

Challenges and Strategies in Controlling COVID-19 in Mainland China: Lessons for Future Public Health Emergencies

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Abstract:

Being the first country to identify the Coronavirus Disease 2019 (COVID-19), mainland China was also the first to implement strict preventive measures in controlling the outbreak. Despite having various challenges in the country's fight against COVID-19, China was able to overcome them through successful outbreak response, such as imposing early and strict lockdown, implementing active case surveillance, rapid case diagnosis and effective contact tracing, building temporary shelter hospitals to accommodate the increasing influx of patients, utilizing modern technology in preventing nosocomial transmission and addressing the inadequate healthcare workforce, and developing and administering vaccines to end the outbreak. These strategies and practices, which were implemented by mainland China, can be replicated by the international community in the current and future management of public health emergencies.

Keywords: COVID-19, pandemic, public health strategies, outbreak response, China

INTRODUCTION

China was the first country to recognize the Coronavirus Disease 2019 (COVID-19), earlier termed as the 2019 Novel Coronavirus (2019-nCoV) and its pathogenic virus, Severe Acute Respiratory Coronavirus 2 (SARS-CoV-2) (World Health Organization [WHO], 2020). Due to its unexpected discovery, the country was also the first to require drastic actions in response to the outbreak, such as imposing lockdown measures and other preventive measures. Surprisingly, it was also among the first countries to control the outbreak due to its successful public health responses.

It all started from an outbreak of an unknown viral pneumonia in Wuhan in December 2019 (WHO, 2020). Infected individuals showed flu-like signs and symptoms, such as fever, dry cough, fatigue, sore throat, loss of taste or smell, headache, diarrhea, difficulty of breathing, and/or chest pain (WHO, 2021a). Due to the continuous rise of cases in Wuhan, WHO was notified on December 31, 2019 about this emerging disease (WHO, 2020). At first, WHO reported that human-to-human transmission was unlikely due to the unclear evidence found during the preliminary investigations two weeks after the initial cases were discovered. However, many individuals were continuously and reportedly getting sick after being exposed from the virus. Due to its highly infective nature, the contagious disease spread across all Chinese provinces after almost a month. Concurrent with the nationwide spread, it also reached outside mainland China just after 13 days (WHO, 2020).

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After discussions among public health experts and the meeting between the Chinese President and the WHO Director-General, WHO declared the 2019-nCoV outbreak as a global public health emergency with the highest alert level, exactly one month since its initial published report (WHO, 2020). The WHO further reported that possible modes of transmission of SARS-CoV-2 may include direct contact, respiratory droplets, fomite, airborne, fecal-oral, blood-borne, maternal-fetal, and animal-to-human transmissions which were contrary to their first claim regarding the disease transmission (WHO, 2021a). The WHO also later renamed 2019-nCoV as COVID-19 on February 11, 2020, which was subsequently declared a pandemic exactly a month after its initial report due to its rapid global spread, resulting in a total of 165,772,430 confirmed cases and 3,437,545 deaths globally. As of May 22, 2021, COVID-19 has already infected 220 countries and territories (WHO, 2020; WHO, 2021b).

Although mainland China has already reached 90,954 confirmed COVID-19 cases, the country has only reported 301 active cases as of May 22, 2021 due to 90,653 closed cases: 95% recoveries and 5% deaths (WHO, 2021b). This decline has been attributed to the successful COVID-19 response of the country despite the many challenges in the prevention and control of the nationwide and worldwide spread.

Challenges in controlling COVID-19 in China

Since the outbreak started in December 2019, mainland China also faced numerous challenges in its fight against COVID-19. First and foremost, during the earliest phase of the outbreak, the Chinese Center for Disease Control and Prevention (China CDC) failed to detect and respond to the emerging outbreak in Wuhan, resulting in the failure of notifying the country's Ministry of Health and WHO as early as possible; which could have prevented the nationwide and global spread (WHO, 2020; Sun et al., 2021). For this reason, in the beginning, a majority of the residents were also not aware of the novel disease and its highly contagious nature.

Large hospitals in the country were overwhelmed with the tremendous influx of COVID-19 patients, resulting in rapid nosocomial transmission among patients, as well as among healthcare workers. The outbreak also worsened due to the refusal of locals to visit community hospitals because the public regard these hospitals as inefficient and incompetent for their old-fashioned medical facilities and limited testing capacity (Sun et al., 2021). Contrary to this belief, community hospitals are supposed to act as a first defense to prevent a virus outbreak. The hospitals also struggled to efficiently and effectively treat and care for both COVID-19-infected and non-infected patients because of full bed capacity (Burki, 2020). Hospitals, then, opted to send several patients with mild to moderate symptoms back home for quarantine and monitoring, exposing and infecting their immediate family and relatives to COVID-19 (Sun et al., 2021).

Another challenge was the country's inadequate healthcare workforce during the outbreak. Healthcare professionals working in the frontlines started getting infected as well because of the exponential rise in the number of patients and shortage of personal protective equipment (PPE) to shield them from contracting COVID-19 (Burki, 2020; Sun et al., 2021). For this reason, the number of healthcare workers was not enough to accommodate all patients. Additionally, hospitals also started experiencing insufficient medical supplies and equipment due to the high demand for healthcare services (Sun et al., 2021). By this time, China's healthcare system was almost collapsing. Nevertheless, despite being repeatedly blamed and criticized by the international community as the pandemic's origin, China was able to manage the challenges it faced in controlling local transmissions in the country through successful public health strategies which can be emulated by foreign countries.

Chinese strategies against COVID-19

China's governance mechanisms played a vital role in the country's success in fighting COVID-19. One of these is the rapid response mechanism against the epidemic. In the face of the unknown and emergent outbreak, China reacted rapidly according to the National Emergency Plan for Public Health Emergencies and subsequently established Epidemic Prevention and Control Headquarters System (EPCHS). On January 20, 2020, COVID-19 was classified as a Class B infectious disease based on the law of the People's Republic of China on

the Prevention and Treatment of Infectious Diseases while prevention and control measures for class A infectious diseases were taken to underscore the seriousness of the outbreak (National Health Commission [NHC], 2020a). The Chinese government then imposed the strict and immediate lockdown of Wuhan which lasted for 76 days. Any outbound and/or inbound travel was prohibited. Checkpoints in different transport hubs were also set up nationwide (Burki, 2020). Strict nationwide public health policies were also implemented during the Chinese New Year holiday (Chen et al., 2020a).

Another crucial public health component in fighting the epidemic is the multisectoral cooperation platform. Set up on January 21, 2020, the Joint Prevention and Control Mechanism of the State Council (JPCMSC) served as a multisectoral cooperation platform (NHC, 2020b). The JPCMSC coordinated and commanded departments and institutions in all levels to make medical and health emergency responses, organize information release, conduct medical research, and foster international cooperation. The mobilization of emergency supplies and equipment, logistical support, supervision and inspection, and other emergency response measures were also carried out by relevant sectors under the command of JPCMSC. Consequently, on February 27, 2020, nearly 10% of China's talent resources in critical care were sent to Wuhan (Wang & Wu, 2020). A detailed information about the epidemic situation was also released daily on various media platforms by the Health Emergency Office.

The nationwide governance over the COVID-19 epidemic is a miscellaneous and complicated operation, which is hard to perform effectively through top-down mandates or policies alone. Therefore, the community governance model was applied to achieve a fast response. Community governance systems were empowered with more functions to react flexibly with local variations. Referral systems were also established for primary diagnosis. Afterwards, suspected patients were transferred to local quarantine facilities or hospitals according to their symptoms. This approach accelerated the identification and treatment of infected cases. In just weeks, the country had already screened 9 million residents for SARS-CoV-2, demonstrating the high efficiency of the community referral system. Additionally, active case surveillance, rapid case diagnosis, and effective contact tracing were simultaneously implemented (Burki, 2020; Xu et al., 2020).

The task of health information management is decentralized and geographically dispersed among community systems. Information about the epidemic situation, such as the number of suspected cases, diagnosed and cleared cases, and confirmed deaths, were gathered by the staff of the community governance system. The information was then uploaded level by level along with careful analysis. Meanwhile, strict surveillance and hierarchical obligation mechanism were adopted to guarantee the authenticity of the information. Community systems were also the basic unit to implement close management. In an outbreak, grid governance and a high degree of autonomy allow communities to coordinate resources from all sources and adopt specific management method. With the help of grassroots staff and health screening, suspected case containment was carried out. The community systems were also responsible for contact information, such as the gathering of one's temperature daily and providing supplies to residents quarantined at home (NHC, 2020b; Wang & Wu, 2020).

The full bed capacity problem in hospitals and the increasing influx of patients were addressed by putting up *Fangcang* hospitals, which accommodated 13,000 beds (Sun et al., 2021; Chen et al., 2020b). *Fangcang* is a new public health strategy, which refers to constructing temporary shelter hospitals by turning public venues into makeshift healthcare facilities to isolate and quarantine patients with mild to moderate COVID-19 symptoms (Chen et al., 2020b). Moreover, the country also addressed the nosocomial transmission with the use of advanced technology and innovation. Internet hospitals emerged during the outbreak since the government issued policies regarding the incorporation of telemedicine and other online healthcare services in addressing the public health emergency (Han et al., 2020). Also, many patients no longer visited hospitals physically, resulting in decreased nosocomial transmission. With the help of large technology companies, they have also created 5G-enabled smart robots using artificial intelligence to assist healthcare workers in delivering medications, measuring the temperature of patients, cleaning and disinfecting healthcare facilities, and other routine tasks within the hospitals (Sun et al., 2021). These strategies do not only address nosocomial transmission, but also the inadequate healthcare workforce in the country.

Finally, the development of COVID-19 vaccine in China has been the ultimate solution to the outbreak in the country (Kim et al., 2021). As of May 13, 2021, 388,313,603 vaccine doses have been administered all over China (WHO, 2021b). The COVID-19 vaccinations have been proven to be an effective strategy in the fight

against the pandemic. People who have been fully inoculated are less likely to get COVID-19 and are less likely to get COVID-19 and are less likely to spread SARS-CoV-2 to others. A fully vaccinated person need not also be hospitalized because they have a low possibility of acquiring severe symptoms.

CONCLUSION

While other countries are still addressing the COVID-19 pandemic in their own territories, the international community can learn from the public health strategies, practices, and interventions implemented by China. In addition to the usual implementation of wearing masks and social distancing, the aforementioned strategies may drastically control the spread of the virus.. Facing all these challenges, the country's healthcare system has certainly improved due to their successful COVID-19 response. Indeed, the outbreak response may be used as a model in managing public health emergencies at present and in the future.

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