark in a news conference.

"In our country, even with the declaration of the state of emergency, the government cannot impose compulsory lockdown measures with penalties. Even so, the country has managed to almost put the epidemic under control within about a month and half. I believe this is the power of the Japan model."

On this day, in lifting the emergency declaration that had continued for about a month and a half, the prime minister himself named the government's efforts the "Japan model" and declared to the Japanese public and the rest of the world that Japan made a certain achievement in containing the first wave of the pandemic. What did the government see in this "Japan model?"

It was not the prime minister's May 25 news conference where the word "Japan Model" was used for the first time. In its report titled "Situation analysis and recommendation" released on April 1, the Expert Meeting on the Novel Coronavirus Disease Control referred to the "Japan model" to explain Japan's measures by saying,

"While various countries around the world resort to 'lockdowns,' the world's attention is on Japan's efforts ('Japan model') that focused on people taking voluntary actions and early detection of clusters."

From the beginning to the latter half of March, while developed nations including the United States and European countries began imposing strict restrictions on their citizens in response to the rapid spread of COVID-19, Japan was seeking ways not to impose tight curbs on people's movement and activities.

In this report issued immediately before the state of emergency was declared on April 7, the expert panel introduced the "Japan model" by stating that the country had formed a strategy to tackle the novel coronavirus based on three pillars to maximize the effect of preventive measures while minimizing the impact on social and economic functions. The three pillars were 1) early detection and response to infection clusters (patients); 2) early diagnosis of patients, strengthening intensive care for patients with serious conditions and securing a medical care system; and 3) people's behavioral change by urging them to voluntarily change their lifestyles.

Following the lifting of the state of emergency on May 25, the expert panel reviewed Japan's measures in its May 29 report "Situation analysis and recommendations for tackling the novel coronavirus." In that report, the panel gave high marks for Japan's measures compared to other developed countries in Europe and the U.S., saying that it had made certain achievements by curbing the increase in the number of infected people and keeping the number of deaths and patients with severe conditions low.

The expert meeting cited the following factors for the success:

- Early detection of COVID-19 infection cases with links to China and Europe
- Experience of dealing with the Diamond Princess was utilized.
- Because of the good access to medical care provided by universal health insurance coverage, an abundance of medical institutions both public and private, and a high level of medical care in rural areas, it was possible to quickly detect infected people from the early days of the epidemic.
- High public health standards centered on regional public health centers across Japan.
- People's strong awareness of hygiene and their different lifestyle (compared to Europe and the United States).
- High degree of public cooperation in response to request for voluntary actions from the government and the experts.

In addition to these factors, the expert panel cited an effective cluster-based approach. The report stated the following:

"Japan had realized at an early stage that about 80 percent of people who were

infected with the novel coronavirus, whether their conditions were severe or mild, do not pass on the virus to others, and those who have been infected showed symptoms that were clearly different from those of influenza, which is highly contagious to other people. Thus, public health centers across Japan focused on dealing with clusters as this virus was spread mainly through clusters, and if clusters can be controlled at an early stage, the spread of the novel coronavirus can be prevented to some extent.

"By analyzing the result of active epidemiological investigations in the initial phase, especially by implementing a special kind of contact tracing called 'retrospective tracing,' in which regional health centers across Japan ask people infected with the virus to detail their movements, analyze places that were likely to be the sources for clusters and identify common sources of infection, Japan discovered effective measures of avoiding the 'Three Cs' (Closed spaces, crowded places and close-contact settings) that had not been recognized by other countries. Due to this discovery, the Japanese government was able to warn people to avoid the Three Cs – conditions likely to generate clusters – from an early stage."

Based on such analysis by the expert panel, Yasutoshi Nishimura, minister of state for economic revitalization who was also put in charge of COVID-19 response, contributed an op-ed piece to the Wall Street Journal (published on July 7).[9] In that article, he reported on Japan's measures by writing "Japanese health experts focused on contact tracing called 'cluster-busting' by identifying common sources of infection, and developed and implemented the concept of 'Three Cs: closed spaces, crowded places and close-contact settings.' But 'cluster-busting' isn't a panacea. For one thing, it works best when outbreaks are relatively small. The voluntary business closures and other restrictions succeeded in reducing in-person contact by as much as 80 percent." And he called on the world to share Japan's experiences and learn from each other.

2.2 How the "Japan model'' was perceived

People in Japan and abroad, however, questioned Japan's approach from time to time in the process of forming the "Japan model."

2.2.1 Passengers and crew of the Diamond Princess treated like guinea pigs

On Feb.26, The New York Times carried an article that lashed out against the Japanese government as follows:[10] "[In Japan] people have been told not to seek testing or bother visiting medical institutions unless their symptoms are severe and lasting. [Prime Minister Shinzo] Abe has, in effect, outsourced the government's containment

efforts to the population itself, while the state makes little effort to increase medical resources on the severely ill and to sufficiently provide face masks for medical professionals. He might also have been thinking: With no test, there can be no rise in confirmed cases either. The inadequacy of the government's response was laid bare by the unmitigated epidemiological and public relations disaster that was the saga of the Diamond Princess cruise ship. After a 14-day quarantine, at least 634 passengers and crew members (out of a total of 3,645 people) were confirmed to have been infected aboard the ship. 'We're in a petri dish,' one passenger said. 'It's an experiment. We're their guinea pigs.'"

2.2.2. "I really hope Tokyo will not make the same mistake as New York"

On April 4, Yuichi Shimada, a doctor at the Columbia University Irving Medical Center, told The Japan Times in an interview as follows [11]: "Japan's capital now 'looks like' New York two to three weeks ago. (…) People in Japan do not seem serious enough about the situation. (…) Infection routes have not been identified for many infected people. (…) New York is one of only [a] few U.S. cities where people can commute by public transportation systems, and it has many restaurants and bars where people can gather. The virus can spread easily in such major cities, and this has actually happened. The situation in Tokyo is very similar to that of New York. I think the virus could spread explosively (in Tokyo) if people remain optimistic about the situation. I really hope Tokyo will not make the same mistake as New York."

2.2.3. Thorough testing and isolation basic prevention measures for the novel coronavirus

On April 18, Kenji Shibuya, senior advisor to the director-general of the World Health Organization and professor at King's College London, spoke to the weekly news magazine Aera. Asked how experts around the world judge Japan's policy of protecting its medical system by limiting the number of PCR tests, Shibuya responded that he had never heard such a policy seriously discussed among global health experts. Because of the lack of testing, infections have spread, and were leading to a collapse in the medical system, he said, adding that that was the situation in Japan.[12]

2.2.4. Japan's low mortality rate clear, and criticism subsides

Overseas media described Japan's situation "just like a mystery''[14] as many people in the country still went out drinking at bars even during the state of emergency,[13] and its mortality rate was clearly low compared to countries that had implemented forcible lockdowns.

Later, overseas media gradually deepened their understanding about Japan's response to the crisis. There was also a sign of change in how the global experts viewed Japan's policy, with the WHO beginning to recognize Japan's concept of "Three Cs" and call on people to avoid "Confined and enclosed spaces, Crowded places and Close-contact settings." However, at the WHO, director-general Tedros continued to recommend PCR testing by saying "test, test, test,'' even stronger than before he recognized Japan's Three Cs policy. Thus, it was wrong to say that the WHO was promoting Japan's policy to the world, which focused on anti-cluster measures while limiting the number of PCR tests (at least in the early stage of the pandemic). There still continues a huge debate at home and abroad over why the number of infected people and the number of deaths were lower in Japan than in Western countries.[15]

2.3. Real opinions of expert panel members and officials in the related sections of government about the "Japan model''

How did the government's expert panel members view the novel coronavirus disease? How did they try to deal with the virus and how did they judge the risk-return trade-off that comes with the measures? And how did they evaluate the results achieved by these measures? Based on their advice, how did the government draw up a strategy and hammer out the measures? As a result, what did they judge as good practice (successful measures) and problems to be solved, and what did they gain as lessons for the future? Moreover, in this process, at what juncture did they start feeling comfortable calling it the "Japan model?'' This report will try to shed light on these points by various testimonies of the expert panel members as well as other government officials and experts involved in dealing with the crisis.

2.3.1. Domino effect in the largest city in Asia

At the end of January, one of the expert panel members was most concerned that "large cities in Asia will collapse one after another just like a domino phenomenon." That was because "a huge number of Chinese people live in Asia." But the domino

phenomenon did not happen. Speaking about a possible reason for Asian countries having low mortality rates, the expert said, "It has yet to be analyzed, and it is not easy to come up with an answer,'' and added the following points:

"In reality, countries that are suffering from serious conditions include the U.S., major countries in Europe, South America, South Africa, India, Indonesia, and the Philippines. Though Indonesia may be an exception, a common factor among these countries is that they embrace European and American values. Countries that highly esteem Asian values are not suffering as much. The nations with illusions that the novel coronavirus could be contained imposed incomplete lockdowns (they implemented lockdowns after a considerable number of deaths had occurred) and suffered serious damage. Their logic was that the virus could be eliminated. I think the current situation is that countries that have given up eliminating the virus and decided to coexist with it to some extent are not in a terrible situation."

(Interview with a member of the expert panel)

2.3.2. In an aging country like Japan, taking a herd immunity strategy will result in a considerable number of deaths, and that option was unthinkable

"Initially, there were various scenarios, the extreme of which was herd immunity. Herd immunity[16] may be a feasible option in a country with a young population, but if it was applied in a country with a huge aging population such as Japan, a considerable number of deaths would probably occur. Since the herd immunity strategy cannot be changed once it starts, the heard immunity option was unthinkable at that stage. That decision was right. Sweden clearly has reported a larger death toll than similar countries."[17]

(Interview with a senior official at the Health Labor and Welfare Ministry)

2.3.3. Notorious "37.5 degree for four days"

"I especially remember the discussion in February. Since the flu was still going around in February and March, we were discussing how we could distinguish COVID-19 from the flu. That's why the expert panel came up with its notorious notion of having '37.5 degrees for four consecutive days'. It was originally us who asked for the criteria to judge whether it was COVID-19 or the flu. It's true that the fever of the flu goes down relatively quickly, and it doesn't last for four days. So, if the fever continued for four days, they should not stay at home but take a PCR test. I think that's what it initially meant.

However, some public health centers took the criteria too rigidly as if they should not give a PCR test to those who didn't have such symptoms, and it was negatively perceived.

"Another point I'd like to make was that if you give a PCR test in a place with very low morbidity, there would be quite a few false positives and false negatives because the tests are not 100 percent accurate. People with a false-negative result would become optimistic that they had tested negative, and people with false-positive would get infected because they would be isolated with positive people. Moreover, assuming that if they were isolated, their families would be treated as the families of infected patients. I think it's necessary to have a national debate over how much to allow these criteria."

(Interview with a senior official at the health ministry)

2.3.4. Limiting PCR tests established a negative reputation, but prevented collapse of the medical system

"There are three reasons as to why we managed to get through the first wave. First, the self-restraint measures without penalties worked very effectively. Other countries imposed penalties, but in the end, some slipped through. In Japan, because tremendous peer pressure exists, the self-restraint policy was effective. Second, PCR testing. In the early days, PCR tests were only given to those with severe conditions. Because of that, it had a terrible reputation. However, thanks to this, hospital beds were not filled and we just barely managed to prevent a collapse of the medical system. Third, I think Japan's social customs and hygienic environment helped."

(An interview with a senior Cabinet Secretariat official)

2.3.5. Infectious disease, economy, human rights – finding a good balance of those three is important

"The key points of the 'Japan model' were 1) implementing non-forcible measures; 2) having good access to the medical system; and 3) conducting measures to tackle clusters, especially holding retrospective epidemiological investigation. It may be due to the characteristics of the Japanese people. Anyway, Japanese people changed their behaviors. That's it. People often talk about finding a good balance between the right response to the infectious disease and the economy, but I think another element – democracy and human rights – should also be added, and finding a good balance between the three is important. Dealing with an infectious disease in general could restrict human rights. So, we tried to keep a good balance between the three. The history of dealing with infectious diseases show that it creates discrimination. We need to cope with the disease

under the framework of the democratic system. The prime minister was also conscious of that.

(Interview with Health, Labor and Welfare Minister Katsunobu Kato on September 8)

2.3.6. Prime Minister Shinzo Abe

"There was a remark at the G7 meeting that Japan was doing well. I think it was British Prime Minister Boris Johnson who said it."

(Interview with Prime Minister Shinzo Abe on September 11)

3. Japan model: Epidemiologically reviewing Japan's response to the first wave

We will now try to examine from an epidemiological point of view what kind of effect the Japanese government's response had or did not have, especially the initial response, the mass infection of passengers and crew aboard the Diamond Princess, the cluster-based approach, PCR tests and others.

3.1. The initial response: Immediately after receiving information from the WHO, the Japanese government strengthened its domestic surveillance system and quarantine for pneumonia confirmed in Wuhan

January 6: Warning from the Quarantine Information Office website "FORTH"

Pneumonia of unknown cause – China: Translation of WHO information

January 6: An administrative notification titled "About the informed cases of pneumonia of unknown etiology detected in Wuhan City, Hubei Province of China" was sent to the health bureaus of local governments from the Tuberculosis and Infectious Diseases Control Division of the Health, Labor and Welfare and Ministry's Health Service Bureau. The message said, "If a sentinel medical institution for suspected infectious diseases examined a patient with symptoms of pneumonia of unknown cause and a history of travel to Wuhan, the National Institute of Infectious Diseases can examine the case based on its

surveillance system for suspected cases as part of the epidemiological investigation of infectious diseases. Therefore, please inform the medical institutions in your jurisdiction to actively consider using this scheme."

According to the Infectious Diseases Control Law, conventionally when a doctor diagnoses an infectious disease classified into categories I to V, it is obligatory to report it to the nearest public health center. However, in the case of a new infectious disease, since it is different from existing diseases, there was no established way to report it, nor was there an obligation to do so. However, this does not allow early detection of the domestic outbreak of new infectious diseases, which may cause them to spread. Therefore, in 2019, the law was amended to define "suspected infectious diseases" with the aim of grasping the outbreak of serious infectious diseases of unknown cause at an early stage.[18]

Invoking the surveillance system for suspected infectious diseases means that if a designated hospital found patients with symptoms of pneumonia similar to the cases in Wuhan, it should first ask the National Institute of Infectious Diseases for sample analysis.

January 7: Chinese scientists announced that the cause of pneumonia cases confirmed in Wuhan was a novel coronavirus that shared 80 percent of genes with SARS.[19]

January 15: The first case of the novel coronavirus infection in Japan was detected.[20] The surveillance system for suspected infectious diseases proved to be immediately effective.

Though the patient was not infected in Japan, it was the first case reported in Japan. This patient told the authorities that he did not visit the seafood market in Wuhan, which was suspected to be linked to the outbreak of the novel coronavirus. When he returned to Wuhan, his father was suffering from pneumonia, and he was infected there. He passed through the airport quarantine and returned to Japan, thus it was an imported case of infection. At this point, though the Chinese government had not acknowledged it, Japan became the first in the world to learn that the novel coronavirus could be transmitted from person to person. It was easy to imagine that this infectious disease would eventually spread to Japan and the rest of the world.

A case in Italy will be described here for comparison.[21] On February 20, a marathon runner in his thirties was suddenly admitted to the intensive care unit at Codogno Hospital in Lodi, Lombardy. He was diagnosed with a novel coronavirus infection, and in the next 24 hours, 36 people tested positive for the virus. These 36 people had no contact with the first man in his thirties. By the time they noticed, the infection had spread in the city.

Using the surveillance system for suspected diseases, Japan succeeded in detecting the first domestic case before the virus spread in communities.

3.2. The Diamond Princess: Isolating passengers in their private cabins helped limit the spread of infections

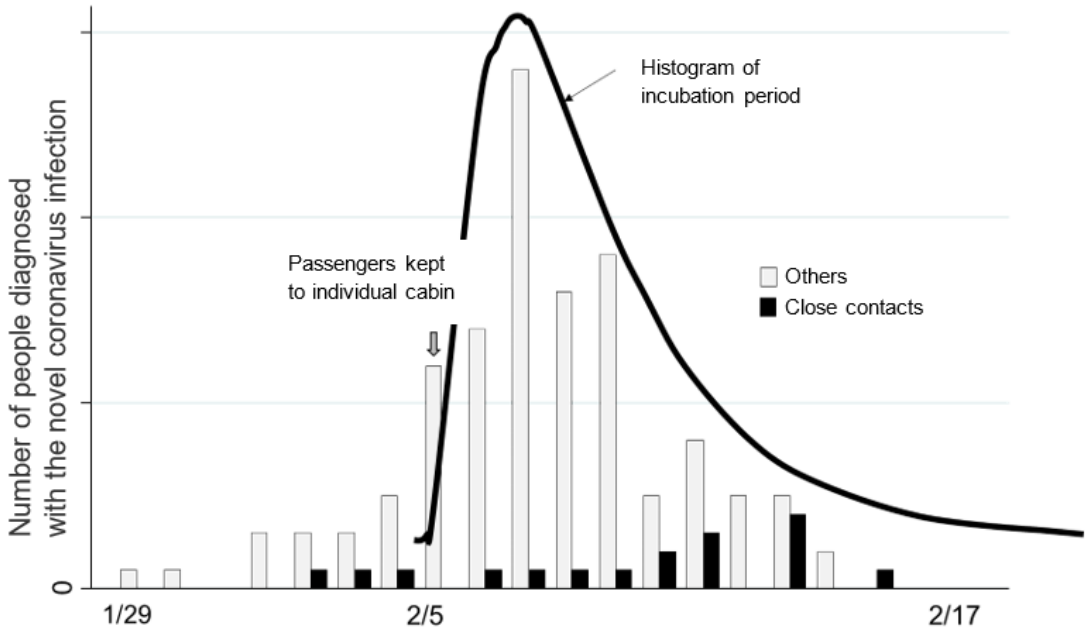
An interview with Chief Cabinet Secretary Yoshihide Suga (article from the monthly magazine Chuokoron):[22]

"The Diamond Princess arrived in Yokohama on February 3. The following day, on the 4th, we were informed that 10 of the 31 passengers who first got the PCR test results had tested positive. I thought this was going to be serious."

At the February 7 meeting of the advisory board for COVID-19 measures, the following discussion took place: "Though there was an opinion that 'all passengers on the cruise ship might be disembarked,' we settled for the following consensus in the end. 'Based on the opinions of the members, we feel dealing with the cruise ship is different from chartered flights, and it is not necessary to test all the cases. Giving tests to people with symptoms will be enough. For other people, we discussed 14 days for a monitoring period, and we were able to agree on that (There was no other objections)."

However, it was well known among epidemiologists that cruise ships are often prone to outbreaks of infectious diseases, such as influenza. Among them, the influenza outbreak aboard a cruise ship that left Sydney in September 2000 (310 out of 836 people developed symptoms, 40 were hospitalized, two died) was famous. Eventually, all the crew and passengers of the Diamond Princess were tested (some returned to their home countries), and the passengers were quarantined in their cabins for 14 days.

Figure3: Epidemic curve aboard the Diamond Princess: The gray bar shows the number of people who were not in close contact with infected patients, the black bar shows those in close contact with infected patients, and the black line is the expected histogram of the incubation period.
(Created by the author based on data on cases aboard the Diamond Princess)



The histogram of the incubation period[23] has been superimposed on the infectious disease epidemic curve on the onset date of cruise ship passengers (Figure 3). Isolation of passengers on board in their private cabins began on February 5. The number of people diagnosed with the novel coronavirus peaked (gray bar) on February 7. With a median incubation period being three days, many passengers were believed to have been infected on February 4. Meanwhile, the rapid decrease in the number of cases after that suggests that the spread of infection among the passengers was limited due to their isolation in their private cabins. The number of infected people sharing a room with patients (black bar) peaked on February 13, so the numbers suggest that it was a secondary infection from an infected person in the same room. The incidence rate for the same room (close contact) was 21%, which is consistent with the subsequent statement by the health ministry's cluster taskforce that "about 80 percent of infected people have not infected others." Japan was the first in the world to discover, as of February, that 80 percent of family members who had been living with and in close contact with a patient for a long time would not be infected.

3.3. Cluster-based approach: Strategy that Japan chose

A cluster-based approach is intended to detect the onset of cluster infection (source of infection, etc.) by conducting an active epidemiological investigation, and to delay or minimize the future spread of infection by taking immediate countermeasures.

"In mid-February, one member of the expert panel was wondering why there weren't any infected people from those in close contact with patients. Most infected people did not spread the virus, but only a small number of infected people infected a large number of people. If the infection was still widely expanding, the epidemic would not continue unless there were 'super-spreading events' (in which one person infected with the virus infected many other people) as seen in the case of SARS. Therefore, I thought that it would be possible to counter the virus by thoroughly dealing with clusters."

(Interview with a member of the expert panel)

Based on these experts' opinions, a new unit to tackle such clusters was set up within the health ministry on February 25, and with this, the government's countermeasures against clusters got into full swing.

On March 9: The legitimacy to promote cluster measures was explained in the report "Views about cluster measures against the novel coronavirus" as follows:

"Overall, about 80 percent of those who have been confirmed to be infected in Japan, regardless of whether their conditions are severe or mild, have not infected other people. (…) Up to now, there have been cases in which clusters (groups) could be detected relatively early. This has led to a slower increase in the number of infected people compared to other countries where the number of the infected was increasing at a rapid pace."

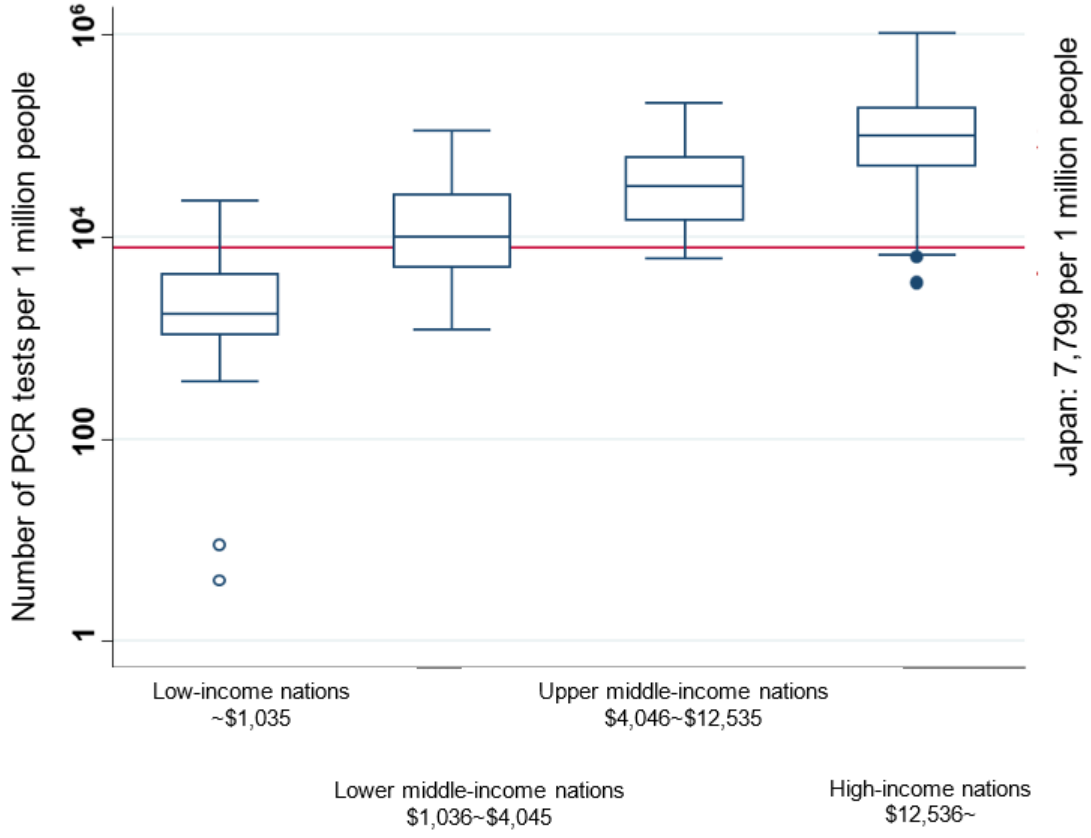
The statement that "about 80 percent of the infected people do not infect other people" was based on the results stated in a non-peer-reviewed paper by the cluster taskforce (reported on February 28)[24]: Of the 110 cases examined, 27 (24.6%) were primary cases who generated secondary transmission. To put it conversely, the paper clearly stated that 80% of infected people did not infect other people. It also suggested that the risk of secondary transmission in a closed environment was 18.7 times greater than in an open-air environment.

Furthermore, in the analysis and recommendations made by the expert panel on May 29, it was stated that the cluster-based approach have "not only identified those who had close contacts with the people infected through contact tracing,'' but also identified the "places'' which became a common source of infection, and helped to "discover the concept of Three Cs at an early stage."

3.4. PCR Tests: Achilles' heel of the Japan model

In the response to the first wave, the implementation system for PCR and other tests became one of the major issues in the Japan model. From the beginning, the number of PCR and other tests has been small compared to other countries (Figure 4), and despite the government's efforts to strengthen the system, the pace of increase was slow, and the government was unable to hide its frustration.

Figure 4: Comparison of the number of PCR tests per 1 million people by income level in each country
(Compiled based on data from Worldometers and the World Bank)



As stated in 3.3., the cluster-based approach were chosen as the main pillar of the "Japan model," but there is no way to deal with clusters if we don't know from whom or where people have been infected. Furthermore, the novel coronavirus had specific features of being contagious even during the incubation period two to three days before the onset and that 80% of patients remain in a mild condition. Thus, it would not be

enough to just focus on clusters if people were spreading the virus during the incubation period and those with mild symptoms were infecting others.

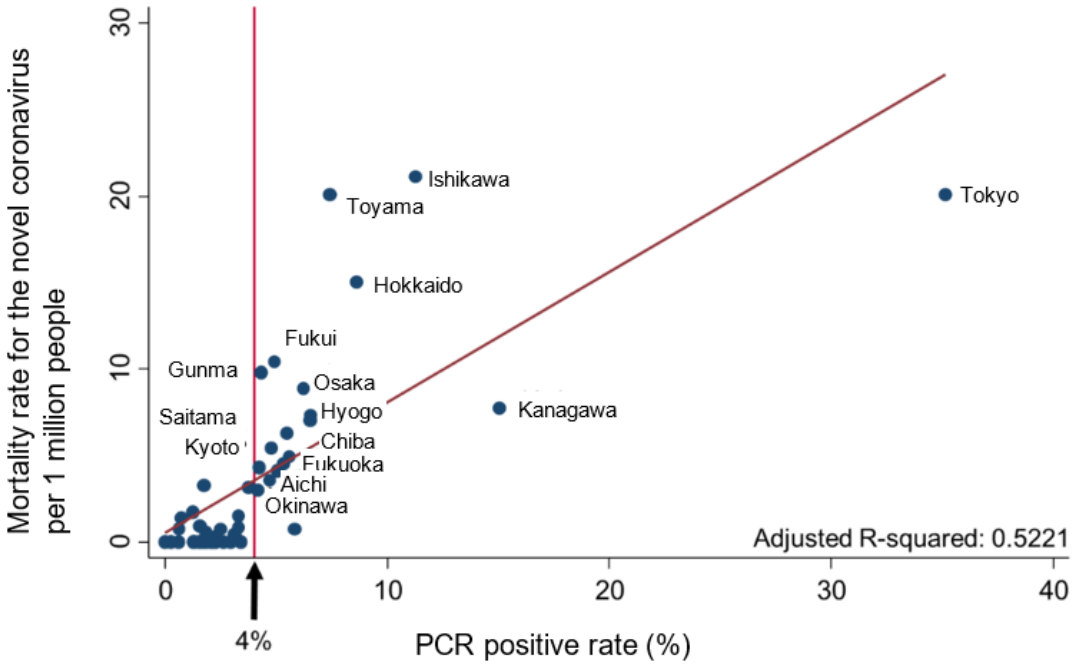
In other words, having an adequate PCR testing system to properly monitor community infection would be a precondition for implementing appropriate measures against clusters. However, under the Japan model, the PCR test system did not function sufficiently.

Though factors behind the weakness of the PCR test system will be further examined in Chapter 7 of Part II, this chapter will examine what the problem meant to the Japan model.

3.4.1. Pyramid theory: Higher PCR test positive rate increases mortality rate per population

The relationship between the PCR positive rate (number of people who tested positive/number of tests) and the mortality rates per 1 million[25] in 47 prefectures when the state of emergency was lifted (through May 24) can be seen here (Figure 5). As a result, the mortality rate tended to be higher in prefectures where the PCR positive rate exceeded 4%, compared to those where it did not.

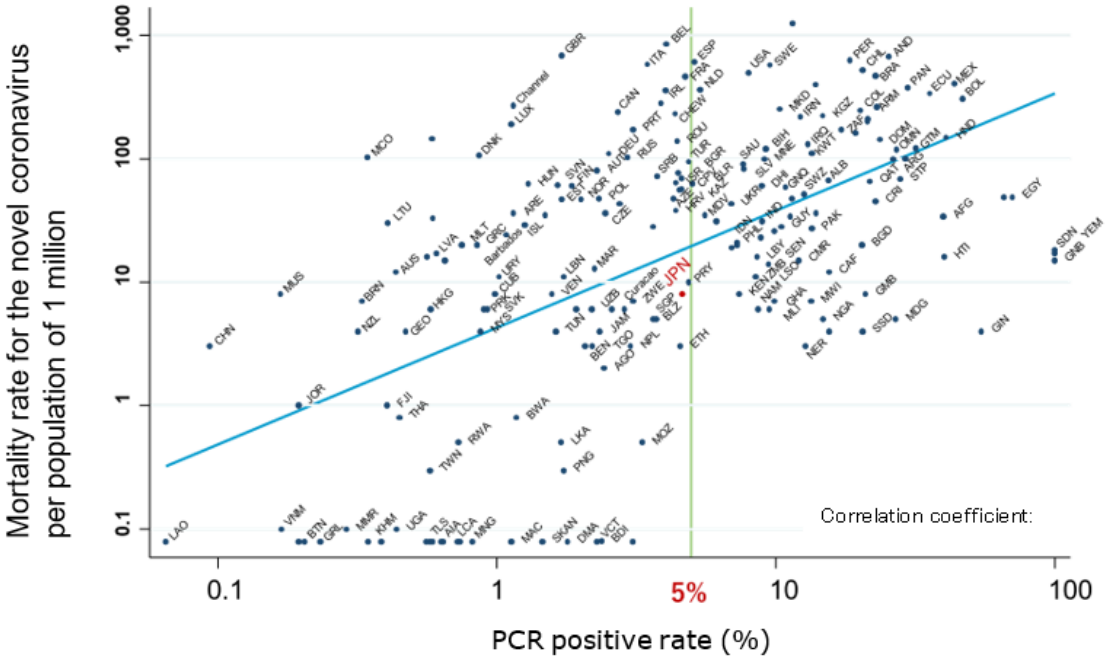
Figure 5: Relations between PCR positive rates and mortality rates
(Compiled by the author based on publicly available data of the Health, Labor and Welfare Ministry)



The relationship between the PCR positive rate and mortality rate as of August 9 in 195 countries around the world is shown here (Figure 6). The higher the PCR positive rate, the higher the mortality rate. On May 12, the WHO indicated "keeping a PCR positive rate at 5% or less for at least two weeks'' as one of the conditions for lifting the state of emergency.[26] With this number as a threshold, mortality was clearly higher in countries with PCR positive rates higher than this threshold, while mortality was lower in countries with lower PCR positive rates.

Japan managed to clear this standard with 3.8% on July 17 and 4.6% on August 9. It was also true that countries with few deaths had kept the positive rate below 1%. Asian countries such as Mongolia, Taiwan, Hong Kong, Bhutan, Vietnam, Laos, Cambodia, Myanmar, Thailand, had a PCR positive rate of less than 1% and a mortality rate of less than 1 per 1 million people.

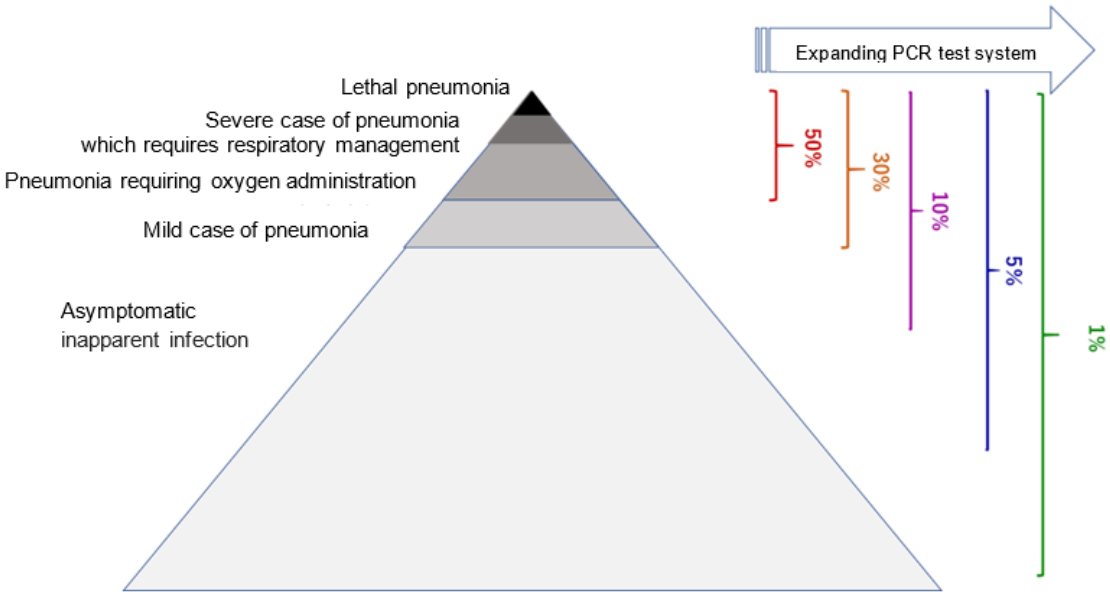
Figure 6: Scatter diagram of the relations between PCR positive rate and mortality rate



But why will the death rate also be low if a positive rate is low? We'd like to explain this point using Figure 7.

As for the symptoms of the novel coronavirus, seriousness varies from severe conditions that could lead to death to mild cold-like symptoms and asymptomatic conditions, but in general, there are large numbers of people with mild symptoms, while the number of patients with severe conditions is small. Thus, it will be like a pyramid-shaped distribution.

Figure 7: Why does low PCR positive rate result in low mortality rate?
(Created by the author)



If the number of PCR tests that can be implemented is limited, people with severe conditions in the top part of the pyramid will be prioritized to take the tests. If only those people were given PCR tests, the positive rate among them would turn out to be higher. However, in this case, only the upper part of the pyramid can be checked, and many people who are presumably in the lower part of the pyramid with mild symptoms will not be sufficiently covered. And they are likely to infect others unconsciously.

If the PCR test system can be expanded and people with mild cold-like symptoms are able to take the tests, the PCR positive rate would generally go down. And that would prevent many people with mild symptoms who tested positive from going about town. As a result, community infections would decline, and the elderly and people with chronic illnesses would have less chance of being infected, and thus, mortality would also drop.

Based on this pyramid theory, the limited number of PCR tests could result in a failure to detect many with mild symptoms who would test positive. And the spread of infection in communities caused by those individuals would increase severely ill patients, leading to a rise in the mortality rate. To prevent such a scenario and keep the PCR positive rate below 5% and less than 1% if possible, it would be effective to widely conduct PCR tests on people with mild symptoms and those in close contact with them. That would be one of the most effective strategies against COVID-19.

In this regard, of various local governments, Wakayama Prefecture was one that implemented this strategy and effectively made it work in the early stage of the outbreak. On February 13, a cluster of COVID-19 infections was reported at Saiseikai Arida Hospital in Wakayama Prefecture. All the people infected were Wakayama residents and had no idea whom they had contracted the virus from. Until then, it was confirmed through contact tracing that all the people found infected in Japan had links with Hubei Province of China. Thus, the hospital case meant that the fight against the novel coronavirus had entered a new stage.

To cope with the situation, Dr. Takako Nojiri, who was an executive advisory engineer in Wakayama Prefecture, ordered the hospital 1) to suspend receiving outpatients; 2) to hospitalize patients of COVID-19 and suspend discharging hospitalized patients; and 3) to set up a division in the hospital to accept outpatients with fever and other symptoms. At the time, strict conditions, such as having a travel history to Wuhan or Hubei Province, or having had close contact with infected patients, had to be met to take the PCR tests, but Nojiri did not apply the central government's strict standard. First, Nojiri gave PCR tests to all the medical professionals who were working in the hospital's surgery ward and those who were hospitalized in the ward, expanding testing to eventually all the people in the hospital, their families, friends and staff of the hospital's business partners who often came to the hospital.

At the time, since the number of PCR tests was limited to up to 40 a day in Wakayama Prefecture, the prefecture sought the cooperation of Osaka and other prefectures. As it turned out, they tested 802 people and detected 11 PCR positives. And because of such measures, the prefecture managed to contain the spread of infections at the hospital – among Japanese who had no links to Wuhan – in three weeks. This became the first domestic case that showed the effectiveness of the thorough implementation of PCR tests on people who had contact with patients.

3.4.2. The meaning of the Achilles' heel of the Japan model

In the Japan model, the problem of a fragile PCR testing system forced the authorities to adopt the strategy of concentrating the limited resources of PCR tests on patients with severe symptoms. For instance, on February 24, the expert panel announced the following message to the Japanese people:

"The virus is currently spreading in Japan, and to prevent infection from spreading, it is not effective to give PCR tests to all the people in Japan as a way of fighting against this virus. Although the government, industries and the academic sector are making utmost efforts, due to the limited facilities and human resources, it is not possible to provide PCR tests for everyone. To prepare for a sharp increase in patients, we believe that the limited resources of PCR tests should be concentrated on patients with a high risk of developing severe symptoms.

"We would like to ask people in Japan to please contact the novel coronavirus consultation center set up by each prefectural government if you have symptoms of a cold or a fever of 37.5 degrees or higher for four consecutive days or more, or if you have a sense of fatigue or trouble breathing.

"Even if you don't have such symptoms, there is a chance that you may have contracted the virus. Please do not visit medical institutions immediately just because you are worried, and be careful not to spread the infection to medical staff and other patients and overburden medical institutions."

As a result, under the Japanese model, based on the above-mentioned pyramid theory, severe cases in the upper part of the pyramid were preferentially examined, and it was highly possible that patients with severe conditions who tested positive were properly traced. It was likely, however, that a large number of mild or asymptomatic patients were overlooked, and it was undeniable that the community infections caused by those people may have contributed to an increase in the number of severely ill people and a rise in the mortality rate. That was the Achilles' heel of the Japan model, or the inadequate PCR and other test system in Japan.

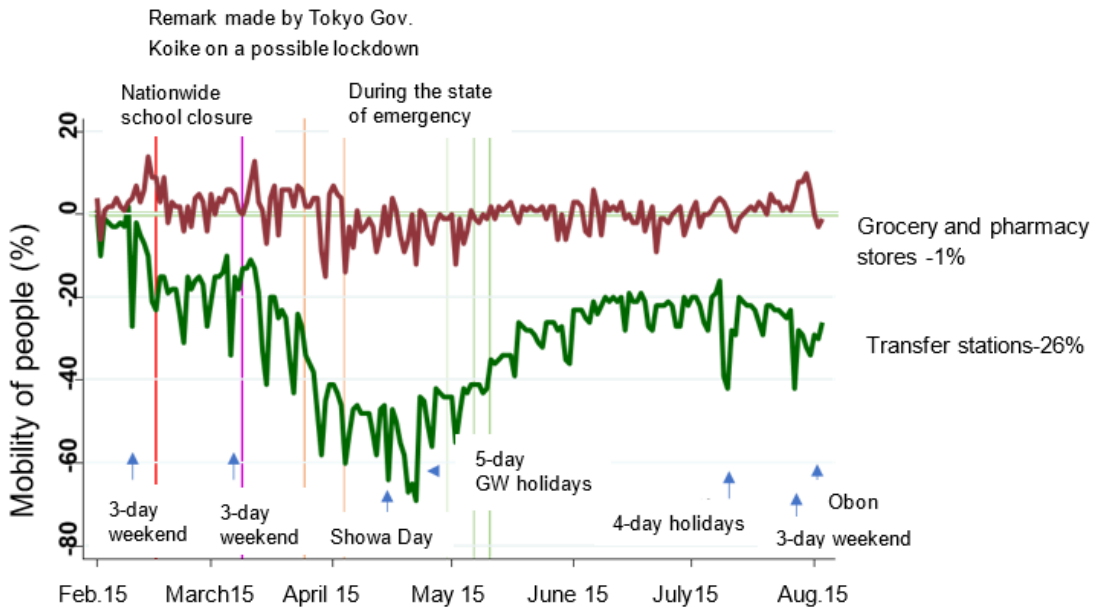
3.5. People's behavioral change: Political intervention or voluntary behavioral change?

On March 9, as a way to maximize effectiveness of the measures to prevent the spread of the novel coronavirus, the expert panel proposed 1) to find and respond to clusters as early as possible; 2) to diagnose patients at an early stage, enhance intensive care for patients with serious conditions and establish a sufficient medical support system. It also stressed 3) the importance of people's behavioral change. This chapter has so far examined the impact of the former two points in the Japan model, but we would now like to closely look at people's behavioral change. Given the existing problem of not being able to expand the PCR test system and to prevent community infection, which could be caused mainly by patients with mild symptoms, encouraging people's behavioral change seems to have had a relatively significant meaning.

In this regard, we have analyzed people's behaviors using publicly available data on people's mobility provided by Google Inc. According to the analysis, people's behavior did not change very much in terms of their use of "grocery and pharmacy stores,"

but people's movements at "transfer stations" for subways, buses, trains and others showed a reasonable decline (Figure 8). As far as these data show, we could say that Japan was successful in promoting people's behavioral change during this period.

Figure 8: People's behavioral change
(Compiled by the author based on publicly available data from Google)



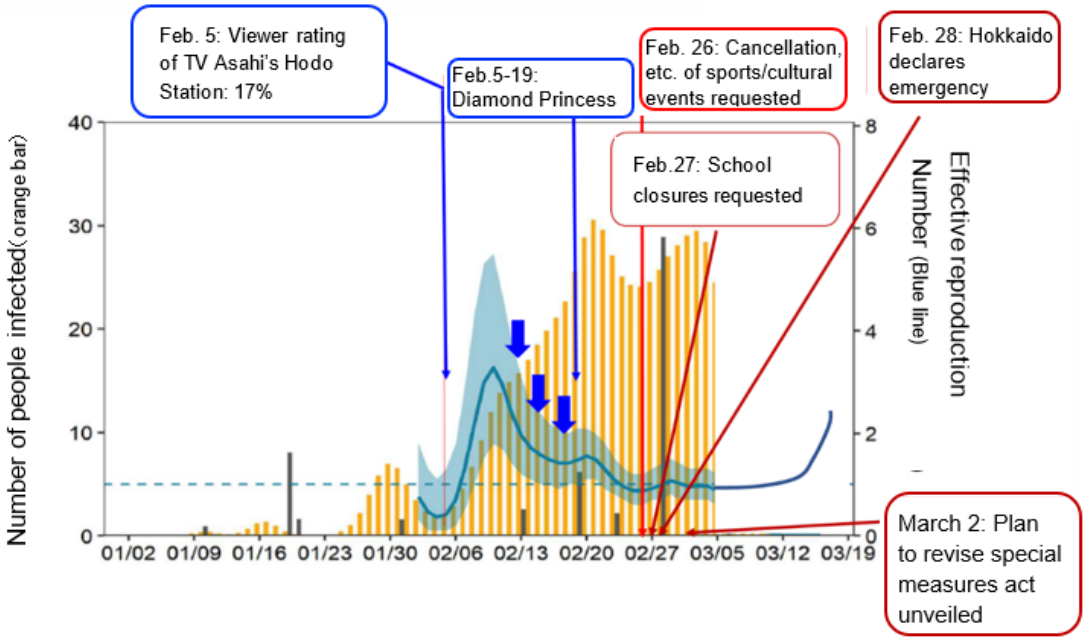
3.5.1. Enforcing quarantine on the cruise ship served as a preparation period for Japan

Next, we add an analysis to the epidemic curve (Figure 9) based on the onset date of the first wave cases. Focusing on the change in the effective reproduction number (the line),[27] it peaked on February 10, and began to decline naturally even though the government did not take any specific measures.

In this regard, the impact of the outbreak aboard the Diamond Princess was presumed to be great. Upon returning to Yokohama on February 3, 10 out of 31 people whose PCR test results were made known were found to be positive on February 4, and as it was reported widely in the news on a daily basis, the response to the cruise ship became the focus of public attention. A considerable number of newly confirmed PCR positive cases was reported almost every day, and TV stations broadcast footage of PCR positive patients being transported by ambulances. It is assumed that these reports had a significant impact on public awareness. During the 14 days when the entire ship was under quarantine, Japanese people, the central and local governments, medical staff and care facilities for the elderly were forced to think carefully about what would happen in

Japan. It was highly possible that this "awareness'' became the basis of the public's mindset in accepting the prime minister's request on February 26 that all sports and cultural events attracting large crowds be cancelled, postponed or downsized, and another request made on February 27 to temporary close elementary, junior and senior high schools nationwide.

Figure 9: Epidemic curve in Japan from January to March based on the onset date
(Created by the author based on the epidemic curve shown by the expert panel)



3.5.2. Nationwide school closure prompted people's behavioral change

Prime Minister Abe's request to temporarily close all elementary, junior and senior high schools in Japan was a political decision made without asking the opinion of the expert panel. Behind this decision was also the government's 2010 "review" of measures against pandemic influenza that pointed to the need for temporary school closure. On the other hand, from an epidemiological point of view, unlike influenza, children are at a low risk of developing COVID-19 symptoms and suffering from severe conditions. Because of this reason, some people raised questions about implementing the school closure.

However, the epidemiological argument aside, there was no doubt that the nationwide school closure at the time was a major factor in prompting people's behavioral change. Although the effective reproduction number was less than 1 before the request for cancellation, postponement or downsizing of events and the request for nationwide

school closure were announced, people's behavioral change suddenly began once the school closure was implemented. According to a survey conducted in the latter half of March by Professor Junyi Zhang of Hiroshima University's Mobilities and Urban Policy Lab,[28] dramatic changes were observed beginning March 1, right after the announcement of the school closure request. From that day on, 75% of people began to avoid crowded areas, 60% refrained from going out, 53% refrained from eating out, and 47% avoided face-to-face conversations. As research results in the United States show,[29] school closure is said to help reduce incidence and mortality, especially when implemented in the early stages of an epidemic, and it is possible that Japan's nationwide school closure also had a certain impact on the results of the Japan model in terms of people's behavioral change.

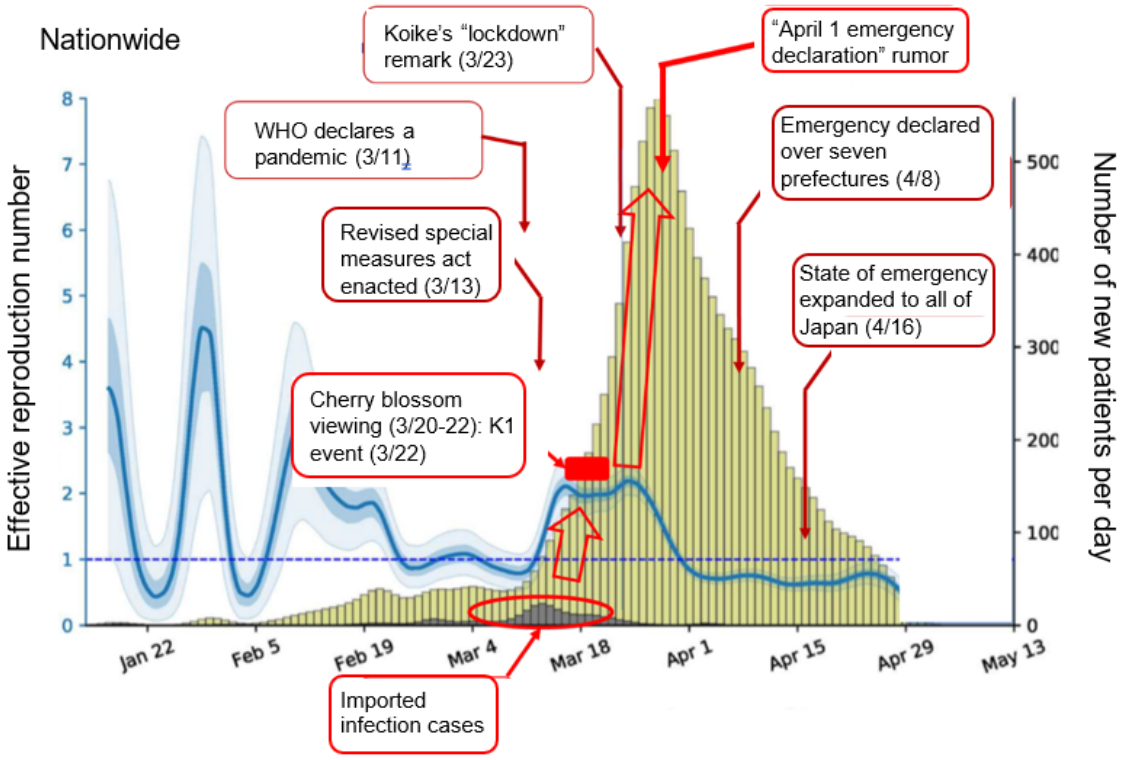
3.5.3. Impact of the lockdown remarks and declaration of the state of emergency

Tokyo Governor Yuriko Koike made a remark on March 23 that a citywide lockdown may become "the only option left" if various measures failed, and with this remark, public anxiety, which had eased at one stage, sharply shot up again in late March.

Around that time, speculations that a state of emergency would be declared on April 1 were beginning to spread. It was not whether a state of emergency would be declared or not, but when it would be declared that became a major point of public interest. People's mobility data also confirm that public mobility at transfer stations was on a downward trend since the "lockdown'' remark.

On April 7, the state of emergency was finally declared in Tokyo and six other prefectures, and became effective the following day. On April 16, the effective area was expanded to the entire country. However, the epidemic curve (Fig.10) shows that the number of new patients was beginning to decline sharply as of the end of March. Thus, the declaration may have had some impact on accelerating the speed of decrease, but it could not be confirmed that the declaration of a state of emergency had a major influence on reducing infections.

Figure 10: Epidemic curve in Japan based on the onset date before and after the declaration of state of emergency
(Created by the author based on the epidemic curve shown by the expert panel)

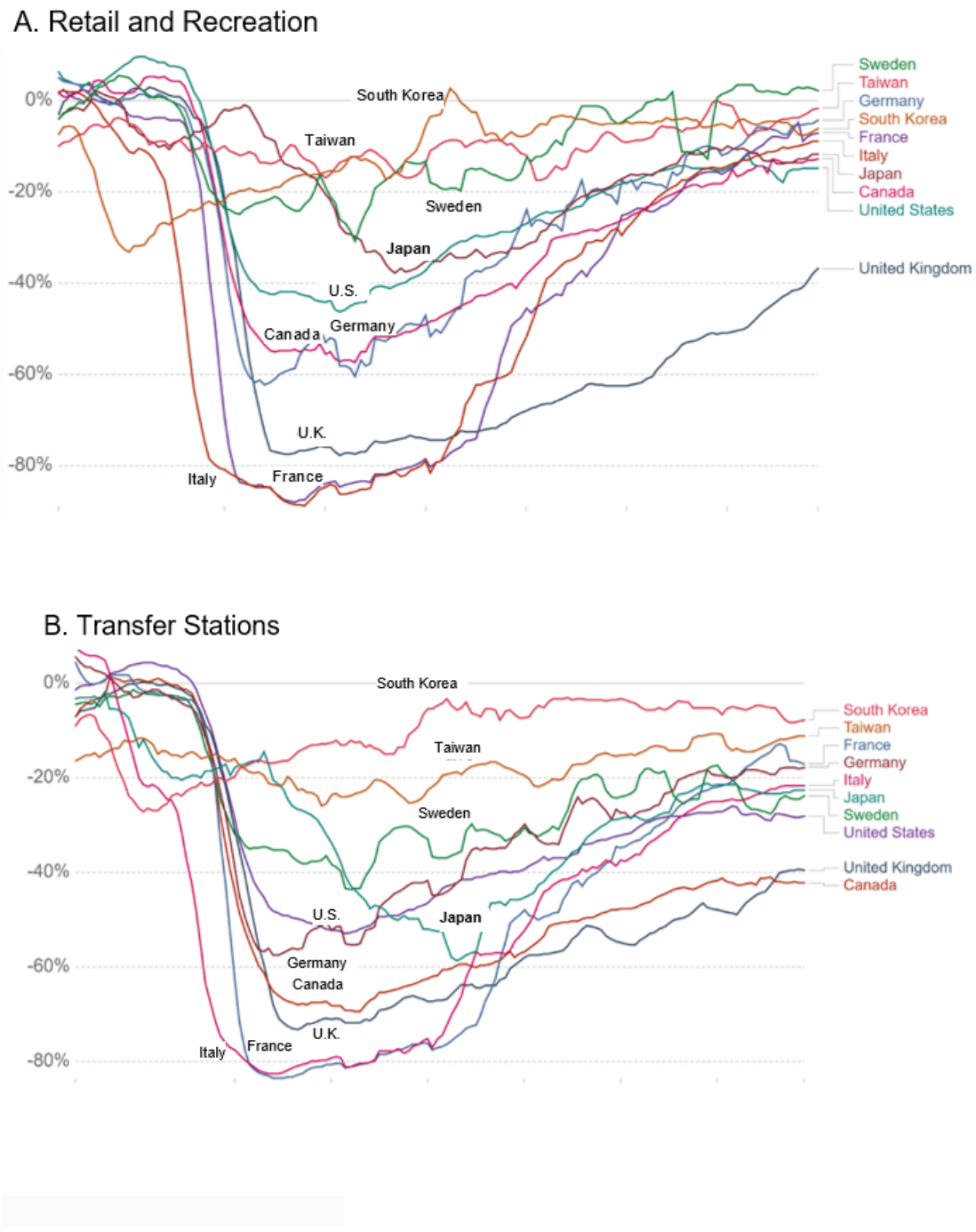


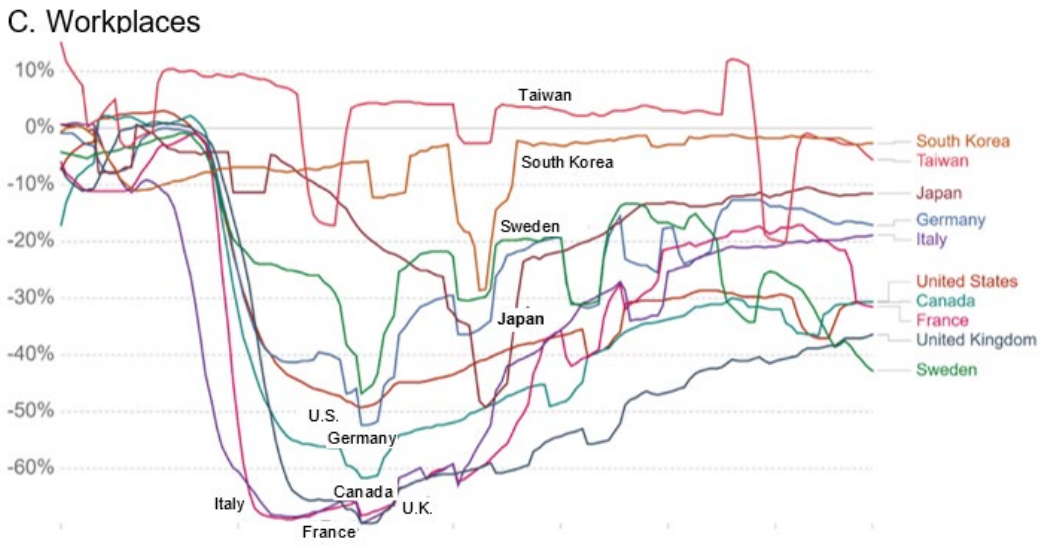
3.5.4. Comparison of behavioral change in Japan and other countries: change smaller than in countries that imposed lockdowns, but relatively large among the nations that had soft lockdowns

Next, based on Google's publicly available data, changes in people's movement (seven-day moving average) at "retail and recreation'' (Figure 11A), "transfer stations'' (Figure 11B), "workplaces'' (Figure 11C) were compared among the G7 countries, Sweden, Taiwan and South Korea.[30]

Compared to the G7 countries and others which imposed strict lockdowns, declines in people's movement in the three categories of retail and recreation, transfer stations and workplaces in Japan were all relatively small. On the other hand, the declines were relatively large compared to Sweden, Taiwan and South Korea, which did not go through "hard lockdowns.'' Therefore, it can be said that Japanese people's behavioral change was not as large as the countries that took a "hard lockdown'' approach, but it was larger compared to the countries that took "soft lockdown" measures.

Figure 11: International comparison on people's behavioral change
(Compiled by the author using Our World in Data)





4. Truth and falsehood of the "Japan model''

Before discussing the "Japan model,'' some points need to be confirmed.

First, what Japan focused on in fighting COVID-19 was to limit the spread of infection and minimize the impact on the economy while respecting human rights and the privacy of individuals in accordance with the law. It was no different from what other nations, especially those run by democratic governments, aimed to achieve.

In addition, the number of deaths reported per day in Europe since August was not much different from that in Japan. One of the Cabinet Secretariat staff said in an interview in mid-August, "The time when we declared the 'Japan model' may have been the most glorious time for Japan. Currently, about 2,000 people are infected each day in Japan, and it is almost the same as the figures in Britain, Spain and France. On the surface, it appears to be the same as those countries, and it is also the same in the sense that we are all trying to deal with the new virus on an ad-hoc basis. In other words, there is no such thing as the 'Japan model'." Thus, careful consideration is required when defining the so-called Japan model.

Second, each country has its own political, legal, and crisis management systems, relationships between central and local governments as well as medical, health insurance and nursing care systems. There are also other differences in the process of urbanization and living environments, experience with infectious diseases and sanitation concepts. The measures they took also varied. Since very little was known initially about the novel coronavirus itself, each country saw the threat from the virus differently and took a

different approach. Japan responded to the crisis under its governance system, which included the legal system, organizational structure, infrastructure, available human resources, assets, materials and chain of command.[31] Individual decisions, choices and activities would be bound by the social, historical and structural conditions of their organizations. And such decisions would become a factor in determining whether the next response would be successful or not. If there was such a thing as the "Japan model,'' it was only a crystallization of the experiences filtered in this process. In other words, the "Japan model'' was nothing but the consequence of how Japan's governance was exercised.

The third point is related to the second one. The "Japan model'' may produce a "success'' under certain circumstances and conditions, but it may not be possible to achieve the same effect if the circumstances and conditions change. It should be recognized that if the "Japan model'' is treated as an established model, used for self-consumption and to alienate the nation from global dialogue and learning from the rest of the world, that may lead to a Galapagos syndrome-like "Japan problem." The "Japan model'' and "Japan problem'' are the flip sides of the same coin.

Fourth, by calling it the "Japan model,'' there is a tendency to emphasize that Japan's performance in terms of dealing with COVID-19 was better in comparison to other G7 nations. "Japan managed to keep the number of infections and deaths in proportion to the total population surprisingly low among G7 countries. This is an objective fact that can be backed by numbers,'' Prime Minister Abe told a news conference, clearly showing his confidence in Japan's performance. However, compared to the other East Asian and Oceanian countries that performed equally well or even better, Japan has not done overwhelmingly well.

Traditionally, the various world's "models'' have been created based on European or American experiences, so it is highly understandable that the "Japan model'' was mainly discussed in comparison to the Western developed countries. However, since the pandemic attacks human society regardless of borders, political systems, stages of economic development, race, ethnicity or region, the model may have to be discussed in light of a more universal standard.

In the first place, what kind of discussion was held between the government and the expert panel when sublimating Japan's experience into the concept of the "Japan model?'' What kind of dialogue was there between the political judgement of the government and the scientific judgement of the members of the expert panel?

Experts who were in the position to advise the government sought measures emphasizing 1) early detection and early response to clusters (patient groups); 2) early diagnosis of patients, enhancement of intensive care for critically ill patients and securing the medical care system and (3) behavioral change for citizens.

Politicians who received such advice tried to tackle the novel coronavirus based on the same concepts. However, the two sides were not always on the same page. For

example, regarding the PCR tests, the Prime Minister's Office had repeatedly ordered the health ministry to expand testing capacity as it was concerned about growing dissatisfaction and anxiety of the people who could not take the tests promptly and widely, as well as possible international distrust of Japan as a "lesser PCR test nation'' and deterioration of its image. And when it could not see any progress despite repeated requests, the Prime Minister's Office could not hide its frustration.

Some officials at the health ministry and its affiliated organizations put priority on keeping their power to give PCR tests and their vested interests through "administrative testing,'' while medical institutions feared that an expansion of testing capacity would increase the number of positive cases, eventually causing the collapse of the medical care system. Such contradictions and conflicts over PCR testing show that the substance of the "Japan model'' was the result of learning to overcome various constraints during the process of responding to each problem, rather than a strategy.

However – or therefore – as a result, the "Japan model'' worked effectively under the circumstances Japan faced during this period.

What lessons should be drawn here? Though the conclusion will be left for Part IV, one thing should be pointed out. It is better not to be overconfident that the "Japan model," which came into being as a result of the conditions Japan was under, will continue to be effective in its original form. That is because it is almost impossible to expect that the situation Japan went through during this period will be repeated in the same way.

Notes

1. A research team of the Health, Labor and Welfare Ministry reported about excess mortality during the novel coronavirus pandemic that "It was either not detected, or there could have been excess mortality of several dozen to a hundred or several tens of people.'' Based on this report, Japan's mortality rate did not seem to be underestimated.
2. Mortality rate per 1 million people. Germany=109, Canada=234, the U.S.=426, France=462, Italy=579, U.K.=664 Coronavirus Update. Available online: https://www.worldometers.info/coronavirus/ (accessed 17 July 2020).
3. Mortality rate per 1 million people. China=3, South Korea=4, Australia=6 (as of July 17.) As of August 9, Australia's mortality rate rose to 12 people, exceeding the eight posted by Japan. Thus, Japan was the third lowest among G20 nations as of August 9.
4. The percentage of people aged 65 or older (%) https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS
5. "Views on realizing the basic policies for novel coronavirus control" (Feb. 24, 2020) Expert Meeting on the Novel Coronavirus Disease Control https://www.mhlw.go.jp/stf/seisakunitsuite/newpage_00006.html
6. https://www3.nhk.or.jp/news/html/20200526/k10012444921000.html
7. https://www3.nhk.or.jp/news/html/20200526/k10012444921000.html
8. Some big questions remain, such as "Why is the mortality rate in Japan or East Asian countries extremely low compared to Western countries?'' and "Could measures taken by different governments be enough to explain why there were huge differences in the death rates, which were more than dozens of times different in some countries?" To elucidate this, it is necessary to analyze differences in culture, lifestyle, ethnicity, medical insurance system, medical system and level of the medical system, urban structure, obesity rate, morbidity rate of diseases such as hyperlipidemia and a large number of other

factors, such as BCG vaccination coverage, genome and racial differences in immune response in each country and region. However, since this mechanism is highly likely to be elucidated by future research, this chapter will focus on the response and measures of the Japanese government.

9. Yasutoshi Nishimura (WSJ, July 7, 2020) "How Japan Beat Coronavirus Without Lockdowns"
10. Japan Can't Handle the Coronavirus. Can It Host the Olympics? https://www.nytimes.com/2020/02/26/opinion/coronavirus-japan-abe.html
11. Japanese doctor in New York alarmed by Tokyo's complacency over COVID-19. https://www.japantimes.co.jp/news/2020/04/06/national/japanese-doctor-new-york-tokyo-coronavirus/
12. https://dot.asahi.com/aera/2020041700078.html?page=2
13. https://www.nytimes.com/2020/04/19/world/asia/tokyo-japan-coronavirus.html
14. Coronavirus: Japan's mysteriously low virus death rate https://www.bbc.com/news/world-asia-53188847
15. For example, Shinya Yamanaka, director of the Center for iPS Cell Research and Application at Kyoto University, calls the factors that cause Japan to have fewer infections and deaths than Europe and the United States as "Factor X," and cites the cluster-based approach, genetic factors, and BCG vaccination as possible reasons. He said that if Factor X can be clarified, it can be used for future countermeasure strategies.
16. If many people obtain immunity by being infected by the novel coronavirus, it would serve as a barrier to prevent other people from getting infected.
17. The Swedish government explained that it did not choose not to impose a lockdown in order to obtain "herd immunity," but because it was a sustainable response that the people and society could endure for a long time, considering that this infectious disease would require a long-term response. https://www.nira.or.jp/president/opinion/entry/n200722_981.html
18. Suspected infectious diseases are cases in which fever, respiratory symptoms, rash, gastrointestinal symptoms or neurological symptoms and other symptoms suspected to be infectious diseases are found and deemed by doctors to require intensive treatment or other similar care based on the general medical knowledge – although it is judged that a specific infectious disease cannot be diagnosed immediately.
19. Wu Z, et al. Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. JAMA. 2020 Feb 24. doi: 10.1001/jama.2020.2648.
20. About the outbreak of pneumonia related to the novel coronavirus (1st case) https://www.mhlw.go.jp/stf/newpage_08906.html
21. Grasselli G, et al. Critical Care Utilization for the COVID-19 Outbreak in Lombardy, Italy: Early Experience and Forecast During an Emergency Response. JAMA. 2020 Mar 13. doi: 10.1001/jama.2020.4031.
22. Re-examining division of powers between the central and local governments is needed. (Chuokoron, October 2020)
23. Li Q, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. N Engl J Med. 2020 Mar 26;382(13):1199-1207.
24. Nishiura H, et al. Closed environments facilitate secondary transmission of coronavirus disease 2019. https://www.medrxiv.org/content/10.1101/2020.02.28.20029272v2.full.pdf
25. https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000164708_00001.html. Accessed May31, 2020
26. https://www.who.int/publications/i/item/public-health-criteria-to-adjust-public-health-and-social-measures-in-the-context-of-covid-19
27. One of the key parameters for anti-infectious disease measures. It is the average number of secondary infections caused by one patient. If it is more than 1, the number of patients will increase. If it is 1, the number of patients will be flat and if it is less than 1, the number of patients will decline.
28. Zhang J. "How Did People Respond to the COVID-19 Pandemic during Its Early Stage? A Case Study in Japan" https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3595063
29. Auger KA, et al. Association Between Statewide School Closure and COVID-19 Incidence and

Mortality in the US. JAMA. 2020;324(9):859-870. doi:10.1001/jama.2020.14348
30. https://ourworldindata.org/policy-responses-covid#google-mobility-trends-how-has-the-pandemic-changed-the-movement-of-people-around-the-world
31. As Figure 11 shows seven-day average numbers, differences between weekdays and holidays are not seen compared to data in Figure 8.