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# **Proactive and Coordinated Response to COVID-19: Comparing the Experience of China, South Korea and Singapore during the First 100 Days**

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Working Paper  
CIKD-WP-2020-005 EN



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## **Acknowledgement**

Many thanks to the authors of the three country case reports for their materials, including Liu Chen and Chen Xiao (2020) *China's Strategies and Actions Against COVID-19 and Key Insights*; Zhao Litao and Qian Jiwei (2020) *The Fight against COVID-19 in Singapore: Strategies, Measures and Impacts*; Chiang Min-Hua and Yin Jason Dean-Chen (2020) *COVID-19 Responses in South Korea: Strategies, Measures and Potential Impacts*.

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## Executive Summary

Countries around the world are searching for answers to the question: how to effectively respond to the pandemic when there is no vaccine available? They come up with different solutions. This report compares the responses of China, South Korea and Singapore, focusing on their overall strategies, the constraints of each country, and the outcomes of the decisions. This systematic comparison maps out the issues countries in the world need to face when considering their own responses.

China, South Korea and Singapore were affected by COVID-19 early on, but the three countries managed to contain the virus through proactive and coordinated measures. This study shows that the strategies and measures adopted by the three countries share critical similarities. Their different approaches are a result of the policymakers' assessment of the health risks, resource constraints and the governing capacity of each country.

Before the pandemic, all three countries established and updated their emergency management systems and public health emergency response plans based on their recent experiences of epidemics. As they took actions, all three countries coordinated between the central and local governments, and among different departments and sectors. The policy mix of the three countries reflected each country's conditions. China put people's right to life and health at its priority and introduced the most stringent lockdown early on, which slowed down the spread of the virus as much as possible. South Korea managed to strike a balance between health protection and maintaining the freedom of human movement. Active testing, tracing and



isolation was the central feature of South Korea's responses. Digital surveillance played a central role in making this strategy possible. Singapore adopted an evidence-based strategy which relied on its strong capacity for public health intervention. The response was set to be "one step ahead" of the WHO required response level given the severity of the health risks.

Comparing the three countries, China nearly ended the spreading of the virus. Its public health response did not only focus on providing care and treatment to patients, but also blocking the spread of the virus. Measures were introduced to effectively control the epidemic through extensive epidemiological investigations and concentrated isolation. China's lockdown approach corresponded with its limited ability to monitor and enforce social distancing rules during the Spring Festival, and fewer healthcare resources per capita. The capacity of providing intensive care and the support that can be mobilized in the communities all contributed to the adoption of strategies. What we can see is that if there had been no lockdown in so many cities, the threat of outbreaks in other regions would have made it impossible for Hubei to get as much support as they had received.

The effort to contain the virus in South Korea and Singapore was relatively low compared to China, but it also had tradeoffs. The cycle of the containment efforts had to last longer. Obviously, people did not want their freedom to travel to be restricted. Thus, it should also be well communicated to the public that it was not a choice between no freedom and full freedom, but between shorter pain and more prolonged pain. The



seemingly non-interventionist approach adopted by South Korea and Singapore required diligent and efficient testing and case tracing capacity. South Korea and Singapore had done better in using early testing and isolation to flatten the initial outbreak curve and had thereby won precious time for mobilizing resources and gradually intensifying responses when the situation became worse. Even so, South Korea's policy implementation had to face partisan challenges throughout the pandemic management process. Both South Korea and Singapore used heavy penalties and legal measures against offenders. China's legal system is still developing. During the pandemic management period, the pressure not to impose heavy penalties on the public was high, particularly in the heavily infected areas.

It is important to note that each country's strategy has its limits. China's strict lockdown was fast and effective, but people had little time to prepare for it either psychologically or materially. However, as the situation evolved, it becomes more obvious that China's approach was not just about the centrally commanded lockdowns. It had many bottom up initiatives with community and market support. South Korea's success so far had much to do with the fact that Koreans were tolerant of surveillance and willing to give up on personal privacy. Surveillance cameras, credit cards and banking records, and mobile phone usage records were all used to track close contacts. This approach required strong social and technical support. The Singaporean approach required a strict rule by law and a social consensus on harsh punishments.

In short, the pandemic is a stress test of the governing capacity of each country. Countries affected have to select a policy mix according to the



national conditions. It is worth highlighting that many provinces in China were less wealthy than many developed countries. However, these Chinese provinces had not suffered as much as many developed countries. In a similar vein, South Korea quickly adjusted its initial strategy after the spike in community transmission. Singapore also avoided major outbreaks by March. The experience of these countries shows that the outcome of the pandemic is not necessarily determined by a country's political system or its economic strength. These factors may have some impacts, but it is also down to the determination and leadership of the government, their ability to listen, make rational decisions, and adapt to changing circumstances.

**COVID-19** is a newly identified virus that had never been found in the human body before. Most patients infected will suffer from symptoms such as coughing and fever. In some cases, people may catch pneumonia and trigger other health problems or even die. The virus spreads quickly from person to person, and people without any symptom can infect others. In late December 2019, a local hospital in Wuhan City, Hubei Province of China reported cases of pneumonia of unknown etiology to local authorities. Then the cases also appeared in other provinces and cities in China in mid-January, 2020. South Korea and Singapore discovered the first case on 20 January 2020 and 23 January 2020, respectively. On 11 March 2020, the World Health Organization (WHO) announced the COVID-19 outbreak a pandemic and asked governments in the world to take “urgent and aggressive action” to suppress and contain. Governments are expected to “strike a fine balance between protecting health, minimising disruption and respecting human rights” (WHO, 2020)<sup>1</sup>. As of 31 March, there were 750,890 confirmed cases and 36,405 deaths worldwide. The pandemic was spread to more than 200 countries and regions, and the pandemic epicentre shifted from Asia to Europe and North America.<sup>2</sup> How to effectively deal with the pandemic when there is no vaccine becomes an urgent quest around the world. Countries take very different approaches and at various stages of the cycle of an outbreak. This report compares the responses of China, South Korea and Singapore systematically. Such a comparison can help us to gain a better understanding of the characteristics of pandemic responses and what needs to be taken into

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<sup>1</sup> WHO (2020) “WHO Director-General’s opening remarks at the media briefing on COVID-19 - 11 March 2020”, <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>, 11 March 2020.

<sup>2</sup> WHO (2020) Coronavirus Disease 2019 (COVID-19) Situation Report 71, [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200331-sitrep-71-covid-19.pdf?sfvrsn=4360e92b\\_4](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200331-sitrep-71-covid-19.pdf?sfvrsn=4360e92b_4), 31 March 2020.



account when developing such interventions.

China, South Korea and Singapore were affected by the epidemic early on, but the three countries managed to contain the virus through active management and introduced effective measures. The different actions taken by the three countries are often portrayed as entirely different approaches to fight against COVID-19. With an in-depth and systematic analysis of the pandemic management practices of the three countries, this research finds that the strategies and measures adopted by the three countries share many similarities. The differences in their practices are calculated decisions to balance the advantages and constraints of each country when facing a certain level of health risk. The following section of this report first outlines the nature of the pandemic response and then compares the three countries' strategies for fighting against the pandemic. It is followed by a systematic comparison of the policies and their implementation and a discussion of the effects of these actions. The conclusion section summarises the lessons of the three countries and the implications for pandemic responses in general. Since the pandemic has not yet ended, this report only analyses the actions and their effects before 31 March 2020. Therefore, this is by no means an effort to draw conclusions regarding which model is successful, but rather to understand the relationship between strategies, constraints and outcomes. At the end of the paper, we will briefly discuss the updates of responses after 31 March 2020.

## **DECIDING ON PANDEMIC RESPONSES—A FRAMEWORK**

Responding to a pandemic is a complicated issue for policymakers around

the world. They have to make decisions weighing against numerous factors and react quickly to the pandemic. COVID-19 spreads very fast and can be asymptomatic, so it needs a specific strategy, and the decisions have to be made. The pandemic response has to balance several goals: 1) to minimise the transmissibility, morbidity and mortality; 2) to make sure that the healthcare system is not overburdened; and 3) to reduce the externalities of pandemic management (political, economic, and social costs) (Sander, 2009; Shete, 2018)<sup>3</sup>.

The decision-makers need to assess the status and forecast the future development of the pandemic, the resources available in the medical service system and the external support that can be mobilised. When facing conflicting goals, which one to prioritise has much to do with the ethical considerations.

### **Proactive or inactive?**

Governments may take an active or inactive approach to respond to a pandemic. Decision-makers who try to be inactive hope that the pandemic would pass unnoticed. This strategy might have worked in the past for other types of viruses. In this context, the politicians would face little scrutiny and the economy would suffer less. So far, this approach has not worked for COVID-19. Some governments also tried to strategise inaction and expressed the intent to develop “herd immunity”, that is, enough people are infected to build up resistance to further infection (Financial Times, 14-03-

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<sup>3</sup> Sander, B., et al. (2009) An Economic Evaluation of Influenza Pandemic Mitigation Strategies in the United States Using a Stochastic Microsimulation Transmission Model. *Value in Health*, 12(2), 226-233.

Shete, P. B., Reid, M., & Goosby, E. (2018) Message to World Leaders: We Cannot End Tuberculosis without Addressing the Social and Economic Burden of the Disease. *The Lancet Global Health*, 6(12), e1272-e1273.



2020)<sup>4</sup>. This was mistaken as a possible strategy to prevent the healthcare system from being overwhelmed. Unfortunately, the logic works in the opposite direction. As many scientists pointed out, a large number of people may get sick in a short time resulting in a hospital run. At the same time, it will also risk infecting medical professionals, which will lead to the collapse of the healthcare system before a herd immunity is achieved. This overburden and loss of medical resources may also cause patients of other diseases not getting treated. Therefore, the “herd immunity” route is “unethical and potentially dangerous” (Basu, 2020)<sup>5</sup>. Although a number of European countries proposed “herd immunity” in the early days of COVID-19 outbreak, they eventually gave up on this thought. This shows that inaction is not an option when social, economic and ethical considerations are taking into account.

A proactive strategy, according to University College London’s epidemiological research model is to isolate patients, reduce social interaction by 75%, and close schools (Regalado, 2020)<sup>6</sup>. Within the bracket of proactive responses, there can be different approaches, including incremental, dynamic or aggressive. Which strategy a country decides to adopt depends on the decision-makers’ expectations of the development of the pandemic, the resources required to fight against it, and the ability to enforce the strategy.

A run on the hospitals has resulted in the dire situation that healthcare

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<sup>4</sup> Financial Times (2020) “Defiant Boris Johnson tries to keep Britain open for business”, <https://www.ft.com/content/0475f450-654f-11ea-a6cd-df28cc3c6a68>, 14 March 2020.

<sup>5</sup> Basu, A. (2020) “The ‘herd immunity’ route to fighting coronavirus is unethical and potentially dangerous”, <https://theconversation.com/the-herd-immunity-route-to-fighting-coronavirus-is-unethical-and-potentially-dangerous-133765>, 17 March 2020.

<sup>6</sup> Regalado, A (2020) “What is herd immunity and can it stop the Coronavirus”, Technology Review, <https://www.technologyreview.com/s/615375/what-is-herd-immunity-and-can-it-stop-the-coronavirus>, 17 March 2020.

professionals have to decide whose lives to save as happened in Italy, Spain and the UK (Chisholm, 2020; Sills and Lombrana, 2020; Gianotti, 2020)<sup>7</sup>. It is not good for the morale of the medical professionals and society. What needs to be done is to find ways to “flatten the curve” or even shorten the cycle: i.e. introduce isolation measures that keep the daily amount of cases at a manageable level for medical providers (Specktor, 2020)<sup>8</sup>.

### **A whole of society approach**

A whole of society approach emphasizes not only the central role played by the health sector but also the significant roles of other sectors such as the government, businesses, families, communities and individuals (WHO, 2009)<sup>9</sup>. Each sector can play different roles. There is a close link between the actions of these different sectors. Figure 1 shows the tasks to be taken by each sector and the relationship between them. Mistakes at every level may accumulate problems downwards. For example, if the government departments do not treat the pandemic seriously enough, or sending confusing instructions may result in reduced public compliance, little action in public health monitoring and support, and put massive pressure on the clinical system eventually.

The whole of society approach means that the more capable the public

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<sup>7</sup> Chisholm, J (2020) “Doctors will have to choose who gets life-saving treatment. Here’s how we’ll do it”, Guardian, <https://www.theguardian.com/commentisfree/2020/apr/01/doctors-choose-life-saving-treatment-ethical-rules>, 1 April 2020.

Sills, B. and Lombrana, LM (2020) “Spanish doctors are forced to choose whom to let die”, Bloomberg, <https://www.bloomberg.com/news/articles/2020-03-25/spanish-doctors-forced-to-choose-who-to-let-die-from-coronavirus>, 26 March 2020.

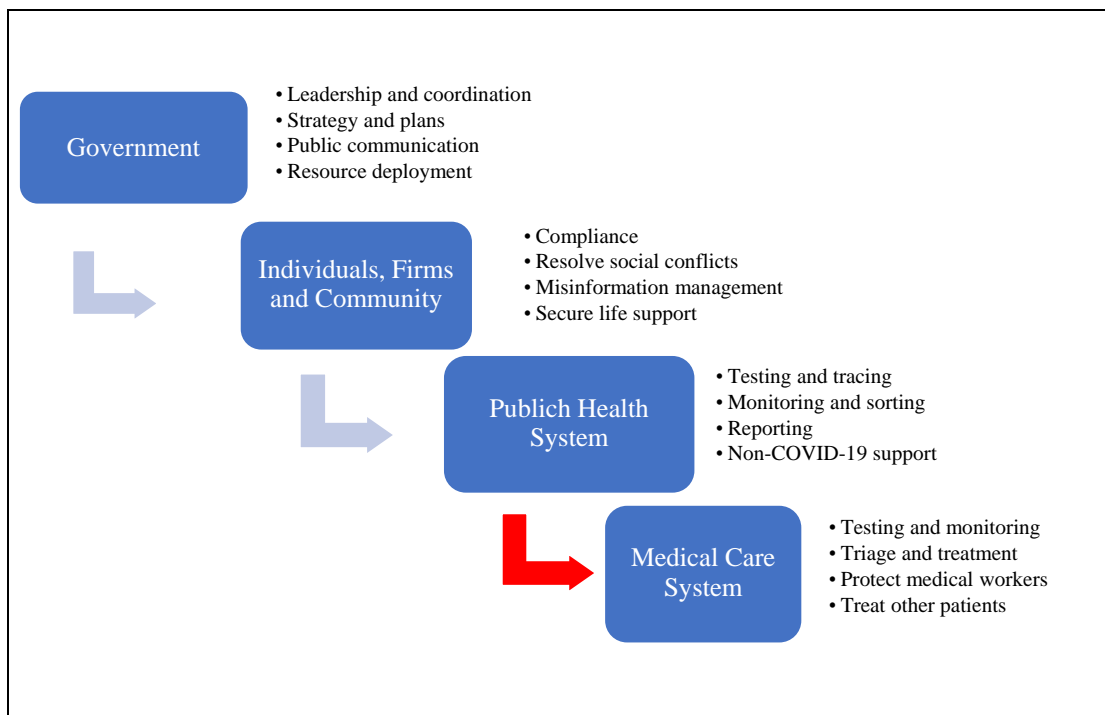
Gianotti, G. (2020) “I’m a doctor at Italy’s hardest-hit hospital. I had to decide who got a ventilator and who didn’t”, ABC News, <https://www.abc.net.au/news/2020-03-27/coronavirus-doctor-cremona-hospital-decide-who-lives-and-dies/12090912>, 27 March 2020.

<sup>8</sup> Brandon Specktor (2020) “Coronavirus: What is ‘flattening the curve’, and will it work?” <https://www.livescience.com/coronavirus-flatten-the-curve.html>, 16 March 2020.

<sup>9</sup> WHO (2009) Pandemic Influenza Preparedness and Response: A WHO Guidance Document? [https://www.ncbi.nlm.nih.gov/books/NBK143062/pdf/Bookshelf\\_NBK143062.pdf](https://www.ncbi.nlm.nih.gov/books/NBK143062/pdf/Bookshelf_NBK143062.pdf).

health sectors are (including the resources, quality of services and management) in testing, preventing, sorting and isolating the prospective patients, the more cooperative the society is in support the actions outside the hospitals, and the better the government is at leading and coordinating the responses, the fewer people will be infected, and the less likely a person would become critically ill.

**Figure 1: Multi-sectoral Interaction and Cooperation**



**Source: the authors' compilation.**

## METHODOLOGY

This research is conducted with comparative policy analysis to classify and compare the three countries' strategies, policy instruments and outcomes, displaying the roles of the four main sectors shown in Figure 1.

The comparison will answer the following questions: 1) What are the national strategies and the considerations behind them? 2) What policies measures are introduced and how they are implemented? 3) What are the



outcomes of these responses?

As the pandemic is still on-going, apart from some journals in the medical field, most academic journals are not yet able to publish research articles on the subject matter due to the longer publication cycle. However, there is an enormous amount of information available online, which allows us to gather information on the practices of each country.

The data on pandemic control practices used in this report comes from three sources: 1) The three-country case reports of pandemic responses published by China Center for International Knowledge on Development. 2) Country policy measures listed in the websites of the three countries' governments, mainstream media, and research-based media articles published by think tanks and academics. Such grey literature provides updated information on the sequence of events. As there are lots of rumours spreading on the internet during the pandemic, we conducted triangulation of data on each source of information. For example, if a media article talks about the comments of an expert, we also traced other interviews done by this scholar in other places to ensure that the information we quoted represents their views. 3) In addition to the data provided in CIKD's country reports, we also cited official data from each country which can be found in the official statistics websites and commercially run databases, and second-hand data from published academic research.

For the comparison, we sorted and populated all the information of each country into the framework shown in Figure 1 to produce a metadata template. We then summarised and analysed the data to capture the features of each country in a given field.



## STRATEGIES

### **Influential factors**

This section examines the pandemic situation, cultural factors and historical imprints, primary conditions, the capability of the clinic system and the balance between different interests. These factors determine the challenges, issues and constraints each country faces.

#### *Pandemic status quo and forecasts*

Understanding the nature of COVID-19 is the basis for developing containment strategies. The assessment of the future trend of the outbreak may also affect their adoption of plans.

Both China and South Korea did not expect a high risk at the beginning when reported cases were few, and the transmission range was limited. The earlier efforts focused on reporting within the disease control system. In contrast, Singapore was on high alert right from the beginning and took preemptive measures. It immediately launched a high-level inter-departmental task force. At the early stage in China, the National Health Commission tried to figure out what was going on in Wuhan and decided to focus on preventing further community transmission. South Korea and Singapore paid close attention to the situation in Wuhan and tried to control imported cases. After the accelerated increase in the number of confirmed cases in China and South Korea, both countries launched cross-sectoral protection and containment mechanisms led by national leaders.

South Korea and Singapore controlled the local transmission, but the outbreak in Europe and America increased the pressure at home and from

abroad. Their containment measures became stricter over time. In the prevention of community transmission, the three countries followed the same principle of early detection, early isolation, and early treatment. This helped to significantly flatten the curve and leave more time for the healthcare system to cope. After COVID-19 turned to a global pandemic, the three countries all strengthened their control of imported cases.

### *Cultural factors or historical imprints*

As many observers in the west have noted that the Chinese general public has a stronger sense of pursuing collective interests, and the majority of people do not mind temporarily give up some personal freedom to eliminate the epidemic as soon as possible (Kim, 2016)<sup>10</sup>. The same can also be said about Singapore and South Korea<sup>11</sup>. As pointed out by Fendos (2020): “Koreans, quite fortunately, tend to be very socially conscious, willing to go out of their way to reduce risks for others. From the perspective of virus containment, this is an incredible gift. Most Koreans will readily admit they wear masks, not only to protect themselves but also to help protect others. Get caught in the streets these days without one, and you will most certainly be greeted with reproach.”<sup>12</sup>

However, this has been criticized for being over-simplistic and cliché (Sonn, 2020)<sup>13</sup>. The so-called culture, such as wearing masks and

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<sup>10</sup> Kim, S. (2016) Public Trust in Government in China and South Korea: Implications for Building Community Resilience. *Chinese Public Administration Review*, 7(1), 35-76.

<sup>11</sup> Logan, J. (2020) “A coordinated response”, *The Current*, <https://www.news.ucsb.edu/2020/019835/pandemic-panic>, 19 March 2020.

<sup>12</sup> Fendos, J (2020) “Lessons from South Korea’s COVID-19 outbreak: The good, bad, and ugly”, *the Diplomat*, <https://thediplomat.com/2020/03/lessons-from-south-koreas-covid-19-outbreak-the-good-bad-and-ugly>, 10 March 2020.

<sup>13</sup> Sonn, JW (2020) “Coronavirus: South Korea’s success in controlling the disease is due to its acceptance of surveillance”, *The Conversation*, <https://theconversation.com/coronavirus-south-koreas-success-in-controlling-disease-is-due-to-its-acceptance-of-surveillance-134068>, 20 March 2020.



maintaining social distancing rules, can be a result of the better awareness of the level of risks for not following expert instructions. The three countries had a painful experience with epidemics caused by coronaviruses (including SARS or MERS).

The same is also reflected in the policymakers' attitudes. China was the first country to fight the COVID-19 pandemic, and there was a minimal initial understanding of the virus. After the leading medical expert in China announced that the virus is highly infectious, widespread, and very adaptive, the strictest measures were introduced, and the governments did everything possible to stop the virus from spreading because they were aware of the severity of SARS. South Korea and Singapore paid close attention to China's pandemic situation and actions, and frequently exchanged information with China to update the information about the virus and shared experience in order to avoid mistakes. The data gradually showed that although the death rate of COVID-19 is higher than that of influenza, it is lower than SARS and MERS. For this reason, South Korea and Singapore did not take as a radical approach as China when formulating their strategies. However, their profound historical experience made the three countries to treat the new coronavirus much more seriously than influenza and did active management.

### *Primary conditions*

Different primary conditions may affect the choice of responses to the pandemic by the national governments. The three countries are very different in terms of their outbreak cycles, population sizes, levels of economic development and regional inequality, and governance ability.

First, these three countries were at different stages of the outbreak cycle. Wuhan, the capital city of Hubei Province, had the first confirmed Chinese case. It was caught in a shock and had no book to follow. However, other regions in China and other parts of the world had more time to prepare. South Korea and Singapore were in a more similar position to other Chinese provinces and major cities in the outbreak cycle.

Second, as shown in Table 1, the three countries are different in population sizes. There are 1.438 billion people in China. The largest province in Guangdong has a population of 113 million. If only the urban permanent population is counted, the Chinese epicentre, Wuhan city, is the seventh-largest city in China. In contrast, the total population of South Korea is 51.26 million, equivalent to China's eleventh largest province, a medium-sized province, closest to Hubei Province. Seoul, the largest city in South Korea, has a population similar to China's fifth-largest city. Singapore is equivalent to the tenth-largest city in China and the second-largest city in South Korea.

Third, the three countries have different levels of economic development and varied level of regional inequality. Among the three countries, the GDP per capita is the highest in Singapore, South Korea is the second, and China ranked the third. Singapore's GDP per capita is nearly five times that of China, and South Korea's is almost three times that of China and Hubei. Daegu, a pandemic area in South Korea with the lowest level of provincial GDP in the country, has a similar level of GDP per capita to Beijing (with the highest level among Chinese provinces). Seoul's GDP per capita is nearly twice that of Wuhan's. The income gap between the highest (Ulsan) and lowest (Daegu) provinces in South Korea is less than three times, while in China, it is about five times between Beijing and Gansu.

**Table 1: Background Information on the Three Countries**

Country	Region	Population (million)	Population density (person/km <sup>2</sup> )	GDP per capita (USD)
<b>China (2019)</b>	National	1,438.1	153.0	10,121.3
	Largest province (Guangdong)	113.5	3,814.0 (Shanghai)	23,802 (Beijing)
	Smallest province (Tibet)	3.3	2.1 (Tibet)	4,792 (Gansu)
	Largest city Shanghai	24.3	24,305.0 (built-up area)	20,130.0
	Hubei Province	59.27	318	11,218
	Wuhan City	11.21	13798.8 (built-up area)	21,100
<b>Korea (2018)</b>	National	51.3	505.1	31,430.0
	Largest province (Gyeonggi)	13.5	1,170.6 (Gyeonggi)	65,093 (Ulsan)
	Smallest province (Gangwon-do)	1.56	90 (Gangwon-do)	23,794 (Daegu)
	Largest city Seoul	9.7	16,096.0	39,558.0
	Daegu	2.5	2,818	23,794
<b>Singapore (2018)</b>		5.8	8,702.8	56,679.2

**Note:** The population density of Shanghai and Wuhan = permanent urban residents / constructed area

**Sources:**

1. China National Statistics Bureau (2020) “2019 China National Economic and Social Development Statistical Communiqué”, [http://www.stats.gov.cn/tjsj/zxfb/202002/t20200228\\_1728913.html](http://www.stats.gov.cn/tjsj/zxfb/202002/t20200228_1728913.html), 28 February 2020. Shanghai Municipal Statistics Bureau (2020) “2019 Shanghai National Economic and Social Development Statistical Communiqué”, <http://tjj.sh.gov.cn/tjgb/20200329/05f0f4abb2d448a69e4517f6a6448819.html>, 28 March 2020. Wuhan Municipal Statistics Bureau (2020) “2019 Wuhan National Economic and Social Development Statistical Communiqué”, <http://www.cjrbapp.cjn.cn/toutiao/p/170580.html>, 30 March 2020. Department of Urban Socioeconomic Investigation, National Bureau of Statistics (2019) 2018 China City Statistical Yearbook. China Statistics Press.
2. Population data for South Korea and Singapore came from Worldometer (2019)-based on UN data. South Korea ’s income data came from Wikipedia.

Finally, the three countries have different governance capabilities. According to the Transformation Index of the Bertelsmann Stiftung (2018), China faced the highest level of difficulty in governance with the most

significant structural constraints. Its governance performance score is lower than the other two countries. In terms of the ability of the government to set the priority and implement it, China's score is as same as Singapore's, but lower than South Korea's. It also has a lower score of resource efficiency. All these factors mean that the government would face much more difficulties in implementing rapid responses in an emergency.

**Table 2: Governance Index of the Three Countries**

Index	Country		
	China	South Korea	Singapore
Level of Difficulty	6	1	1
Structural constraints	9	5	6
Governance Performance	5.33	7.88	7.13
Prioritization	5	8	5
Implementation	5	6	5
Resource Efficiency	5.7	7.3	9.3
Efficient use of assets	6	8	9

**Note:** Structural constraints: To what extent do structural constraints affect the political leadership's governance capacity?

Prioritization: To what extent does the government set and maintain strategic priorities?

Implementation: How effective is the government in implementing its own policies?

Efficient use of assets: To what extent does the government make efficient use of available human, financial and organizational resources?

**Sources:** BTI (Transformation Index of the Bertelsmann Stiftung) Project Team (2018) Codebook for Country Assessments, [project.org/fileadmin/files/BTI/Downloads/Zusae](https://www.bti-tzliche-Downloads/BTI2018_Codebook.pdf) [https://www.bti-tzliche-Downloads/BTI2018\\_Codebook.pdf](https://www.bti-tzliche-Downloads/BTI2018_Codebook.pdf)

### *The capacity of the clinical system*

The availability of medical resources is essential to decide how to respond. This includes local resources and other resources that can be mobilised at the fronts of medical service and community support.

Table 3 shows, the number of hospital beds per 1,000 people in China is 5.64, in Hubei Province is 6.77, and in Wuhan is 7.56. As a vital province

in central China, the number of hospital beds per thousand people in Hubei Province is higher than the national average and also higher than the number of Singapore (2.8), but much lower than 12.27 in South Korea. The number of critical care beds per 100,000 in China is 3.6, in South Korea is 10.6 and in Singapore is 11.4. Although the number of hospital beds per 1,000 people in Singapore is not as high as in China and South Korea, its resource of critical care beds per capita is more abundant than in the other two countries, 3.2 times that of China, and 0.8 more than South Korea. In terms of doctor numbers, there are 2.4 doctors per 1,000 people in China, 2.57 in Hubei Province, 3.42 in Wuhan, 2.34 in South Korea, and 2.4 in Singapore. In China, the capabilities of medical professionals in different regions are uneven (Wang, et al., 2017)<sup>14</sup>.

**Table 3: Medical Resources in the Three Countries**

Country	Region	Hospital beds per 1000 persons	Critical care beds per 100,000 persons	Doctors per 1000 persons
China	National	5.64 (2019)	3.6 (2017)	2.4 (2017)
	Hubei Province	6.77 (2019)		2.57 (2018)
	Wuhan City	7.56 (2019)		3.42 (2018)
South Korea	National	12.27 (2017)	10.6 (2017)	2.34 (2017)
Singapore	National	2.8 (2015)	11.4 (2017)	2.4 (2017)

**Source:** Statistic Bureau of Hubei Province (2019) Hubei Statistical Yearbook 2019, China Statistics Press.

So, W. (2020) “Hospital bed density in South Korea from 2000 to 2017”, <https://www.statista.com/statistics/647213/hospital-bed-density-south-korea>, 24 March 2020.

Phua, J., et al. (2020) Critical Care Bed Capacity in Asian Countries and Regions, *Critical Care Medicine*, 48(5), 654-662.

Statstia (2020) <https://www.statista.com>.

<sup>14</sup> Wang, Z., et al. (2017) Records of Medical Malpractice Litigation: A Potential Indicator of Healthcare Quality in China. *Bulletin of the World Health Organization*, 95(6), 430-436.



### *Balancing other interests*

The balance of different interests determines which goals to prioritise during containment. The decision-makers need to strike a balance between public safety and health, economic development and individual rights (such as the right to life and health, the right to personal freedom, the right to information and the right to privacy). There is also a need to balance long-term and short-term performance.

In China, the central government announced on 25 January 2020 that people's lives and health would be in the first place in its response to the pandemic (People's Daily, 2020)<sup>15</sup>. The Chinese economy as one of the world's largest manufacturing economy has a more varied portfolio, and the domestic market still has potential to develop. This means that it may have more room to absorb the pressure imposed by short-term inactivity than smaller countries.

In South Korea, the strategy of pandemic control is related to the election on 15 April. Containing the pandemic can win praise from the public, but the overly aggressive strategy will face criticism from the opposition. Drawing lessons from the MERS epidemic, the government values information disclosure to the public. Constrained by the fear of votes loss, it is more difficult for politicians in restricting people's freedom to move. The South Korean economy is highly export-oriented. The economic impact of a total shutdown would create a significant threat to local businesses that have lots of international interests.

Singapore is tuned to be on high alert of potential threat to its national

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<sup>15</sup> People's Daily (2020) "Putting people's lives and health in the first place", [http://www.xinhuanet.com/politics/2020-01/28/c\\_1125507344.htm](http://www.xinhuanet.com/politics/2020-01/28/c_1125507344.htm), 28 January 2020.



security because it is such a small country. The sudden pandemic is perceived to be a new national security threat and must be actively controlled. It has a high degree of international integration with the world economy, with a large amount of flowing population. As a city-state, it cannot use interregional support as a buffer. Pausing the economy and population movement would be very costly. Seeing the import cases had not led to community transmission, it opted to contain the virus with the least disruption to the economy.

Under the great epidemic, the three countries have placed public safety and health in an important position and guided the people to cooperate with prevention and control by guaranteeing the right to know, and personal freedom and privacy have made certain compromises for it.

#### *Overall advantages and disadvantages*

These background factors show that the pandemic management tasks are much more substantial in Wuhan and more broadly Hubei Province, where the governments started to take aggressive responses when there were already severe community outbreaks. It demanded the Chinese government to react more urgently and decisively, and the government was ready to do so. The critical challenge was the insufficient knowledge of the nature of the virus, fewer average resources and relatively more governing difficulty. The decision-makers had to find ways to overcome the constraints.

The fact that China is a big country with many regions and with a unitary governing structure helped China to defeat the bottleneck. The central government could enlist other local governments to support Wuhan. Local officials performing badly in fighting against the pandemic could be

removed from office. Also, the media frequently compared the performance of different regions which helped to put pressure on the reluctant officials in some regions. As a result, despite that Wuhan's medical resources were not sufficient to protect Wuhan from the pandemic and China's medical supplies were also not enough for fighting pandemic with equal force across the country, the central government could deploy high-quality medical resources from other parts of the country to Wuhan as long as the other regions could ensure that they would not be in shortage of such resources. By 25 March, a total of 42,000 medical professionals arrived in Wuhan from all over the country bringing along all the equipment for intensive care units and gears.

It also has an integrated Joint Prevention and Control Mechanism running across different levels of governments to carry out inter-departmental coordination (Zhang & Li, 2011)<sup>16</sup>. The general public has a strong expectation for the government to solve their problems (Zeng, 2011)<sup>17</sup>. At the street level, Chinese Communist Party and government offices are intertwined with the self-governance organisations such as the Resident Committee (Li, et al., 2019)<sup>18</sup>. This governing structure allows the government to be quite confident that they are able to mobilise the support of local governments, social organisations and volunteers to offer support. The advantages of developed platform technology, strong financial strength, solid infrastructure, and strong manufacturing capabilities all help to centralize the allocation of resources, implement precise prevention and

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<sup>16</sup> Zhang, Y., & Li, B. (2011) Motivating Service Improvement with Awards and Competitions-hygienic City Campaigns in China. *Environment and Urbanisation*, 23(1), 41-56.

<sup>17</sup> Zeng, J. (2014) The Debate on Regime Legitimacy in China: Bridging the Wide Gulf between Western and Chinese Scholarship. *Journal of Contemporary China*, 23(88), 612-635.

<sup>18</sup> Li, B., Hu, B., Liu, T., & Fang, L. (2019). Can Co-production Be State-led? Policy Pilots in Four Chinese Cities. *Environment and Urbanisation*, 31(1), 249-266.



control, emergency production of materials and protect people's lives.

In South Korea, a comprehensive and inter-sectorally coordinated disease control system was established. With the execution of the high-level leaders, the central and local governments can coordinate efficiently. The government is confident that with strong warnings and advice through multiple channels, the public would be likely to comply. Its well-developed medical industry and financial capability can help prevent and containment of the virus, as well as stimulate the economy at this time (Ferrier, 2020) <sup>19</sup>.

In Singapore, the government has fewer administrative levels than larger countries and is known for strong policy implementation capabilities supported by meritocracy (Teo, 2018) <sup>20</sup>. The legal system is comprehensive, and the rule by law is strict. The public has a higher degree of trust in the government and the media than other developed countries (Edelman Trust Barometer, 2019) <sup>21</sup>. The country has influential community organisations and an integrated care system at the community level (Lim, et al., 2019)<sup>22</sup>.

What needs to be highlighted is that all three countries have been front runners for digital technology industries and the general public is more curious about and acceptable to digital applications and are less sensitive about digital surveillance than people in the west (Sonn, 2020)<sup>23</sup>.

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<sup>19</sup> Ferrier, K (2020) "South Korea ramps-up exports of COVID-19 testing kits", The Diplomat, <https://thediplomat.com/2020/04/south-korea-ramps-up-exports-of-covid-19-testing-kits>, 9 April 2020.

<sup>20</sup> Teo, T. A. (2019) Perceptions of Meritocracy in Singapore: Inconsistencies, Contestations and Biases. *Asian Studies Review*, 43(2), 184-205.

<sup>21</sup> Edelman Trust Barometer (2019) "Singaporeans' trust up in government and media: Survey", <https://www.straitstimes.com/singapore/singaporeans-trust-up-in-govt-media-survey>, 18 March 2019.

<sup>22</sup> Lim, C., Lim, I., & Chern, S. J. (2019) Building Enabled Communities in Singapore. *International Journal of Integrated Care*, 19(4), 1-8.

<sup>23</sup> Sonn, J.W. (2020) "Coronavirus: South Korea's success in controlling the disease is due to its acceptance of surveillance", The Conversation, <https://theconversation.com/coronavirus-south-koreas-success-in-controlling-disease-is-due-to-its-acceptance-of-surveillance-134068>, 20 March 2020.

## National strategies

After the outbreak, China, South Korea and Singapore have all adopted active strategies to contain the pandemic. The policy mix of the three countries was aligned with their respective national conditions.

China took the most aggressive route. It introduced a wide lockdown early on, not only in the pandemic's epicentre but also in other parts of the country. The wide lockdown facilitated Hubei to be relieved its situation more quickly. Once the virus was effectively contained, economic activities gradually returned to normal. In the first two months of lockdown, there was no strict travel ban from other countries. Starting from the second half of March, international travel bans or limits were introduced to reduce imported cases.

The outbreak in South Korea in February was quickly under good control. South Korea has managed to strike a delicate balance between health protection and maintaining the freedom of human movement. South Korea's response was focused on testing, tracing and isolation. Surveillance based on digital technology played a central role. South Korea did not introduce a domestic travel ban, and the cities and communities was not locked down in a strict sense. International travellers were sorted into different groups, registered and managed differently. There were limitations to visa approval, travel advice and reduction of flights. There has been an increased level of control over inbound travellers.

Singapore adopted an evidence-driven public health intervention. The intervention is adjusted to a higher level if the severity of transmission increased. The idea was to stay one or two steps ahead of the pandemic. Singapore did not lock down the city until 7 April. Instead, Singapore



imposed stricter rules to enforce social distancing and implemented them diligently. New digital apps were introduced to maintain social distancing. Border control was based on classified management and dynamic adjustment. The scope of monitoring was enhanced. High-risk groups were banned from entering the country or had their visas cancelled.

## **POLICY MEASURES AND IMPLEMENTATION**

Pandemic response strategies require specific measures for implementation. The actions need multi-level policies to be consistent and coordinated across the board. As discussed earlier, pandemic control requires four important elements: the leadership and coordination of the government, the front-line battles by the medical care services, the testing, identification and referral by the health system, and compliance and support by the individuals, firms and communities. To a certain extent, the combination of policy tools for anti-epidemic measures depends on the government's judgment on the ability of policy implementation and support systems, as well as the ability to feed back promptly and correct errors.

### **Management system and leadership**

#### *China*

China established a four-phased disease management system after the SARS epidemic in 2003 and published the *National Emergency Response Plan* (Wang, et al., 2016)<sup>24</sup>. The response to public health incidents was led by the National Health and Family Planning Commission and now the

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<sup>24</sup> Wang, Z., et al. (2016) The Disaster and Emergency Management System in China, <https://www.hkjcdpri.org.hk/download/policy/PolicyBriefDisasterandEmergMxSysinChina.pdf>, May 2016.

National Health Commission. Xi Jinping presided the pandemic containment campaign. During the pandemic control period, the central government sent working groups to Hubei Province to lead the work.

The underpinning principle used in China for pandemic management is “concentrating on the most significant issue” (jizhong liliang ban dashi), involving the whole of government and the whole of society (quan zhengfu, quan shehui). The resources (human, medical equipment and personal protection equipment (PPE)) were centrally deployed throughout the country. The resources for treatment and protection were concentrated to support the frontline. At the same time, the state guaranteed the supply of daily necessities to the residents of the pandemic. At the community level, grassroots officials and volunteers worked together to solve practical problems.

### *South Korea*

Disease management in South Korea was led by two agencies: The Ministry of Health and Welfare (MHW) and the Central Emergency Response System of the South Korean Center for Disease Control and Prevention (CDC). When the level of emergency was raised from Blue to Orange, the Central Incidence Management System (IMS) (a backup integrated disaster management mechanism) was activated to promote cross-ministerial cooperation. On 30 January, the President Moon Jae-in, the Premier, Deputy Premier, the relevant ministers, mayors and governors of provinces and cities were called in to discuss a coordinated action plan. After the meeting, the IMS held two or three sessions a week. Each ministry set up a dedicated task force to respond to COVID-19. Thus a “pan-government” contact network was created.



After raising the alert level to red, the Central Disaster and Security Response Headquarters (CDSCHQ) led by the Prime Minister was established to enhance the government's response to COVID-19. At the local level, each municipal government set up a local Disaster and Security Countermeasures Headquarters, led by the head of the local government. When a local government reported shortages of hospital beds, human resources and supplies, the central government would assist.

### *Singapore*

Singapore used an inter-departmental working group plan system for pandemic management. This planning system was established after the SARS epidemic in 2003 to ensure that when a public health crisis occurs, the government can take control, centralise decision-making, and respond quickly. On 22 January, proposed by the Minister of Health, the Multi-Ministry Task Force was launched, with Vice Premier as an adviser, Health Minister and National Development Minister as co-chair. Members from 8 Government departments are the Ministry of Communications and Information, the Ministry of Trade and Industry, the Ministry of the Environment and Water Resources, and the National Trades Union Congress, Ministry of Education, Ministry of Manpower, Ministry of Social and Family Development, and Ministry of Transport. Singapore's next generation of leaders also participated in this working group. Inter-departmental working groups met every day to discuss the outbreak and responses and held press conferences frequently to announce the development of the outbreak and significant response measures.

Generally speaking, in the organisation of pandemic management, the three



countries all set up emergency management systems and produced an emergency response plan. The management system has the top leader as the chief commander involving multiple government departments. Dedicated working groups are formed. In China and South Korea, there are several layers in the hierarchy. Although the three countries have the same pandemic governance structure, because China is a super-large country with more layers of government, it is more likely for China to take a longer time to respond even if everyone follows the reporting rules diligently. Singapore is a city-state, and the speed of response would be unavoidably faster than that of China and South Korea. This issue shows the merit of devolving decision power to the local level or shorten the reporting line.

### **Citizen communication and information disclosure**

Information transparency is essential for pandemic management. The void credible information will be filled in by misinformation, causing unnecessary difficulties for pandemic control. Pandemic management requires the public to change their behaviour. People will not be able to protect themselves or others without having access to the correct information. Therefore, transparency and skillful communication with the public are the key to effective implementation. The way of communication should not be top-down only (Gesser-Edelsburg, et al., 2014)<sup>25</sup>. The communicators need to be more creative and rely on the communities.

#### *China*

After the outbreak of the pandemic, the Health Committees around China

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<sup>25</sup> Gesser-Edelsburg, A., et al. (2014) Risk Communication Recommendations and Implementation during Emerging Infectious Diseases: A Case Study of the 2009 H1N1 Influenza Pandemic. *Disaster Medicine and Public Health Preparedness*, 8(2), 158-169.



began to update the information on the epidemic at the national and local levels every day. Starting from February 5, the Joint Prevention and Control Mechanism of the State Council held daily press conferences to update the epidemic situation and corresponding measures in a timely manner and address critical issues at home and abroad. A team of credible experts were assembled to distribute relevant knowledge to the public. To make sure the message could reach everyone, including the elderly people and those who were not skilful in acquiring information online, posters, banners, easy to remember slogans, hotlines and broadcasts were all applied. Social media, such as WeChat and QQ, played the role of a virtual group organization. Some platform firms cooperated with authoritative institutions to publish trustworthy information in real time, popularized health education, and helped identify rumours. Official announcements, expert answers and corporate participation effectively stabilized the people's morale.

### *South Korea*

The South Korean government updated the pandemic situation twice a day and held a regular press conferences. Multimedia (website, social network, broadcasting system) updated information, and websites or mobile apps publicized the locations of the infected persons. Several ministries and commissions established a news response system to combat false news, and the Broadcasting and Communications Commission fact-checked the rumours and clarified them in time. Codes of conduct were offered to government employees, medical professionals and the entire society. South Korea's anti-epidemic measures were affected by party politics (Rich, et

al., 2020)<sup>26</sup>. Some South Korean media's criticism of the pandemic treatment was highly politicised. Negative comments made front-line work more difficult and had jeopardized public safety.<sup>27</sup>

### *Singapore*

Inter-departmental working groups held regular press conferences to announce the development of the pandemic situation and significant policy measures. National leader Lee Hsien Loong will give a public speech to stabilize social sentiment at a critical moment.<sup>28</sup> The government published information, policy measures and suggestions through various means such as TV broadcasts, HDB (housing & development board) area bulletin boards, official website of the Ministry of Health and social media, and uses law (*Protection from Online Falsehoods and Manipulation Act*) to combat false information and rumours (Singapore Legal Advice, 2020)<sup>29</sup>. In addition, media also addressed all aspects of people's lives: clothing, food, housing, transportation, shopping, medical treatment, child care, religious activities, funerals, money withdrawal, fitness, dog walking, haircut, borrowing books, sending and receiving mail, and even gambling (Chong, 2020).<sup>30</sup>

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<sup>26</sup> Rich, T.S., et al. (2020) "The public judgment of South Korea's COVID-19 response", <https://www.lowyinstitute.org/the-interpreter/public-judgment-south-korea-s-covid-19-response>, The Interpreter, 27 March 2020.

<sup>27</sup> Fendos, J (2020) "Lessons from South Korea's COVID-19 outbreak: The good, bad, and ugly", The Diplomat, <https://thediplomat.com/2020/03/lessons-from-south-koreas-covid-19-outbreak-the-good-bad-and-ugly>, 10 March 2020.

<sup>28</sup> For example, after cases of local human-to-human transmission appeared, Singapore announced on February 7 to increase the alert level from yellow to orange, which triggered a supermarket stockpile. Premier Lee gave a televised speech on the next day and then social sentiment quickly stabilized. After WHO announced that COVID-19 was a pandemic, Premier Lee delivered a second televised speech on March 12 to introduce the development of the outbreak in Singapore and the government's response measures.

<sup>29</sup> Singapore Legal Advice (2020) Singapore Fake News Laws: Guide to POFMA (Protection from Online Falsehoods and Manipulation Act), <https://singaporelegaladvice.com/law-articles/singapore-fake-news-protection-online-falsehoods-manipulation>, 3 February 2020.

<sup>30</sup> Chong, C. (2020) "COVID-19 circuit breaker measures: What you can and cannot do for the next one month", The Strait Times, <https://www.straitstimes.com/singapore/a-new-normal>, 5 April 2020.



On the whole, China, South Korea and Singapore all pay great attention to prevent fake news while disclosing information. Singapore pays more attention to legal means than China and South Korea. China uses internet monitoring and public supervision. Singapore's national leader frequently communicates with the public, and then guides people through various media to provide meticulous daily guidance, which not only provides convenience but also helps to reassure the people and reduce panic. Another important lesson is that effective information management needs lots of local supports and creativity.

### **Maintain social distance, reduce social activities and human movement**

Maintaining social distance is an important part of mitigating the pandemic. It may cut off the transmission path and reduce the speed of virus transmission. The most radical way is to minimize human movement through the lockdown of cities, communities and even households. The more lenient approach is to urge people to maintain social distance. The implementation can be monitored by law enforcement staff or electronic facilities based on individuals' self-discipline.

How to maintain social distance depends on two factors. One is whether the public would comply. Due to the strong externality of the pandemic, people's health depends on how others' behave. In this case, in order to ensure the safety of the individual, an interventionist approach towards freedom to move is used. The second is the capability of law enforcement. The smaller the unit for locking down, the greater the difficulty in enforcement. For example, the lockdown of a country or a city without

stopping people from moving within the country or the city, then people's life may not be disrupted that much, and law enforcement may not be very complicated. The enforcement would be controlling several major ports and road entrances. However, if the lockdown is at the community level or about buildings, the manpower and resources required to enforce, and support would be exponentially greater.

Comparing the three countries, China's policy was mostly about the lockdown of cities and communities. Buildings and units are locked down in places where the pandemic was serious. The reasons why China adopted the most aggressive and comprehensive measures in Wuhan has several considerations. Wuhan is a transport hub linking to nine provinces by highspeed train. The outbreak took place during the Lunar New Year era when people often travel to their hometowns or home villages for family gatherings. Some others will travel abroad for the holidays<sup>31</sup>. Most of the travellers will use packed public transportation and transportation hubs. If Wuhan and its surrounding cities were not shut down, the virus could have spread to the whole country and the world much faster. Besides, families and friends are expected to visit each other and gather together during the holiday season. Therefore, it was unrealistic to expect the public to comply with social distancing rules without vigorous enforcement. The lockdown of Wuhan city would not only help to contain the infection, but also send a strong signal to the people across the country that everyone must stop unnecessary social activities. Of course, this decision also came with the hope that the pandemic would end soon after the spring break so that the

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<sup>31</sup> The Ministry of Transportation estimated that the total number of journeys for 2020 Spring Festival would be 3 billion, the most massive human migration in human history. Source: Bloomberg News (2020) "China will rack up three billion trips during world's biggest human migration", <https://www.bloomberg.com/news/articles/2020-01-20/china-readies-for-world-s-biggest-human-migration-quicktake>, 23 January 2020.



negative impacts on the economy and the society would be kept low.

China required the people to wear a mask in public places. This reduced the difficulties in supervising and maintaining social distance in public places. At the same time, the mask was highly visible; the law enforcement people could spot it from afar, which was easier to detect than checking whether people keep enough distance. Therefore, the combination of China's social distancing and lockdown methods was a more practical solution based on its limited resources and capacity to enforce the regulations. In the course of China's pandemic containment period, there were indeed small numbers of law enforcers who did not behave professionally. It is precisely these few cases that have created the illusion that China's containment effort is excessive.

South Korea did not lock down any cities. Singapore only started to lock down on the 7 April. South Korea's social distancing relies on good compliance and warning, but it is not enforced. Singapore relied heavily on legal means to enforce. Some people often compare Singapore with China and think that China has "draconian" regulations. However, if we look at the methods to enforce social distancing, requiring people to voluntarily maintain social distancing and isolation is to some extent a "lockdown" at the individual level (e.g. maintaining a distance of one meter). This requires powerful capacity for surveillance. In addition to law enforcement, ground markings, numerous volunteers, Singapore also introduced special "social distance ambassadors". It is worth mentioning that under heavy penalties, there are not many Singaporeans who dare to break the law (Tan, 2020)<sup>32</sup>.

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<sup>32</sup> Tan, H. (2020) "Singapore will jail and fine people who do not keep a 1-meter physical distance in public", <https://www.cnbc.com/2020/03/27/singapore-imposes-jail-and-fines-for-breaches-of-public-social-distancing.html>, 27 March 2020.

## Testing, tracing and isolation

Testing, tracing and isolation are effective means to identify, confirm and control the sources of infection. COVID-19 has a long incubation period, and early symptoms are not distinctive. It is necessary to conduct testing to distinguish the sick person, the virus carrier and the healthy person. After the screening is completed, it is essential to track close contacts through epidemiological investigations and other methods and take necessary isolation measures for patients, suspected patients and close contacts.

### *China*

China's testing capacity improved after the outbreak. In the early days of the pandemic, there were insufficient testing kits. After the Chinese government commanded to test all suspected patients and close contacts, the speed and ability of testing increased and the power of testing is delegated to lower levels.

The work of contact tracing was mainly carried out by medical professionals. Through the epidemiological survey and the big data platform firms, close contacts were identified with the help of grassroots community organizations, grassroots health services, disease prevention and control agencies, and public security departments. When necessary, according to the travel trail of the case, the hospitals could retrieve CCTV footages to support CDC's tracing, and the public security department provided assistance in the investigation of other public places.

At the beginning of Wuhan's lockdown, patients were recommended to isolate at home, which led to the infection of family members. To stop this,



the Chinese government decided to carry out concentrated treatment of all confirmed cases and adopt a strategy of “isolating all if necessary” (yingge jing). Different groups generally adopted three kinds of isolation methods: home isolation and observation, home medical isolation and observation, and centralized medical isolation and observation. Local governments acquired hotels and other places as centralized isolation sites, which were free of charge to the people under centralized quarantine. The local governments carried out an intensive investigation, and some regions used the isolation index as a performance evaluation indicator. Dedicated personnel were assigned to each community, and each person had specific responsibilities.

### *South Korea*

Large-scale testing and screening are the prominent features of the practice in South Korea. Most testing capacities were developed before the outbreak of Daegu. As of late March, South Korea had 118 test sites, including 23 public facilities (many of which were “drive-in testing clinics”), 81 medical facilities, and 14 commercial laboratories offered testing and diagnostic services. South Korea tested nearly 20,000 people every day and the scope of testing also expanded. The test was free for those who recently returned from China, contacted a confirmed patient or other people at high risks. For those who did not belong to these categories but wanted to be tested, the test would be 160,000 South-Korean won (about 129 US dollars). If the test result was positive, the charge would be reimbursed.

Immediately after the test, extensive tracing was carried out. The tracing was supported by surveillance cameras, smartphone data, and credit card



records to accurately (up to minutes) record the patient’s travel and socializing. The government also authorized and encouraged innovative ways to share information, such as using GPS tracking applications to monitor, publishing patient activities in real time, and penalising violations of isolation rules. Any close contacts identified through epidemiological investigations were isolated and managed one-on-one by the Ministry of Interior and Security and the local government. For those who were in close contact and those with mild symptoms, if their family members did not have chronic diseases and could measure their own temperature, they would be required to isolate themselves within two weeks. A local monitoring team would talk to the person in home isolation twice a day to ensure that these people stay where they should be. They would also ask and follow their health status by phone. Those who violated the isolation rules would be fined up to 3 million South-Korean won (about 2,428 US dollars).

### *Singapore*

Singapore attached great importance to testing. It stressed that instead of isolating people at home, it was better to screen patients and take care of them. The targeted group for testing included all suspected patients, influenza patients, high-risk groups, close contacts, ordinary pneumonia patients and other doctors referred patients.<sup>33</sup> It had 6,800 tested cases per million population (including foreigners in Singapore), slightly higher than

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<sup>33</sup> Ng Y., et al. (2020) “Evaluation of the Effectiveness of Surveillance and Containment Measures for the First 100 Patients with COVID-19 in Singapore — January 2-February 29, 2020”, *Morbidity and Mortality Weekly Report*, 20 March 2020, Vol. 69, No. 11

Xia, Z. (2020) “Zenlike responding to the pandemic — the experience of Singapore”, <http://zhishifenzi.com/depth/depth/8559.html>, 22 March 2020.

South Korea (6,500 cases per million people).<sup>34</sup> The test-related costs were borne by the Singapore government. Public health officials would contact all contacts by phone and assess symptoms. The tracing team of the Ministry of Health continued to expand, and police and civil defence forces also joined. Those who tested positive must be isolated from relatives and friends, and those with symptoms were all concentrated in the hospital. People with symptoms were not advised to do isolation at home. Suspected cases would be inspected at the door. Offenders would be punished harshly by law. Starting from March 20, the “Trace Together” application automatically checked close contacts.

**Table 4: Testing in the Three Countries (as of April 6)**

Country \ Testing	China			Singapore	South Korea
	National	Hubei Province	Wuhan City		
<b>Test number</b>				65,000	466,804
<b>Confirmed cases</b>	81,740	67,803	50,008	1,375	10,284
<b>Test people/million</b>	Not test all	Not test all	Not test all	11,396	9,231
<b>Test positive rate per thousand</b>	-	-	-	20	22

**Data source:** Singapore Ministry of Health (2020) “Number of Covid-19 tests performed and daily updates on national health statistics for comparison”, <https://www.moh.gov.sg/news-highlights/details/number-of-covid-19-tests-performed-and-daily-updates-on-national-health-statistics-for-comparison>, 6 April 2020. Korea CDC (2020) “Coronavirus infection-19 domestic outbreak status (April 5, 00:00)”, 5 April 2020.

## Care and treatment

Caring for and treatment of patients is as important as controlling the

<sup>34</sup> Statement by Mr Gan Kim Yong, Minister for Health, at the Singapore Parliament, 25 March 2020.

spread of the pandemic. If the patients cannot be cared for and treated in time, it will affect the cure rate and the mortality rate and cause considerable losses to the health and lives of the people.

### *China*

In order to deal with insufficient medical resources, the central government improved the deployment of national medical resources. In Wuhan, large hospitals were teamed up with temporarily acquired hospitals so there could be more beds for patients with fever. Leishenshan and Huoshenshan hospitals were built in about ten days to receive COVID-19 patients. In addition, public utilities such as the stadiums and convention centres were transformed into shelter hospitals (also called “square cabins” or fangcang) to offer more beds for centralized isolation. The central government also urged local governments in other provinces to send supporting medical teams to Hubei Province. Digital technology was also used for remote diagnosis and treatment with doctors who could not come to Wuhan. The government promised to “leave no patient uncared for and leave no patients untreated” and took all confirmed cases into the clinical system. To enhance productivity, it developed a special model of treatment: “concentrating patients, concentrating specialists, concentrating resources, and concentrating treatment”. It sorted patients with mild and critical symptoms and treated them separately. Great emphasis was put on protecting and respecting medical professionals. All medical professionals would receive three-day training before they could join the others at the front line. Apart from PPE, they were also arranged to work in shorter shifts so that they could rest properly.

### *South Korea*

The patients were sorted by the severity of the disease into four categories:



mild, moderate, severe, and critical. Mild and more severe cases are transferred to hospitals and treated in negative pressure isolation rooms or infectious disease hospitals according to standardised treatment protocols. Acute patients were sent to the designated emergency centre, and mild patients were treated at community-based treatment centres. Ninety-one hospitals were designated as public relief hospitals and set up dedicated and separated areas for patients with pneumonia-like symptoms. Doctors and nurses and nursing assistants were dispatched to the community treatment centres to assist in their work. Starting from the first week of March, community treatment centres in each city/province could treat mild patients to relieve pressure on the hospital.

### *Singapore*

Confirmed cases in Singapore were required to receive medical treatment. There were ten public emergency general hospitals that provided comprehensive inpatient or outpatient services, 24-hour emergency services, and services for women, children and mental health. In addition, there were eight private emergency general hospitals and one non-profit general hospital. There was also a newly built Singapore National Infectious Diseases Center equipped with public clinical laboratories, testing centres and isolation wards. Public health prevention clinics can obtain resources provided by the Ministry of Health and can preferentially receive antiviral drugs and antibiotics from national stocks.

To sum up, in the medical sector, all three countries treat suspected cases very seriously. South Korea and Singapore test a more substantial proportion of the population than China. Three countries all adopt patient sorting practice which helps to divert the pressure on ICUs. All three

countries have a centralized deployment of medical resources, which are particularly important when the outbreaks are not evenly distributed across the country. Singapore is less well-cushioned in this sense as the city-state has less capacity for interregional support.

### **Supplementary measures and social support**

Pandemic management will inevitably use resources from other sectors and affect economic activities and disrupt people's lives. Without additional measures and active support from the society, the strategy can hardly be implemented appropriately. To a great extent, what kind of approach the government adopts depends on public compliance, and whether communities, enterprises, and individuals have the ability to form alliances to support the government's strategy. Communities, volunteers and companies have all played important roles in the containment activities in the three countries.

#### *China*

Locking down posed a challenge for food supply. After lockdown, cities like Wuhan began to use urban grain reserves and organised inter-provincial mutual support. During the pandemic, residents could purchase food through digital platforms and the delivery services continued to work. Community social workers or property companies coordinated food delivery.

China did not provide cash subsidies to the public, but it offered various forms of in-kind assistance and cash assistance. In addition, grassroots staff and institutions strengthened their visits, and helped the people in need, especially the elderly people and poor people (Ministry of Civil Affairs,



2020)<sup>35</sup> In order to help small- and medium-sized enterprises (SMEs) to overcome difficulties, the central and local governments issued a series of policies, such as offering targeted credit and financing support and reducing tax and fee reduction.

New technology was widely used. Big data and health codes provided references for gradually unlocking the cities (Science and Technology Daily, 2020-2-28)<sup>36</sup>. The online maps for “COVID-19 Designated Hospitals and Fever Clinics” could offer remote consultation and early warning intelligence.<sup>37</sup> Some large platform firms also promoted apps for remote work and education, so as to reduce the impact of office and school close.

At the community level, in addition to full-time professionals, a large number of street-level local officials and volunteers joined in the work. After the lockdowns, the central government proposed to provide community workers with subsidies, occupational injury insurance, health checkups and psychological consultation, improve labour protection, and offer awards.

### *South Korea*

The South Korean Ministry of Planning and Finance used the supplementary budget plan to support pandemic management. It provided low-interest loans and other means to support SMEs and business owners affected by the pandemic. Daegu and Gyeongsangbuk received special

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<sup>35</sup> Ministry of Civil Affairs (2020) “Subsidies for people with difficulties can be issued in areas with severe epidemics”, China News, <https://m.chinanews.com/wap/detail/zw/gn/2020/04-01/9144395.shtml>, 1 April 2020.

<sup>36</sup> Science and Technology Daily (2020) “Big data strongly supports the epidemic prevention and control”, [http://www.xinhuanet.com/tech/2020-02/28/c\\_1125633167.htm](http://www.xinhuanet.com/tech/2020-02/28/c_1125633167.htm), 28 February 2020.

<sup>37</sup> Wang H.W.(2020) “Promote specialization, institutionalization, and intelligence of emergency management”, [http://www.qsttheory.cn/zhuanqu/bkxj/2020-03/10/c\\_1125690436.htm](http://www.qsttheory.cn/zhuanqu/bkxj/2020-03/10/c_1125690436.htm), 10 March 2020.

support to fill in the gap in local revenues. In order to stimulate consumption, the South Korean government planned to issue shopping vouchers to about 5 million low-income people and the elderly in the next four months and provide 10 per cent subsidies to the price of household appliances. The support was provided to those who were self-isolated, although the amount was not large, it could provide basic living security for those affected by the control measures.

In addition, the government attached great importance to the cooperation with religious institutions for the containment work and called on the congregation to cooperate with the government. Many NGOs in South Korea demanded the government to take measures to support disadvantaged and elderly groups and helped to fill in the gap of social work.

### *Singapore*

The Singaporean government increased employment assistance. Support low- and middle-income people and graduating students with subsidies, cash assistance, employment training, and job fairs.<sup>38</sup> At the same time, cash, supermarket vouchers and coupons were distributed to all adults. There were also subsidies for community development. College students were also allowed to defer repayment of student loans.

The government also proposed a series of support for enterprises, including tax relief, real estate rebates, delayed payment of income tax, strengthening corporate financing, providing assistance packages and salary subsidies for

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<sup>38</sup> Chen K.Y. (2020) “[Additional Budget] The government increases the salary subsidy for local employees”, *Zaobao*, <https://www.zaobao.com.sg/special/report/singapore/budget2020/story20200326-1040356>, 26 March 2020.



specific industries and employees.<sup>39</sup> Chambers of Commerce and industry groups also received support funds from the government to assist enterprises in difficulty. For tourism, retail and catering companies participating in the “SG Clean” Campaign, the government would also cover their audit fees and license fees.<sup>40</sup>

The Singapore government emphasised community and personal responsibility and attached importance to social solidarity and resilience. For example, employers were obliged to ask employees to fill out health and travel declaration forms, apply for absence leave or home separation notice, etc. The Singapore Enterprise Development Board proposed a business continuity plan for enterprises and recommended that employees should be divided into different teams to minimise risks.

In addition, the government enhanced the support towards the front line. The number of frontline staff was increased. Singapore’s budget for the fiscal year of 2020 specifically arranged 4 billion Singapore dollars (2.8 billion US dollars) as Stabilization and Support Package and 1.6 billion Singapore dollars (1.1 billion US dollars) as Care and Support Package. In addition an extra month of special allowance for the frontline staff, it also gave all public health prevention clinics one-off financial assistance.

Comparing the three countries, a prominent aspect of Singapore’s response is the extra assistance given to disadvantaged groups, self-employed individuals, and SMEs. This played an important part in stabilizing public expectations and increasing trust in the government. Although South Korea

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<sup>39</sup> People.cn (2020) “Singapore adds \$ 48 billion to help people survive the epidemic”, <http://world.people.com.cn/n1/2020/0326/c1002-31649885.html>, 26 March 2020.

<sup>40</sup> Sina Net (2020) “Together with difficulties, the Singapore government issued another 48 billion cash subsidies!”, [https://k.sina.cn/article\\_7347941766\\_1b5f8b18601900s75z.html](https://k.sina.cn/article_7347941766_1b5f8b18601900s75z.html), 26 March 2020.



and China did not give the same amount of economic support to the public, their citizens are able to draw on their savings to temporarily support their daily life, because the savings rates of these three countries are among the highest in the world fortunately.

### **OUTCOMES (TILL THE END OF MARCH)**

At the time of writing this report (1 April-12 April), the three countries achieved relatively better pandemic control than other countries by adopting active strategies and implementing the plans. However, the global pandemic is still developing. It is necessary to maintain vigilance and cautious about what conclusions drawn from the studies. However, based on the data from January 23 to March 31, some outcomes can be learnt from their experience.

#### **Pandemic control effects**

Compared with countries that are still facing a steep upward curve, e.g. the United States, the United Kingdom, Italy, Spain and Turkey, the cumulative confirmed cases in the three countries gradually turned stable, as shown in Figure 2. As of March 31, the cumulative number of confirmed cases in China<sup>41</sup> was 8,154, in South Korea 9,887, and in Singapore 926.

In terms of newly confirmed cases, as shown in Figure 3, the number in China rose rapidly from January 23 to 3,694 on February 5. Due to the change in the statistical method in Hubei Province on February 12, it reached a peak of 15,152, and since steadily declined, and locally transmitted cases were gradually cleared. There were 36 cases on March

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<sup>41</sup> The Chinese data in this section referred to the data of the Mainland of China. The population number in 2019 in China was 1.4 billion, in South Korea 51.7 million, Singapore 5.7 million. Source: Statistics Bureaus of the three countries.

31, including 35 imported cases and one local case. Many studies have shown that China's non-pharmaceutical interventions in Wuhan and other regions greatly reduced the number of infections, slowed the spread of the virus outward, and bought valuable time for other countries and regions.<sup>42</sup> The number of new cases in South Korea increased very slowly before February 18 and then rose rapidly. It reached a peak of 1,076 people on March 2. After a few rebounds, it tended to decline overall, with 101 people on March 31. The number of new cases in Singapore increased slowly before March 17 and since accelerated, with 73 people on March 25 and 47 on March 31. Overall, China has basically stopped local transmission in a short period of time, and South Korea and Singapore have better flattened the growth curve.

As shown in Figure 4, China's number of active cases increase rapidly in the early stage and steadily decreased after reaching its peak. The peak occurred on February 17, reaching 58,016 people, but by March 31 it was reduced to 2,004 (of which 466 were critical). South Korea had a similar trajectory. After reached the peak of 7,470 people on March 11, the number of active cases steadily decreased, with 4,155 people on March 31. The number of active cases in Singapore was growing, with 683 people (including 22 critical cases) on March 31.

When it comes to recovered cases, China had the largest cumulative number of cured persons, reaching 76,238 on March 31, South Korea and Singapore with 5,567 and 240 respectively. As shown in Figure 5, China's

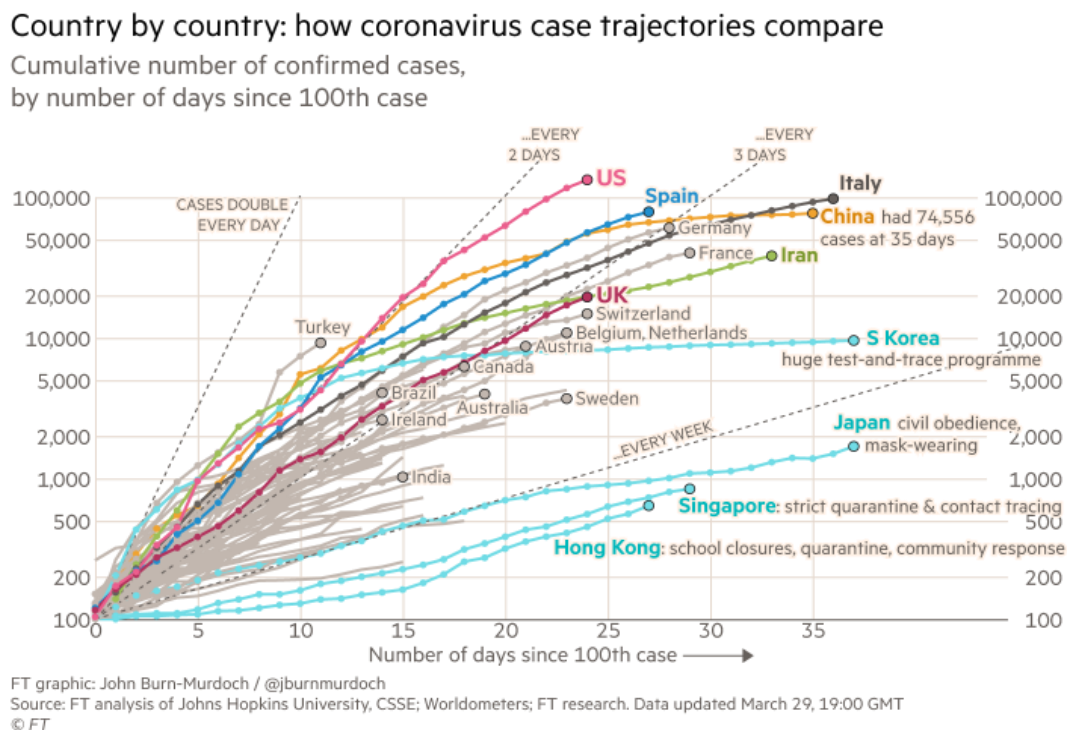
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<sup>42</sup> WHO (2020) Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19), 16-24 February 2020. Tian, H., et al. (2020) An Investigation of Transmission Control Measures during the First 50 Days of the COVID-19 Epidemic in China, *Science*, 31 March 2020. Qiu, Y., Chen, X., & Shi, W. (2020) Impacts of Social and Economic Factors on the Transmission of Coronavirus Disease 2019 (COVID-19) in China, GLO Discussion Paper, No. 494, Global Labor Organization (GLO), Essen.

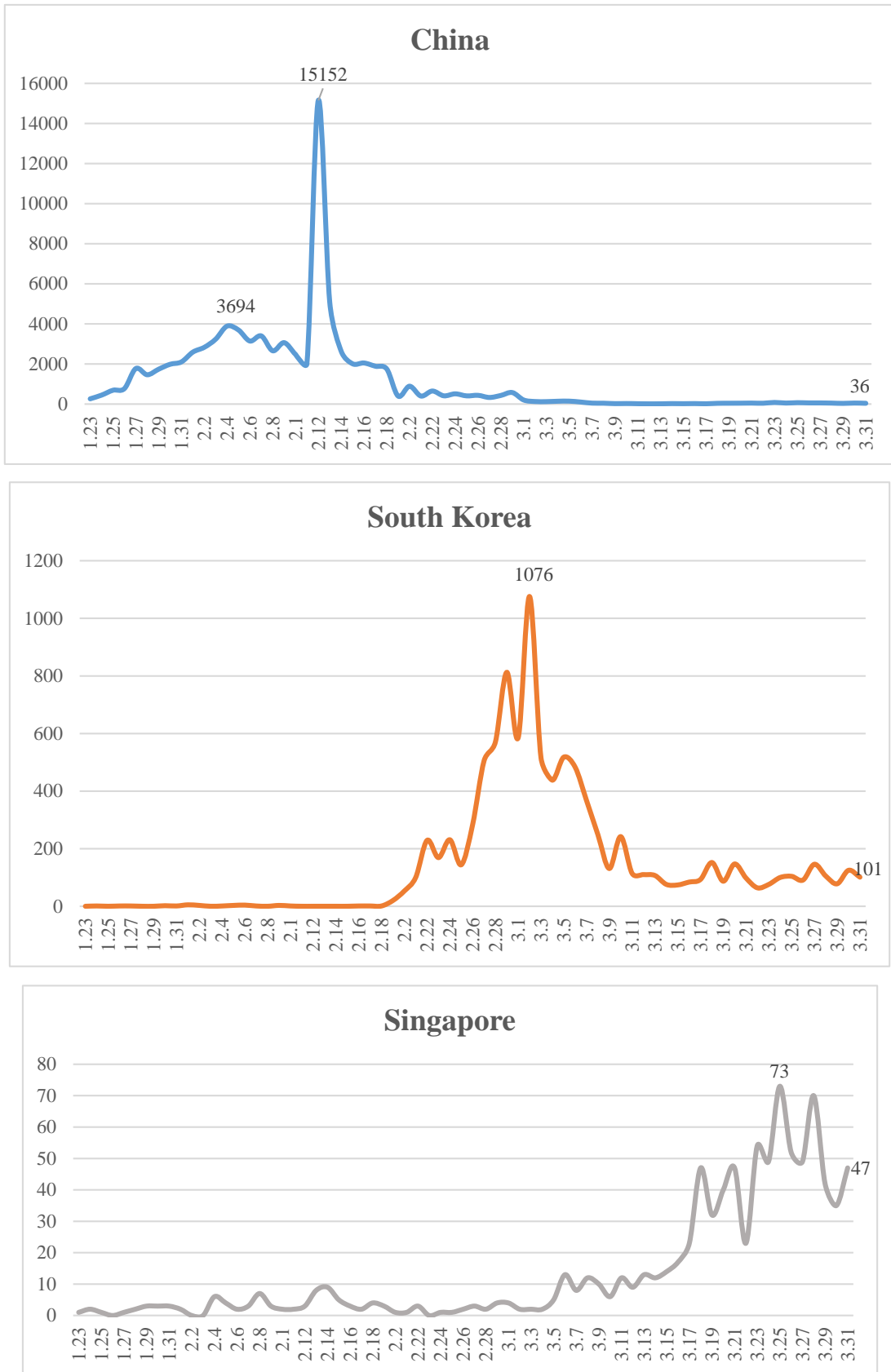
recovery rate steadily increased to 93.5%. To a certain extent, the increase of total confirmed cases affected the curve of recovery rates in South Korea and Singapore. South Korea's recovery rate experienced ups and downs, and it went through a U-shaped change from 38.7% on February 18 to 56.3% on March 31. Singapore experienced a change from rising to falling. After reaching 72.2% on March 2, it fell to 25.9% on March 31.

In terms of deaths, as shown in Figures 4, China had 3,312 cumulative deaths (outside Hubei was only 119 cases) on March 31, South Korea 165, and Singapore only 3. The case fatality rate in China, as Figure 5 shows, was 4.06% (in other provinces except Hubei was only 0.87%), South Korea was 1.67%, and Singapore was only 0.32%.

**Figure 2: Cumulative Number of Confirmed Cases in Different Countries**

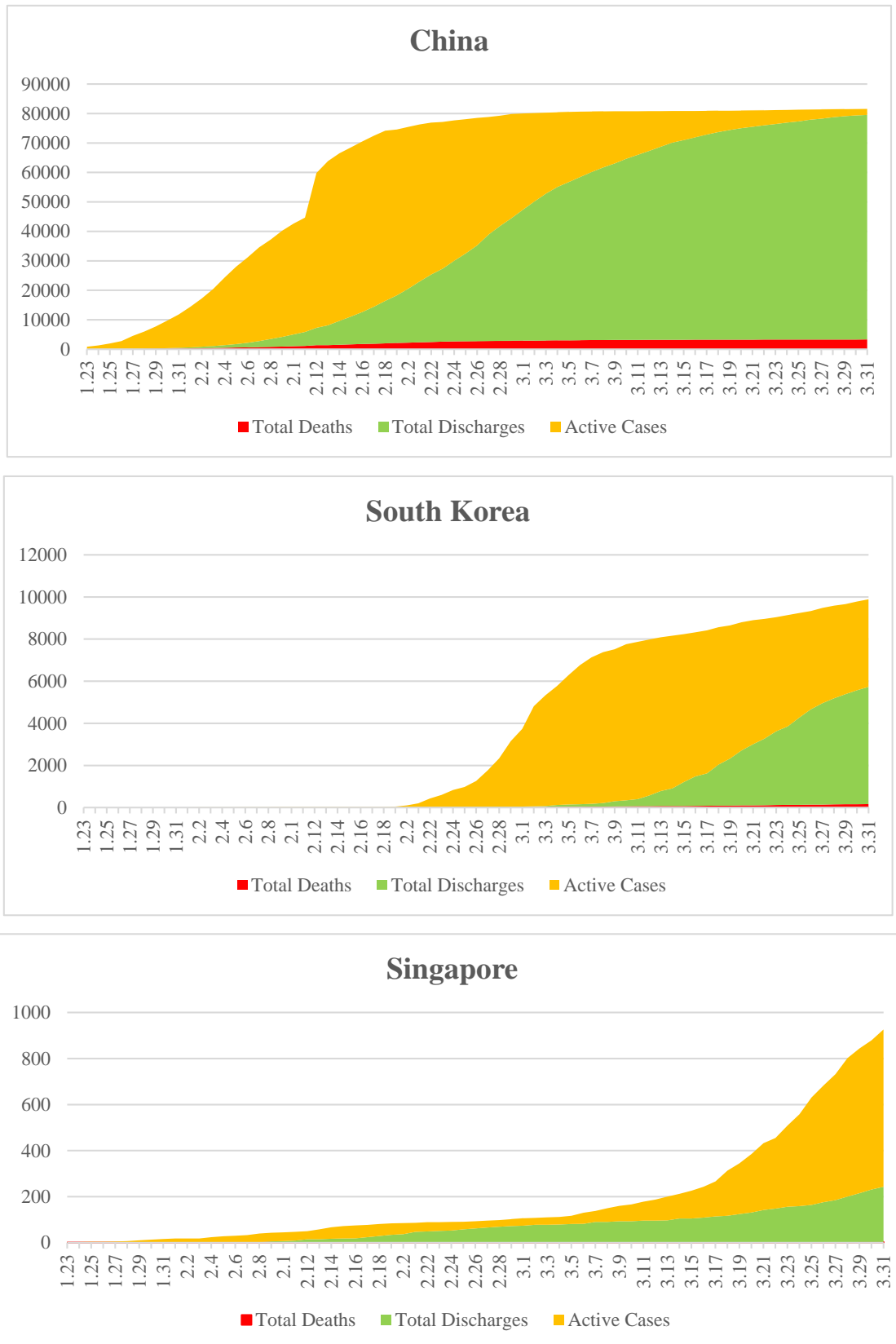


**Figure 3: Daily New Cases in the Three Countries**



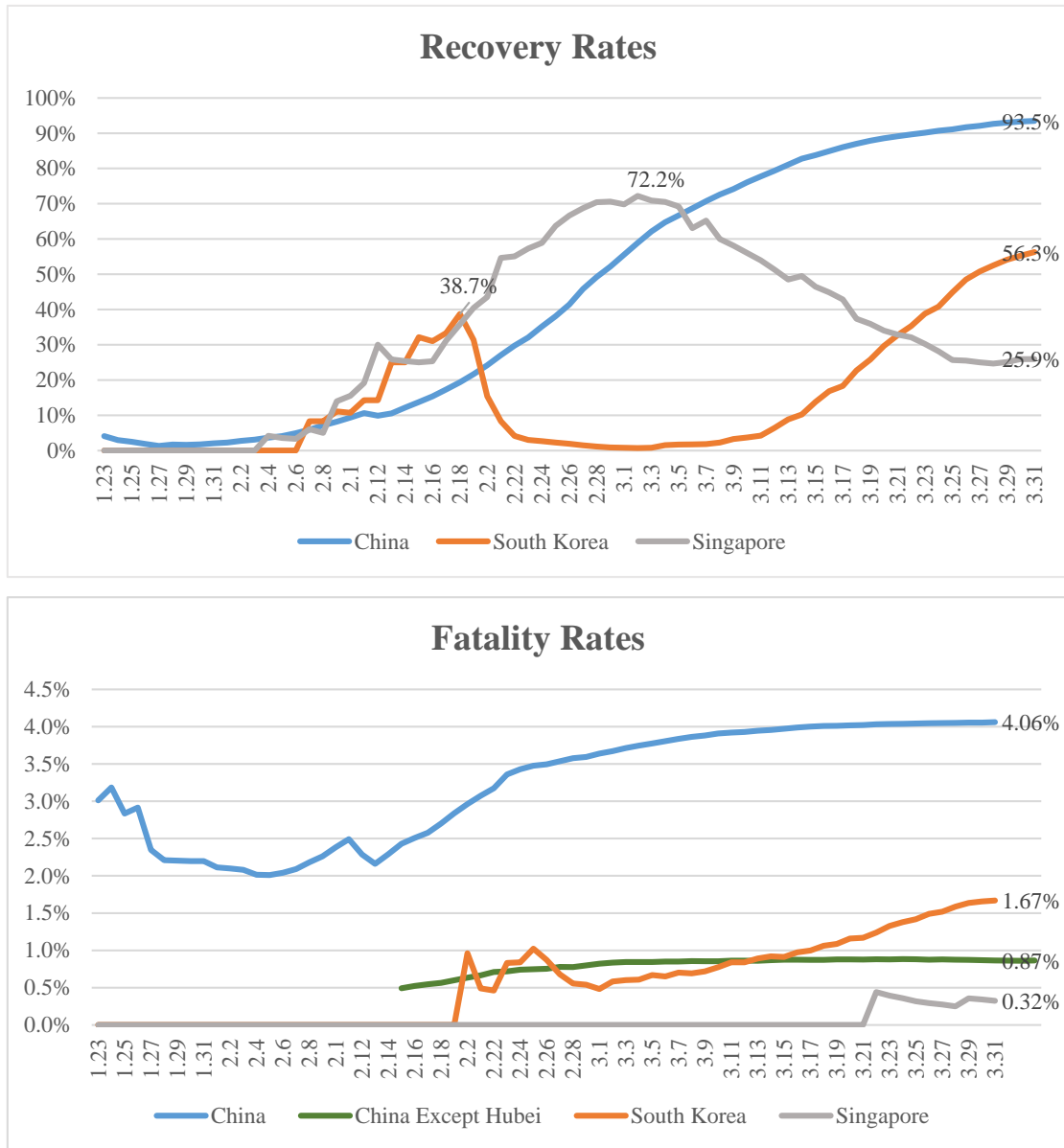
**Sources:** China National Health Commission, Korea CDC, Singapore Ministry of Health

**Figure 4: Total Deaths, Total Recharges and Active Cases in the Three Countries**



**Sources:** China National Health Commission, Korea CDC, Singapore Ministry of Health

**Figure 5: Case Recovery Rates and Fatality Rates in the Three Countries**



**Notes:** Recovery rate=total recovery cases/total confirmed cases

fatality rate=total death cases/total confirmed cases.

**Sources:** China National Health Commission, Korea CDC, Singapore Ministry of Health

### Economic impacts

The COVID-19 had significant economic impacts on the three countries.

China's added value of large industries in January-February 2020

decreased by 13.5% year-on-year (National Bureau of Statistics, 2020) <sup>43</sup>. In March, as the resumption of production and production continued, the Purchasing Managers Index (PMI) jumped up sharply from that of February. The manufacturing PMI reached 52.0%, 16.3 percentage points up from the previous month (National Bureau of Statistics, 2020) <sup>44</sup>. The latest *World Economic Outlook* published by the International Monetary Fund (IMF) forecast that China's real GDP growth rate in 2020 would drop to 1.2%, decreasing 4.9 percentage points than last year. <sup>45</sup> Moody's analysis showed that if based on March's forecast, China's real annual economic growth rate would be 4.4%, a decrease of 1.7 percentage points year-on-year<sup>46</sup>. According to estimates by the Standard & Poor's on March 22, China's GDP growth rate would drop to 2.9%. <sup>47</sup>

In February 2020, the Bank of Korea's forecast for South Korea's annual growth rate was 2.1% for 2020, a decrease of 0.2 percentage points from the prediction made in November 2019. Moody's forecast in February was 1.9%, decreasing 0.3 percentage points from the prediction made in November last year. Standard & Poor's expectation in March was 1.6%, a decrease of 0.5 percentage points from the forecast done in November last year<sup>48</sup>. According to the IMF's projection, Korea's real GDP growth rate

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<sup>43</sup> National Bureau of Statistics (2020) "The added value of large industries fell by 13.5% from January to February 2020", [http://www.stats.gov.cn/tjsj/zxfb/202003/t20200316\\_1732233.html](http://www.stats.gov.cn/tjsj/zxfb/202003/t20200316_1732233.html), 16 March 2020.

<sup>44</sup> National Bureau of Statistics (2020) "Enterprise resumption of production and production remarkably accelerated in March, the purchasing manager's index fell sharply from February to the previous month", [http://www.stats.gov.cn/tjsj/sjd/202003/t20200331\\_1735878.html](http://www.stats.gov.cn/tjsj/sjd/202003/t20200331_1735878.html), 30 March 2020.

<sup>45</sup> IMF (2020) *World Economic Outlook*, <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>, April 2020.

<sup>46</sup> Zandi, M. (2020) "COVID-19: Global economic tsunami", <https://www.moodyanalytics.com/-/media/article/2020/covid-19-economic-tsunami.pdf>, March 2020.

<sup>47</sup> S&P Global Ratings (2020) "Coronavirus impact: Key takeaways from our articles", <https://www.spglobal.com/ratings/en/research/articles/200204-coronavirus-impact-key-takeaways-from-our-articles-11337257>, 9 April 2020.

<sup>48</sup> Bae, H.J. and Jung, M.K. (2020) "South Korea's economic rebound loses heat", <http://www.theinvestor.co.kr/view.php?ud=20200313000530>, the Investor, 13 March 2020.



would be -1.2% in 2020, decline by 3.2 percentage points.

Singapore's GDP in the first quarter of 2020 shrank by 2.2% year-on-year and 10.6% from the previous quarter. In February, industrial production decreased by 1.1 percentage points year-on-year (Singapore Ministry of Trade and Industry, 2020)<sup>49</sup>. According to the IMF's projection, Singapore's real GDP growth rate would be -3.5% in 2020, declining by 4.2 percentage points. Standard & Poor's forecast on April 6 suggested that Singapore's economy would contract by 2.6% in 2020.<sup>50</sup>

## CONCLUSIONS AND IMPLICATIONS

This report compares the pandemic management practices in China, South Korea and Singapore till the end of March.<sup>51</sup> It helps to generate a better understanding of the nature of each country's strategy, the considerations behind it and their own conditions. Table 5 lists the main factors that have been considered in the three countries. This table can be useful to develop decision models in the future.

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<sup>49</sup> Singapore Ministry of Trade and Industry (2020) <https://www.mti.gov.sg>.

<sup>50</sup> S&P Global Ratings (2020) "For Asia-Pacific banks, COVID-19 crisis could add US\$300 billion to credit costs", 6 April 2020.

<sup>51</sup> For more specific measures, please refer to the three-country reports published by CIKD.



**Table 5: List of Considerations for Strategy-Making**

Types		Fields
Pandemic management needs	Evaluation of pandemic	Current state and forecast of transmissibility, morbidity, mortality and severe rate
	The need for medical service	Medical resources (testing kits, treatment equipment, infrastructure, PPEs) and human resources
Front-line supply capacity	Medical care system capacity	Existing medical system capacity in the infected areas
		Resources from other departments of the health sector besides the respiratory departments
		Interregional support that can be enlisted
Uncertainty	Leadership	Decision-making, organisation, coordination, credibility
		Capacity to supervise the implementation of pandemic control measures
	Public compliance	Institutional arrangement for emergency management
		Pandemic management plan
		Human resources
		The urban form and technology infrastructures. Are they suitable for the desired interventions?
	Public compliance	Does the public comply with pandemic control requirements?
		Is there any panic?
		Capacity to meet the needs of vulnerable groups
		Logistic capacity for life support in emergency lockdown/shutdown
Prioritizing different interests	Political pressure	Public opinion
		Decision-makers' personal political career (election, job security)
	Economic pressure	Direct economic costs
		The destructiveness of economic stagnation
	Social ethics	Right to life, freedom and privacy, human dignity, etc.

**Source:** the authors' compilation.



The three countries actions can offer several lessons:

First, the institutional arrangements for pandemic management in the three countries are similar. They all have an existing pandemic management plan and emergency response systems were updated because of their experience with virus attack in the past. When an emergency occurs, the three countries have dynamically adjusted the level of alert. At all levels of government institutions, leaders are the captains. However, it is not difficult to see that the larger a country is and the more government levels it has, the slower the decision would be made. Countries with multiple layers of governments have to continuously improve the management system and increase response speed, in particular the large countries with big population.

Secondly, China's approach to pandemic management is often portrayed as most intensive, extreme, destructive to the economy, and even unnecessary.<sup>52</sup> However, as found in this research, China's approach corresponds with its limited ability to monitor and enforce laws in particular during the Spring Festival, and relatively less resources on a per capita basis in the healthcare sector. It is also based on the evaluation of the support in the medical front and the backup capacity in the communities. Countries without such control capabilities and logistics foundation may face unexpected social costs. What we do see is that if there is no wide lockdown, it is likely that there will be outbreaks in other regions which will make it impossible for Hubei to receive enough support. In this sense, even if the number of cases were not large enough outside Wuhan to justify

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<sup>52</sup> Gunia A. (2020) "China's draconian lockdown is getting credit for slowing Coronavirus. Would it work anywhere else?" <https://time.com/5796425/china-coronavirus-lockdown>, 13 March 2020.

a full lockdown, it allows Wuhan to receive full support from other parts of the country.

South Korea and Singapore's seemingly none interventionist approach requires thorough and efficient testing and case tracing. It is feasible when the number of cases is still relatively small. It can be said that these two countries have done better than China in flattening the outbreak curve in the early stage and have gained valuable time for mobilizing resources and gradually intensify the response when the situation becomes more serious. The latest move of Singapore towards stricter lockdown proved this point. Similar to what China has done, Singapore also began to build a shelter hospital. Compared to China, despite that, the intensity of containment in these two countries is relatively low, to begin with, but as shown in Figure 6, the pandemic containment cycle may last longer. Obviously, people do not want their freedom to move to be limited. However, it should also be well communicated to the public that it should not be a choice between no freedom and full freedom, but between shorter pain and more prolonged pain.

Third, Singapore and South Korea have relatively more developed governance system than China. Both South Korea and Singapore use heavy penalties and legal measures against offenders. Even so, South Korea's policy implementation is also plagued by partisan interests throughout the pandemic management process. There is a need to prevent politicising the response to the pandemic. Also, the South Korean government's interaction with the religious groups should be a good reminder for other countries that it is important to communicate with religious groups and



other communities and win their support as soon as possible before the pandemic response become tense. Otherwise, charismatic leaders can disrupt the pandemic response and cause unnecessary human costs. China's legal system is still under continuous development. During the pandemic management period, the pressure not to impose heavy penalties on the public is high, particularly in the stricken areas.

Fourth, the pandemic situation and pandemic control measures will have major impacts on these three countries. Since April, there was a community outbreak in Singapore. The Singaporean government immediately raised the level of emergency response, announced a half-closed city, and asked residents to stay home for one month. The South Korean pandemic has been steadily increasing by about 100 new cases per day. The South Korean government has decided to extend social isolation and strengthen law enforcement. In comparison, China has only a few local cases but has to deal with the challenges of imported cases from abroad.

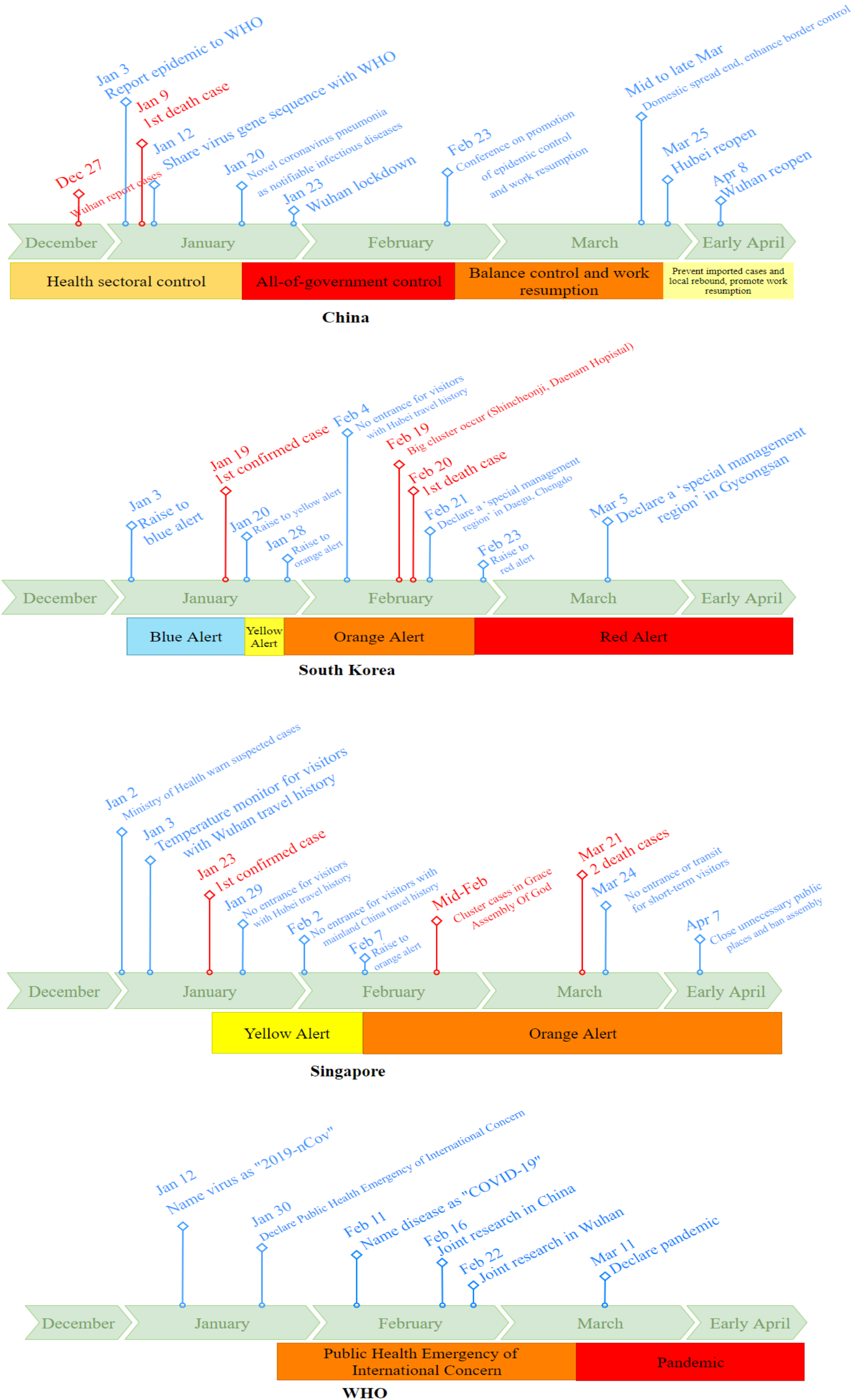
Five, it is important to note that each country's strategy has its limits. China's strict lockdown is fast and effective, but people have little psychological and material preparation. However, as the situation continues to evolve, more and more countries begin to realize that China's approach is not just about top-down driven lockdowns. It has many bottoms up initiatives with community and market support. South Korea's success so far has much to do with the fact that South Koreans are tolerant of surveillance and willing to alienate personal privacy. Surveillance cameras, credit card records, and mobile phone usage records are all used to track close contacts. This approach requires strong social and technical

support. Thanks to the similar conditions, China has taken the same approach from early on and is very likely to resort to active surveillance after reopening the economy. The Singaporean approach requires a strong rule by law and a social consensus on harsh punishments.

In short, the pandemic is a stress test of the governing capacity of individual countries. Each country involved has to select a corresponding policy mix according to its own national conditions. It is worth highlighting that many provinces in China have weaker economic strength than that of many developed countries. However, these Chinese provinces have not suffered as much as many developed countries. In a similar vein, South Korea has quickly adjusted its strategy after the initial spike. Singapore has also avoided major outbreaks by March. This experience shows that the outcome of the pandemic is not necessarily determined by a country's political system or its economic strength. These things matter, but it is also down to the determination and leadership of the government, their ability to listen, make good choices, and adapt to circumstances.



**Figure 6: Intervention Timelines for the Three Countries and the WHO**



Source: the authors' compilation.







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