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Thinking about China's Response to the COVID-19 Outbreak

A healthy society should not have only one voice.

—Dr. Li Wenliang¹

Dr. Zhong Nanshan was a national hero during the SARS (severe acute respiratory syndrome) epidemic in 2003. Based in Guangzhou, he correctly diagnosed that mysterious pneumonia disease as viral despite pressure from Beijing. He also spoke up about the severity of that outbreak when national officials sought to downplay it in early April 2003.

On January 20, 2020, the 83-year-old Dr. Zhong took on the awesome burden of breaking the bad news about the outbreak in Wuhan. For several days, Dr. Zhong had been on a multi-city emergency itinerary that included a high-profile expert visit to Wuhan and a whole day of meetings in Beijing on January 20. At 9:44 PM, the visibly exhausted Dr. Zhong appeared on the *News 1+1* program of China Central Television. Contrary to the obfuscations from Wuhan, he informed the audience bluntly that the novel coronavirus found in Wuhan, later named “SARS-coronavirus 2” (SARS-CoV-2), “is certainly transmissible from human to human.” Health workers in Wuhan were among the infected, he noted. Confirming rumors that began to circulate in December 2019, Dr. Zhong observed that the patients’ symptoms were like those for the much-dreaded SARS. He warned the public to put on facemasks and to not go to Wuhan.²

Seventeen years after the SARS crisis of 2002–2004, the *News 1+1* interview with Dr. Zhong became the first Chinese official communication of yet another novel coronavirus epidemic. It also marked the beginning of national mobilization in China.³ In the morning of January 23, 2020, the Wuhan leadership, on the order of General Secretary and President Xi Jinping, sealed off Wuhan, a city of about 11 million people, from the rest of the country. The Wuhan lockdown would last 76 days.

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By imposing the cordon sanitaire on Wuhan, China persuaded the World Health Organization (WHO) to refrain from immediately declaring the emergence of the novel coronavirus (2019-nCoV) a public health emergency of international concern (PHEIC). The PHEIC declaration happened on January 30, 2020. On February 11, 2020, the International Committee on Taxonomy of Viruses named the novel coronavirus first identified in Wuhan as “SARS-CoV-2” and thus a genetic sibling to the virus responsible for the SARS epidemic of 2003.⁴ On the same day, the WHO named the disease caused by SARS-CoV-2 “coronavirus disease COVID-19,” or COVID-19.

The WHO declared the COVID-19 outbreak a global pandemic exactly a month later. When Wuhan reopened on April 8, 2020, the COVID-19 pandemic was still in its infancy for the rest of the world. According to a WHO study, in its first 2 years (2020–2021) alone, the estimated worldwide death toll associated directly or indirectly with the COVID-19 pandemic was about 14.9 million (ranging from 13.3 to 16.6 million).⁵ The COVID-19 pandemic had become the worst plague of the twenty-first century.⁶

I was in Beijing for research on China’s governance during the SARS crisis of 2003.⁷ Like many others who had experienced the ups and downs of the SARS crisis, I was immediately hooked when the first pieces of information about an outbreak of SARS-like pneumonia cases in Wuhan began to circulate on Chinese social media on December 30, 2019.

The SARS crisis was the first pandemic of the twenty-first century.⁸ It started in Guangdong, China at the end of 2002, and the coronavirus that caused SARS was believed to have jumped from wildlife such as civet cats to humans.⁹ Before SARS was contained, the SARS-coronavirus (SARS-CoV-1) reached 29 countries and territories, spreading fear and destruction along the way. In Beijing, authorities concealed the outbreak from the public for weeks, at one point putting some patients in ambulances roaming around the city when a WHO expert mission made hospital visits.¹⁰ In late April 2003, China’s newly installed leaders Hu Jintao and Wen Jiabao sacked Health Minister Zhang Wenkang and Beijing mayor Meng Xuenong and unleashed a massive public campaign against SARS. As part of the campaign, the city of Beijing built the Xiaotangshan SARS Hospital, then the largest field hospital for the quarantine and treatment of infected patients, in about a week. By hard work and luck, the SARS crisis was over by summer 2003.

The SARS crisis left painful memories for China’s leaders, healthcare professionals, and many members of the public.¹¹ It also helped catalyze important governance reforms in China, especially in public health.¹² Massive

investments were made to enhance disease prevention and control capabilities, and the Chinese Centers for Disease Control and Prevention (China CDC) quickly built a nationwide online disease reporting and surveillance network system. Such capacity-building also helped to instill growing confidence in China's health emergency preparedness.

When information about an outbreak of SARS-like pneumonia cases in Wuhan began to circulate at the end of 2019, it was inevitable for people who had experienced SARS to draw on that experience to make sense of the new and unusual pneumonia cases. In fact, the clinicians credited with identifying the initial cases in Wuhan drew on their SARS experiences. Even though the Wuhan Municipal Health Commission (WMHC) quickly denied that the unusual pneumonia cases were SARS, there was high hope and a significant amount of trust among the Chinese public that Chinese health authorities had learned the lessons from the SARS crisis and would be better at handling the outbreak in Wuhan.

As I eagerly searched for what I could find about the outbreak in Wuhan on December 30, 2019, the SARS crisis loomed large in the back of my mind. Unlike in 2003, when information traveled much more slowly in China, a good amount of information from Wuhan quickly circulated on social media in real time. Some of the online postings included portions of lab reports that pointed to a SARS-like coronavirus.

Two red letter-headed WMHC emergency notices also circulated in WeChat groups. They made no mention of a SARS or SARS-like coronavirus but referred to cases of pneumonia of uncertain etiology (PUE) or cause associated with a certain Huanan Seafood Market in Wuhan. These notices directed hospitals to submit information on PUE cases to the WMHC and to mobilize resources for patient treatment. "If there's a SARS outbreak as in 2003, we'd expect the official response to escalate soon," I tweeted hopefully early that evening.¹³

In contrast with 2003, the national party-state media in China was heavily engaged with the outbreak in Wuhan as soon as it became public. By late in the evening (around noon Beijing time on December 31, 2019), I noted that "The Wuhan health authorities have spoken to strongly suggest it's not exactly SARS (of the 2003 kind)."¹⁴ There were also reports from China that experts organized by the National Health Commission (NHC) and the China CDC had reached Wuhan to conduct investigations. The *People's Daily* post on Weibo, China's Twitter-like service, appeared at 11:56 AM (Beijing time, December 31, 2019):

According to multiple hospital sources in Wuhan, the cause of [these viral pneumonia cases] is not yet clear; it cannot be concluded that it is the SARS virus

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rumored online but it is more likely some other severe pneumonia. Even if it is the SARS virus, there is a mature prevention and control treatment system in place, so the public need not panic.¹⁵

The *People's Daily* Weibo post allowed moderated comments. The first comment that users could see was also widely shared. It offered an enormously assuring message: “Wuhan has the world’s top virology research institute, there’s nothing to worry about, don’t panic.”¹⁶

As I digested these releases in Chinese official media, I couldn’t help but notice the contrast between the diagnostic information of patients I could read from Chinese social media postings and the reassuring tone in the official releases.¹⁷ This contrast gave me a premonition that all might not go as well as projected in the official media. At 10:42 PM, I wrote that “I was in Beijing in 2003 during the SARS outbreak and remember well how the authorities kept lying for weeks until they couldn’t hide it anymore.”¹⁸ Though China learned strong lessons from the SARS crisis and made major investments to strengthen public health institutions and capabilities, my previous research also reminded me that China’s multi-level party-state hierarchy often followed its own political-institutional logic, not that of the virus, and that leaders made decisions under the influence of various forms of cognitive bias.¹⁹

When there is very limited information, my research background in Chinese politics and governance and contacts in China have proven handy for making sense of what was going on in Wuhan and how the Hubei/Wuhan authorities interacted with central authorities.²⁰ Like millions of others, I was angered but not surprised by the crackdown on Dr. Li Wenliang and other medical professionals for sharing information about the SARS-like coronavirus. I was also frustrated by official obfuscations on the identity and infectivity of the pathogen and of outbreak severity in January 2020 but again not surprised because “being intense internally but relaxed externally” was well known as the operating motto in Chinese health emergency response.

Still, I was shocked to learn that the much-vaunted national disease reporting system was not utilized for reporting the initial cases to the China CDC in December 2019 until the NHC and the China CDC had sent emergency response teams to Wuhan, and even then it was put into disuse until after Wuhan was in lockdown.²¹ This naturally begged questions of what happened, why, and what might have been. The questions kept growing as it became known that NHC and China CDC experts and senior officials went to Wuhan on December 31, 2019; maintained their presence in Wuhan in the ensuing days and weeks; and yet did not publicly disclose human-to-human transmission of the novel coronavirus until January 20, 2020. Still more

questions arose for me when Wuhan was sealed off from the rest of China and I joined in efforts to provide much-needed personal protection equipment to Wuhan and later to Chicago. After the Wuhan lockdown was lifted, China's tenacious pursuit of zero COVID until late 2022, including putting Shanghai, China's most populous and wealthiest city, under an extended siege in spring 2022, raised a different set of questions about the Chinese body politic.²²

Pivotal historical events are important in themselves as well as transformative of existing structures.²³ Having already claimed millions of lives and disrupted the entire world in generation-defining terms, the COVID-19 pandemic is such a pivotal event. To understand how a small outbreak in Wuhan exploded into one of the most devastating pandemics in human history, it is essential to learn more about the choices and decisions of authorities in China in the initial handling of the Wuhan outbreak and the subsequent efforts to contain the epidemic and prevent its resurgence in China. This study thus contributes to the burgeoning literature on the COVID-19 pandemic by examining Chinese decision-making during the Wuhan outbreak and the ensuing lockdown. It is a study on how the Wuhan outbreak spiraled out of control despite China's experiences with SARS and other respiratory infectious diseases such as the H7N9 influenza. Since the Chinese health emergency response regime is part of a complex multi-level governance system dominated by the Communist Party, this is by necessity a study of the politics of health emergency response. The findings of this project should not only help us recognize the strengths and limitations of existing systems but also provide valuable knowledge and lessons for efforts to better prepare for future epidemics.

Organizations, Leadership, and Epidemic Information

In spring 2019, China CDC director general Gao Fu, known as George F. Gao in English, assured the public that "SARS-like events will not occur again."²⁴ In making that oft-recalled remark, Gao showed a technocrat's faith in the health emergency response system that had been enhanced in the post-SARS years to strengthen infectious disease prevention and control. Inadvertently, he also inserted himself in a long-standing debate about organizations, leadership, and disasters. More specifically, he represented a school of thinking known as "high reliability theory," which holds that it is possible and indeed necessary to build high reliability organizations and systems to deliver safety, reliability, and effectiveness in medicine and other domains.²⁵

In contrast to high reliability theory, social scientists led by Charles Perrow, Scott Sagan, and Diane Vaughan, among others, have argued that “accidents” or disasters are unavoidable in systems of great complexity even if efforts could be made to reduce the probability of their occurrence.²⁶ According to Perrow’s “normal accidents” theory, systems that exhibit both high complexity and tight coupling—strong interdependence among units—tend to be prone to system-wide risks. Moreover, efforts to layer on additional safety devices or measures also increase the complexity of the system and may instead produce unanticipated failures. The space shuttle disasters at NASA and the Chernobyl nuclear disaster are among the most striking examples of such phenomena. Vaughan argued that the *Challenger* space shuttle accident occurred in an organizational culture characterized by the “normalization of deviance.”²⁷ In such an organizational culture, unacceptable practices or standards became acceptable. Tragically, efforts to change the organizational culture in NASA following the *Challenger* disaster were not effective, and the *Columbia* accident followed.²⁸

The debate between normal accident theory versus high reliability theory has become the starting point for more open approaches to the study of disasters and disaster response.²⁹ It also offers valuable theoretical lenses and historical perspectives for examining China’s handling of the initial outbreak in Wuhan and subsequent responses to the COVID-19 pandemic over time.

Both official discourse and academic studies from China have highlighted how China’s leadership led by General Secretary Xi Jinping took prompt and decisive decisions to lock down Wuhan and contain the COVID-19 pandemic within China in the first half of 2020.³⁰ China’s formidable determination and capability to implement the lockdown of more than 10 million people through to conclusion and then to pursue a zero-COVID policy for years are a constant reminder of the capacities of the Chinese party-state and the sacrifices that Chinese society could be made to endure for party-defined commonweal.

With the casualties and costs of the COVID-19 pandemic continuing to pile up in China and the rest of the world, the growing capacities for disease surveillance and testing in China and elsewhere point to the potential for saving lives and mitigating losses if infectious disease outbreaks could be prevented from spiraling out of control with enhanced pandemic preparedness.³¹ None other than Xi Jinping lamented in early February 2020 that there had been “shortcomings in public health” as well as “formalism and bureaucratism in epidemic prevention and control work.”³² However, during the Wuhan lockdown, the Chinese party-state also imposed strict restrictions on research and publication of COVID-19-related research.³³ In consequence, official as well as academic publications from China have highlighted the effectiveness of

non-pharmaceutical interventions centered on the lockdown but have elided the weaknesses and deficiencies in China's early epidemic response.³⁴

It has long been known that non-democratic regimes tend to suffer from problems of information.³⁵ In Wuhan, the crackdown on medical professionals such as Dr. Li Wenliang, whose poignant words grace the beginning of this chapter as an epigraph, epitomized the politics of information suppression in the initial outbreak response.³⁶ Proponents of authoritarian advantage in dealing with epidemics are hard pressed to explain the juxtaposition between China's formidable disease surveillance and health emergency response capabilities and the extended delay in announcing human-to-human transmission of the novel coronavirus in January 2020.

Organizational Cultures, Information Flows, and Disasters

In researching for this project, I have engaged in an ethnography of decision-making in China's epidemic response. The more I have delved into the many interviews and reports about China's handling of the outbreak, the more I have felt compelled to reach back to the literature on disasters and disaster response because of its emphasis on the interaction of humans and organizations in complex systems.³⁷

Decades of research on disasters, safety management, and organizational cultures have shown the vital importance of obtaining, sharing, and properly making use of information, especially anomalous information, based on the criteria of relevance, timeliness, and clarity.³⁸ The measure of an organization or system is how it processes and uses information and what information it ignores. In the literature on disasters, a disaster is not defined in purely physical terms but "as a significant *disruption or collapse of the existing cultural beliefs or norms* about hazards, and for dealing with them and their impacts."³⁹ The incidence of disaster is a process that includes an incubation period, errors and communication difficulties, and an element of surprise—cognitively, materially, as well as politically—for those who thought they were in control.

Organizational cultures are the shared assumptions or expectations invented or developed by a given group in processes of internal integration and external adaptation.⁴⁰ James Reason describes the ideal organizational culture for safety management as one in which individuals are willing and ready to report their errors and near-misses and share essential safety-related information, and, as a result, the leaders and managers of the system have

access to current knowledge about the factors that affect system safety.⁴¹ Real-world organizational practices rarely match Reason's ideal. One can nonetheless invert Reason's description of the good organizational culture for safety to approximate the organizational environment that is prone to safety lapses and even disasters. Incorporating style of information processing as a key marker, Ron Westrum has developed a spectrum of three types of organizational cultures—bureaucratic, generative, and pathological—for assessing the quality of organizational cultures for safety.⁴² The generative type of organizational culture is performance- or mission-oriented and akin to Reason's ideal safety culture. It can “get the needed information to the right person in the right form and in the right time frame.”⁴³ It scores high on measures of trust and cooperation, treatment of bearers of bad news and whistleblowers, and respect for the needs of the information recipient. It empowers rather than muzzles voices. By fostering a level playing field, it encourages the discovery and sharing of information horizontally and vertically. Decision makers in a generative organizational culture tend to receive relevant safety-related information timely and clearly and are thus equipped to make appropriate decisions to forestall disasters or respond to them.

At the other end of the Westrum spectrum is the pathological type of organizational culture wherein information is a political commodity prone to distortion and hoarding. This is an organizational environment centered on personal power and glory and filled with fear and threat. In a climate low on trust and cooperation, people watch their words carefully and keep quiet. Messengers of bad news are punished. Because of the suppression of safety-related information amid collective silence, “latent pathogens” tend to build up, creating the potential for disasters to occur.⁴⁴ Suppression of critical safety-related information, shirking of responsibility, and scapegoating tend to go together.

In between the generative and the pathological is the bureaucratic, which is characteristic of most organizations. The bureaucratic organization emphasizes rules and positions and is a potent structure for mobilizing resources in pursuit of various objectives. It also has well-known weaknesses when business as usual is no longer adequate. “Turfs” and hierarchies may hinder cooperation. Important safety-related information may become encapsulated and neglected. Table 1.1 is a summary of the three types of organizational culture and how they differ in information flows.

When we employ the organizational culture concept to facilitate analysis, we need to keep in mind that different organizations in the same organizational ecosystem may possess very different cultures. Moreover, subordinate organizations in a large and complex system may also have different types of

Table 1.1 Organizational Culture Types and Information Flows

Type of organizational culture	Orientation	Characteristics
Bureaucratic	Rules and regulations	<p>Focus is on following rules and procedures.</p> <p>Communication is formal and often slow. Critical thinking and questions are not encouraged.</p> <p>Decisions are made based on rules in hierarchies, not necessarily what is most appropriate for the challenges at hand.</p> <p>This type of organizational culture falls between the generative and the pathological.</p>
Generative	Mission and performance	<p>Focus is on mission and performance.</p> <p>The discovery of information and the sharing of information horizontally and vertically are both encouraged. Critical thinking is encouraged.</p> <p>Decision-making is distributed and collaborative, characterized by trust and cooperation.</p> <p>Decision makers make appropriate decisions with relevant safety-related information. There is willingness to learn from failure.</p>
Pathological	Power and control	<p>Focus is on power and control.</p> <p>Information is hoarded and siloed. Abnormal information tends to be ignored. Communication is one way and limited. Messengers of bad news are not welcome.</p> <p>Decision-making is centralized and arbitrary. Degree of trust and cooperation is low.</p> <p>This type of organization tends to let safety lapses accumulate. Shirking of responsibility and scapegoating go hand in hand.</p>

organizational cultures. Furthermore, organizational culture continues to evolve because of interactions with the environment and of the internal dynamics of agency–structure interactions.⁴⁵ Leaders of organizations are not simply passive processors of information but are decision makers with self-interest and varying degrees of discretion. Their leadership and decision-making styles can make a significant difference, shaping the cultures of

organizations in terms of organizational openness, transparency, and more generally how organizations manage information.

The information processing and interpretive capacities of organizations that are nested in still larger organizations or systems are in turn affected by the imperatives of the larger organizations or systems. Generalizing from cases they had examined, Martin and Turner argued that the propensity for a system to amplify errors and misinformation and produce serious consequences such as disasters is related to how the system pursues order.⁴⁶ Systems that are preoccupied with the maintenance of order and stability may paradoxically be carriers of the pathological type of organizational culture and breeding grounds for instability. “The more extensive a negentropic order-seeking system becomes, the greater is the potential which it also develops for the orderly dissemination of unintended consequences.”⁴⁷

The typology of organizational cultures and the broader understanding of the dynamics of organizational leadership offer a useful analytical framework as we review how individuals and organizations in China obtained, processed, and responded to information of the emerging outbreak in Wuhan in December 2019 and after. On the one hand, all the key individuals and organizations involved in the health emergency response operated in a complex political-administrative landscape dominated by the party-state. To help with the understanding of the incentives and pathologies of China’s party-state system, I shall lay out, in Chapter 2, the key features of China’s neo-Communist Party-state system, including its preoccupation with stability maintenance and growing emphasis on party leadership. The health emergency response regime is part of this party-state and must contend with the needs for vertical and horizontal cooperation in a complex political-administrative hierarchy as well as societal involvement.

On the other hand, information tends to be scarce and fragmentary in the early phases of an outbreak. It should be obvious as well as important to note that specialists such as clinicians, epidemiologists, and virologists as well as the leaders of health organizations and administrations that participate in handling an initial outbreak must work with incomplete information and make decisions under uncertainty.

Cognitive Biases, Incentives, and Decision-Making in a Hierarchy

Within and across organizations, the roles of leaders and of leadership are important but are also hard to quantify and generalize.⁴⁸ Besides variations

in personality, there can be many factors to consider about the roles of and incentives for leaders that shape their behavior, and I want to highlight two of them here. First, contemporary societies have increasingly turned to the quantification of performance using various metrics to evaluate the performance of organizations and of their leaders. In consequence, organizational leaders such as party secretaries, mayors, and hospital presidents are themselves responsive to the incentives facing them and their organizations. In the larger organizational setting of the Chinese party-state, these incentives have become increasingly rule-governed and metric-driven even while they fall under the leadership of the Communist Party elite.⁴⁹ In such a setting, considerations of power, rules, and performance are oftentimes in tension and thus mediated by the judgment of organizational leaders as decision makers. Metrics of evaluation intended to promote good governance may instead prompt officials seeking to look good to their superiors and other evaluators to engage in deliberate manipulations and distortions.⁵⁰ As I shall note, municipal leaders in major cities like Wuhan are acutely sensitive about maintaining their city's image and rankings, frequently going to great lengths, and even adopting measures that might seem unreasonable to outsiders, in order to achieve this goal.

Second, it is well acknowledged that individuals rely on heuristics and are susceptible to cognitive biases when making decisions under uncertainty.⁵¹ Turner was among the first to recognize how decision makers' use of cognitive heuristics or simplifying assumptions could limit the range of considered scenarios and impact the precautions taken.⁵² When these practices result in the neglect of certain information, anomalies, or considerations, allowing "unnoticed, mis-perceived, and mis-understood events" to accumulate, disruptions and even disasters may ensue.⁵³ In healthcare, particularly when responding to infectious disease outbreaks with long incubation periods and causative pathogens not easily visible to the human eye, cognitive biases tend to lead decision makers to "prioritize the readily imaginable over the statistical, the present over the future, and the direct over the indirect."⁵⁴ Even the most highly trained experts may still succumb to such biases and other psychological influences, such as motivated reasoning.⁵⁵

Questions about the Chinese Body Politic and the Handling of the Coronavirus Outbreak in Wuhan

The general insights on organizations, decision makers, and hierarchies from the literature on crises and disasters are useful scaffolding when we

seek to understand what took place in Wuhan in late 2019 and early 2020, in the context of the Chinese party-state and health emergency response regime. The official Chinese narrative on the initial outbreak response depicted near perfection, emphasizing openness, promptness, transparency, and responsibility.⁵⁶ However, any field epidemiologist, especially one experienced in epidemic outbreak studies, would instinctively question such lofty political rhetoric, given that many governments worldwide struggled with their initial COVID-19 responses.⁵⁷ Fortunately, a wealth of information from the early months of the Wuhan crisis became available, despite attempts to promote a unified narrative, conceal misjudgments and missteps, and enforce strict heavy-handed censorship on reporting, research, and publishing.

Throughout this book, I excavate from the rich veins of evidence from Wuhan and other parts of China, supplemented by in-depth background interviews with individuals who had access to the health emergency decision-making processes. I explore how clinicians, epidemiologists, scientists, hospital administrators, local and national health leaders, and patients infected with the novel coronavirus (later known as SARS-CoV-2) made crucial choices within China's multi-layered political-administrative system beginning in December 2019. These early decisions significantly influenced the scale and scope of the outbreak in Wuhan and beyond.

Following the imposition of cordon sanitaire, Wuhan reopened on April 8, 2020, and declared itself COVID-free in June 2020. In retrospect, Dr. Zhong's announcement of human-to-human transmission on January 20, 2020 and the imposition of cordon sanitaire in Wuhan on January 23, 2020, commonly known as the "Wuhan lockdown," were pivotal moments in China's COVID-19 response.⁵⁸ In this study, I differentiate between the pre-Wuhan lockdown period and the post-lockdown period. The 4 weeks or so prior to the Wuhan lockdown were among the most important weeks in the history of pandemics.

In epidemic outbreak responses, information about the causative pathogen is the currency of the realm, and the fate of the response hinges on decision makers' ability to collect, interpret, and act upon key pieces of epidemic information. As I detail in the book, the front-line respiratory medicine doctors who reported early cases in late December 2019 and early January 2020 suspected contagion and took appropriate precautions. Some also had access to diagnostic results identifying a SARS-like coronavirus in late December 2019. Despite the involvement of numerous experts, organizations, and political-administrative authorities in the initial health emergency

response and considerable information about initial case clusters and the novel coronavirus, it took the Chinese health system and leadership over 3 weeks to publicly announce the human-to-human transmission of the novel coronavirus.

This project primarily examines the handling of emerging epidemic information during the outbreak in Wuhan, followed by a portrayal of the massive efforts to rescue Wuhan and contain the epidemic during the lockdown period: Who knew what about the earliest cases and about the causative pathogen, later named SARS-CoV-2? When and how did the information surface? How did the individuals and organizations with access to early outbreak information react? How did health and political authorities use available information and other resources to respond to the outbreak and specifically to interrupt viral transmission chains?

The answers to these questions will help address the following: What were the misjudgments, missteps, and deficiencies in collecting, accessing, and using epidemic information? Why did leading national experts like Xu Jianguo and health policymakers believe the outbreak was under control in mid-January 2020 while Wuhan became, in Guan Yi's words, an "unguarded city"? What did China CDC leaders mean when they referred to "limited human-to-human transmission"? What caused the delay in publicizing the novel coronavirus's contagious nature and human-to-human transmission? In other words, what made China's health emergency response system falter in Wuhan during the first 3 weeks of January 2020?

Once China's leaders recognized the necessity to contain the novel coronavirus, they sealed off Wuhan and the rest of Hubei from the rest of the country, mobilizing and unleashing the full power of the Chinese party-state to combat the coronavirus in Wuhan and nationwide. The campaign in Wuhan and the rest of Hubei successfully brought the epidemic under control within China. However, since SARS-CoV-2 had already spread in the weeks preceding the imposition of cordon sanitaire in Wuhan, China could not afford to relax its efforts after concluding its campaign to save Wuhan and the rest of Hubei. As the COVID-19 pandemic continued to devastate the rest of the world, China shifted to a persistent zero-COVID strategy to safeguard the accomplishments of the Wuhan lockdown. The pursuit of zero COVID became synonymous with heightened societal control and lasted until late 2022.⁵⁹ Consequently, China was the first to implement sustained lockdowns and the last to exit, leading to significant repercussions for Chinese society, the economy, and its relationships with the rest of the world.

The Chinese Communist Party-State and the Political-Institutional Context for Health Emergency Response

Possessing Leninist organizational discipline, Maoist mobilizational capabilities, and twenty-first-century digital technologies, the Chinese party-state stands unrivaled in its command of organizational and material resources and its dominance over society. Our examination of how the Chinese body politic has responded to SARS-CoV-2 begins with an overview of the Chinese party-state and its intricate multi-level governing hierarchy (Chapter 2). The Chinese public health emergency response system is an integral component of this elaborate system.

At the most basic level, there are five levels of government administration (central, provincial, municipal, district, street/town/township), each with its own administrative and parallel Communist Party leadership. All but the lowest government administrative level (street/town/township) possess their own health commissions or bureaus. The subnational CDCs in the provinces, municipalities, and districts (counties) follow technical guidance from the China CDC but are embedded in the health commissions (bureaus) of the respective territorial jurisdictions. Public hospitals physically located in the same city district may still belong to various levels of health commissions (bureaus).

This brief enumeration of the multiple layers of health administrations and variegated landscape of health-related organizations is suggestive of the complex institutional terrain for managing an infectious disease outbreak that spans organizational boundaries. As is generally known and as I'll elaborate in Chapter 2, much of this system, together with laws and regulations for infectious disease prevention and control and for health emergency response, was reconstituted and reinforced during and in the aftermath of the 2003 SARS crisis.⁶⁰ The online National Notifiable Disease Reporting System, the world's most extensive, was put into operation in 2004 to serve as the cornerstone for dealing with infectious disease outbreaks. This system, often referred to with considerable pride, had acquired mythical status in the minds of China's health leaders and the Chinese public prior to the Wuhan outbreak.

Known for its pursuit of the twin objectives of economic growth and sociopolitical stability, the contemporary Chinese party-state is an example of Turner's "negentropic order-seeking system."⁶¹ When there are real or perceived threats such as labor demands, not-in-my-backyard protests, and local emergencies, local authorities through the party leadership impose or maintain order using the stability maintenance regime, an institutionalized

multi-departmental mechanism that includes the police and the courts. They can enlist the propaganda system and the police to silence critics and manage the aggrieved.⁶² This is a body politic that is primed to react strongly to any real or perceived threat. Yet, the obsession with order-seeking, as Turner contended, may also create the potential for the dissemination of unintended consequences and cause disasters to occur.⁶³ Meanwhile, as I elaborate in Chapter 2, the Chinese party-state is plagued by tendencies toward fragmentation and disjointedness in policymaking and implementation that can also hamper epidemic information flows, decision-making, and coordination during an outbreak.

The Order-Seeking Polity and the “Preventable and Controllable” Outbreak

Within the broader governance context for health emergencies, I delve into and explain how individuals and organizations responded to the outbreak in Wuhan and several other cities in China. Chapter 3 recounts the initial encounters by clinicians, independent clinical laboratories, and health administrators with the PUE cases that presented SARS-like symptoms. While the official story credits Dr. Zhang Jixian as the first doctor to report the PUE cases that were later identified as COVID-19 cases, this chapter reveals the involvement and persistence of clinicians in various hospitals as well as the contributions of commercial diagnostic laboratories that alerted clinicians and health leaders to the dangers of a SARS-like novel coronavirus early on. I also present, for the first time, the investigation conducted by a provincial–municipal–district joint team, highlighting what the team report focused on and overlooked.

From an emergency response perspective, Chinese public health experts and health leaders held a remarkably strong hand of cards in terms of information about the early cases on December 31, 2019. They possessed not only crucial information about the so-called PUE cases but also diagnostic results identifying a SARS-like novel coronavirus as the pathogen (Chapters 3 and 4). That evening, health officials and experts, including those from the NHC and China CDC, reviewed the outbreak situation in Wuhan. They recommended and secured approval for the closure of the Huanan Seafood Market as the presumed source of infections. They also formulated an anti-epidemic action program.

However, despite having highly significant information about the SARS-like pneumonia cases and China's vivid memories of the SARS crisis, it took

more than 3 weeks for the national health leadership to finally inform the public, through Dr. Zhong Nanshan, that the novel coronavirus was transmissible from human to human. Despite the dedication and hard work of clinicians, epidemiologists, and scientists who cared for and observed patients, conducted contact tracing, and carried out genomic research in challenging circumstances, the crux of the matter is that the novel coronavirus spread in Wuhan and beyond unimpeded for much of January 2020 before the lockdown. In retrospect, the failure to implement *public* health measures to contain the virus during that period was monumental, especially because clinicians and virologists warned of the dangers in late December 2019 and early January 2020.

Chapters 5–10 outline the multiple and parallel bureaucratic and political processes that were activated in Wuhan and nationally to manage and control the availability and flow of epidemic information. These processes, complicated by principal–agent problems (Chapters 8 and 9), hindered the sharing and use of quality epidemic information that had become available, led to the disregard of valuable information about the contagiousness of the novel coronavirus, and failed to prompt the public to take protective action. The intricate fault lines of fragmented authoritarianism presented a substantial obstacle to cohesion between the National Health Authority, inclusive of the China CDC, and the health authorities of Hubei and Wuhan, which encompass their respective CDCs. They contributed to and were further exacerbated by a cognitive framework rooted in the belief that the virus had jumped from wildlife to humans in the Huanan Seafood Market and would therefore be of limited transmissibility at the time (Chapters 7 and 8).

All these weaknesses and deficiencies could have been alleviated, if not fully eliminated, had the larger system been more transparent, more open to new information and the consideration of alternative views, and more straightforward in communicating risk with the public. As John Barry underscored in his magisterial study of the great influenza pandemic of 1918–1919, authorities need to communicate openly with the public and to maintain public trust: “The way to do that is to distort nothing, to put the best face on nothing, to try to manipulate no one.”⁶⁴

However, the health emergency response in Wuhan diverged drastically from the tenets of transparency and open communication. To the contrary, the authorities managing the responses to the Wuhan outbreak focused on dominance and control, which stemmed from the Chinese party-state’s order-and-stability complex and were reinforced by an increasingly complex array of evaluation metrics for individuals, hospitals, and local governments. The preoccupation with order and stability led in multiple ways to the suppression,

distortion, and neglect of important pieces of disease information and, more generally, to an atmosphere of organized silence that strongly discouraged views deviating from the official stance and discourse (Chapters 5, 6, 8, and 9). The punishment of Dr. Ai Fen, Dr. Li Wenliang, and others for sharing disease information with fellow professionals resulted in the silencing of clinicians more broadly (Chapter 5). Despite the scientific culture of priority, scientists at multiple research laboratories were prohibited from immediately releasing their findings during a period when their announcements about the novel coronavirus could have informed health professionals and the public and stimulated spirited discussion about the virus's dangers (Chapter 6). Instead, the official press, as the mouthpiece of the party-state, amplified official messaging even when some reporters submitted internal warnings.⁶⁵ One cannot help but be reminded of the scenes in *The Plague*, where the Prefect equivocated about the plague with the public and delayed implementing rigorous prophylactic measures.⁶⁶

The patterns outlined above were enhanced in the first half of January 2020 by political and seasonal calendars, which prompted officials to accentuate the positives and suppress the negatives. Nonetheless, it is still shocking to learn that, even with a growing number of new suspected cases and medical staff infections known internally by mid-January, those familiar with the situation in the Wuhan/Hubei health bureaucracy and major hospitals went to great lengths to conceal the infections. In hindsight, it wasn't a huge leap for these individuals to transition from not following through on early leads to actively restricting and suppressing the submission of new cases (Chapter 8) and preventing experts from Beijing from discovering in-hospital infections of healthcare workers (Chapter 9). Furthermore, they were able to do so by hiding behind rules and pleading innocence. In the meantime, key scientific and health leaders, who relied on honest reporting from Wuhan/Hubei, were lulled into a false sense of security, believing that they had made the right decisions and taken adequate actions to control the outbreak (Chapter 7).

Information, Cognition, and Overcoming Tunnel Vision in Organizational Cultures

In the context of organizational cultures, the Chinese political-administrative system, which involved multiple levels of health administrations, CDCs, and hospitals across the governing hierarchy, exhibited strong bureaucratic-pathological tendencies in handling early information about the outbreak. Rather than warning the public, the political-administrative complex in

Wuhan/Hubei, under the guidance of the NHC, insisted until January 20, 2020, that the outbreak was “preventable and controllable,” suppressing those who raised concerns about viral contagion (Chapters 5, 6, and 8–10).

Rather than clearly communicating risks to the public, the official discourse was marked by ambiguity and evasion. Before the Wuhan lockdown, the WMHC’s language downplayed the outbreak. Although health authorities were aware of the novel coronavirus and its potential for infectivity, they continued using the term “PUE” until January 9, when the official verification process was completed. The public was not informed of the partial knowledge and serious concerns held by leading experts (Chapters 6 and 7). This situation reflects Diane Vaughan’s concept of disaster-prone organizational culture that “created a way of seeing that was simultaneously a way of not seeing.”⁶⁷

Various processes reinforced the official “no worries” and wait-and-see discourse, causing crucial cases pointing to human-to-human transmission of the novel coronavirus to be ignored or dismissed in Wuhan and Beijing (Chapters 8–10). If the virus had limited infectivity, as officially claimed, the multi-pronged efforts to isolate and treat patients in Wuhan might have succeeded (Chapter 7). If the outbreak had been contained, it would have been a minor event in global health history, showcasing the capabilities of China’s public health system as part of the Chinese party-state.

Set against the official discourse, Dr. Zhong Nanshan’s announcement of human-to-human transmission on January 20, 2020, sparked public outrage in China and worldwide. People questioned why it took the Chinese government so long to acknowledge the transmission and mobilize the public.⁶⁸

In reality, experts, the Chinese CDC system, and health administration leaders had adopted a cognitive framework centered on zoonosis-in-Huanan-market, which led to the expectation of a small number of human-to-the-human transmission cases. Even though they had evidence pointing to cases of suspected human-to-human transmission from the very beginning (Chapters 3, 4, and 7–9), such evidence was seen as “limited transmission.” The primary concern of Chinese public health leadership was not the presence of any human-to-human transmission, as the public had come to see, but rather the severity and extent of such transmission. Consequently, members of the second expert team and the Senior Advisory Panel, led by Dr. Zhong, sought evidence of medical staff infections as a key indicator of transmission severity (Chapters 9 and 11).

Simultaneously, from the end of December 2019, experts and health authorities created multiple obstacles to recognizing viral PUE cases without exposure to the Huanan Seafood Market in Wuhan. These included the initial

case definition in the joint provincial–municipal–district epidemiological investigation, the inclusion–exclusion criteria in early January, deficiencies in epidemiological investigations, and testing delays (Chapters 3, 4, and 6–8). While Chinese authorities often deploy the stability maintenance regime to suppress incidents, using the same approach for a highly contagious virus proved counterproductive, akin to trying to wrap fire in paper.

Seventeen years after the SARS outbreak, once again key voices that effectively challenged the prevailing narrative and sounded the alarm during the health emergency in Wuhan/Hubei came from outside the established response regime. Taiwan CDC epidemiologists visited Wuhan and raised important questions regarding intra-family infections (Chapter 7). Though they were not part of the official government pathogen verification programs, virologists at the Shanghai Public Health Clinical Center sequenced the genome of the novel coronavirus and advocated for a more robust outbreak response (Chapter 6). Clinician-researchers in Thailand identified the first novel coronavirus-infected patient outside China (Chapter 10). Clinicians, public health specialists, and research scientists in Shenzhen and Hong Kong identified and sounded the alarm about patients who had not traveled to Wuhan but were nonetheless infected with the novel coronavirus (Chapter 10). The stalemate in Wuhan was resolved when national health policymakers enlisted 83-year-old Dr. Zhong Nanshan from Guangdong to lead the Senior Advisory Panel on a mission to Wuhan to recognize the severity and urgency of the epidemic situation (Chapter 11). Ultimately, General Secretary Xi Jinping made the difficult decision to seal off Wuhan following intense discussions as well as pressure from the WHO.

The contributions from experts based outside of Wuhan/Hubei played a pivotal role in counteracting the organizational dysfunctions and pathologies that led to the suppression and concealment of crucial epidemic information in Wuhan. Moreover, these contributions bring to light pressing and complex questions regarding leadership, decision-making, and missed opportunities in responding to the outbreak. Above all, they underscore the challenging issue of preventability.

Research using the SEIR (susceptible–exposed–infectious–removed [recovered]) model, co-led by Dr. Zhong Nanshan, found that if public epidemic control measures had been implemented merely 5 days earlier in January 2020, China's total COVID-19 cases would have decreased by a staggering two-thirds.⁶⁹ Another study, conducted by Xu-Sheng Zhang and his team, modeled the potential effects of putting such measures into action 1, 2, or 3 weeks earlier in Wuhan. They concluded that these hypothetical scenarios would have curtailed confirmed cases in China by approximately 57%,

81%, and 93%, respectively.⁷⁰ Findings of this magnitude inevitably lead us to the following question: Was there a genuine opportunity to contain the outbreak in its early stages in Wuhan/Hubei and thereby avert one of the most catastrophic pandemics in history?

By excavating and reconstructing the initial response to the outbreak in Wuhan, this study aims to help the global community of dedicated public health specialists and the public to draw their own conclusions on this pivotal issue. Such endeavors will also contribute to our understanding of effective strategies and best practices necessary for preventing and managing future pandemics.

The Politics of the Wuhan Lockdown

In its responses to the initial outbreak in Wuhan and the outbreak of SARS in 2003, China's public health emergency system, as part of the party-state, has found it difficult to promote accountability and earn public trust through transparency. In both cases, the outbreak spread beyond the origin city before authorities, with their command of the propaganda system, were willing to inform and mobilize the public to combat the epidemic outbreaks.

However, once the decision was made to lock down Wuhan and provide medical assistance to the region, the Chinese system rapidly transitioned into performance mode, showcasing its strengths in disaster response. With unwavering focus and determination, Xi and the Chinese leadership adopted a comprehensive approach involving the party, government, and society in their efforts to rescue Wuhan. They mobilized resources and manpower from across the country to alleviate the burden on overwhelmed hospitals and address community disarray and paralysis (Chapters 12 and 13).

Organizationally, the Chinese leadership established a special party-centered emergency leadership structure in late January 2020. Layered on the State Council Joint Prevention and Control Mechanism, this structure enabled the front-line leader, Politburo member and Vice Premier Sun Chunlan, to utilize the authority and organizational capabilities of the party-state to allocate resources and exert leadership over local authorities (Chapter 12). In February 2020, the national leadership replaced key leaders in Wuhan and Hubei to allay calm public anger, enhance political control, and enforce community-level lockdowns (Chapter 13).

I divide the emergency rescue operations in Wuhan/Hubei into two phases. The first phase focused on providing additional medical resources to treat infected patients when health centers were overwhelmed (Chapter 12). In

what became the largest peacetime medical rescue mission ever, every province in China sent emergency medical teams to the region. Concurrently, Wuhan leaders repurposed existing hospitals and built temporary field hospitals to accommodate the surge in infected individuals. Moreover, under national guidance, Wuhan transformed large public spaces such as convention centers and stadiums into *fangcang* shelter hospitals to quarantine those with mild to moderate symptoms (Chapter 12).

Contrary to the conventional view emphasizing the importance of grassroots governance, the shock of the lockdown and the surge in infected individuals initially overwhelmed the grassroots governance structure. It wasn't until the middle of February 2020 that community-level actions gained traction, when treatment and quarantine capacities were significantly increased. Chapter 13 focuses on community-level struggles and, as the second phase of the Wuhan campaign, the efforts to enforce "enclosed management" of residential areas and home confinement of residents. Authorities relied on both "sent-down" staff of the party-state bureaucracy and the rank and file of grassroots governance structures to enforce community-level lockdowns and home confinement and provide essential services. Meanwhile, the rest of society was demobilized because of the community-level lockdowns and home confinement.

By the time the Wuhan lockdown was lifted on April 8, 2020, after 76 days, COVID-19 had already been declared a pandemic by the WHO, and the SARS-CoV-2 virus was rapidly spreading across the globe. China's ability to impose and strictly enforce the stringent lockdown in Wuhan/Hubei and throughout the rest of the country distinguished it from most other nations in terms of party-state dominance and societal compliance. It wasn't until late 2022 and early 2023 that China, weary from the costs and challenges of repeated lockdowns, finally transitioned away from its dynamic zero-COVID strategy and reopened its borders to the rest of the world. Meanwhile, the striking contrast in China's anti-epidemic performance before and after the Wuhan lockdown compels us to investigate and assess the causes of these variations in China's outbreak response, as well as explore their implications for both China's and global public health.