


COVID-19 Containment: Comparisons and Suggestions for Global Response

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Abstract

Background: The 2019-nCoV (COVID-19) is spreading at an alarming rate worldwide. Therefore, it is currently one of the biggest global health challenges. This research review describes the differences in response to the coronavirus epidemic between countries across the world. In addition, an opinion that the experience of China in response against the epidemic would play an important role globally in the battle against the novel coronavirus has been discussed as well as the insufficient and delayed response by other countries.

Objectives: To provide an overview of China's experience in the control and prevention of the COVID-19, and compare it to that of other countries.

Methods: Relevant literature for this review was obtained from the Chinese government website; the World Health Organization website; Johns Hopkins University website; the European Centre for Disease Prevention website; and the PubMed databases. In addition, related news channels were used to obtain information.

Results: China's experience in the fight against COVID-19 provides valuable insight into the handling of this epidemic, and suggests that promoting cooperation between countries is imperative for effective control and prevention measures against this global virus pandemic.

Conclusions: China's experience suggests that the following measures were effective in the fight against COVID-19: "social isolation," "medical observation," "social distancing" or "limited contact with people," "self-protection," and combined modern public health intervention measures. These findings could help control outbreaks in other countries and regions across the world.

Keywords

comparisons, suggestions, cooperations, global response, COVID-19

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What do We Already Know About This Topic?

COVID-19 is a global public health concern. The current situation in some countries is a sign that China's lessons and experience should also be used in other countries in order to contain the pandemic effectively.

How Does Your Research Contribute to the Field?

This research has highlighted the gaps in the global response against the COVID-19 pandemic and suggested that these gaps could be filled by strengthening international cooperation, and other countries could also benefit from China's experience in a successful fight against the pandemic.

What Are Your Research's Implications Towards Theory, Practice, or Policy?

The comprehensive intervention measures taken by the Chinese government have provided the first step and increased confidence in the global fight against COVID-19.

Introduction

The COVID-19 pandemic, which is currently one of the major public health concerns worldwide, was first reported on December 8, 2019, in Wuhan, Hubei Province, China.¹ Quickly, the outbreak of pneumonia of unknown causes which raised intense attention not only within China but internationally.² As of March 31, 2020,³ the COVID-19 had already spread rapidly across the world, affecting more than 754 948 people, and causing more than 3657 deaths in about 202 countries.⁴ Meanwhile, the rising numbers of cases in Europe, the United States of America (USA), and elsewhere represent a huge death threat.⁵ Despite rigorous global containment and quarantine efforts, the incidence of COVID-19 continues to rise, hence increasing pressure on governments to contain the outbreak crisis. In spite of that, the COVID-19 pandemic presents different challenges for developed and developing countries in terms of how a country's health system would respond to the pandemic using resources at its disposal?

Thus, depending on the capacity of the available resources, and of course political will, such unprecedented outbreaks of disease could overwhelm some countries' public health services; even destroy health systems, particularly in some low-income countries. For example, evidence has shown that many countries' response to the pandemic is still lagging, and they have been facing shortages in the supply of test kits and medical protective equipment.⁶ In addition, some countries are yet to perform unilateral actions in the fight against the COVID-19 pandemic. Obviously, International institutions and media around the performance of COVID-19 do not comply with the overall interests of China and mankind.^{7,8} Countries in the European Union, for example, failed to respond to Italy's request for emergency medical supplies, perhaps due to the fact that all these countries had similar concerns regarding both health and economic issues related to the COVID-19 pandemic.⁷

The current situation in some countries is a sign that they have not learned from China's lessons and experience. Besides, this could be attributed to a lack of preparedness, transparency, information sharing, and international cooperation in the fight against the pandemic. At this stage of the spread of COVID-19,

it cannot be denied that only collective action by the international community could effectively respond to this challenging global health emergency, but the question is, "are international governments putting the interests of global health first?" In this regard, this study aimed to examine the English and Chinese literature, official news channels, and other official government data and documents related to the COVID-19 pandemic, in order to compare the similarities and differences in the responses of governments and the international community to the COVID-19 pandemic and summarize the current state of knowledge surrounding the action and response of the international community to the same.

Methods

Using the Chinese Government website, the Chinese Center for Disease Control and Prevention (<http://www.chinacdc.cn>); the National Health Commission of the People's Public of China website; the situation report of COVID-19 on the World Health Organization (WHO) website; Johns Hopkins University website; the European Centre for Disease Prevention and Control (<http://www.ecdc.europa.eu>) data; and a comprehensive review of literature from the PubMed database, Google Scholar, and China National Knowledge Infrastructure; information was obtained regarding China's and other countries' experiences worldwide in the fight against COVID-19. Additionally, from other media platforms, news, articles, and reviews were used to obtain up-to-date confirmed numbers of the victims infected with COVID-19 cases globally. Nevertheless, data were compiled from the WHO's latest situation report for the creation of graphs to compare the epidemic situation in different countries. The detailed website information and corporate contents are summarized in [Table 1](#).

Results*China's Response Experiences*

Wuhan, the capital city of Hubei province in China, is the city in which the first outbreak of the severe acute respiratory

Table 1. The websites' information that collected about COVID-19.

Website	Summary of Content Reported
Johns Hopkins University (https://coronavirus.jhu.edu/map.html) WHO: World health organization report. Available online: https://www.who.int/csr/sars/country European Centre for Disease Prevention and Control (https://www.ecdc.europa.eu/situation-update/worldwide) http://www.OurworldinData.com	Related to confirmed cases and deaths; total cases of nucleic acid test by date across countries
Ministry of industry and information technology of the People's republic of China (www.miitbeian.gov.cn) and National Center for clinical laboratories (https://www.ncccl.org.cn/main) Information office of Hubei Province People's Government: https://www.hubei.gov.cn	Nucleic acid testability of China and Wuhan Report on the centralized nucleic acid test result, presented at the 78th press conference held at the COVID-19 prevention and control headquarters in Wuhan
http://www.chinadaily.com.cn/Guardian NEWS. https://www.Guardian.com/news/2020-3-11 reported (11 March 2020, date last accessed).	Some countries' responses and actions against the spread of COVID-19, after the first laboratory-confirmed cases emerged
http://www.COVID-19 live World.com	Some countries' response and actions against the spread of COVID-19, after the first laboratory-confirmed cases emerged

syndrome coronavirus 2 (SARS-CoV-2) occurred. Noteworthy, the occurrence of SARS-CoV-2 in Wuhan was unexpected and overwhelming; hence it was a big challenge to organize measures to put off its spread immediately. However, a well-organized relentless fight with great sacrifices achieved enormous success in stopping the spread of this disease in China, and this experience could serve as an example for other countries or regions to learn from as they strive to successfully contain the pandemic. Meanwhile, China is sharing her valuable experiences with the international community on strategies aimed to deal with infectious disease crises and promote global public health governance. Therefore, in this study, China's experience in epidemic prevention has been systematically summarized.

Social Distancing

The Chinese government took action immediately after noticing the SARS-CoV-2 outbreak by launching the national emergency response in all the 31 provinces, autonomous regions, and municipalities. Initially, on January 23, 2020, Wuhan authorities made a very important decision to close down the city's public transportation and all places for getting into or out of Wuhan, in order to control the source of infection and protect the vulnerable populations.⁹ Moreover, according to Prem et al,¹⁰ the Wuhan Authorities later put Wuhan on lockdown to stop the spread of the virus. Therefore, this created valuable time for Wuhan to provide medical services, which ultimately drastically reduced the total number of cases. The actions taken by the Wuhan Authorities were commendable considering the projection made by Tian et al.¹¹ that the number of cases could reach 744 000 by February 19, 2020, without those necessary interventions. Generally, Yang et al¹² using a modified (Susceptible, Exposed (infected, but not yet infectious), Infectious (now can infect others), Removed (SEIR) model

confirmed that the public health interventions implemented in China, since January 23, 2020, have effectively controlled the spread of the epidemic, and noticed that if Wuhan lockdown plan had been delayed for another five days, the epidemic trend would have uncontrollably spread to many places and regions; thus having a devastating impact on humans. Furthermore, a study published on April 13, 2020, by Pan¹³ et al indicated that the non-pharmaceutical public health interventions (cordons sanitaire, traffic restriction, social distancing, home confinement, and centralized quarantine) implemented in China were temporarily associated with improved control of the COVID-19 outbreak. Therefore, strict community control and home quarantine measures nationwide prevented the epidemic from spreading in China.

Medical Rescue

Generally, for severe and critically ill patients, the standard procedures for the diagnosis and treatment of COVID-19 patients were carried out in advance with full participation and then based on the strategy of "moving forward, one person, one strategy," to prevent patients from moderately becoming severe patients. In this regard, the "four concentrations" in principle should be conducted, that is; patients, medical experts, resources, and treatment should be concentrated in specialized centers. Therefore, based on this approach, Wuhan started to transform exhibition centers and sports venues into "square cabin hospitals" for the treatment of mild infections with the novel coronavirus. Therefore, a patient can only be transferred to the main hospital for further treatment when his/her condition turns serious. According to the relevant new report, the medical team has been consisting of doctors, nurses, local and military personnel as well as specialists of Western Medicine and Traditional Chinese Medicine. In summary, this covers almost all the medical resources and strengths in China.¹⁴ Furthermore, based on the strategy of "increase the

cure rate and reduce the fatality rate,” the Tongji hospital, affiliated to the Tongji medical college of Huazhong University of Science and Technology, had transformed two branch hospitals in Wuhan (optical valley biology city and Sino-French new city) into a fever clinic, expanding from less than 200 square meters to more than 5000 square meters, with an emergency response.¹⁵ Moreover, two new temporary hospitals were built within 10 days. During this period, therefore, a large number of medical and life supplies were provided quickly and orderly to assist in this intervention in Hubei Province. As of March 10, 2020, a total of 16 mobile cabin hospitals received 12 000 patients.¹⁶ One out of every four COVID-19 patients in Wuhan was treated in a shelter hospital. It is worth noting that, with these shelter hospitals, China has created a new concept for responding to public health emergencies and major disasters.¹⁷ Also of note is that early epidemiological evidence in Wuhan showed that more than half of patients infected with the novel coronavirus had at least one family member with the disease, and 75% ~ 80% of the clustered infections occurred within families.¹⁸ According to experts, patients with COVID-19 may progress from mild to severe or even critically ill situation in a short period and may require a rapid referral to a hospital. Thus, the development of shelter hospitals was a key response to the outbreak in Wuhan, and this model could be recommended for use in other countries responding to the COVID-19 crisis.¹⁹

Further, during the prevention and control of the epidemic, traditional Chinese medicine (TCM) also played an unprecedented positive role in the treatment of COVID-19 patients. For example, the utilization rate of TCM in Hubei province reached 91.91%, whereas in “Fangcang shelter hospitals” the utilization rate of TCM exceeded 98%.²⁰ Therefore, all the makeshift hospitals were equipped with TCM, which significantly improved the patients’ symptoms and reduced the chance of mild symptoms turning into critical conditions. The treatment of severe patients with a combination of TCM and Western medicine promoted early recovery and reduced the sequelae of patients with COVID-19.

Besides, to mitigate the psychological damage and social impact caused by the epidemic, the mental health service platform provided psychological support and social work services to frontline health care providers, patients, and their families, quarantined persons, and other stakeholders at risk. Therefore, those who developed mental health problems could consult psychiatric specialists who in turn prescribed treatment as appropriate. In addition, more than 4000 qualified counselors volunteered for the psychological consultant programs, including more than 1000 who worked in shifts. Also, online community psychological support services were provided in China during the COVID-19 outbreak.^{21,22}

Epidemiological Investigation

Through epidemiological investigation, the activity tracking and disease regularity of suspected cases were identified as well as close contacts and potential close contacts. As of

March 7, 2020, the total number of close contacts tracked was 674 038²² indicating resolute measures taken by China to identify and trace COVID-19 cases and close contacts. In Wuhan, for example, there are more than 1800 epidemiological teams, with at least five people in each group, tracking thousands of close contacts every day. Moreover, at least 580 000 social workers were organized to conduct epidemiological investigations in Hubei Province.²³ It was through painstaking work that the vast majority of identified close contacts have been traced and given full medical attention.²⁴ In areas with community transmission (Wuhan), the strictest prevention and control strategies were developed, which focused on “four early,” namely early detection, early reporting, early quarantine, and early treatment. This approach ensured optimization of diagnosis and treatment process, and effectively blocked the spread of the epidemic; hence reduced the infection rates.

It is worth noting that the Chinese government, effectively implemented the containment measures as suggested by the World Health Organization (WHO) expert group, during the press conference of COVID-19, on 26 February 2020. This was possible because of the firm commitment of the Chinese people to collective action in the face of this common threat. At the community level, this is reflected in the provinces and cities’ strong support for the most vulnerable groups and communities.

International Community Responses

Regarding containment of this outbreak, however, evidence has shown that the international community and policymakers needed to act faster and more aggressively.²⁵ Suggesting that the international community was not mentally and materially ready. It has been noticed that, in some countries, there has been no nationwide lockdown nor implementation of the prevention and control measures. Also, during the early stages of the pandemic in China, people in Italy, aging and densely populated in Europe, held parties and even refused to wear masks. Therefore, at the end of February 2020, this country had the largest number of cases in Europe. The shortage of medical materials and lack of medical experience in dealing with this pandemic placed a huge stress on the country.

As of March 11, 2020, WHO declared Europe as the “epicenter” of the pandemic. The new number of confirmed cases of COVID-19 in Italy had risen to 977 cases (per daily) by the evening of March 11,²⁶ making Italy the worst-affected country in Europe. Fortunately, Italy learned from China’s experience, and the situation has been brought under control recently. To contain the outbreak, the Italian government issued an executive order to “close down” 11 cities or towns. However, Britain, the United States, and Sweden had a delayed response to the initial outbreak. For example, some of these countries tried to control mortality by protecting only the elderly and those with comorbidities.

Also, in the early stages of the outbreak in China, the UK authorities had a vague idea about the pandemic and they adopted a “passive defense” strategy aimed at delaying the

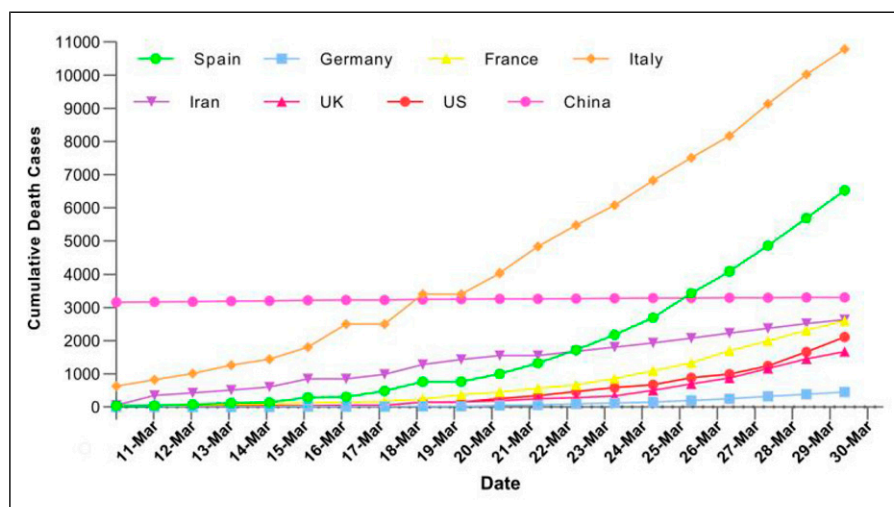


Figure 1. Cumulative death cases across countries (updated as of March 30, 2020).

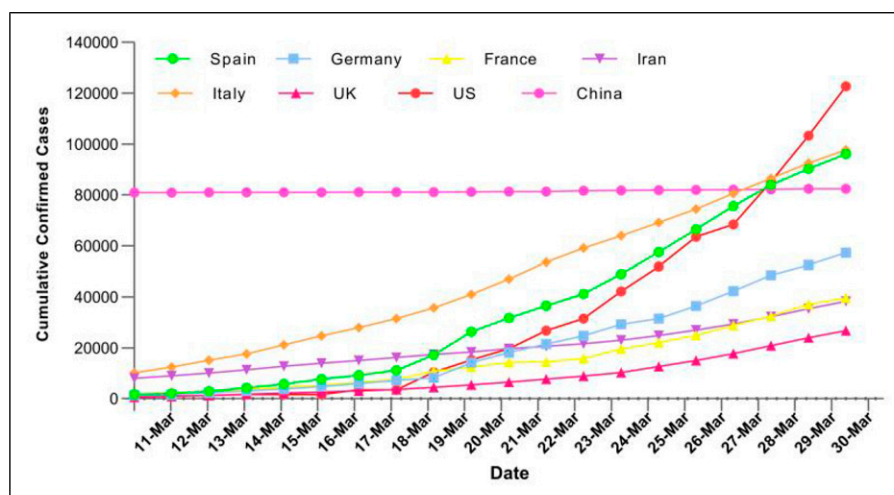


Figure 2. Cumulative confirmed cases across countries (updated as of March 30, 2020).

peak rather than imposing control. That is, they opted for a “herd immunity strategy,” which allows people to acquire immunity through infection by the natural spread of the virus. This caused great controversy at home and abroad. Mild cases were isolated at home and only older people were advised to isolate themselves. However, China’s experience shows that home isolation of people with mild symptoms not only increases the risk of home transmission but also the rate of acquiring the severe illness. Yang and colleagues²⁷ stated that the mortality rate among severe cases with COVID-19 and the severity of patients seriously limit hospitals’ critical care resources, especially when medical facilities are limited, which can threaten human life. Unfortunately, this has been the case in Europe. The death toll in Italy increased sharply in the first two weeks of the critical period of the pandemic (Figure 1). In addition, during the same two weeks period, the

cumulative confirmed cases increased exponentially in other European countries (Figure 2).

According to related media, the Swedish government only banned gatherings of more than 500 people. Also, the government did not close schools and bars and did not impose restrictions on travel. Moreover, the Swedish authorities on March 11, 2020, suddenly announced that they would stop counting COVID-19 confirmed cases and providing the virus tests to mild and suspected cases. In Australia, people largely ignored the government’s instructions and continued to organize big gatherings such as music festivals.

As of March 31, 2020, the United States had the most confirmed cases (150 000) in the world (Figure 2). During the initial phase of the COVID-19 outbreak, the Trump administration unprecedentedly barred the Chinese nationals and those who had visited China in the previous 14 days from

Table 2. Comparisons of the main response actions against COVID-19 taken by different countries.

Country	Date	Details of Public Health Intervention Measures Taken
China	December 27, 2019 (The first case was confirmed)	Hubei provincial hospital of integrated traditional Chinese and western medicine reported severe unidentified cases of pneumonia to the Center for disease control and prevention in Jianghan district, Wuhan. According to the analysis of the disease condition, treatment outcome, epidemiological investigation, and preliminary laboratory test, experts in Wuhan concluded that the above cases were viral pneumonia
China	December 30, 2019	The Wuhan municipal health commission issued an urgent notice on the treatment of pneumonia of unknown cause to medical institutions in its jurisdiction. The national health commission (NHC) immediately organized the study and carried out the action as soon as it received the information
China	January 7, 2020	President personally hosted a conference of the standing committee of the political bureau of the CPC central committee, where he put forward requirements on the prevention and control of the epidemic. Besides, he made a comprehensive study of the situation and promptly put forward the general demands of "strengthening confidence, working in the same boat, scientific prevention, and control, and taking precise measures" as an overall goal
China	January 20, 2020	COVID-19 was included in the statutory report of class B infectious diseases and border health quarantine infectious diseases by the national health commission, which also made a timely release of information on the epidemic situation
China	January 23, 2020 10:00 AM	In Wuhan, according to the announcement of the epidemic prevention and control headquarters, the city's buses, subways, ferries, and long-distance passenger transport were suspended, and the airport and railway station were temporarily closed
Italy	February 21, 2020 (The first case was confirmed)	The Italian ministry of health urgently issued regulations requiring those who had been in close contact with confirmed COVID-19 patients in the last 14 days, as well as those returning from the worst-affected areas, to report to the local health authorities to be quarantined for observation. The government also activated emergency telephone lines to assist citizens who are seeking medical treatment and screening for infections. The Italian government had planned to allocate 20 million euros to deal with the outbreak. Some 50 000 residents in 11 municipalities were under quarantine. In addition, people were banned from entering or leaving enclosed towns, events such as meetings in public or private places were suspended, and residents were asked to go out less. The ban is enforced by the police and offenders face criminal penalties of up to three months in prison or a fine of up to € 206
Italy	February 27, 2020	Novel coronavirus pneumonia had 17 new cases in northern Italy, resulting in at least nine cities ordering the closure of public places such as schools and bars for a week; and suspending commercial activities except for public needs and in-house production. They also encouraged telecommuting, and temporarily closed all schools, cinemas, museums, and other places throughout the territory, and canceled public events. Further, as a result of the outbreak, carnival celebrations in Venice had been suspended and several series matches had been postponed
The United States	January 23, 2020 (The first case was confirmed)	The centers for disease control and prevention (CDC) confirmed a novel coronavirus infection in Illinois as the first known human-to-human transmission of severe respiratory syndrome coronavirus 2 (SARS-CoV-2) case in the United States (US). President trump held a press conference to discuss the COVID-19 outbreak in the US and outline the administration's response. In his remarks, Trump advised Americans to take precautions similar to flu season, including, like him, avoiding unnecessary contact with public surfaces and patients. During the initial phase of the COVID-19 outbreak, the Trump administration unprecedentedly barred the entry of Chinese nationals, and those who had visited China in the previous 14 days, into the US.
Germany	January 28, 2020 (The first case was confirmed)	The first case of COVID-19 in Germany on January 28, 2020, was initially ignored by the government as a severe form of influenza. Later, on February 27, 2020, a county in NRW reported a high incidence and the government immediately closed schools. The incidence of nosocomial infection after medical personnel paid no attention to protection. In the middle of March, the government began to allocate resources and introduce policies for the shortage of personal protective equipment such as masks and protective suits in hospitals. On March 14, 2020, schools were closed. The Prime minister called on people to keep a distance of more than 1.5 m between people and avoid crowding medical personnel with protective equipment and other medical resources. On the 23 rd of January, people were banned from interacting with each other. After these measures were implemented, the Koch Institute recommended two weeks of observation. The epidemic entered a plateau in early April

(continued)

Table 2. (continued)

Iran	February 20, 2020 (The first case was confirmed)	Iran reported its first confirmed case of novel coronavirus infection on February 20, 2020. The official news agency in the country indicated that Iran was confident and could quickly contain the spread of the disease. Therefore, the government closed schools and suspended football matches across most of the country. Performances in cinemas and other venues were also suspended. The Iranian government then began the daily sanitization of the Tehran metro and public vehicles in the capital. In the early stage of the epidemic, the Iranian government was slow in the prevention and control of the epidemic. Schools across Iran remained closed until March 2, 2020, as well as concerts and sporting events. On March 23, 2020, Iran President Hassan Rouhani ordered the establishment of a national epidemic prevention and control command department and suspended all domestic sports events from December 23, 2019. In March 2020, Iran had temporarily closed all cinemas and art centers across the country and sent 300 000 medical teams from all over the country to investigate the epidemic status house to house
France	March 6, 2020 (The first case was confirmed)	Similar to Italy, the French government decided not to adopt a lockdown plan for a while but would guide the public to take more personal protection. In addition, the French government banned indoor gatherings of more than 5000 people across the country, canceled large outdoor public events in some areas, and ordered the purchase of masks with a prescription issued by hospitals. Also, Emmanuel Macron, President of France, said on March 3, 2020, "We will requisition and distribute all masks manufactured and in stock to medical staff and to Frenchmen infected with novel Coronavirus." Mr. Welland (Ministry of health) noted that France already had 10m surgical masks in dispensaries across the country, with 15m-20 m in stock to be used that March On COVID-19 vaccine research and development, the President of France supports international cooperation and encourages domestic medical institutions to accelerate research and development. All intensive care patients and all hospitalized patients with respiratory infections would be tested for the virus, he said the first case of COVID-19 was confirmed in Spain on February 1, 2020. As of March 3, 2020, Spanish cases rose to 150, with Madrid having the highest number of cases at 49, making it a disaster zone. However, Spain's health ministry had not taken any further precautions against the rising number of confirmed cases. In spite of that, the president of the Madrid region suggested that the city would be raised to level two, limiting the flow of people, but it remains to be seen exactly when the measures would be implemented
Spain	February 1, 2020 (The first case was confirmed)	
United Kingdom	February 19, 2020 (The first case was confirmed)	The first case of COVID-19 was confirmed in England on February 19, 2020. In this regard, the British Prime Minister, Boris Johnson, held a news conference on March 3, 2020 (London time) to indicate a variety of new measures that would be introduced in the corresponding node (prohibit assembly, etc.). However, a timely response would be very important, not one-size-fits-all. Besides, in the early stages of the pandemic, the United Kingdom made a decision not to close down schools and ban large gatherings. Also, in the medical rescue aspect, they believed that mild cases should be isolated and treated at home. However, in China, mild cases were isolated and treated at a temporary hospital. Subsequently, the Prime Minister suggested that the city of England would be raised to level two, limiting the flow of people, when the measures had been implemented

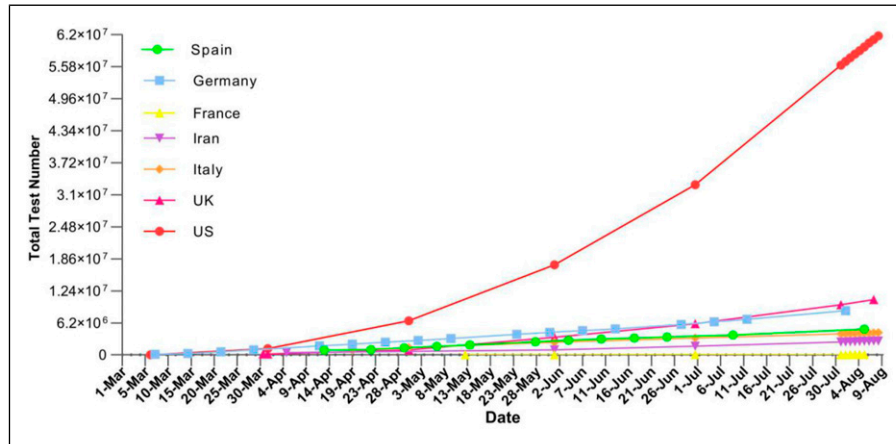


Figure 3. Cumulative numbers of Nucleic Acid RT-PCR Test across countries (updated as of August 10, 2020).

Table 3. The detailed nucleic acid testability of Wuhan and China.

Location	Date	Number of People Tested
Wuhan	2020/5/14	Thousands/Day begin testing
	2020/5/22	14,700 000
	2020/5/24	9,899,828
	2020/6/2	10 900 000
China		Millions/Day
	2020/03/01	1 260 000
	2020/06/01	3 780 000
	2020/7/30	4 840 000

Data source: China's National Health Commission commissioner at the State Council joint prevention and control mechanism press conference (10 August 2020, date last accessed). And Ministry of Industry and Information Technology of the People's Republic of China (www.miitbeian.gov.cn) and National Center for Clinical laboratories (<https://www.nccl.org.cn/main>). Date accessed: June 24, 2020.

entry into the United States (US). However, this idea might have discouraged the formation of a joint force to curb the pandemic. Separate government management measures may not work in this crisis because this may create a vicious cycle in which states compete, not with each other, but for resources. Some countries have not yet met the threat with the required political decisiveness needed to contain this pandemic. Therefore, this situation has only added to the WHO's concerns. Nonetheless, in the face of an epidemic, the international community must unite and strengthen cooperation to jointly implement prevention measures. Comparisons of the main actions against COVID-19 taken by different countries are summarized in [Table 2](#).

The Nucleic Acid Test Information

The epidemic continues to develop worldwide. Thus, countries have also actively expanded the scope of testing to reduce the risk of transmission. In light of the current international situation, total cases of detailed nucleic acid tests (updated as of August 10, 2020) are presented in [Figure 3](#).

Combining with the current international situation, Wuhan can provide experience for other countries to carry out nucleic acid testing, including the implementation of the path method, quality management, problems encountered, and solutions. Nucleic acid testing in Wuhan is a concentrated effort to show China's strength and determination in fighting the epidemic. On May 11, 2020, Wuhan embarked on nucleic acid testing action.²⁸ Therefore, from 0:00 on May 14 to 24:00 on June 1, Wuhan City concentrated nucleic acid tests on 9,899,828 people. The results showed no new confirmed cases, but 300 asymptomatic infected persons. The detection rate was .303/10 000 person. Professor Lu Zuxun who is a social medicine specialist said: "Wuhan universal nucleic acid detection has important political significance."²⁹ The concentrated effort to test for nucleic acids highlights China's strength and determination in fighting the epidemic of COVID-19. The detailed nucleic acid testability of Wuhan and China is summarized in [Table 3](#).

Middle East Countries Response

Iran

Iran is the country with the most severe COVID-19 epidemic in the Middle East. In the early stage of the epidemic, the Iranian government was slow in the prevention and control of the epidemic.³¹ Thus, the number of confirmed cases and deaths in Iran soared. On February 24, 2022, Bahrain, Kuwait, Iraq, Afghanistan, and Oman successively announced that they had novel Coronavirus cases for the first time in their countries, most of which were related to Iran.

Subsequently, after noticing the magnitude of the spread of the disease, Iran announced the closure of educational institutions in 14 provinces including Tehran, and all cinemas across the country were closed during the week until Friday. Also, all cultural events, concerts, and sports competitions had been canceled. Therefore, Iraq, Kuwait, and the United Arab Emirates had issued travel bans on Iran. Kuwait also closed its border crossings with Iraq because many people would arrive

in Iraq from Iran and then travel to Kuwait. In addition, Saudi Arabia ordered anyone traveling from Iran to be quarantined for at least 14 days before entering the country.

Kuwait

Kuwait can be said to be the fastest responders to the prevention of the epidemic in the Gulf. Kuwait quickly imposed a travel ban on Iran after the outbreak.³⁰ Kuwait also closed its border crossings with Iraq because many people would arrive in Iraq from Iran and then travel to Kuwait. On February 24, 2020, Kuwait civil Aviation administration announced the suspension of flights to and from South Korea, Thailand, and Italy. As early as January 30, 2020, Kuwait imposed strict entry control measures on Chinese citizens in response to the epidemic.

Israeli

Similarly, the Israeli government has begun denying entry to foreigners into Israel who had visited Hong Kong, Macau, Singapore, or Thailand in the past two weeks. Oman's Civil Aviation Public Administration (PACA) also announced that it would suspend all flights to and from Iran from Monday (February 24, 2020) until further notice.³¹

Afghanistan

Afghanistan has probably been the most vulnerable country after Iran to a serious outbreak because of its poor economy and health care system. Even Afghanistan's health minister expressed concern: "Because of the poor performance of the economy, many people in Afghanistan are already sick and have weak immune systems."³²

Japan and South Korean Response

According to the Ministry of Health, Labor, and Welfare of Japan, 420 people had been infected with COVID-19 in Japan, which was 71 more than the previous day. Also, 696 people were infected aboard the "cruise ship Diamond Princess." The Japanese government announced several anti-epidemic measures including suspending visa-free entry for South Koreans from Monday to strengthen the control of COVID-19. The Foreign Ministry of the Republic of Korea announced on 22 February afternoon that it would revoke the visa-free entry policy for Japanese from 0 PM local time, and the visas already issued would be invalid. In addition, a "special entry procedure" would be implemented for all foreigners arriving in South Korea from Japan, and the level of travel alert for Japan would be raised.

South Korean

President Moon Jae-In announced on February 23, 2020, that his government had raised its crisis alert level for COVID-19

to the highest "severe" level following advice from infectious disease experts. Moon said the next few days were a critical moment for South Korea's response to the COVID-19 epidemic. Thus, the central and local governments, epidemic prevention departments, medical teams, and the entire nation were to work together to prevent and control the epidemic. This, therefore, further intensified its response at the government level and strengthened the cooperation system between the central and local governments. Noteworthy, South Korea's infectious disease alert is classified into four levels, namely "concern," "attention," "alert," and "serious." After issuing a "severe" warning, the government could take the highest level of response, including ordering schools to close and banning collective activities. The South Korean government on 1 March decided to delay the start of the 2020 school year for kindergartens, primary, and secondary schools at the national level by one week from March 2 to March 9, 2020.³³ In addition, South Korea announced the creation of the Central Disaster Safety Response Unit, which was to serve as the government's highest-level response to the outbreak, and this was headed by the Prime minister. To curb the spread of the virus, Mayor Park Yuan-chun of Seoul city announced on 4 March to temporarily ban rallies in Gwanghwa Gate Square, Seoul Square, and other downtown areas.

Cooperation Between Organizations and Governments

This COVID-19 crisis poses different challenges to all humanity. During the outbreak, the Chinese Ministry of Health shared the genetic sequencing of the COVID-19 virus,³⁴ eight days after isolating the virus (January 11, 2020), which provided other countries with the ability to diagnose the virus quickly by utilizing rapid testing methods, although government transparency at the start of the outbreak was not ideal. As the domestic spread of the virus pandemic has been effectively controlled in China, the global confirmed cases have soared. Therefore, China has actively shared its experience and lessons with other countries in the battle against the novel coronavirus. Thus, by March 26, 2020, the Chinese government assisted 89 countries to prevent and control the disease.³⁵ That is, China has sent medical expert teams to several countries to offer epidemic-control guidance and share protocols for COVID-19 diagnosis. Meanwhile, China has delivered essential medical supplies and protective equipment, such as test kits, antiviral drugs, traditional Chinese medicine, respirators, and facial masks, to some foreign countries and regions. The Chinese health authorities and experts have also been in close communication with the WHO and held over 40 virtual technical conferences with more than 100 countries and regions across the global.³⁴

Nevertheless, cooperation in drug and vaccine research and science development for epidemic prevention is needed. Helping low-income countries with weak public health systems to improve their response capacity and actively

supporting the role of international organizations would help all parties to boost information communication and achieve policy and action coordination for effectively stopping the cross-border spread of the epidemic.

Discussion

The new outbreak of the respiratory illness caused by coronavirus disease since December 2019 has is a global public health concern.³⁶ The crisis is a test for not only developed countries' health systems and capacity but also that of other countries. To curb the global spread of the COVID-19, China responded quickly and adopted the most rigorous, extensive, and thorough public health intervention measures. In addition, the Chinese medical and scientific researchers are in a race against time to continuously improve the diagnosis and treatment measures, increase the cure rate, and reduce the disease death rate.

Also, China's experience tells us that isolation is the most effective way to stop the spread of COVID-19 in the intervening time because this disease is not fully understood and there are no special drugs and vaccines to treat and prevent it. Moreover, according to China's experience, quick action is crucial after the first mild cases of COVID-19. So, there is an urgent need for global surveillance and cooperation. A question to the international governments is "to what extent can they replicate China's experiences rigorously?" Decisive actions at the start of an outbreak could at least slow down the outbreak and give authorities more time to prepare for infections that could strain health services. However, strict quarantine measures, including long-term control of cities, are unlikely to be acceptable in many countries. Nevertheless, as most scientists said, social isolation measures to stop the spread of COVID-19 should be considered as necessary around the world. Otherwise, if an epidemic infects a significant part of the population, social isolation would become meaningless. Therefore, for now, when the majority of people are still not infected, the best way to avoid the spread of this infection is to do the most rational containment measures, like isolation, and using masks.

It is advisable, therefore, for the affected countries to frequently make an assessment of their prevention measures to enhance them so as to optimize their efficiency in the prevention of the spread of the COVID-19 outbreak. Moreover, lessons could be learned on better epidemic preparedness from countries such as China, Singapore, South Korea, and Japan. Thus, these countries can provide valuable insight into handling the current epidemic situation. For example, in terms of China's experience, some proactive surveillance measures include proper hand hygiene, social isolation of infected individuals in properly ventilated hospitals, isolation of individuals with suspected symptoms or fever, wearing masks, and building new hospitals.

Furthermore, activities involving economic globalization need to be monitored as these may contribute to the spread of the virus across countries at a rapid pace. However, this has been a challenge because many countries are either slow in

taking the necessary measures to contain the outbreak or are handicapped by their relatively weak healthcare systems to appropriately respond to the health crisis. At the G20 Leaders' Summit on the COVID-19 on March 26, 2020,³⁷ President Xi Jinping's call for a "global comprehensive fight" against the pandemic was of great significance for dealing with the global public health crisis. China's strict use of non-pharmaceutical measures, to control the spread of COVID-19 in several cases, offers important lessons for the global community. Meanwhile, in China, this rather unique and unprecedented public health response has reversed the escalation of cases in Hubei, which had witnessed widespread community transmission.

Nevertheless, the Chinese model has some drawbacks that need to be acknowledged. First, this outbreak has sounded an alarm about health governance exposures that China has, and showed an obvious health emergency knowledge gap in the prevention and control system; and mechanism of the public health emergency management system. Secondly, any possible violation of human rights while carrying out measures to prevent and control the spread of the pandemic should be discussed. However, China's mode of response is the most comprehensive, stringent, and thorough regardless of exposing herself to a period of economic decline or even a short-term "shutdown." This is consistent with an editorial comment in the *Lancet*, "China's success has come at a huge social and economic cost, and China must make tough decisions to strike the best balance between its citizens' health and economic protection."³⁸ Also, during the epidemic, China ensured that infected patients received timely treatment, and had their privacy rights protected. Besides, China ensured that the rights of the public to information and supervision were guaranteed. These are remarkable achievements in human rights development. Thus, generally, the Chinese government has always given top priority to the safety and health of its people, and taken strict and effective measures, making an important contribution to the global fight against the epidemic.³⁹ On the controversy about protecting human rights and saving lives in the face of a pandemic, Lu Zhian, the executive deputy director of the Human Rights Research Center of Fudan University, said that all human rights are equal, but to protect the rights to life, health and other human rights that are urgently threatened and violated during the epidemic, the state should appropriately weaken other human rights in emergencies, which is in line with the spirit of the human rights law.⁴⁰ Therefore, China's experience offers important lessons and references to other countries.

Conclusion

A major opinion expressed in this study is that China has played a significant role in protecting the global community and creating a stronger first line of defense against the international spread of the COVID-19. In spite of that, some countries' insufficient and less timely action would hamper the process of containing the spread of COVID-19. Therefore, international cooperation is imperative in the fight against this pandemic.

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References

- Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395(10223):497-506.
- Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet*. 2020;395(10223):470-473.
- World Health Organization (WHO). *Novel Coronavirus 2019*; 2020. Accessed on 31 March 2020 <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.
- Johns Hopkins University. Accessed on 31 March 2020 <https://coronavirus.jhu.edu/map.html> <https://coronavirus.jhu.edu/map.html>.
- Global Summary news. *The Case of New Coronavirus Infection Has Been Reported in Some European Countries*. https://www.xinhuanet.com/english/2020-02/29/c_138830757.htm.
- WHO Raised the Risk Assessment of the Novel Coronavirus Disease (COVID-19) from "high" to "very High" at a Global Level, and the UN Chief Called for Intensified Efforts to Contain COVID-19 without Stigmatization. Director-General Tedros Adhanom Ghebreyesus Speaking in Geneva. <https://www.who.int/> (Accessed on 29 February 2020).
- Guardian NEWS. *Italy Criticises EU for Being Slow to Help over Coronavirus Epidemic Issues*; 2020. Accessed on 11 March 2020 <https://www.Guardian.com/news/2020-3-11reported>.
- "Why Are Tests Ability for COVID-19 So Late in the United States?" http://www.fortunechina.com/shangye/c/2020-03/04/content_359988.html
- People's Government of Hubei Province. *Wuhan Will Be Coronavirus Pneumonia Epidemic Prevention and Control Headquarters Notice* (No. 1) [EB/OL]. (2020-0123) [2020-01-27]. http://www.hubei.gov.cn/zhuanti/2020/GZXXGZBD/ZXTB/202001/t20200123_2014402_SHTML. (In Chinese).
- Prem K, Liu Y, Russell TW, et al. The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in Wuhan, China: a modelling study. *Lancet Public Health*. 2020;5:e261.
- Tian H, Liu Y, Li Y, et al. *An Investigation of Transmission Control Measures during the First 50 Days of the COVID-19 Epidemic in China*. *Sciences* 2020;32234804.
- Yang Z, Zeng Z, Wang K, Huang S. Prediction of COVID-19 increasing trend in China under public health intervention based on SEIR optimization model and AI. *Journal of Throacic Disease*. 2020.
- Pan A, Liu L, Wang C, et al. Association of Public Health Interventions With the Epidemiology of the COVID-19 Outbreak in Wuhan, China. *JAMA*. 2020;323(19):1915-1923. doi: [10.1001/jama.2020.6130](https://doi.org/10.1001/jama.2020.6130).
- Press Conference on the Progress of Prevention, Control and Treatment of the Epidemic Situation of New Coronary Pneumonia. http://www.nhc.gov.cn/xcs/zhengcqwj/list_gzbd.shtml (Accessed on 25 February 2020)
- Dialogue between Bai Yansong of CCTV and Wang Wei, President of Huazhong University of Science and Technology, Affiliated to Tongji Hospital (In China); on New 1+1 of CCTV in Beijing, accessed on February 14, 2020.
- Press Conference on the Progress of Prevention, Control and Treatment of the Epidemic Situation of New Coronary Pneumonia. www.nhc.gov.cn/xcs/zhengcqwj/list_gzbd.shtml (Accessed on February 28, 2020). (In Chinese)
- Chen S, Zhang Z, Yang J, et al. Fangcang shelter hospitals: a novel concept for responding to public health emergencies. *Lancet*. 2020;395(10232):1305-1314. doi:[10.1016/S0140-6736\(20\)30744-3](https://doi.org/10.1016/S0140-6736(20)30744-3).
- Guan Q, Liu M, Zhuang YJ, et al. [Epidemiological investigation of a family clustering of COVID-19]. *Zhonghua liu xing bing xue za zhi = Zhonghua liuxingbingxue zazhi*. 2020;41(0):629-633.
- Chen S, Zhang Z, Yang J, et al. Fangcang shelter hospitals: a novel concept for responding to public health emergencies. *Lancet*. 2020;395(10232):1305-1314.
- Press Conference on the Progress of Prevention, Control and Treatment of the Epidemic Situation of New Coronary Pneumonia. www.nhc.gov.cn/xcs/zhengcqwj/list_gzbd.shtml (Accessed on March 15, 2020).
- Li W, Yang Y, Liu Z-H, et al. Progression of mental health services during the COVID-19 Outbreak in China. *Int J Biol Sci*. 2020;16(10):1732-1738.
- Liu S, Yang L, Zhang C, et al. Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatr*. 2020;7(4):e17-e18.
- In Hubei Province, 580,000 Party Officials Sank into Communities to Combat the Outbreak*. (In Chinese). http://www.hubei.gov.cn/hbfb/bmdt/202003/t20200310_2176611.shtml.
- China - World Health Organization COVID - 19 Joint Mission Final report*. Pdf. <http://www.nhc.gov.cn/gjhzs/s3578/202002/35991766592b4f9a83b5f2448ee6bbab.shtml>. (Accessed on 25 February 2020).
- The Lancet L. COVID-19: too little, too late? *Lancet*. 2020;395(10226):755.
- World Health Organization (WHO). *Novel Coronavirus 2019*; 2020. (Accessed on 11 March 2020) <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.
- Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med*. 2020;8:475-481.

28. *Since May 14, Wuhan Has Launched Free Nucleic Acid Testing for All Citizens, Screening Asymptomatic Infected People.* http://hbrbshare.hubeidaily.net/hbshare/news/detail_index.html?spm=zml033-001.0.0.1.b7Z74R&contentType=5&contentId=701340&cId=0
29. Wuhan has launched free nucleic acid testing for all citizens". *Social Medicine Experts Zu Xun Lu Explains the Significance of Nucleic Acid Testing in Wuhan.* <http://www.cjrb.cjn.cn/html> (Accessed on 22 May)
30. *COVID-19 Is Spreading in the Middle East, with the Number of Confirmed Cases Rising Rapidly in Many Countries.* <https://world.huanqiu.com/article/3xDFXHBalCL> (Accessed on 28 February 2020).
31. *Summary News: The First Case of New Coronavirus Infection Has Been Reported in Two Countries in the Middle East, with Additional Confirmed Cases in Many Countries.* http://www.xinhuanet.com/world/2020-02/22/c_1125612010.htm (Accessed on February 22, 2020)
32. *Asahi Shimbun News.* <https://m.huanqiu.com/article/3xPupkFf40S> (Accessed on February 14, 2020)
33. Global news. World Health Organization. *China Is Doing the Right.* https://news.china.com/focus/ceshifagaos/11167381/20200308/37880861_all.html.
34. Munster VJ, Koopmans M, van Doremalen N, van Riel D, de Wit E. A novel coronavirus emerging in china - key questions for impact assessment. *N Engl J Med.* 2020;382(8):692-694. doi:10.1056/NEJMp2000929. Epub 2020 Jan 24.
35. The People's Daily NEWS. *China Has Assisted 89 Countries and Four International Organizations to Again COVID-19.* (Accessed on March 27 2020).
36. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med.* 2020; 382:727-733. doi:10.1056/NEJMoa2001017.
37. *President Xi Jinping Delivered an Important Speeching at the G20 Leaders' Special Summit on COVID-19 Sustaining Containment of COVID-19 in China.* [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30864-3/fulltext-2020-4-18](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30864-3/fulltext-2020-4-18) (Accessed on 22 May)
38. Sustaining containment of COVID-19 in China. *Lancet.* 2020; 395(10232):1230. doi:10.1016/S0140-6736(20)30864-3
39. *People's Daily news.* "We Have Never Needed International Cooperation So Badly"; 2020. <https://www.paper.people.com.cn> (Accessed on 17 February 2020).
40. The "Development and Progress of Human rights in China". In 43rd conference of the united nations human rights council, Geneva, 30 February 2020, 2-29.

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