State Capacity in Response to COVID-19: A Case Study of China

Shaolong Wu*, Chunxiao Wang**, Luwen Zhang***

* Sun Yat-sen University, China
† Guangzhou Medical University, China
^ Southern Medical University, China

Countries across the world responded very differently in their prevention and control of coronavirus disease 2019 (COVID-19), and state capacity is likely driving these differences. In this study, we define state capacity in preventing and controlling COVID-19 as the extent to which a state takes rapid intervention measures based on scientific evidence to prevent and control infectious diseases. This case study explores China’s experience in terms of pandemic prevention and control, showing that the goal of pandemic prevention and control in the country is a concrete combination of outcome goals and multidimensional process objectives. This research also demonstrates the important role of state capacity in pandemic prevention and control in China by analyzing different ways to quickly achieve accessibility and full coverage of intervention measures for the target population. Finally, we argue that a country’s political system is not a decisive factor in pandemic prevention and control. Rather, the historical experience of a country in dealing with similar outbreaks and current state capacity play important roles.

Keywords: state capacity, COVID-19, China, case study

INTRODUCTION

With more than 6,000 confirmed cases in China and nearly 100 confirmed cases in other countries, the World Health Organization (WHO) categorized coronavirus disease 2019 (COVID-19) as a public health emergency of international concern on January 30, 2020. COVID-19 rapidly developed into a global pandemic with the epicenter shifting from East Asia to Europe and then from Europe to America, resulting in social quarantine, a global economic recession, and a large number of deaths. In this battle against the pandemic, some countries, like China, South Korea, Germany, and Vietnam (Hu et al., 2020; Moon, 2020), performed better than other countries, such as the US and Brazil (Kettl, 2020), in the first wave of the pandemic.

Countries responded very differently regarding pandemic prevention and control. Previous studies discuss the effects of the political system, political leadership, social solidarity, community participation, culture, health care, and other factors (Cheng et al., 2020; Kettl, 2020), as well as the role of state capacity (Capano, 2020), on pandemic management and outcomes. Still, state capacity in the prevention and control of COVID-19 remains largely underexplored. How should state capacity in the prevention and control of COVID-19 be defined, and what role(s) does state capacity play in the prevention and control of COVID-19? At present, COVID-19 remains a global pandemic and will likely see resurgences in the future, similar to the three waves experienced during the 1918 pandemic, COVID-19 is likely to make a comeback. Here, we argue that the definition and analysis of state capacity in pandemic prevention and control are helpful to the global prevention and control of subsequent waves of outbreaks.

First, this study defines the three principles of infectious disease prevention and control as the general goals of COVID-19 prevention and control. State capacity in the prevention and control of COVID-19 is the extent to which these objectives are
achieved by policy interventions. Specifically, state capacity is the extent to which the government and health care system eliminate sources of infection, cut off transmission routes, and protect susceptible populations. Second, this study analyzes China’s experience in pandemic prevention and control, expounds its pandemic prevention and control objectives, and identifies how it aims to achieve these goals through various intervention measures. This is particularly apt, given that The Lancet, a world-class medical journal, published an editorial at the end of July 2020 indicating that China has generally controlled COVID-19. Finally, this study argues that a country’s political system is not a decisive factor for the success of pandemic prevention and control, whereas a country’s historical experience in dealing with similar outbreaks and the resulting state capacity play important roles.

STATE CAPACITY IN PANDEMIC PREVENTION AND CONTROL

State capacity is defined as the ability of a country to formulate and implement public policies or to achieve its will and goals (Fukuyama, 2004; Wang, 1991). State capacity is based on the extent of state intervention. No matter how strong or weak a country is, intervention to control infectious diseases is always considered a form of state intervention. Eliminating, preventing, and controlling infectious diseases is the embodiment of state capacity in the public health sector and may lead to the rise and fall of countries and civilizations. Furthermore, human survival and development includes a history of struggle and coexistence between humans and viruses (McNeill, 1989).

Humans have always dreamed of eliminating infectious diseases. However, states did not know how to scientifically and systematically prevent and control infectious diseases until the establishment of three principles of infectious disease control in the 19th century—eliminate the source of infection, cut off the route of transmission, and protect the susceptible population (Nelson & Williams, 2014). Based on these principles, state capacity in the prevention and control of infectious diseases can be defined as the extent to which the state can quickly take effective intervention measures based on scientific evidence to achieve the goal of infectious disease prevention and control. It specifically includes the capacity to identify infectious diseases, eliminate the source of infection, cut off routes of transmission, protect susceptible populations, and maintain people’s normal production and living order during a pandemic. Only when a state has achieved equal capacity in each of these aspects can it effectively contain a pandemic. If deficiencies exist in one or several of these areas, pandemics will be unavoidable.

The modern state generally establishes a public health system to undertake the function of prevention and control of infectious diseases. In general, the capacity of the public health system is equivalent to state capacity in the prevention and control of infectious diseases. In the case of a pandemic, state capacity is the ability of the state to mobilize its population to prevent and control infectious diseases (Mills, 2005).

Pathogens and hosts of most infectious diseases are extremely different, and some infectious diseases lack specificity in terms of symptoms, the people they infect, infectivity, and pathogenicity. Indeed, most infectious diseases are quite uncertain. Even professional medical and health workers have difficulty in identifying the source and the kind of infectious diseases in time. For example, the disease specificity of COVID-19 is poor, and the uncertainty around symptoms, infectivity, and pathogenicity makes COVID-19 a cunning adversary (Bai et al., 2020; Guan et al., 2020). Therefore, the primary goal of state capacity in the field of infectious diseases is to find out the specificity of diseases and quickly diagnose and identify infectious diseases. Only through diagnosing and identifying people infected with COVID-19 can we eliminate and identify the source of infection, cut off the transmission route, and protect the susceptible population.

To achieve the above-mentioned outcome goals, the state must quickly realize the accessibility of infectious disease prevention and control measures and the full coverage of the measures in the target...
population. Accessibility can be achieved by the state and its health care system by identifying the infected and potentially infected populations for intervention as soon as possible. China’s prevention- and control policy defines this goal as early detection, early report, early diagnosis, early tracking, early quarantine, and early treatment (Sun, 2020). Full coverage refers to the ability of the state and its health care system to intervene for all infected people and potentially infected people. Before discovering specific drugs and producing effective vaccines, China’s prevention- and control policy aims to identify, quarantine, admit, and treat those people who must be identified, quarantined, admitted, and treated (Information Office of the State Council, 2020). The relationship between the outcome goals and the process objectives is shown in Table 1. The prevention and control of infectious diseases ultimately depend on science and technology. Coordination between government and society is also important for achieving the goal of infectious disease prevention and control (Price-Smith, 2001). This study aims to analyze the state capacity of China in non-drug comprehensive interventions.

### STATE CAPACITY: PROMPT ACCESS

China implemented large-scale social isolation and suspension to tackle the SARS epidemic in 2003, which had enormous impacts on economic and social development. Retrospectively, the Chinese government was heavily criticized due to its reluctant and inefficient response, and over 100 countries and regions had temporarily suspended trade with China. The situation in 2020 was a recurrence of 2003—COVID-19 spread abruptly and rapidly from Wuhan to the whole country, and the international community, led by the United States, was highly concerned with this. The epidemic happened during a period of intensified competition between China and the U.S., exemplified by the China-US trade war. In such situations, public health emergencies will inevitably provide an excellent excuse to attack China. Therefore, the Chinese government needed to quickly eradicate this epidemic.

#### Early Detection and Early Report

On December 27, 2019, the Chinese government received a report from Jixian Zhang, a doctor in Wuhan, who discovered for the first time an aggregated case of pneumonia of unknown origin. On January 20, 2020, China’s leading respiratory expert, Nanshan Zhong, announced in a national television program that COVID-19 can be transmitted through human-to-human interactions. Daily reporting systems were implemented after the announcement. COVID-19 cases were also included in the national infectious disease reporting system to thoroughly solve the problem of detecting and reporting outbreaks. Consequently, the diagnosis, suspected quarantine observation, number of deaths, and other daily information were quickly reported to the health department for summary and publication.

#### Early Diagnosis

The diagnosis of COVID-19 depends on the gold standard of laboratory detection in addition to
clinical manifestations and epidemiological history. At first, only China CDC could detect COVID-19 in laboratories. The process, from seeking medical advice to sending a sample to China CDC and obtaining results, took approximately seven days. COVID-19 spreads extremely fast. Such a slow detection and diagnosis process led to the rapid spread of the epidemic. With the improvement of the quality and quantity of domestic test kits and the improvement of laboratory conditions of various institutions, China CDC began to decentralize the detection and diagnosis to provincial CDCs, tertiary hospitals, and even private testing institutions in late January. With the help of medical aid teams, almost all prefecture-level cities in Hubei province could detect the spread of the disease in the last 10 days of February. Thus, the authority of diagnosis was transferred to prefecture-level cities and even counties. With improvements in technology, the results that were previously available in a few days could now be obtained in only a few hours. Technological progress and decentralization led to the rapid improvement of the epidemic prevention and control capacity in all provinces.

**Early Tracking and Early Quarantine**

Before diagnoses were confirmed by nucleic acid testing, the Chinese government generally implemented community-based active screening measures, such as self-report of health status and body temperature measurement, to find suspected patients based on symptoms as soon as possible. Another way to detect potentially infected people is to track and quarantine the close contacts of confirmed patients to find high-risk groups promptly. According to the Epidemiological Investigation Plan for COVID-19 Cases (Edition IV), suspected cases shall be reported directly through the Internet within 2 hours, and epidemiological investigation shall be completed within 24 hours. In many places, the epidemiological investigation is actually faster than this requirement, and the quarantine and medical observation of close contacts are implemented immediately.

**Early Treatment**

With the integration of traditional Chinese and Western medicines, the former was used to treat people at an early date. China’s medical experience showed that the earlier the treatment, the better the rehabilitation. Therefore, while doing a good job in the treatment of patients, traditional Chinese medicine was actively promoted in community prevention and control. In fact, Chinese patent medicines and prescription decoctions were distributed to people in centralized quarantine and observation, as well as to close contacts in their homes. Once the infected people were admitted to hospitals, supportive treatment was provided to avoid mild to severe cases. With the implementation of the policy of early detection, early report, early diagnosis, early tracking, early quarantine, and early treatment, the Chinese government quickly controlled the transmission of the epidemic (WHO-China, 2020; Sun, 2020).

**STATE CAPACITY: UNIVERSAL COVERAGE**

**Detect Those People Who Should be Detected**

First, the policy of body temperature measurement was implemented in China. Specifically, temperature measurement was widely conducted in public places, vehicles, work units, residential areas, and other public working and living spaces. Those who have excessively high body temperature were dissuaded from entering and advised to seek medical treatment. The body temperature of suspected patients and close contacts was measured several times a day during the quarantine period. Even people quarantining at home were required to report their body temperature every day. Although COVID-19 patients with fever symptoms on admission accounted for only 43.8% of cases (Guan et al., 2020), temperature measurement was the only active screening measure for the government to achieve full coverage because of the universal and easy operation of thermometry tools.

Second, the nucleic acid testing capacity of the state was improved. Wuhan City was closed from January to mid-February to prevent further transmission. However, China’s nucleic acid testing capacity had always been insufficient, and many suspected patients in the epicenter could not be diagnosed and treated
in hospitals. With the improvement of the detection capacity in various regions, the Chinese government decentralized testing. Consequently, detection of suspected cases and close contacts was increased, and testing could be done for those returning to work and study in accordance with the needs of individuals and employers. To determine the extent of asymptomatic infections, the state conducted a national nucleic acid testing in Wuhan in May, which helped to thoroughly dispel the doubts of the outside world about the pandemic in Wuhan and the discrimination against the Wuhan people. The testing of nearly 10 million people was completed within 18 days, demonstrating the expanding detection capacity of China.

**Quarantine Those People Who Should Be Quarantined**

When COVID-19 was prevalent in China, people from Wuhan or Hubei who had contact history with confirmed cases were tracked and quarantined in the provinces outside Hubei. General contacts were quarantined at home, whereas close contacts were quarantined in a centralized way. Although more than five million people left Wuhan before the closure, the scale of the centralized quarantine outside Hubei was insufficient. Many infected people and close contacts were detected in Wuhan. To quarantine them, the Wuhan municipal government used a large number of hotels and school dormitories. This method was also adopted in other regions of Hubei, rapidly expanding the centralized quarantine capacity to avoid the spread of the virus caused by home quarantine.

**Admit and Treat Those People Who Should be Admitted and Treated**

In Wuhan and Hubei, where the outbreaks were the most serious, a lack of hospital bed capacity was observed from late January and early February, respectively. Consequently, patients were not admitted to hospitals even if they were diagnosed as positive cases. With the support of the public, Huoshenshan and Leishenshan hospitals rose within 10 days, providing an additional 2,500 beds for critical cases. China also invented a mobile cabin hospital similar to a field hospital to admit and treat patients with mild illnesses on a large scale (Chen et al., 2020). A total of 16 mobile cabin hospitals were established in Wuhan, providing an additional 13,000 beds, which rapidly exceeded the number of patients with mild illnesses. In line with the expansion of hospitals and beds, a total of 42,000 medical workers and nursing staff were organized to support Hubei province, fully realizing the goal of treating those who should be treated.

**DISCUSSION AND CONCLUSION**

China aims to improve its national governance system and capacity and achieve the goal of building a modern country by the middle of this century (CPC Central Committee, 2019). By overcoming COVID-19, China can truly realize modernization. With the efforts of the government, the health care system, and all the people, China has achieved phased success in fighting and blocking further COVID-19 outbreaks. Facing the increasingly severe international pandemic situation, the state is also actively preparing for the challenge of subsequent waves of outbreaks. If no major outbreak occurs in China by the time the vaccine or specific drug is produced, the state can assume its success in terms of pandemic prevention and control.

From the perspective of legitimacy, historical experience shows that democratic regimes have stronger state capacity than authoritarian regimes (Fukuyama, 2004). When applied to the field of infectious disease prevention and control, Western media and some researchers believed that a liberal democratic regime has a stronger ability to prevent and control COVID-19 than an authoritarian regime (Ang, 2020). Given that the first outbreak of COVID-19 occurred in China, many scholars believed that this health crisis is a failure of China’s system, and COVID-19 is the state’s Chernobyl Moment (Anderlini, 2020; Zhang, 2020). After China successfully controlled the outbreak, COVID-19 became a pandemic in the Western world, causing serious deaths and economic and social depression. Western liberal democracy has failed in pandemic prevention and control, which shows the flaws of the regime-state capacity theory. Still, the COVID-19 pandemic is far from over. On the one hand, the success or failure of a regime is too early to be determined. On the other hand, states can be
categorized as having good or poor performance under different regimes, such as South Korea and the US under democratic regimes and Vietnam and Iran under authoritarian regimes. Therefore, the effectiveness of pandemic prevention and control is determined by the capacity outside the regime, which is possibly related to the historical experience of a country.

Generally, the performance of countries and regions in pandemic prevention and control during the COVID-19 pandemic is closely related to whether they experienced severe accurate respiratory syndrome (SARS) in 2003. Countries and regions in East and Southeast Asia, such as China, South Korea, Vietnam, and Singapore, experienced SARS. These countries and regions have more effective COVID-19 interventions following their experiences with the SARS outbreak. However, most European and American countries have not experienced large-scale respiratory infectious diseases for decades. With influenza as a reference frame, they seriously underestimated the contagion, incidence rate, and mortality of COVID-19, resulting in casualties far higher than their expectations, which ultimately resulted in a severe economic recession. Comparatively speaking, the historical experience and ability of states to respond to epidemics and/or pandemics plays a key role in their response to COVID.

Historical experiences influence not only a nation’s perception and estimate of an epidemic outbreak but also its responsive strategy as well as the related state capacity. To fight the SARS outbreak in 2003, China had to launch a mass campaign to contain the epidemic due to the inability of the public health system to respond, as well as insufficient science and technology. China’s experience with SARS prevention and control meant that the nation could respond to the epidemic at two levels: public health systems and mass campaigns. Once the public health system is unable to contain a large-scale epidemic, the state will mobilize the masses to join prevention and control. Although the capacity of the public health system is lacking in some ways, the multi-level structure of state capacity led to the containment of the COVID-19 epidemic in China.

On the contrary, the United States and European countries have relied on advanced science and technology and excellent public health systems to prevent and control various epidemics. This system is very effective when viruses, such as influenza and Ebola, are not lethal or highly contagious. However, when it comes to a virus like COVID-19 with a high mortality rate, the lack of strong state mobilization capacity means the public health system would be strained and the containment of the pandemic would be difficult.

Plague is the enemy of mankind. All political regimes in history have fought against them. Even if some countries do not perform well because of leadership and other factors, this is not necessarily related to the political regime. The history of mankind’s victory over disease is based on scientific evidence and strong state capacity. In modern societies, biomedical technologies have been developed. Still, the effectiveness of these technologies and tools against the current pandemic still depends on the ability of the state to mobilize and organize its people to achieve the goals of prevention and control.

REFERENCES

Anderlini, J. (2020, August 24). Coronavirus could be China’s Chernobyl moment. The Irish Times. https://www.irishtimes.com/opinion/coronavirus-could-be-china-s-chernobyl-moment-1.4170366

Ang, Y. Y. (2020). When COVID-19 meets centralized, personalized power. *Nature Human Behaviour, 4*(5), 445–447.

Bai, Y., Yao, L., Wei, T., Tian, F., Jin, D-Y., Chen, L-j., & Wang, M. (2020). Presumed asymptomatic carrier transmission of COVID-19. *JAMA, 323*(14), 1406–1407.

Capano, G. (2020). Policy design and state capacity in the COVID-19 emergency in Italy: If you are not prepared for the (un)expected, you can be only what you already are. *Policy and Society, 39*(3), 326–344.

Chen, S., Zhang, Z., Yang, J., Wang, J., Zhai, X., Bärnighausen, T., & Wang, C. (2020). Fangcang shelter hospitals: A novel concept for responding to
public health emergencies. *The Lancet*, 395(10232), 1305–1314.

Cheng, Y. D., Yu, J., Shen, Y., & Huang, B. (2020). Coproducing responses to COVID with community-based organizations: Lessons from Zhejiang Province, *China. Public Administration Review*, 80(5), 866–873.

CPC Central Committee. (2019, August 24). *Decision of the CPC Central Committee on upholding and improving the socialist system with Chinese characteristics and promoting the modernization of national governance system and governance capacity*. http://www.xinhuanet.com/politics/2019-11/05/c_1125195786.htm

Fukuyama, F. (2004). *State-building: Governance and world order in the 21st century*. Cornell University Press.

Guan, W.-j., Ni, Z.-y., Hu, Y., Liang, W.-h., Ou, C.-q., He, J.-x., Liu, L., Shan, H., Lei, C.-l., Hui, D. S. C., Du, B., Li, L.-j., Zeng, G., Yuen, K.-Y., Chen, R.-c., Tang, C.-l., Wang, T., Chen, P.-y., Xiang, J., ... Zhong, N.-s. (2020). Clinical characteristics of coronavirus disease 2019 in China. *The New England Journal of Medicine*, 382(18), 1708–1720.

Hu, Q., Zhang, H., Kapucu, N., & Chen, W. (2020). Hybrid coordination for coping with the medical surge from the COVID-19 pandemic: Paired Assistance Programs in China. *Public Administration Review*, 80(5), 895–901.

Information Office of the State Council. (2020, June 12). *China’s action against COVID-19* [Authorized release]. http://www.xinhuanet.com/politics/2020-06/07/c_1126083364.htm

Kettl, D. F. (2020). States divided: The implications of American federalism for Covid-19. *Public Administration Review*, 80(4), 595–602.

McNeill, W. H. (1989). *Plagues and peoples*. Anchor Books.

Mills, A. (2005). Mass campaigns versus general health services: What have we learnt in 40 years about vertical versus horizontal approaches? *Bulletin of the World Health Organization*, 83(4), 315–316.

Moon, M. J. (2020). Fighting against COVID-19 with agility, transparency, and participation: Wicked policy problems and new governance challenges.

*Public Administration Review*, 80(4), 651–656.

Nelson, K. E., & Williams, C. M. (2014). *Infectious disease epidemiology: Theory and practice*. Jones & Bartlett.

Price-Smith, A. (2001). *Plagues and politics: Infectious disease and international policy*. Springer.

Sun, C. (2020). Thoroughly implement the spirit of General Secretary Xi Jinping’s important instructions, strengthen the guidance and supervision in the front-line of pandemic prevention and control (in Chinese, http://www.qsttheory.cn/dukan/qs/2020-04/01/c_1125791378.htm). *Qiushi*, 7, 21–28.

Wang, S. (1991). *From revolution to involution: State capacity, local power, and (un)governability in China* [Unpublished manuscript]. Yale University.

WHO-China. (2020). *Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)*. https://www.who.int/publications/i/item/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-(covid-19)

Zhang, C. (2020, May 4). Covid-19 in China: From ‘Chernobyl Moment’ to impetus for nationalism. *Made in China Journal*, 5(2), 162–165.

ABOUT THE AUTHORS

Shaolong Wu is an associate professor in the Department of Health Policy and Management, School of Public Health at Sun Yat-sen University (SYSU) and a senior fellow of the Sun Yat-sen Global Health Institute, Institute of State Governance, SYSU. Wu has a Ph.D. in public administration, and he is familiar with the fields of public administration and health system and policy. His research interests span the governance of health and state. He has published dozens of papers in English and Chinese.

Chunxiao Wang, M.P.H., Ph.D., graduated from SYSU with a major in medicine. Dr. Wang obtained his M.P.H. from the University of Hong Kong and his Ph.D. in public administration from SYSU. He is familiar with the fields of health economics and health policy. He is a senior fellow of the Sun Yat-sen Global Health Institute, Institute of State Governance, SYSU as well as a guest professor at Guangzhou Medical
University.

Dr. Zhang Luwen is an assistant professor at Southern Medical University, Guangzhou, China. She graduated from SYSU’s School of Public Health, majoring in social medicine and health management. Her research interests span health system and services research, noncommunicable diseases management, and health education and promotion.