

Exploring the Challenges and Future Development of Humanitarian Logistics in China: SARS, H1N1, and COVID

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Abstract. China has been the country that was affected by the COVID-19 outbreak, and it has been receiving continuous humanitarian assistance from other countries and global organizations before the situation improved. At the same time, other provinces in China are sending relief supplies to medium-risk and highly infected areas such as Hubei province. However, despite a large number of donations and relief supplies being sent to Hubei province, many cities in the province still lack the necessary medical supplies between February and March 2020. The problems of the Wuhan Red Cross in the COVID-19 epidemic are the epitome of the challenges faced by humanitarian logistics throughout China. The Red Cross Society of China cannot make decisions on its own. It cannot perform its duties efficiently, which makes its credibility in front of the people continue to decrease. Due to the increasing frequency of natural disasters and human-made disasters, humanitarian supply chain management (HSCM) has become an essential scientific research subject. Because of the diversity of disasters and the difference in disaster resilience in affected areas, humanitarian logistics is not easy and has considerable complexity. A comprehensive study of the challenges of different phases of disaster relief is needed.

This paper reveals the main problems and causes of Chinese humanitarian logistics' supply chain management by evaluating the situations during the SARS, H1N1, and COVID-19 outbreak and comparing the similarities and differences. Many other challenges have been discussed throughout the literature. By examining these issues, the paper puts forward suggestions to improve and promote the development of China's humanitarian logistics to better adapt to national conditions. This study is of great value for Chinese humanitarian organizations to recognize and understand their environment and challenges. At the same time, it can help government and humanitarian organizations understand the relevant knowledge and training methods of humanitarian logistics, to cultivate more available resources in the industry.

Keywords: COVID-19 outbreak, China, Red Cross Society of China, Humanitarian Logistics, Humanitarian Supply Chain Management

1 Introduction

1.1 Background of the Study

COVID-19 is a disease discovered in Wuhan in December 2019. Currently, the disease is spreading globally. According to a report issued by the World Health Organization (WHO, 2020), there are currently 15,581,009 cases worldwide, and the total death toll has reached 635,173. In the current dire situation, it is very important to carry out humanitarian assistance operations to countries/regions with severe epidemics.

As the country with the earliest COVID-19 outbreak, China has been receiving humanitarian assistance from other countries and organizations before the domestic epidemic improved. At the same time, provinces such as Zhejiang and Jiangsu, which are less affected by the epidemic in China, have been sending relief supplies to the severely affected provinces such as Hubei (Zhang & Xu, 2020).

However, despite a large number of relief supplies being sent to Hubei Province, hospitals in Wuhan and many cities in the province still lack medical supplies such as masks between February and March 2020 (Buckley et al., 2020). The reason is that there are problems with the operations of the Red Cross organizations in various regions of Hubei Province. For instance, in Wuhan, the charity's officials were quickly paralyzed by bureaucracy, competing for mandates and chaos (Hernández & Wee, 2020). The emergence of this situation has left tens of millions of dollars in aid funds not being used, and piles of protective equipment and other medical supplies lie in a huge warehouse. At the same time, medical staff is forced to fight the virus with little protection (Hernández & Wee, 2020).

After receiving negative feedback from the public, the government immediately urged the Wuhan Red Cross Society to solve the problem and accept public supervision to ensure that the Red Cross Society operates efficiently while maintaining transparency (Hernández & Wee, 2020). The problems of the Wuhan Red Cross in the COVID-19 epidemic are the epitome of the challenges faced by humanitarian logistics throughout China.

1.2 Purpose of the study

This paper aims to investigate the challenges facing China's humanitarian logistics during SARS, H1N1, and COVID-19 and recommend the future development of China's Humanitarian Logistics.

1.3 Research Objectives

To gain more insight and provide an answer to the problem statement, the following questions have to be addressed:

- 1) The main purpose of this research is to illustrate the problems faced by China's humanitarian logistics and possible solutions.
- 2) This goal will use China's official social assistance group, Red Cross Society of China, as the research object. This article will discuss the performance and role of the Red Cross Society of China in the humanitarian relief of COVID-19.

1.4 Significance of the Study

This is of great value for Chinese humanitarian organizations to recognize and understand their environment and the challenges they face. If these challenges can be solved, then China's humanitarian logistics level will be greatly improved. Even if these challenges are difficult to solve in the short term, Chinese humanitarian organizations can learn from this study how to avoid the negative impact of these challenges.

1.5 Structure

In order to achieve the research goals, the structure of the paper is as follows. The second chapter will introduce the basic theories and concepts of humanitarian logistics, China's humanitarian development, and the challenges faced by humanitarian logistics through a literature review, and finally introduce the conceptual model of this research. The third chapter will prove the conceptual model of this research through three cases of SARS, H1N1 and COVID-19, and explain the challenges faced by China's humanitarian logistics. Chapter 4 will summarize the conclusions of the case study and point out the implications of this study.

2 Literature review

2.1 Disease Outbreak and Pandemic – SARS, H1N1, and COVID-19

This study will focus on three representative diseases that affect the world, namely SARS, H1N1, and COVID-19.

Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus, called SARS-associated coronavirus (SARS-CoV). In February 2003, SARS was first reported in China, and before the global outbreak of SARS was contained in 2003, the disease had spread to more than a dozen countries in North America, South America, Europe and Asia (CDC, 2019). According to data from the World Health Organization (WHO), the total number of SARS patients worldwide that broke out in 2003 was 8,098, of which 774 died.

Influenza A virus subtype H1N1 (A/H1N1) is a subtype of Influenza A virus, the well know outbreak of H1N1 strains in humans is the 2009 swine flu pandemic. In 2009, the virus was first discovered in Mexico and spread globally in the following months, and in June, WHO and the US Centers for Disease Control and Prevention stopped counting cases and declared a pandemic (Chan, 2009). Taking into account unconfirmed or unreported deaths, an estimated 284,500 people died from the flu (Dawood and etc., 2012).

The COVID 19 pandemic is an ongoing pandemic of coronavirus disease 2019 (COVID 19) caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV 2). In December 2019, the virus was first detected in Wuhan, China (WHO, 2020). More and more infected people were found around the world in the following months. The World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January 2020 and a pandemic on 11 March 2020. As of 24 September 2020, more than 31.8 million cases have been reported in 188 countries and territories, resulting in more than 976,000 deaths (Dong and etc., 2020)

2.2 Humanitarian Logistics

Essentially, logistics is related to the flow of goods, services, and information (Lummus, Krumwiede, & Vokurka, 2001). However, the definition of logistics changes as the service objects change. The term "logistics" itself comes from military use, which is all the activities and methods that are used to meet requirements for military supplies (Luttwak, 1971). Since then, business people began to try to redefine the term "logistics", and they believe that commercial logistics is mainly related to goods and customers. The Council of Logistic Management (1998) defined that commercial logistics as "the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements."

Humanitarian logistics includes the basic parts shared by the above two types of logistics, since its service targets are disaster-stricken people, its definition is derived from this. In Thomas and Mizushima's Logistics Training: Necessity or Luxury, they defined HL as "the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from point of origin to point of consumption of the purpose of meeting the end beneficiary's requirements (Thomas & Mizushima, 2005). Bolsche, Klumpp and Abidi expanded the content and came up with a new definition: humanitarian logistics is "the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from the point of origin to the point of consumption for the purpose of alleviating the suffering of vulnerable people. The function encompasses a range of activities, including

preparedness, planning, procurement, transport, warehousing, tracking and tracing, and customs clearance” (Bolsche, Klumpp & Abidi, 2013). Thus, the aim for humanitarian logistics can be defined as maximizing logistic service under the restriction of a given logistic budget.

2.3 Humanitarian Logistics in China

The development of China's humanitarian logistics is closely related to the development of China's non-governmental organizations (NGO). Chinese Ministry of Civil Affairs defined "NGO" as “the formal and non-profit target organizations have no government components. They have certain levels of autonomy, voluntariness, public or mutual benefits.” (Li, 2003, p.23) China's NGOs are roughly divided into two categories: mutual-aid NGOs and public beneficial NGOs. The representatives of mutual-aid NGOs are trade unions, while the representatives of public beneficial NGOs are foundations.

In the 1990s, NGOs emerged in China. Until 2008, their development was slow and inconsistent, so their capabilities were limited (Zhao, 2011). Due to their outstanding performance in the 2008 Sichuan earthquake, the development of China's NGOs has gradually entered the right track. After that, a relatively complete humanitarian logistics system began to be established.

In 2013, Wang mentioned the responsibilities of Chinese NGOs in the disaster relief process, which involved the specific operation of humanitarian logistics (Wang, 2013). The rescue phase begins when a disaster occurs, and the most critical task in this phase is to save lives. Therefore, rescue teams and rescue facilities (such as temporary hospitals) are most needed in the affected areas at this stage. Although the capacity of humanitarian logistics is restricted due to damage to the infrastructure and other unknown factors at this time, humanitarian logistics should still be actively deployed based on actual conditions. The relief phase begins one to two months after the disaster. In addition to saving lives, the tasks at this stage include providing the disaster-stricken people with necessities to help them survive. At this time, after a period of restoration, the infrastructure in the disaster-affected area can be reused, and the operational efficiency of humanitarian logistics has been greatly improved. The reconstruction phase begins after the disaster relief is completed and usually takes several years. At this stage, the participation in humanitarian logistics has declined, because the demand for supplies is now normal, and the affected people can buy the supplies they need locally.

Stage	Degree of Involvement of Humanitarian Logistics	Duties
Rescue	High	Send people and facilities for rescue activities immediately
Relief	High	Discover and satisfy special demand of suffered people
Reconstruction	Low	Send psychologists and give advice of psychological rehabilitation facilities

Figure 1. Humanitarian Logistics in Disaster Relief
Source: Adapted from Wang (2008)

2.4 Red Cross Society of China

The Red Cross Society of China was founded as the Shanghai International Red Cross Committee on March 10, 1904, during the Russo-Japanese War (Reeves, 2008). The founders were a group of Chinese business and political leaders, led by Shanghai tea merchant Shen Dunhe. After the end of the Russo-Japanese War, the Chinese Red Cross expanded rapidly. Due to the frequent occurrence of natural disasters and wars in China during the first half of the 20th century, the activities of the Red Cross Society of China have become more frequent and its scope of influence has also continued to expand. By the 1920s, there were more than 300 Red Cross branches in China. After the end of the Chinese Civil War in 1949, a group of Red Cross staff who had not arrived in Taiwan under the leadership of the Communist Party of China reorganized the Red Cross, which is now the Red Cross of China (Reeves, 2008).

2.5 Red Cross Humanitarian Logistics

According to the statement of the International Federation of Red Cross and Red Crescent Societies, “the basic task of humanitarian logistics comprises acquiring and delivering requested supplies and services, at the places and times they are needed, whilst ensuring best value for money” (IFRC,2020). It means that after a disaster, humanitarian logistics should ensure the supply of food, water, medicine, temporary shelter and other necessities for survival in the disaster area.

The logistics, procurement and supply chain management (LPSCM) department of the International Federation of Red Cross and Red Crescent Societies (IFRC) is the organization's humanitarian logistics service provider. The department is committed to supporting the core work of the National Red Cross and Red Crescent Societies, while providing services to other humanitarian organizations and governments in a non-profit manner (IFRC,2020).

2.6 Challenges of Humanitarian Logistics

2.6.1 Challenges related to different types of disasters

Humanitarian logistics deals with disasters which range from earthquakes, tsunamis, hurricanes, epidemics, droughts, famines, terrorist attacks, and war situations to a combination of several disasters which may occur simultaneously (Kovács & Spens, 2009). Due to China's vast territory, diverse landforms, and large population, there are many types of disasters in China, which means in China, the logistics work of humanitarian organizations is actually quite heavy.

Since different disasters have very different causes, impacts, and scales, humanitarian logistics personnel need to take different measures according to different situations, and this has caused great difficulties in participating in humanitarian logistics. For instance, earthquake, as a natural disaster that is difficult to accurately predict and has an unfixed hazard range, it can easily cause a devastating impact on the infrastructure of a region and cause logistics problems for humanitarian logistics. In 2008, the Wenchuan earthquake in Sichuan forced the closure of Chengdu Shuangliu Airport and all flights were suspended (Loo, 2008). At the same time, all expressways entering Wenchuan and all expressways in Sichuan Province were damaged. The emergence of these unfavorable factors makes the progress of humanitarian relief slow, and it is even more difficult for humanitarian logistics to be transported to the disaster area.

2.6.2 Challenges related to disaster relief phases

In the advanced humanitarian time series scheduling problem, Duran mentioned that disaster management includes four consecutive phases that occur in the disaster life cycle: mitigation, preparation, response, and recovery (Duran, 2012). The mitigation stage means that relevant personnel and institutions should take measures to reduce or even prevent the occurrence of a disaster; the preparation stage means that the government or humanitarian organization purchases relief materials in advance and keeps them properly, thereby reducing the time spent on subsequent disaster relief; the response stage means that Government departments and humanitarian organizations carry out disaster relief operations; the recovery phase includes the reconstruction of the disaster-stricken areas and the treatment of disaster-stricken people.

For humanitarian logistics, its responsibilities are mainly in the preparation phase and response phase, and its challenges are also in these two phases. In the preparation stage, humanitarian logistics should focus on the procurement and storage of disaster relief materials. Considering the quantity and storage location of the materials, this is a considerable expense. In the response phase, humanitarian logistics personnel need to consider how to efficiently deliver disaster relief supplies to the disaster area in a short time, and that's not a simple task.

2.6.3 Challenges related to humanitarian organizations

Humanitarian organizations usually take these following forms: supranational aid agencies (UN agencies), governmental organizations (GOs), big international non-governmental organizations (BINGOs) and one-man non-governmental organizations (NGOs). Differences in the organization's structure and scale will affect the organization's disaster relief response time and operational capabilities, and at the same time, the tasks of humanitarian organizations dictate the disaster relief phases in which they participate (Kovács & Spens, 2009).

The challenges related to humanitarian organizations mainly lie in two aspects, one is the development of the organization, and the other is the operation of the organization. Most of the humanitarian organizations we call in China are NGOs, which emerged in China in the 1990s. Because of their slow and inconsistent development, their abilities are limited (Zhao, 2011). This situation did not change until after the Wenchuan earthquake in 2008. Due to the rapid response in the disaster relief, Chinese non-governmental organizations were widely recognized and entered a period of rapid development. The challenges in the operation of humanitarian organizations are mainly focused on credibility, and the specific performance in humanitarian logistics is the measurement of logistics performance. Performance measurement of logistics is crucial to NGOs accountability, because it is the most expensive part of a disaster relief chain (Beamon B. M., 2004; Wassenhove, 2006). If NGOs cannot explain their operations effectively and transparently, they will definitely be criticized, especially in China.

2.7 Conceptual Model to Identify Challenges of Humanitarian Logistics in China

Based on the challenges of humanitarian logistics, Kovacs and Spens have developed a conceptual model to identify humanitarian logistics challenges as in Figure 2 (Kovacs & Spens, 2009). Humanitarian logistics personnel can use this conceptual model to determine the challenges they face before performing humanitarian missions.

In terms of disaster types, humanitarian logistics personnel need to consider three points: the cause of the disaster, the warning time, and the possibility of a disaster in the area. By studying the causes of disasters, people can understand how to mitigate the effects of disasters. By studying the early warning

time, people can have enough time to evacuate whether it is a sudden disaster or a gradual disaster. By studying the possibility of disasters in the region, national/regional humanitarian organizations can focus on the typical disasters they face.

In terms of focus and location of the humanitarian organization, humanitarian logistics personnel need to consider mandate related to phase of relief, and regional presence. The mandate of the humanitarian organization is determined based on its main rescue phase, the items it provided and the presence of the area before the disaster. The regional presence of humanitarian organizations determines their role and mission in disaster relief.

The biggest challenge for humanitarian logistics personnel is to find partners (Kovacs & Spens, 2009), so it is particularly important to confirm the environment of stakeholders and build possible strategic alliances.

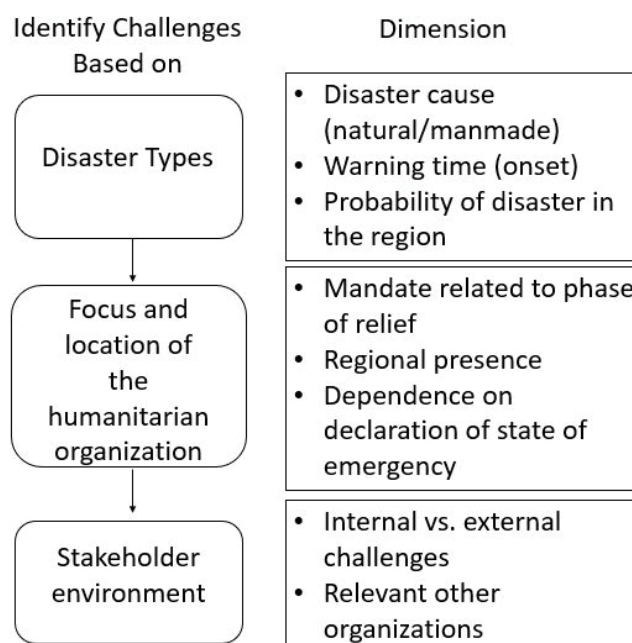


Figure 2. Conceptual Model of Identify Challenges of Humanitarian Logistics

Source: Adapted from Kovacs & Spens (2009)

Since this research focuses on the challenges faced by China's humanitarian logistics in SARS, H1N1 and COVID-19, so there is no need to identify different challenges caused by different types of disasters. The main challenge of the virus to humanitarian logistics lies in sanitation and transportation. In terms of health, logistics personnel need to consider how to safely distribute relief materials to those in need, while ensuring their own health and safety, that is, how to prevent the spread of the virus from affecting humanitarian logistics. In terms of transportation, logistics personnel need to consider how to choose the best method to efficiently complete logistics tasks. Because the epidemic easily affects the operation of regional infrastructure, humanitarian logistics personnel need to anticipate possible obstacles in advance and choose corresponding solutions. Since China's humanitarian logistics is still in the development stage, and this study takes the Red Cross as the research target, the issue of stakeholders is not considered.

With the continuous emergence of diseases that threaten the world, the cooperation between countries and humanitarian organizations in the world has been continuously strengthened. From SARS to COVID-19, countries around the world are paying more and more attention to humanitarian logistics in order to deliver disaster relief materials to the disaster area in time, so as to help people in the disaster area fight disease.

Since the SARS outbreak, China has established and strengthened national and local surveillance systems for the prevention and control of infectious diseases and has also deepened its cooperation and exchanges with the World Health Organization and the international scientific community. (Qiu, 2017). The completion of the monitoring system has improved the emergency response capabilities of the country and region. The cooperation with the WHO and the international scientific community has taught China effective methods to deal with infectious diseases and the importance of ensuring efficient humanitarian logistics during the epidemic.

China's special national conditions make its government play a very important role in the disaster relief process, which directly affects the operation of China's humanitarian organizations and the development of China's humanitarian logistics system. The most obvious manifestation of this is the Chinese Red Cross. The Red Cross Society of China is the only official humanitarian organization in the world, which makes it completely different from Red Cross/Red Crescent organizations in other countries. Its impact on humanitarian logistics is greater than expected.

Therefore, based on the case study of SARS, H1N1 and COVID-19, a conceptual model was developed to identify humanitarian logistics in China. Figure. 3 show that challenges could be identified from two dimensions: the type of humanitarian organization and host government.

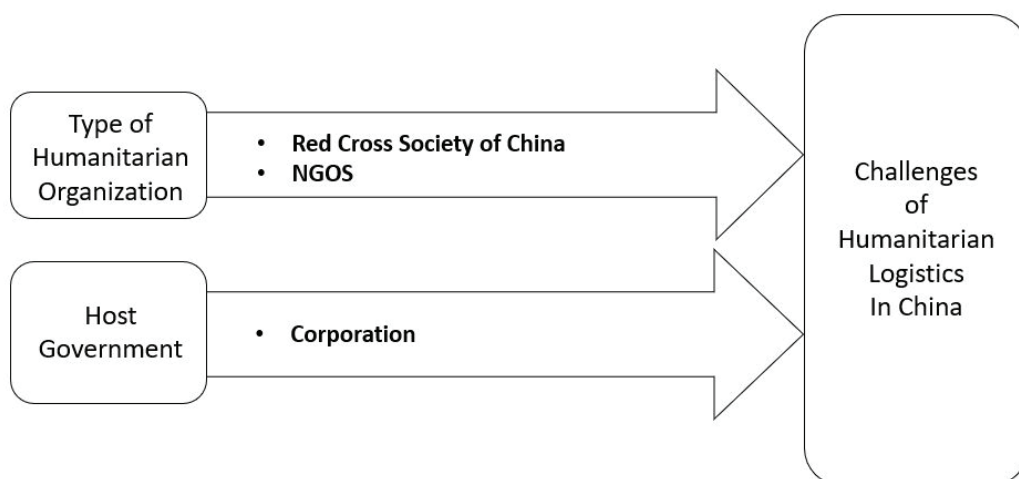


Figure 3. Conceptual Model of Identify Challenges of Humanitarian Logistics in China

3 Case Study

In this paper, the research is based on the literature review and case study. The paper introduces the relevant theories of humanitarian logistics, and the challenges it has encountered in China which identifies by establishing a conceptual model. Through the analysis of the model, key performance indicators are determined to evaluate the performance of China's humanitarian logistics in SARS, H1N1, and COVID-19.

3.1 SARS in China

Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus, called SARS-associated coronavirus (SARS-CoV). In February 2003, SARS was first reported in Guangdong province, China.

The Guangdong Provincial Government covered up the initial SARS outbreak and prohibited the media from publishing related content (Garrett, 2003). This makes carriers of the virus move across the country without realizing that they are spreading the virus, which led to the spread of SARS across the country. In addition, because the SARS report is "top secret", officials from the Guangdong Provincial Health Department cannot discuss the matter with health officials in neighboring provinces/cities. This led to the development of SARS into an epidemic in Hong Kong and then quickly spread to all parts of the world (Jack, 2009).

While blocking information, the Chinese government has not made quick and effective public health response measures to the epidemic. Although the Ministry of Health has long been aware of the possibility of a new type of pneumonia in Guangzhou (Guangdong, 2003), the Chinese Center for Disease Control and Prevention has not issued any statement on how to prevent the disease. It was not until April 11 that the government officially listed SARS as a disease that was closely monitored and reported daily under the Infectious Disease Prevention and Control Law (Huang & Smith, 2010). As result, hospitals and medical personnel in most localities were completely unprepared for the outbreak (Liu, 2003), which has led to a shortage of medical resources.

The slow response of the government illustrates the general lack of cooperation among various departments within the government. This includes not only health administrative departments at all levels, but also central and local administrative agencies, as well as the coordination of civil and military agencies (Huang & Smith, 2010). For example, on April 3, 2003, the Minister of Health announced that there were only 12 SARS cases in Beijing, but in fact there were 60 SARS patients in the 309th People's Liberation Army Hospital in the city.

The Chinese government's non-cooperation during the SARS outbreak and epidemic caused the World Health Organization and other humanitarian organizations to be unable to provide timely assistance. For instance, the government delayed reporting to the World Health Organization and delayed the entry of the WHO team into Guangzhou (Rosenthal, 2003), which indirectly caused more losses to China. Another example is that Médecins Sans Frontières (MSF) assisted in the fight against SARS in Vietnam and other places in Southeast Asia as early as February and March 2003; However, it wasn't until May that MSF started to carry out similar projects in China (MSF, 2003).

3.2 H1N1 in China

Influenza A virus subtype H1N1 (A/H1N1) is a subtype of Influenza A virus, the well-known outbreak of H1N1 strains in humans is the 2009 swine flu pandemic. In 2009, the virus was first discovered in Mexico and spread globally in the following months.

Contrary to the initial response to the SARS outbreak, the Chinese government took swift countermeasures immediately after the outbreak of H1N1. On the evening of April 25, 2009, after receiving a report from the World Health Organization on H1N1, the Chinese government launched a national pandemic prevention and response plan (China Daily, May 20, 2009). Since measures such as mandatory isolation and travel restrictions have effectively contained the spread and outbreak of SARS, the Chinese government has adopted similar measures in response to H1N1. At the same time, the government allocated 5 billion yuan to prevent and control the virus, which is twice the amount during the SRAS period (Huang & Smith, 2010). Sufficient financial support allowed that patients with confirmed H1N1 can be hospitalized for free, and free food and lodging are also provided for those who are quarantined at government designated locations.

The Chinese government's rapid response to the first outbreak of H1N1 has effectively contained the spread of the virus, but it is still unable to control the impact of the second outbreak. From Figure 4, we can see that before September, the number of H1N1 infected people was always low, but after September, the number of people infected quickly rose to a peak. Hang and Smith believe that the main reason for this phenomenon is that the Chinese government has not adopted measures similar to herd immunity (Huang & Smith, 2010). The Chinese government's strict immigration review and martial law measures have certainly reduced the number of infections in China, but this also left most Chinese people lacking self-immunity against H1N1, which directly contributed to the large-scale infection during the second outbreak of H1N1. To some extent, the Chinese government's overreaction in response to H1N1 caused more losses for the country.

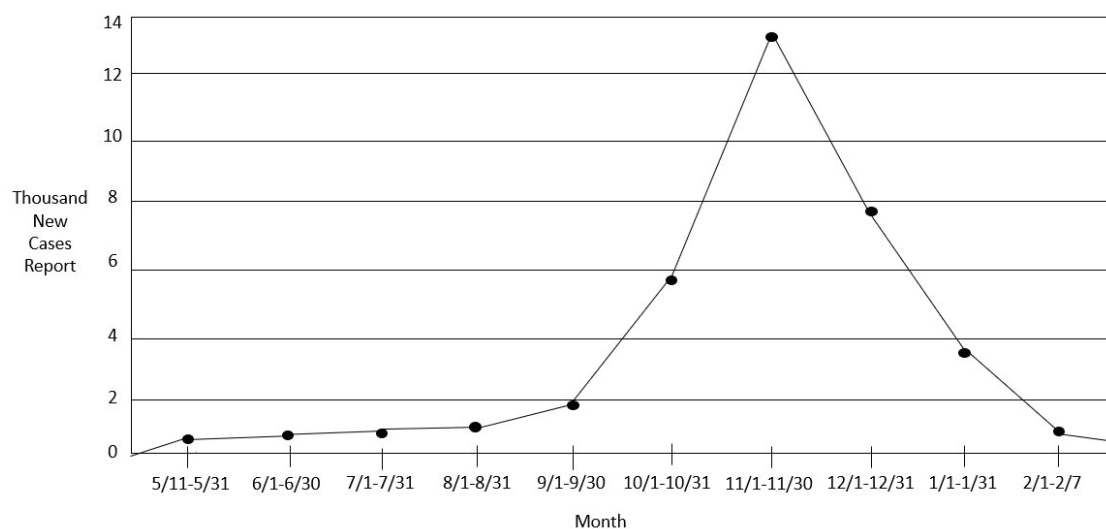


Figure 4. Number of H1N1 cases reported in China during individual weeks from May 11, 2009 to February 7, 2010.
Source: Adapted from Ministry of Health (n.d.).

However, the rapid response of the Chinese government to H1N1 does not mean that all information about H1N1 is open and transparent. Some evidence suggests that the actual death rate caused by H1N1 in China may be higher than reported. According to a document issued by the Ministry of Health (dated October 24, 2009), cases of H1N1 fatality could only be determined by provincial health authorities. In other words, the medical staff cannot confirm that the patient died due to H1N1 without being approved by the superior department. Besides, the Ministry of Health of China stopped the spread of updates of H1N1 cases between September 30 and October 9. Apparently, that's because of concerns of reporting H1N1 deaths would have a negative impact on the 60th-anniversary celebration of the founding of the People's Republic of China (Huang & Smith, 2010).

There is also a problem of opaque information between the Central Ministry of Health and the local health bureaus. On November 4, 2009, the Ministry of Health issued an indicative warning prohibiting local health bureaus from "covering up, underreporting and delaying reports", and it also requires local health authorities to adopt "international standards" when calculating H1N1 deaths, including those related to H1N1 (Huang & Smith, 2010). This shows that local health authorities have not reported many such cases.

3.3 COVID-19 in China

The COVID 19 pandemic is an ongoing pandemic of coronavirus disease 2019 (COVID 19) caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV 2). In December 2019, the virus was first detected in Wuhan, China (WHO, 2020). More and more infected people were found around the world in the following months. The World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January 2020 and a pandemic on 11 March 2020.

Even after experiencing pandemics such as SARS and H1N1, the problem of government concealment of information still exists in China. When COVID-19 appeared in Wuhan, the local government did not pay enough attention and chose to conceal the epidemic. As early as December 30, 2019, Li Wenliang, a doctor at Wuhan Central Hospital, noticed the possibility of SARS and warned his colleagues, but was admonished by the Wuhan Municipal Public Security Bureau for "publishing false statements" (Tan, 2020). The subsequent outbreak of COVID-19 proved that Li Wenliang's worries were correct, so his admonition was lifted later. However, the Wuhan government's concealment at the beginning of the outbreak directly led to a shortage of medical supplies in almost all hospitals in Wuhan, which affected the subsequent fight against the virus.

Another serious problem comes from the Red Cross Society of China. As an official humanitarian organization under the leadership of the People's Republic of China, the Red Cross Society of China has always played an important role in various disaster relief (Red Cross Society of China, 2003). Although most of the aid and donated materials are handed over to the Chinese Red Cross, it is clear that they cannot use these materials rationally.

During COVID-19, despite a large number of relief supplies being sent to Hubei Province, hospitals in Wuhan and many cities in the province still lack medical supplies such as masks between February and March 2020 (Buckley et al., 2020). The main reason for this situation is the bureaucracy and political directives in the organization (Hernández & Wee, 2020). These factors delayed the organization's ability to deal with affairs and caused a tendency in the distribution of disaster relief materials. For example, Wuhan Union Hospital, a public hospital designated to diagnose and treat fever cases (such as accommodate people infected with COVID-19), received only 3,000 masks donated by individuals and a donation of 12,000 RMB; while Wuhan Renai Hospital, a hospital specializing in plastic surgery, obstetrics and infertility, received 16,000 N95 masks donated by companies and a total of 360,000 RMB in donations, but the number of people in Wuhan Renai Hospital is less than one-tenth of that of Wuhan Union Hospital (RFI, 2020). The Wuhan Red Cross did not tilt medical supplies to Wuhan Union Hospital, which treats COVID-19 patients, but transported a large amount of supplies to Wuhan Renai Hospital, which is a very absurd behavior. Another reason for the shortage of medical supplies is that Wuhan Red Cross does not have an efficient logistics network to distribute supplies, but it is unwilling to ask other organizations to help (Hernández & Wee, 2020). As a result, a large amount of relief materials piled up in the warehouse and was not distributed. Even when the hospital's logistics staff proactively came to the warehouse to get supplies, they were rejected by the warehouse staff (RFI, 2020).

Compared with the Wuhan Red Cross society, the personal foundations established by some celebrities are more efficient and transparent. For example, the Han Hong Love Charity Foundation established by singer Han Hong performed extremely well in the fight against the epidemic (Zhou, 2020). Since the outbreak of the epidemic, Han Hong has been able to participate in the concert tour plan. Through his charity foundation, he has been raising funds for Wuhan and calling on many stars to donate to Wuhan. On January 25, 2020, the first batch of aid materials from the Hanhong Love Charity Foundation have reached Wuhan. In the following months, materials from the Hanhong Love Foundation continued to arrive in Wuhan and delivered directly to designated hospitals, which significantly improves the efficiency of humanitarian logistics. At the same time, the foundation will publish the progress of donations and the destination of materials on social platforms every day, thus ensuring the transparency of the organization's operations.

4 Conclusion & Implications

4.1 Conclusion

The poor performance of the Wuhan Red Cross in responding to COVID-19 has caused people to think about the challenges facing China's humanitarian logistics. Due to China's special national conditions, the main challenges faced by China's humanitarian logistics are different from those of other countries. According to the case study based on the three pandemics, it's clear that the main challenges faced by China's humanitarian logistics are the host government and the types of humanitarian organizations.

Regarding the host government, during SARS, H1N1, and COVID-19, China's local or central government will try to conceal the true situation of the epidemic for economic or political purposes. The result is that the damage caused by the epidemic has further expanded, making it more difficult to suppress. This is particularly prominent in the Chinese government's response to SARS, as both local and central governments are delaying the disclosure of the truth. Due to the lack of correct response measures and knowledge of SARS, the infected people carried the virus and spread to all of China, and at the same time spread to the world through Hong Kong. At the same time, it is also more difficult for humanitarian organizations to provide timely help in response to the epidemic, which directly affects the operation of humanitarian logistics. Humanitarian organizations need the support and cooperation of the government to implement rescue operations, because they need government permission to enter the disaster area. At the same time, accurate knowledge of the disaster situation is conducive to the efficient arrangement of aid materials, rescue personnel and corresponding logistics channels.

Regarding the types of humanitarian organizations. Because of its unique national conditions, the Red Cross Society of China is a member of the International Federation of Red Cross and Red Crescent Societies, but it is not affiliated with the International Committee of the Red Cross. The official status of being directly led by the state makes it a dominant Chinese humanitarian organization. The result of this is that there are two types of humanitarian organizations in China, the Chinese Red Cross, and other humanitarian organizations. When a domestic disaster occurs, the Chinese government will call on the people to send donations and aid materials to the Red Cross, which will carry out unified logistics and reasonable distribution. However, due to the continuous scandals of the Red Cross in recent years, especially the poor performance of the Wuhan Red Cross during COVID-19, the trust of the Chinese people in the Red Cross has deteriorated. People are more willing to hand over aid materials to non-governmental charitable organizations such as the Han Hong Love Charity Foundation because they are more transparent and efficient. From a certain perspective, this situation is conducive to the future development of China's humanitarian organizations. For a long time, the powerful propaganda power made the Red Cross Society of China the leader of China's humanitarian cause, which made it overlook its original intention as a humanitarian organization. Now, the emergence of strong competitors allows the Red Cross to focus on how to improve its operational efficiency and organizational transparency

through internal reforms. Other humanitarian organizations in China can also take this opportunity to develop and improve China's humanitarian logistics in the future.

4.2 Implication

Since the challenges faced by China's humanitarian logistics cannot be solved by the government or humanitarian organizations alone, this study suggests that China's humanitarian organizations should actively cooperate with local governments to establish a better humanitarian logistics system. At the same time, this study also recommends that humanitarian organizations in China actively use logistics performance measurement to improve the organization's accountability system. Otherwise, it may suffer a credibility crisis due to the inefficiency and opacity of the organization like the Chinese Red Cross, which will affect the future development of the organization.

Based on this research, future research can focus on how Chinese humanitarian organizations cooperate with the local government to build a better humanitarian logistics system. For example, how should China's humanitarian organizations maintain information exchanges with the government to obtain first-hand information to provide benefits for future humanitarian missions. At present, the Chinese government is unwilling to share real-time information with non-governmental humanitarian organizations, so how to break this barrier is a question that needs to be discussed in future research.

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