National Security System Recheck:

Comparison of the response of Taiwan, South Korea and Japan to COVID-19

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Summary

This policy brief is based on a security perspective and aims to evaluate the following aspects of COVID-19 responses: 1) institutional and legal preparation; 2) recognition of an ongoing crisis; 3) response networks including the use of information communication technologies (ICTs); 4) transparency and credibility; and 5) learning from past and ongoing experiences. These tasks are necessary for authorities and leaders to effectively address a transboundary crisis. In the policy review, we first define COVID-19 as a transboundary crisis and then review the current situation of infection of the disease. In our empirical study, we focus on three countries, Taiwan, South Korea and Japan, because they have relatively mild infection rates compared with those of some European countries and the United States.

For example, Taiwan and South Korea rapidly responded to the COVID-19 outbreak because of their experiences and lessons learned; thus, they effectively decreased the infection rate a few months after the outbreak. Additionally, ICT applications and timely information disclosure earned citizens' broad trust in the authorities. Japan, by contrast, neither acted rapidly nor applied technological applications, compulsory measures and sufficient transparency; thus, they slowly gained control over the epidemic. This article concludes that high-level awareness is necessary to manage a non-traditional security threat and that a response system endorsed by leadership to act based on a legal framework is essential.
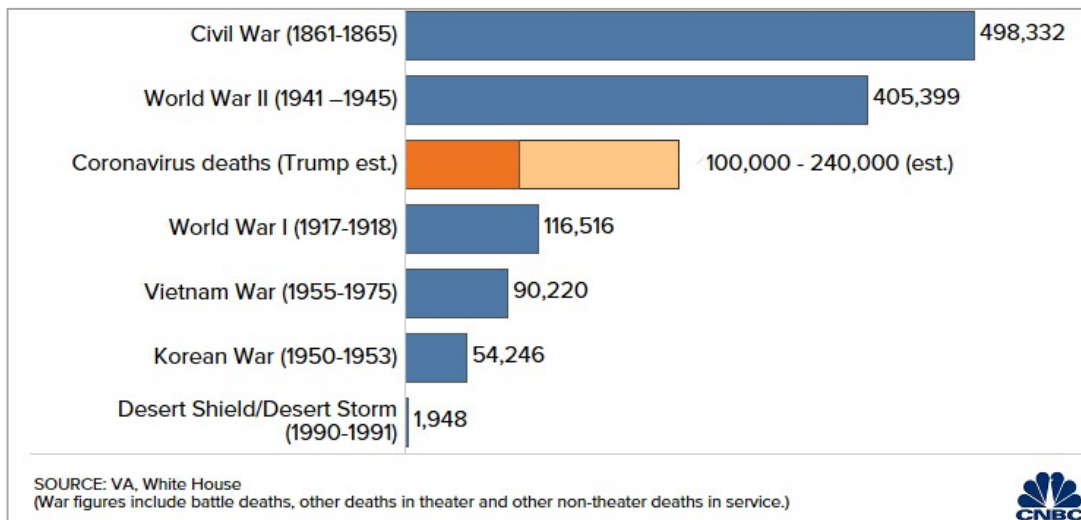
Mature civil society is essential for resilience, and ICT tools as a part of smart city programmes are necessary to improve the efficiency of the response system.

Introduction

The pandemic of the new coronavirus pneumonia disease (officially named 'COVID-19' by the World Health Organization [WHO] in February 2020) symbolises a non-traditional threat to national security. During a press conference on March 31, 2020, the president of the United States (US), Donald Trump, compared fighting the coronavirus pandemic to fighting a war. As of April 1, 2020, in the United States, the number of coronavirus cases and deaths was more than 200,000 and at least 4,400 respectively, and approximately 80 days later, the number of confirmed coronavirus cases and deaths was 2,208,829 and 118,895 respectively (Source: WHO).

The US COVID-19 outbreak has killed more Americans this year than many of the wars waged by them, for example, the Vietnam War and the Gulf War. The White House officials estimated that between 100,000 and 240,000 Americans would die from COVID-19 in 2020, and this estimation considered social distancing, business closures and other mitigation efforts (Figure 1).

Figure 1. Coronavirus Death Estimate vs US War Deaths

Source: CNBC, VA, White House. Retrieved from: https://www.cnbc.com/2020/04/01/corona-virus-could-kill-more-americans-than-some-wars.html)

Worldwide, as of June 20, 2020, the number of confirmed cases was 8,690,140 and the number of deaths was 461,274 (Figure 2). In addition, the worldwide outbreak of COVID-19 has caused, for example, economic stagnation, the loss of assets and restrictions on people's freedom of movement. Notably, although national borders are meaningless to viruses, thus far, each country has independently managed its epidemic; thus, the response has varied by country.

Figure 2. Global Confirmed Cases of and Deaths from COVID-19
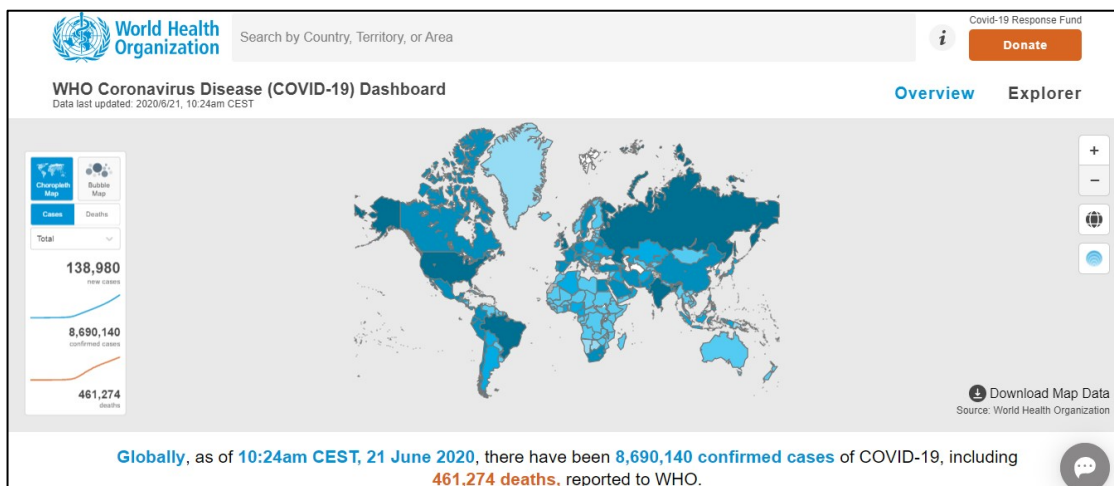
Source: WHO, June 21, 2020

To systematically evaluate the policies that have effectively mitigated COVID-19, this special policy brief aims to reveal the epidemic prevention efforts in three northeast Asian countries (Taiwan, South Korea and Japan) in which the infections are relatively less serious than those in other countries. Namely, the number of confirmed diagnoses and deaths are much less than in the United States and other European countries, despite the case study countries being closer to the epicentre.

This policy brief examines the respective measures taken in Taiwan, South Korea and Japan; provides a comparative perspective by focusing on the actions and policies implemented to mitigate the disease that could seriously harm national stability and security; evaluates tasks outlined in the literature that have been used to manage the urgent public crisis and considers that innovative considerations and approaches are also important and should be incorporated into the existing systems. In summary, based on the most recent epidemic prevention achievements and experiences, this policy brief provides a detailed explanation of the positive and negative lessons learned from the measures taken in Taiwan, South Korea and Japan.

The three countries share characteristics that increase the credibility of this comparative research. They are relatively open civil societies that have public health, health care and insurance systems, and relatively similar political and economic institutions. The case of China, the epicentre of the epidemic, was excluded because the Chinese approaches, compared with those of the three countries, require additional nationwide data and time to provide reliable feedback on their experiences to the international community.

In the case study section, we study the three countries' response measures in detail to assess whether these countries have addressed issues or completed tasks to effectively prevent the spread of infection and how they mobilised resources and implemented defensive measures to mitigate the pandemic. The policy brief also aims to provide constructive policy implications by examining the problems and cruxes in the cases.

This policy brief starts from the perspective of a security study—a perspective rarely observed in the literature. In the context of the current crisis, we review the experiences and progress observed from December 2019 to June 20, 2020 as well as provide feedback on those experiences that could apply to a future crisis.

I.   National Security System Recheck

Infectious Disease: A Transboundary Crisis to Threaten National Security

COVID-19 has been a big shock to all nations but differs from a traditional threat. A threat in the traditional definition, according to international relations theory, should possess the capability and willingness to cause destruction.[1] By contrast, the non-traditional definition describes a new type of threat that does not have to possess the willingness to do harm despite its possible, powerful lethality.

The traditional definition of national security is within the national defence or diplomatic areas. Since the 1990s, the definition of national security has been extended to include political, economic, and social environments, and other aspects, and has thus become more comprehensive.[2] Comprehensive security and human security threats are substantial but are easily overlooked and require early prevention.[3]

Environmental threats, for example, ozone depletion, extreme weather events, and large-scale acid rain can cause serious health problems.[4] These threats have an unclear origin and no intention to harm. Infectious diseases share the same characteristic and can directly harm human beings.

A difference between infectious diseases and other environmental threats is the immediacy, namely, deaths or injuries occur in a short time. Other environmental threats, for example, ozone depletion and climate change had occurred for years before the harm was observed and the causal relationship to the harm demonstrated. Therefore, a large-scale outbreak of an infectious disease can easily cause a public crisis because society must manage it in a short time or incur a relatively rapid increased loss of life.

Among these different security issues, transboundary crises are a current major threat.[5] Rosenthal et al.[6] provided a relatively commonly accepted definition of transboundary crisis: A situation 'when the functioning of multiple, life-sustaining systems, functions, or infrastructures is acutely threatened, and the causes of failure or courses of redress remain

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[1] Richard H. Ullman, "Redefining Security," *International Security* 8, no. 1 (1983): 129-53.

[2] Emma Rothschild, "What is Security," *Daedalus* 124, no. 3 (1995): 53-98,.

[3] United Nations Development Programme (UNDP), *Human Development Report 1994: New Dimensions of Human Security* (New York: Oxford University Press, 1994).

[4] Barry Buzan and Ole Wæver, "Slippery? Contradictory? Sociologically Untenable? The Copenhagen School Replies," *Review of International Studies* 23, no. 2 (1997): 241-50.

[5] Arjen Boin, "The New World of Crises and Crisis Management: Implications for Policymaking and Research," *Review of Policy Research* 26, no. 4 (2009): 367-77.

[6] Uriel Rosenthal, Arjen Boin, and Louise K, Comfort, *Managing Crises: Threats, Dilemmas, Opportunities* (Springfield: Charles C. Thomas Publishers, 2001).

unclear'.[7] This definition builds on the traditional notion of crisis, with its core conceptual elements of threat, urgency, and uncertainty.[8,9]

Transboundary crises have some common characteristics:[10]

1. **Easily cross geographical borders.** A transboundary crisis, contrary to the traditional definition of a threat, can easily cross geographical borders and thus threaten from cities to continents.

2. **Jump functional boundaries.** Transboundary crises can impact sectors, for example, social order, industry, politics and international relations; thus, predicting the causality of the crisis and the impacts is difficult and perhaps impossible.[11]

3. **Transcend traditional time boundaries.** The moment a transboundary crisis begins is difficult to pinpoint, that is, a transboundary crisis has no, or at least more than one, 'Ground Zero'.

4. **Create a power vacuum.** Who is authorised to manage the crisis is unclear; thus, at the beginning of the crisis, identifying the parties responsible is difficult. When a crisis emerges, local, national and international authorities may have different opinions on how to best manage it.

5. **Undermine the legitimacy of governments.** These crises tend to undermine the legitimacy base of governance structures and processes, which are shown to be inadequate in transboundary crises.

A transboundary crisis that affects public interest generally requires the public sector, such as central and local governments, and public forces and resources to respond to the sudden event, because it occurs in the public sphere and has a larger scope of influence to disrupt social order.[12] In particular, a dangerous situation that causes substantial damage to the public and society (e.g. endangering public safety and social order, or a substantial threat to lives and property) requires, for example, public authorities, equipped groups and organisations with expertise and technology to organise society to implement emergency measures to manage the situation.

On the basis of the aforementioned five characteristics, infectious disease epidemics such as severe acute respiratory syndrome (SARS)[13] and COVID-19 are satisfactory examples because they have all five. We further explore the COVID-19 pandemic in the next section.

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[7] Boin, "The New World of Crises."
[8] Uriel Rosenthal, Arjen Boin, and Louise K, Comfort, *Managing Crises.*
[9] Uriel Rosenthal, Michael T. Charles, and Paul 't Hart, *Coping with Crises: The Management of Disasters, Riots and Terrorism* (Springfield: Charles C. Thomas Publishers, 1989).
[10] Boin, "The New World of Crises."
[11] Boin, "The New World of Crises," 368.
[12] Shuigen Hu, Yu Xiaofeng, He Wenjiong, and Mi Hong, *General Theory of Public Crisis Management* (Hangzhou: Zhejiang University Press, 2009).
[13] Boin, "The New World of Crises."

How to Respond to and Manage a Transboundary Crisis

As a transboundary public crisis is often an unpredictable, sudden, urgent and widespread emergency, its management is challenging and uncertain. Through this policy brief, we first focus on the tasks and issues that have been identified by other researchers; next, we highlight a country's possible response measures against a transboundary crisis which represents a deadly threat. We further integrate the two parts into a comprehensive analytical framework.

As pointed out in the paragraphs below, in responding to the occurrence and expansion of transboundary crises, five tasks of crisis control and management are considered important.[14,15] Nevertheless, managing a crisis with high uncertainty and urgency differs from managing a clear and distinct threat such as a meteorite fall, particularly because in the case of infectious disease, before effective therapeutic drugs and a vaccine are available, the wartime-like approach become critical. We argue that this approach is effective in addressing the following tasks brought about by a public health crisis.

Task 1. Preparation in the face of indifference

When a crisis emerges, the authorities must prepare to manage it, even in the initial stage. A wartime-like systematic preparation, including institutional, administrative and legal arrangements, is important, although adequate preparation can be difficult because of high uncertainty and urgency.[16,17] Concrete measures for solving Task 1 can include setting up the command centre, legislation and amendments to existing laws, even if a state of emergency is not declared.

Task 2. Making sense of an emerging, evolving crisis

Leaders and authorities must also recognise what is emerging and evolving. The recognition of what is occurring deeply relates to how the threat is evaluated, which can determine the subsequent outcomes. For instance, at the outbreak of infectious disease, under a high degree of uncertainty, a delay in action may increase the number of infections and thus overwhelm a country's medical care system. A war-like awareness strengthens rapid information collection and studies, which is important for subsequent actions or preventive measures. Concrete measures can include the gathering of intelligence and professional opinions and conducting scenario analysis.

Task 3. Managing large response networks

When a crisis emerges, the authorities, after understanding the situation to some extent, must rapidly implement a wartime-like response to mobilise various functional networks,

[14] Boin, "The New World of Crises."

[15] Arjen Boin, Paul 't Hart, Eric Stern, and Bengt Sundelius, *The Politics of Crisis Management: Public Leadership under Pressure* (Cambridge: Cambridge University Press, 2005).

[16] Boin, "The New World of Crises."

[17] Martin Lodge, "The Public Management of Risk: The Case for Deliberating among Worldviews," *Review of Policy Research* 26, no. 4 (2009): 395-408.

although this is not always considered easy because of many contradictions and negotiations between authorities[18], to effectively cope with the emergency. This may include, for example, the declaration of martial law and a state of emergency and mobilising professional, administrative, social or military networks and the necessary physical resources. Additionally, an effective response network requires interagency coordination, with top decision makers and advanced informational technologies (ITs).[19]

Task 4. Offering credible answers

The authorities must also hold, deliver, and explain to the public the detailed information about a crisis and report how the authorities are managing the situation by offering the known evidence and work plans. From a social perspective, civic participation and social network support are critical because they are closely related to social resilience.[20,21] However, the senses of urgency and uncertainty test whether the public can calmly face the crisis, and the transmission of correct, transparent information becomes very challenging.

A wartime-like approach requires rapid, accurate information sharing without arousing public panic and fear, and because of the progress of IT, information can be transmitted in real-time. Traditional media, such as radio and television, and multiple methods of broadcasting, such as social network services, are available for the authorities and society to share information. Notably, maintaining transparency is crucial when responding to a crisis because it can decrease fear and panic and enhance trust in leaders.

Task 5. Learning under pressure

Furthermore, it is meaningful to see what lessons are drawn 'after' a crisis, that might trigger reform. We conduct this policy review from the perspective of revision and consider it important to assess how leaders and authorities learn from their or others' experiences. As the scope and scale of a transboundary crisis are massive, a wartime-like rapid adjustment of current policies and measures, for example, the establishment of institutional and legal foundations, is necessary to manage the high pressure and urgent condition.

In the case of a global transboundary crisis, because political systems, policy arrangements, responding behaviour and actions differ by country, no single model can be applied to every government managing a crisis. These differences also increase the difficulty of resolving transboundary crises, particularly those that easily cross geographical national borders. Further strengthening of international cooperation and the role of international organisations is indispensable.

Table 1 summarises the analytical framework of this policy brief.

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[18] Boin, "The New World of Crises," 372-73.
[19] Boin, "The New World of Crises."
[20] Boin, "The New World of Crises."
[21] Emery Roe and Paul R. Schulman, *High Reliability Management: Operating on the Edge* (Stanford: Stanford University Press, 2008).

Table 1. Analytical Framework: Wartime-like Approach in Addressing Transboundary Crisis

Task(s) Solved or Responded	Wartime-like Approach	Examples of Concrete Measure(s)
Task 1	Urgent, systematic (institutional and legal) preparation	Command centre set-up; Legislation and amendment;
Task 2	Rapid information collection and research	Gathering of intelligence and professional opinions/advice; Scenario analysis;
Task 3	Mobilisation of personnel, physical and financial resources	Martial law, state of emergency; Professional, administrative, social, and military networks; Interagency coordination; IT applications;
Task 4	Rapid, accurate information transmission and disclosure; Maintain transparency	Traditional and newly developed ICT applications; Increase trust in authorities;
Task 5	Learning from the past and the present; Reference to international experience	Rapid adjustment to adapt to the changing situation; Enhancement of international cooperation; Enhancement of the role of international organisation;

Source: Authors, with reference to Boin, 2009.

In Section II, we clarify how the COVID-19 epidemic is a transboundary crisis; next, we briefly introduce the current situation regarding the global spread of the disease (until June 20, 2020).

II.   COVID-19 as a Transboundary Crisis and Updated Information on the Infection (until June 20, 2020)

SARS and COVID-19 have characteristics of a transboundary crisis. First, experts in public health do not fully understand these diseases, and the research is ongoing. More certain is that with its highly contagious power, COVID-19 spreads easily across socially constructed geographical boundaries, such as states and countries, and rapidly with the movement of people. Second, as observed in many countries, COVID-19 has affected sectors beyond the public health field, such as trade, industry, tourism, politics, and diplomacy. Therefore,

people's lives and social order are affected on a large scale. Third, experts have not put forward a consistent opinion on the origin and starting point of COVID-19, and this situation has triggered various disputes and laying of blame at the political level. The characteristic of high uncertainty and political disputes further strengthens the difficulty of effectively solving problems.

Associated with the aforementioned features is a power vacuum in managing COVID-19 that has occurred because global cooperation is insufficient. For example, there have been disputes between the member states and international organisations over accountability (e.g. the Trump and Johnson administrations have accused WHO of handling this matter improperly.)

Due to the high degree of uncertainty and the urgency of the disease, many countries have taken measures such as declaring a state of emergency, enforcing martial law, or implementing so-called 'lockdown' approaches that strictly prohibit people from leaving their homes or gathering in groups over a maximum size. These social-distancing approaches require comprehensive rulings, approval from legal institutions, and trust and cooperation from the public. Notably, on a case by case basis, the relationship between people and their government has been either improving or deteriorating, according to public polls.

Table 2. COVID-19 Infections in Taiwan, South Korea and Japan

	Cases	Total cases	Deaths	Mortality Rate
		Per 100,000 population		
Taiwan	446	1.8%	7	1.57%
South Korea	12,373	21.5%	280	2.26%
Japan	17,881	12.7%	954	5.34%

Source: COVID-19 Dashboard by the Center for Systems Science and Engineering at Johns Hopkins University, data as of June 20, 2020.

Thus far, COVID-19 is a transboundary crisis that has infected more than 8.69 million people and caused more than 460,000 deaths worldwide, and the death toll is increasing. Compared with this global epidemic, in northeast Asian countries, particularly the cases in this paper, the numbers of deaths and infections are relatively stable. By June 20, Taiwan had reported 446 confirmed cases and seven deaths, and the case fatality rate was 1.57%. South Korea had reported approximately 12,373 confirmed cases and 280 deaths, and its case fatality rate was approximately 2.26%. In addition, another country in the Asia Pacific region, New Zealand, which reported approximately 1,159 confirmed cases and 22 deaths, and a case fatality rate of approximately 1.90%, is also considered to have effectively

controlled the epidemic.[22] [23] [24] These three countries had a case fatality rate lower than the global rate of 5.29% (WHO, https://covid19.who.int/). Japan had reported 17,881 confirmed cases, 954 deaths and a case fatality rate of 5.34% (Table. 2). The situation in Japan is a good case to compare to the neighbouring countries.

In Section III, we examine the major measures taken to address this emergency in Taiwan, South Korea and Japan to prevent the epidemic from spreading further from the following viewpoints: 1) systematic and institutional preparation; 2) intelligence gathering, research, and technology application (e.g. ICTs); 3) networks of solution; 4) transparency; and 5) policy adjustment and policy learning.

III.   Crisis Management: How Taiwan, South Korea and Japan Managed Their COVID-19 Outbreaks

1. Taiwan

Taiwan and China are 100 miles apart, and more than two million Taiwanese work in China. In Taiwan, as of June 20, there were 446 cases (and seven deaths) in Taiwan, and no local case had been diagnosed for 70 consecutive days (Figure 3).

Figure 3. Daily New Confirmed Cases of COVID-19 in Taiwan
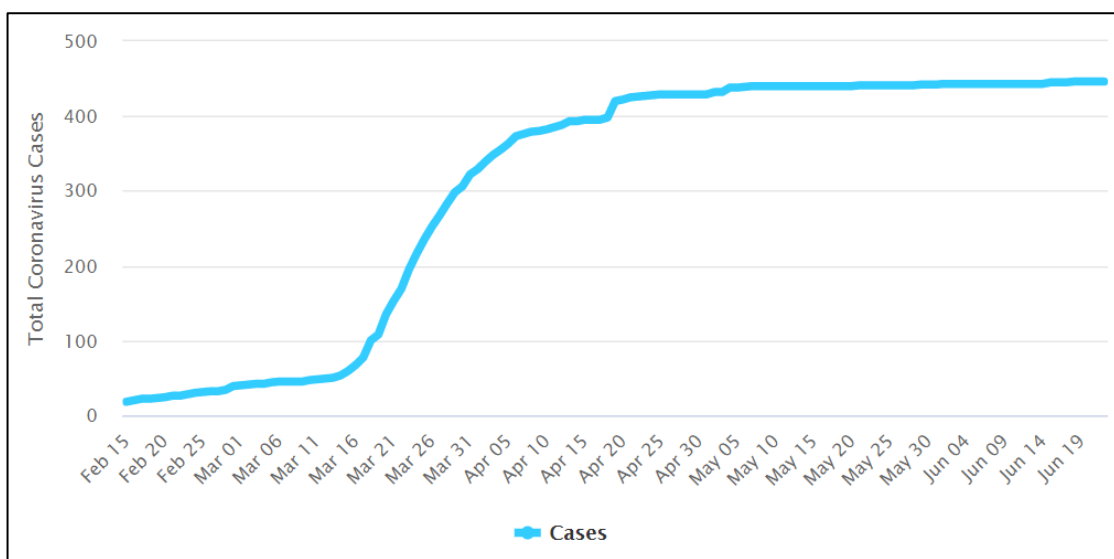
Source: Worldometer's COVID-19 data.

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[22] Collins, Simon. "Coronavirus: Ministry surveys schools to prepare for closures." *NZ Herald*, March 16, 2020.
[23] Fifield, Anna. "New Zealand Isn't Just Flattening the Curve. It's Squashing It." The Washington Post, April 7, 2020.
[24] Manch, Thomas. "Coronavirus: New Zealand Likely to Follow Taiwan in Advising Cancellation of Crowded Gatherings." *Stuff*, March 15, 2020.

On December 31, 2019, New Year's Eve, many events occurred in more or less the following sequence: the Government of Taiwan observed that SARS-like cases had occurred in Wuhan, China; Taiwan's Ministry of Health and Welfare (MOHW) and Centers for Disease Control (CDC) assessed the epidemic situation based on the information they received from the Chinese Center for Disease Control and the WHO; the CDC sent an email to notify the WHO 'International Health Regulations' contact window and specifically mentioned 'SARS', 'pneumonia', and 'patients have been treated in isolation' in the email; public health professionals used the treatment information to assess the possibility of 'human-to-human transmission'; the Government of Taiwan began to secure a sufficient number of masks and its borders, and implemented the 'Special Regulations for the Revitalization' to minimise the social and economic impacts; the Government of Taiwan received a response from China, announced its border quarantine; strengthened the screening of fever for incoming passengers at airports; and checked for direct flights from Wuhan..

On January 20, 2020, the Government of Taiwan opened the Central Epidemic Command Center (CECC), led by the Minister of MOHW as the commander. The Commander of the CECC coordinates government agencies at all levels, for example, military organisations and civic organisations, to conduct anti-epidemic work and attend to other matters. On January 21, a Taiwanese individual returning from Wuhan became Taiwan's first diagnosed patient and the world's first non-Chinese infected person. Since then, Taiwan's epidemic prevention programme has been fully upgraded.

After SARS, a legal system was established for epidemic prevention, and based on its institutional and legal foundation, the commander has support from the Intelligence System, led by the Director of the CDC; the Combat System, which comprises three groups (i.e. 'Border Quarantine', 'Community Epidemic Prevention' and 'Medical Response'), and the Logistics System, comprising, for example, the Ministry of Economic Affairs, National Health Institute, and Chief of the Security Department of the Executive Yuan (Cabinet). This task force facilitated the government's quick, seamless response to the epidemic.

Starting in late January, Taiwan implemented critical responses to the virus. On January 23, Wuhan was locked down, and Taiwan announced that people travelling from Wuhan would be denied entry. On January 24, the Government of Taiwan prohibited the export of medical masks and soon after that, the government coordinated factories to produce medical masks to be distributed by the government. On January 31, the government announced the requisition of all mask factories and unified the management of masks.[25] On February 7, Taiwan had 16 confirmed cases; barred entry of people from China, Hong Kong and Macao; and announced a system to ensure everyone would have access to masks. On February 8, the Government of Taiwan coordinated with supermarkets to maintain a sufficient quantity of supplies.

The mask distribution system was called the 'Mask Real Name System', and residents with a health insurance card could use it to purchase masks. Next, the government created an

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[25] Jason C. Wang, Chun Y. Ng, and Robert H. Brook, "Response to COVID-19 in Taiwan: Big Data Analytics, New Technology, and Proactive Testing," *JAMA* 323, no. 14 (2020): 1341-42.

on-line pre-order channel, in which users could log in with their health insurance card, use the 'E-Mask pre-order system', and go to a convenience store to receive the masks.

On March 19, Taiwan announced comprehensive border control, and all foreigners were subject to new rules of restricted entry and transfer.

In addition, the government used big data analytics with smart contact tracing, automated alert messaging for self-restriction, and followed up on the outcomes related to COVID-19 by using health insurance data, which enabled them to efficiently manage the resources required for conventional epidemiological contact tracing.[26]

Since January 20, to maintain transparency and enhance trust in the government, the CECC has held a press conference at least once per day that usually starts at 2 pm, and the commander has hosted the conference for 120 consecutive days. The command centre starts the press conference with the latest developments on the epidemic and then meets with the media to provide further details.

To avoid social panic and fear, the commander has repeatedly reminded the press conference attendees to be empathetic and emphasised that infected people are innocent and have not committed any wrongdoing. These remarks made the country feel at ease.

In summary, we present the major features that contributed to Taiwan's successful model:

1. Early awareness:

Taiwan was the first country to ban flights from Wuhan and it established the CECC. Thus, awareness is an essential risk-prevention strategy.

2. Block the source of infection at an early stage:

As of June 20, Taiwan had 446 confirmed cases and seven deaths, and 55 cases were from local transmission. Most of the cases were imported.

3. Track the source of infection with compulsory measures:

Among the 55 local cases, the source of infection was unknown for only 10 cases. This finding indicates that Taiwan effectively prevented community infection.

4. Use advanced ICTs for epidemic governance:

Taiwan's e-government and smart city services are more advanced than those of most countries. ICT tools, including big data and artificial intelligence, play key roles in helping the

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[26] Chen Chi-Mai et al., "Works citing "Containing COVID-19 Among 627,386 Persons in Contact With the Diamond Princess Cruise Ship Passengers Who Disembarked in Taiwan: Big Data Analytics," *Journal of Medical Internet Research* 22, no. 5 (2020): e19540.

government and its citizens understand the epidemic and improve the effectiveness of the epidemic governance system.

5. Reduce socioeconomic loss and prepare for the recovery:

Taiwan's infection status has been relatively stable. And in February, the government approved a financial subsidy and subsequently announced a series of policies to help vulnerable groups. The Government announce various subsidy policies for different groups, e.g. tourism, impacted employees, and low-income households.

6. Mature civil society:

The citizens with high awareness of epidemic prevention performed highly autonomous behaviours in preventing the epidemic from spreading further. People wear masks on public transport, and also donate resources to people and groups in need.

Thus, because of the aforementioned reasons, Taiwan has had more time than other countries to improve its quarantine resources and maintain the normal operations of its health system. At this point in the epidemic, the health system is the foundation of the security system. For example, in Italy, the health care system collapsed; that is, more people died than was necessary because of shortages of, for example, ventilators and hospital beds.

Because of Taiwan's effective, rapidly implemented policies, its management of COVID-19 is one of the most successful in the world, and today, everyone in Taiwan continues to wear a mask on the street and public transport. In April, the government donated 12 million masks to other countries. In addition, citizens were permitted to donate their mask quotas through a National Health Insurance app. The Taipei City Government began to open some public areas on May 11, and people are gradually returning to the new normal.

2. South Korea

South Korea's approach to, and experience with, the COVID-19 outbreak differs from that of Taiwan because South Korea had learned lessons from its errors and experiences during the 2015 outbreak of Middle East Respiratory Syndrome (MERS). To increase the speed of its response to COVID-19, laws were amended to allow the immediate approval of testing systems in the event of a public health crisis.[27,28] As a result, the Government of South Korea

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[27] Sangchul Park, Gina Jeehyun Choi, and Haksoo Ko, "Information Technology–Based Tracing Strategy in Response to COVID-19 in South Korea—Privacy Controversies," *Journal of American Medical Association (JAMA)* (April 2020).

[28] Victor Cha, "South Korea Offers a Lesson in Best Practices: The United States May Be Left with Only the Most Invasive of Them," *Foreign Affairs* (April 2020).

was able to respond to COVID-19 faster than many other countries. The South Korean approaches have been widely appraised and referenced by Western media, the WHO, and political leaders worldwide.[29,30,31,32,33]

On January 22, 2020, the Korea Centers for Disease Control and Prevention (KCDC) announced that South Korea had one confirmed case of COVID-19. The number of confirmed cases was maintained and sporadically increased until mid-February (Figure 4). On February 4, South Korea began to deny entry to foreigners who had travelled from Hubei, the Chinese province where Wuhan is located. In the latter half of February, the KCDC reported a sudden increase in confirmed infections, mostly attributed to Patient No. 31, a parishioner of the Shincheonji Church of Jesus who participated in a service in Daegu, a city on South Korea's high-speed rail line.[34,35,36] Daegu is the epicentre of COVID-19 in South Korea because most of the country's cases were diagnosed in the region and nearly 70% of those have been traced to the Shincheonji Church.[37]

Figure 4. Daily New Confirmed Cases of COVID-19 in South Korea
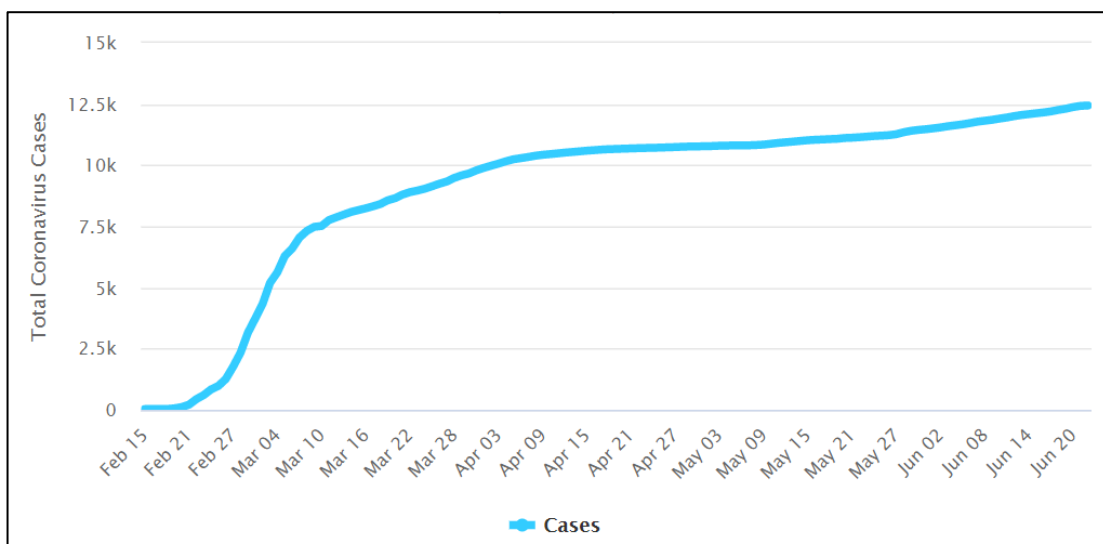
Source: Worldometer's COVID-19 data.

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[29] Dennis Normile, "Coronavirus cases have dropped sharply in South Korea. What's the secret to its success?" *Science* (March 2020)*.*

[30] Laura Bicker, "Coronavirus in South Korea: How 'Trace, Test and Treat' May Be Saving Lives," *BBC News*. March 12, 2020.

[31] Kelly Kasulis, "South Korea's Coronavirus Lessons: Quick, Easy Tests; Monitoring," *Al Jazeera*, March 19, 2020.

[32] Alexis Dudden and Andrew Marks, "South Korea Took Rapid, Intrusive Measures against Covid-19 – and They Worked," *The Guardian*, March 20, 2020.

[33] Max Fisher and Choe Sang-Hun, "How South Korea Flattened the Curve," *The New York Times*, April 10, 2020

[34] Nathan S. Park, "Cults and Conservatives Spread Coronavirus in South Korea," *Foreign Policy*, February 27, 2020.

[35] Isabella Steger, "How Religion is Playing a Role in the Spread of Coronavirus in Korea," *Quartz*, February 26, 2020.

[36] Raphael Rashid, "Opinion: Being Called a Cult is One Thing, Being Blamed for an Epidemic is Quite Another," *New York Times*, March 9, 2020.

[37] Max S. Kim, "South Korea is Watching Quarantined Citizens with a Smartphone App," *MIT Technology Review*, March 6, 2020

Soon after the epidemic in Daegu, South Korea established the Central Disaster and Safety Countermeasures Headquarters headed by its prime minister, declared a state of national emergency (February 23), and introduced a large-scale, well-organised epidemic control programme without comprehensively locking down cities. Several measures have been implemented to screen the population for the virus, such as nationwide drive-through testing stations and walk-through testing stations in hospitals, which contribute to the country's testing capacity of greater than 20,000 tests per day.[38,39,40,41,42] Instead of the policies implemented in other countries that quarantine entire cities or regions, in South Korea, its policy of rapid, extensive testing has been successful in mitigating the outbreak.[43,44,45]

Additionally, the South Korean authorities isolated the infected patients and traced and quarantined the individuals they had contacted, by using traditional and innovative ICT and equipment (e.g. telephone and mobile phone). For example, individuals sent to self-quarantine were asked to download a smartphone app called 'Self-quarantine Safety Protection', developed by the Ministry of the Interior and Safety, to ensure the isolation and lockdown was as effective as possible and to avoid community-acquired infections.[46,47]

The quarantined individuals used the app to report their physical conditions, symptoms, and progress to local government case officers, and a global positioning system service that tracked the individuals' locations to ensure they remained in their designated quarantined areas such as homes, hotels and government shelters. When a monitored individual left her or his designated quarantine area, an alert was sent to that individual and a case officer. Notably, Taiwan and South Korea have implemented similar tracking and reporting systems in their epidemic prevention programmes.

After the outbreak of MERS in 2015, South Korea amended its Contagious Disease Prevention and Control Act (CDPCA) to give it authority to override certain provisions of the Personal Information Protection Act, enacted in 2011, and other privacy laws.[48] To manage the COVID-19 outbreak and prevent further spread, on February 26 the National Assembly passed further laws amending the CDPCA—the Quarantine Law and the Medical laws—referred to as the three COVID-19-related laws.

The amendments allow authorities to test, quarantine and treat individuals who are suspected cases, and individuals who refuse tests can be prosecuted. Further, if individuals ordered to self-quarantine leave the designated area or violate the law, they receive a sentence of imprisonment for up to one year or a fine up to KRW 10 million (approx. USD 8,200). On February 6, the government began to control the distribution of masks, and on March 5, it

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38 Bicker, "Coronavirus in South Korea."
39 Cha, "South Korea Offers a Lesson in Best Practices."
40 Kasulis, "South Korea's Coronavirus Lessons."
41 Dudden and Marks, "South Korea Took Rapid, Intrusive Measures."
42 Kim, "South Korea is Watching Quarantined Citizens."
43 Normile, "Coronavirus cases have dropped sharply in South Korea."
44 Cha, "South Korea Offers a Lesson in Best Practices."
45 Park, Choi, and Ko, "Information Technology–Based Tracing Strategy."
46 Kim, "South Korea is Watching Quarantined Citizens."
47 Park, Choi, and Ko, "Information Technology–Based Tracing Strategy."
48 Park, Choi, and Ko, "Information Technology–Based Tracing Strategy."

further restricted the ban on the export and transfer of masks and other medical equipment. All citizens (and registered noncitizens) were allowed to buy two masks per week on an assigned weekday that depended on birth year, which is similar to the system that Taiwan began to use in early February.[49]

From the perspective of information disclosure, individuals living in South Korea had access to daily television press conferences, reports, hotlines, updated information organised and released by the KCDC, and official emergency alerts through text messages sent to mobile phones when a new COVID-19 case was confirmed in their neighbourhood. The data collected from infected patients' mobile phones and credit cards were used to trace their movements, called a 'footprint,' and target their prior contacts. The messages also urged anyone who might have had close contact or crossed paths with the infected patient to receive testing immediately.[50]

Criticisms of this innovative tracking and alerting approach are that it increases social fear or panic and compromises privacy protections.[51] On March 9, the National Human Rights Commission issued a statement on privacy concerns and made recommendations to ameliorate them. Subsequently, the KCDC responded to the statement by issuing a guideline to limit the scope and detail of the disclosure of individual data and information.

As a result, although South Korea at one time had the highest number of cases worldwide, the outbreak was contained through the rapid implementation of effective policies, including the wide availability of testing kits, extensive testing, effective self-quarantine rules and an innovative monitoring system. Because of the government's rapid response and the strengthened legal infrastructure, the number of infections and deaths peaked by the end of March.[52]

3. Japan

Japanese official responses to COVID-19 are different from those of Taiwan and South Korea. January 16, 2020, was the date that Japan's first case of COVID-19 was confirmed; the patient was a male traveller who had visited Wuhan. Noting the lockdown of Wuhan, on January 28, the cabinet designated COVID-19 an infectious disease. Also in January, a cluster infection on the cruise ship Diamond Princess was discovered. The first case was an elderly male passenger who had disembarked in Hong Kong and tested positive for COVID-19 on January 30; the remaining passengers continued the voyage and returned to Japan.

On January 30, the Government of Japan established its Novel Coronavirus Response Headquarters under the command of Premier Shinzo Abe and had its first meeting on the same day. Notably, Japan has no specialised organisation for infectious disease, such as the CDC in Taiwan and in Korea; thus, at the beginning of the outbreak, the Ministry of Health,

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[49] Tammy E. Kim, "Opinion: How South Korea Solved Its Face Mask Shortage," *New York Times*, April 2, 2020.
[50] Jason Strother, "Is South Korea's Approach to Containing Coronavirus a Model for the Rest of the World?" *The World*, March 3, 2020.
[51] Park, Choi, and Ko, "Information Technology–Based Tracing Strategy."
[52] Fisher and Sang-Hun, "How South Korea Flattened the Curve."

Labour and Welfare mainly managed the related matters. Starting on February 1, a travel ban was imposed on foreigners who had stayed in Hubei. On February 3, the Diamond Princess returned to Yokohama and was ordered to remain in the harbour without allowing passengers to disembark.

On February 5, ten passengers of the 31 tested were confirmed positive.[53] Subsequently, Headquarters ordered all passengers to remain in their respective rooms (in-ship quarantine) for two weeks. By February 19, more than 600 passengers of the 3,711 passengers and crew were confirmed positive, and by March 16, despite the quarantine, the number increased to 719; notably, some passengers who had tested negative before disembarking later tested positive.

The government's response exacerbated the cluster infection on the ship and was severely criticised by domestic and foreign experts and the media.[54,55,56,57] The critics mainly asked why the Japanese government did not implement an aggressive mitigation plan to prevent the spread. Subsequently, the government postponed the 2020 Tokyo Olympics that were to be held between July 23 and August 8. The Japanese government has not been transparent regarding its decision-making processes; thus, in this policy review, we cite two relatively convincing arguments.

Two Major Concerns: the Tokyo Olympics and Further Economic Recession

The first major concern was the Tokyo Olympics, that is, how the epidemic would affect Japan's ability to hold and prepare for this event, including the Paralympic Games, and the economic losses caused by its suspension or delay. According to a trial calculation by Kansai University, if the Olympics were postponed for one year, the economic loss would be approximately JPY 640.8 billion (approx. USD 6 billion). In addition, an estimation is that the economic loss of cancellation would be approximately JPY 4,515.1 billion (approx. USD 42.4 billion).[58] The major decision makers of the Tokyo Olympics, for example, the Premier, the Mayor of Tokyo, and the chief of Tokyo 2020, were asked frequently whether they would consider the suspension of the games, and they all agreed that that plan was impossible.[59,60,61] This attitude demonstrates that until the emergence of foreign pressure from the

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[53]"What Happened on the Cruise Ship?" (in Japanese), NHK, March 4, 2020.

[54] "Update on the Diamond Princess Cruise Ship in Japan," The United States Centers for Disease and Control and Prevention (US CDC).

[55] Rocky Swift, "Diamond Princess Critic Says Tokyo Olympics Should be Halted," *Reuters*, March 19, 2020.

[56] BBC, "Coronavirus: Passengers Leave Diamond Princess Amid Criticism of Japan," *BBC News*, February 20, 2020.

[57] Rebecca Ratcliffe and Carmela Fonbuena, "Inside the Cruise Ship that Became a Coronavirus Breeding Ground," *The Guardian*, March 6, 2020.

[58] "Economic Loss when the 2020 Tokyo Olympics and Paralympics are Postponed or Canceled," Press Release (in Japanese), Kansai University.

[59] The Guardian, "Abe Insists Olympics to Go Ahead as Planned Despite Covid-19," *The Guardian*, March 14, 2020.

[60] Sean Ingle, "Tokyo 2020 Chief Insists Games are on Track despite Coronavirus Outbreak," *The Guardian*, March 11, 2020.

[61] AFP, "Tokyo Governor Says Cancelling Olympics 'Unthinkable'," *The Straits Times*, March 12, 2020.

United States, Canada and Australia, policy makers thought the infectious disease would not necessitate changing the established arrangements.

The second major concern was worsening the recession caused by the October 2019 increase in the consumption tax.[62,63] The nominal GDP growth rate of the fourth quarter (October to December) 2019 was −4.9%, and the real GDP growth rate was −6.3%, compared with the third quarter in the same year.[64] Thus, aggressive epidemic prevention measures would save lives but accelerate the deterioration of economic conditions. Notably, economic concerns have become the focus of the Abe administration when considering mitigation measures.

These arguments are appropriate in the context of the actions of the Japanese government. Soon after the government officially postponed the Olympic games on March 24, the authorities implemented relatively aggressive testing of suspected cases (Figure 5). However, the number of diagnostic tests for COVID-19 in Japan was far less than in other industrialised countries, and Japan ranked second lowest of 36 OECD countries.[65]

Figure 5. Polymerase Chain Reaction Inspections Conducted to Detect COVID-19
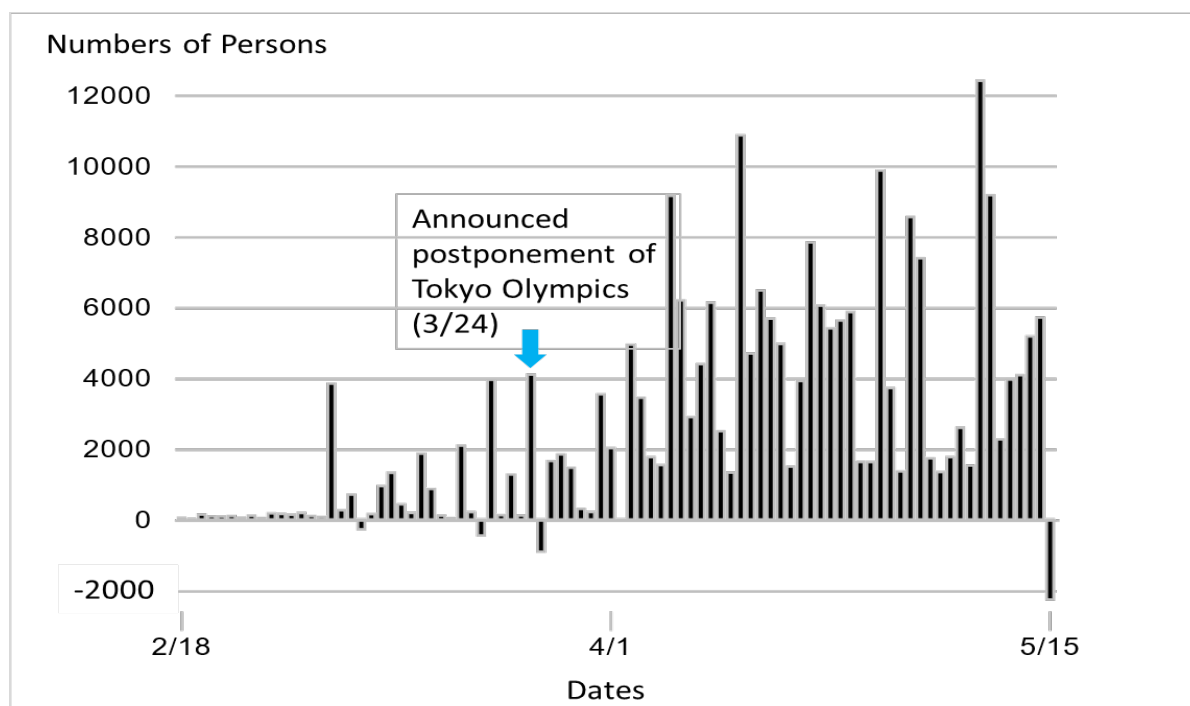
Source: Nikkei, Infection Situation of Japan to See in Chart: New Coronavirus. The negative numbers represent the corrections after a deduction of double counting, etc.

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[62] Keita Nakamura, "Japan's Economy at Critical Juncture as Coronavirus Puts Growth and Olympics at Risk," *The Japan Times*, March 23, 2020.

[63] Ben Dooley and Eimi Yamamitsu, "Japan's Economy Shrank Sharply. Now Comes the Coronavirus," *New York Times*, February 19, 2020l.

[64] "Economic Index Dashboard (in Japanese)," Nikkei

[65] "Testing for COVID-19: A Way to Lift Confinement Restrictions," Organisation for Economic Co-operation and Development (OECD).

The government's expert panel on COVID-19 was first organised in late February, and at a meeting on May 4, the following data could not be denied: The number of tests using polymerase chain reaction testing for the virus was low in Japan compared with other developed countries, and a test system could not be established to manage the new epidemic.[66] On the same day, the Premier admitted, 'the testing has been inadequate,' and the reason provided for this was 'personnel-related bottlenecks'.[67]

The government was concerned about exacerbating the economic recession, and evidence for this assertion is, for example, that since the beginning of April, the government started to discuss and debate bailouts, such as financial assistance for those experiencing economic impacts. On April 20, the Premier announced the payment of JPY 100,000 (approx. USD 1,000) to each citizen, and we propose that the purpose of such payments was to earn support for the current administration.

Relatively radical measures were implemented after postponing the Olympics. For example, starting April 3, at the border, the Japanese government imposed stricter measures against its citizens, refused entry to foreigners arriving from China, increased the scale of testing of suspected infection cases, and announced a state of emergency. The state of emergency, from April 7 to May 6, was first issued in Japan and applied to seven of the 47 prefectures. This decree did not deter domestic travel, and on April 16, the state of emergency was extended to all prefectures and until May 31 (however, in mid-May, the emergency was lifted for most prefectures).

The declaration had relatively limited effects because the 'soft lockdown' allowed people to, for example, commute and work, but the Premier did urge people to limit their movement and contacts with others. That is, the restrictions were non-mandatory and required citizen's voluntary restraints based on its *'Ji-Shuku'* culture. *Ji-Shuku* means self-imposed control based on voluntarily restricting things such as economic activities or mobility, which will be further explained in this section.

As of June 20, the confirmed cases and deaths in Japan have not peaked (Figure 6) because the Japanese government did not implement relatively aggressive management of the pandemic until it had officially announced the postponement of the Tokyo Olympics in late March. Although the number of confirmed cases is relatively small compared with that of European countries and the United States, because Japan has not implemented general screening, the data on the infections in Japan remain limited.

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[66] The Ministry of Health, Labour and Welfare (MHLW), "Situation Analysis and Recommendations for New Coronavirus Infectious Disease Control (in Japanese)," New Coronavirus Infectious Diseases Control Experts Panel, (May 2020).

[67] Nikkei Staff Writers**,** "Japan's Coronavirus Testing behind the Curve, Abe Admits," *Nikkei Asian Review*, May 5, 2020.

Figure 6. Daily New Confirmed Cases of COVID-19 in Japan
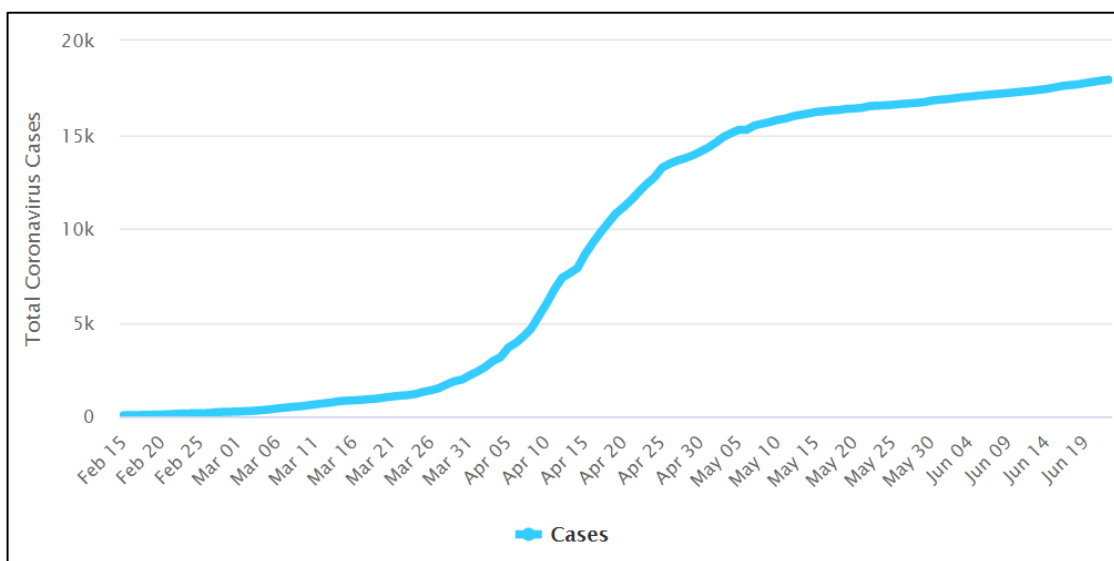
Source: Worldometer's COVID-19 data.

Nevertheless, Japan's situation is somewhat better than those in Europe and the United States, and three reasons possibly explain this phenomenon. The first reason for the better outcomes in Japan is that its people are already accustomed to and do not resist wearing masks, a measure that reduces the rate of infection. The second possible reason is that Japan is geographically close to the epicentre, namely, China; thus, Japan may have learned of the state of disease transmission before countries farther away. The third reason is the behaviours and culture of the Japanese, namely, *Ji-Syuku*.

Notably, the absence of strong enforcement of the infectious disease control measures results in local governments expecting the Japanese people to engage in *Ji-Shuku* behaviours and conduct prevention methods based on recommendations, flexible persuasion, requests, or so-called 'naming and shaming'. Thus, despite the nationwide state of emergency, the declaration did not fully prevent unnecessary outings. As a result, the COVID-19 infection rates, as of June 20, have not been effectively improved.

IV.   Analysis and Implications

Part of the response to the COVID-19 outbreak has been securitisation. Since the beginning of March 2020, particularly in Western countries, the mitigation tasks have mobilised hard resources (e.g. medical supplies, professional personnel, military troops, police forces, financial support) and administrative arrangements (e.g. border control, home isolation, quarantine). Taiwan, South Korea and Japan implemented security-relevant measures in the initial stage of the outbreak.

Additionally, experiences with SARS and MERS have provided policy guidance to mitigate COVID-19, particularly in Taiwan and South Korea. Since in the first half of February 2020, despite the relatively small number of confirmed cases, the degree of policy coercion has

continually increased, and preparations have gradually been made for the next large-scale infection of the community.

In this section, we analyse countries' responses by reviewing five tasks while focusing on the wartime-like measures of the three countries (Figure 7 and Table 3). Notably, in the early stages, Taiwan and South Korea established command headquarters, implemented mask control, issued travel bans against travellers from Wuhan, and declared a state of emergency. These early actions were critical to the success of crisis response.

Figure 7. Wartime-like Measures implemented in Taiwan, South Korea and Japan against COVID-19
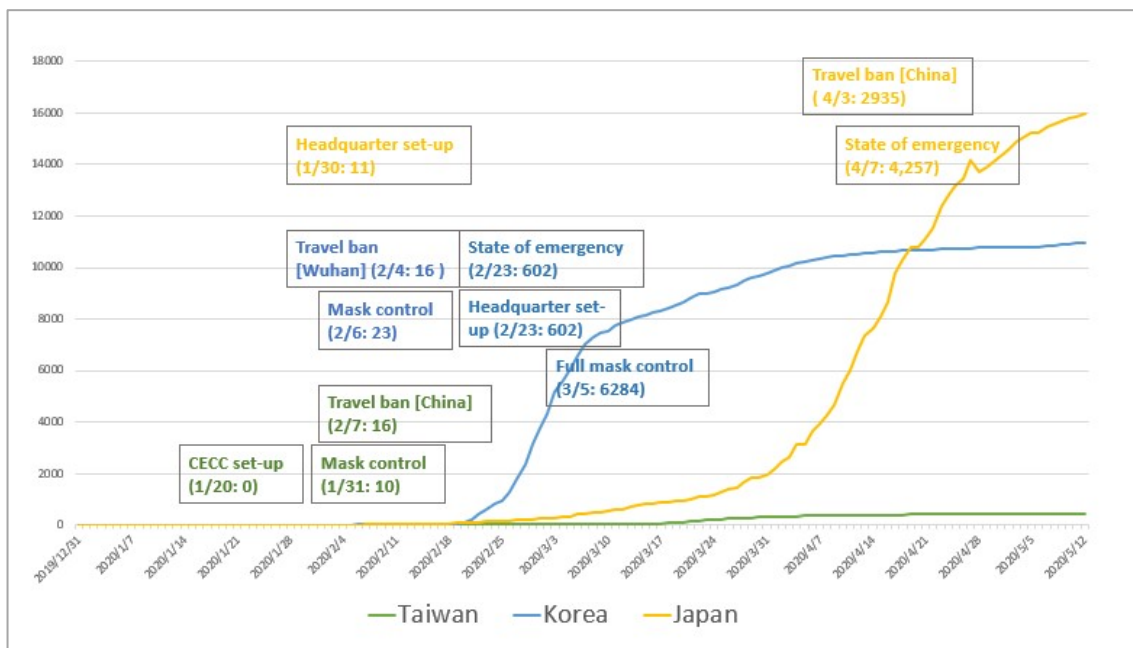
Source: Figure made by authors; data retrieved from COVID-19 Dashboard by the Center for Systems Science and Engineering at Johns Hopkins University.

Task 1. Preparation in the Early Stage

Following Taiwan's experiences from SARS in 2003, it established a military-like system to manage virus threats, such as a legal framework and institutionalised system with mandatory penalties and fines. Additionally, the CECC comprised multiple government agencies (High level of implementation).

South Korea also implemented legal measures with enforcement power, based on its constitution, and it has more actively and successfully curbed the continual expansion of infectious diseases (High) than either Taiwan or Japan.

Although the Japanese people's awareness of public health is relatively high, the institutional preparation was inadequate. Although a command headquarters was established in

late January, it had no legal infrastructure that provided legitimacy for authorities to imple-ment compulsory measures (Medium).

Table 3. Five Elements of the Measures against COVID-19 Implemented by Taiwan, South Korea and Japan

	Taiwan	South Korea	Japan
I. Preparing in the Early Stage	High	High	Medium
II. Understanding the Crisis	High	Medium	Low
III. Responding Networks and Use of ICTs	High	High	Low
VI. Transparency and Credibility	High	High	Medium
V. Past Experiences and Policy Learning	High	High	Low

Source: authors. The level refers to in which stage the country took action by confirmed cases. Country took concrete actions even when confirmed cases are relatively small is regarded high level of implementation.

Task. 2 Understanding the Crisis

Taiwan deployed ahead of the epidemic. We observed that Taiwan was the earliest country to act, for instance, testing passengers on flights from Wuhan, and implementing border control and mask management. In addition, the policies included bailouts and were prepared to be implemented in the long term against the epidemic (High).

Under the command of its MOHW and the KCDC, South Korea responded quickly after the outbreak; the most notable example is that after a super spreader incident during religious activities in Daegu, the government raised the epidemic prevention level, including amendments to laws, a state of emergency declaration, controls on medical equipment, and enhanced screening for the virus (Medium).

Despite recognising the outbreak early because of the cruise cluster in early February, Japan did not act in earnest until after postponing the Olympic games, when the government's attitude towards information disclosure and policy adjustment became positive (Low).

Task 3. Responding Networks and Use of ICTs

As many studies have pointed out, Taiwan's establishment of response networks that use big data ICT tools has played an important role (High).

Similar to Taiwan, South Korea implemented strict control and management measures for infected patients and high-risk groups with a history of contact. Under the supervision of

dedicated personnel, and by using ICTs, self-isolation and strictly enforced quarantine, the virus was successfully contained (as of June 20). The government also provided subsidies during the isolation and quarantine period, and rule violators were punished (e.g. fines; High).

Compared with the governments of Taiwan and South Korea, the Japanese government's epidemic prevention measures relied more on self-imposed control, that is, the *Ji-Shuku* culture, rather than modern, effective methods that use ICTs (Low).

Task 4. Transparency and Credibility

Transparency creates trust in the authorities, and the dissemination of information in an open, transparent manner increases the public's perception that the government is reliable. In Taiwan, the CECC holds a daily, live-broadcasted press conference to explain the developments of the domestic epidemic situation (High).

In addition to the general public's high awareness and cooperation in epidemic prevention, South Korea's authorities share information by holding regular and daily press conferences, publicising the latest progress, and broadcasting the information live to the whole country (High).

In Japan, the latest data and information is updated daily; however, with no organisation such as CDC, sources of information and professional advice are from multiple leaders, for example, the media, medical associations, local governments, academia, expert panels, officials and politicians. Additionally, because the testing in Japan has been insufficient, with no means to acquire detailed, fully integrated information, the public has been provided with incomplete information.[68] All in all, these factors can deepen the distrust of authorities (Medium).

Task 5. Past Experiences and Policy Learning

The experience of SARS is important and was a pivotal moment for Taiwan's prevention system. When the government announced its response in January, few oppositional voices were observed, and subsequently, those doubts disappeared. Taiwan learned to foresee the risk, which is essential for national security when managing an epidemic (High).

After the outbreak of MERS in 2015, South Korea conducted a series of legal reforms to improve its epidemic prevention programme (High).

Different from Taiwan and South Korea, in Japan, the knowledge gained from addressing prior outbreaks of severe infectious diseases played a minor role in the response to COVID-19 (Low). Nevertheless, although it is too soon to judge if Japan has learned from other

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[68] Rupert Wingfield-Hayes, "Coronavirus: Japan's Low Testing Rate Raises Questions," *BBC News*, April 30, 2020.

countries, we predict that from now on (as of June 20, 2020), many reforms must be nego-tiated and realised.

Judging from the three cases, peer-learning among each other across departments and function networks on methodology, while enhancing international cooperation in address-ing transboundary crisis, is important.

V. Conclusion and Policy Recommendations

Because of their rapid reaction and effective wartime-like measures against COVID-19, Taiwan and South Korea can share their best practices with the world. By contrast, Japan depended on compliance and trust, which was a less successful plan and requires additional institutional and legal reforms. Countries that have been considered to have successfully contained COVID-19, such as New Zealand, Australia, Germany, Vietnam, etc., are worth comparing with the cases of this paper. Particularly the rapid response of New Zealand, given the approach and its learning behaviour, is worthy of further exploration and com-parison via the perspective of this paper.

In addition, accurate, effective information disclosure is beneficial to increase society's awareness of epidemic prevention and enhance their trust in government. Taiwan and South Korea provide excellent examples.

According to the experiences of Taiwan, South Korea and Japan, we propose the following recommendations to manage a transboundary crisis, such as an epidemic, natural disaster or manmade catastrophe.

I.   Understand the risks of a crisis by increasing the awareness of leaders and the public and manage these risks through rapid actions and to prevent over-whelming or collapsing the system.

II.   Strengthen crisis governance on the basis of a legal framework, mature civil society and technological tools.

III.   Invest in crisis risk reduction to achieve resilience, for example, using advanced, smart ICTs.

IV.   Enhance crisis preparedness to achieve an effective response and to 'Build Back Better' in recovery, rehabilitation and reconstruction.

V.   Enhance peer-learning and international cooperation among the countries that are regarded to have successfully contained the disease, by first sharing expe-rience, limitations and challenges, etc.

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