Research on the Construction of Emergency Logistics Supply Chain System Based on the Outbreak of New Crown Pneumonia

Wang Landong^{1,a*}, Wang Xueqing^{1,b}, Yan Wancheng¹, Zhang Hanhan¹, Peng Qihao¹ and Wang Hanjie¹

¹Logistics Department, Shandong Jiaotong University, Jinan, Shandong Province, 250357, China

Abstract. New Year's Eve 2020, Wuhan outbreak of new crown pneumonia and spread nationwide. This global epidemic has brought great challenges to the operation of emergency logistics system in China. In the face of this major public health emergency test, we can note that there are still many shortcomings in the current supply chain system of emergency logistics in China. This paper summarizes the experience and lessons accumulated in the anti-epidemic process, aims at all kinds of short boards of the current emergency logistics system and gives the idea of constructing and perfecting it.

1 Introduction

At the end of 2019, the first new type of coronary pneumonia was found in Wuhan, Hubei Province, and the epidemic spread nationwide. At the same time, the mobilization of emergency materials headed by medical materials also brings great challenges to the operation of emergency logistics system in China. Facts have proved that in the face of the epidemic, China's current emergency logistics system has exposed many shortcomings. On the one hand, the link of logistics system is not smooth and the material supply chain is broken, on the other hand, the supply chain operation lacks unified deployment and implementation basis, and the emergency logistics information platform shared by many parties.

In view of the public health emergencies experienced at present, the characteristics of emergency logistics can be roughly divided into sudden, uncertain, urgent, weak economy, multi-agent and multi-link characteristics. The reason for the short board highlighted in the epidemic examination is that one is "urgent" and the other is "chaos ". In order to be quick and fast," chaos ", that is, location, direction, scale, material category, quantity and so on, can not be preset and obtained in time, which brings great difficulties to the management and operation of emergency logistics. However, JingDong logistics, Shunfeng and EMS, which have integrated supply chain services, have become the backbone of the transportation of materials to fight the epidemic, and it is concluded that the supply chain construction based on the whole ecological business will become the norm. In view of the shortcomings of the anti-epidemic emergency work, this paper gives the perfect ideas and solutions.

2 Problems of Emergency Logistics System in China in Prevention and Control of New Crown Epidemic

In this epidemic prevention and control work, China's current emergency logistics system mainly has the following problems:

(1) Lack of professional capability in emergency material management and dispatch

Due to the shortage of talents in the field of emergency logistics and the tight response time, it is difficult to make scientific judgment and reasonable arrangement in emergency materials to make scientific judgment and reasonable arrangement in practice, and the number of decision-making errors is small, which may eventually make the operation efficiency greatly reduced.

(2) Lack of strategic objectives and guidance for emergency logistics to address public health emergencies

Although every link of emergency logistics supply chain system has its corresponding functional department, because of the weak sense of pattern, it has less interaction and can not make clear the overall work orientation. With the continuous change of epidemic situation, the problems existing in emergency logistics system become more and more obvious. The problems of medical device supply, the unified dispatch and coordination of donated materials and the effectiveness of materials need to be reformed; At the same time, the law construction of emergency logistics is relatively backward. The law of emergency logistics in our country is often reflected in many legal provisions, such as the Emergency response Law and the General Emergency Plan for Emergencies, while in the United States and Japan, there are quite standard bills.

(3) Lack of specialized emergency logistics information platform and difficulty in obtaining information

^{*} Corresponding author: a1286276136@qq.com

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In addition to the unclear strategic direction of emergency logistics, in this anti-epidemic material scheduling work, material procurement, acceptance of arrival, classification management, information input, material distribution and other links have also appeared the problems of redundant operation, low transparency, poor rationality and low efficiency. The reason is the lack of emergency logistics information sharing platform for participating in obtaining real-time and accurate material information, so the whole supply chain can not cooperate closely, and each link can not accurately formulate a reasonable and efficient material transfer scheme.

(4) Lack of upper-level leadership and unified planning and deployment of multi-agent emergency supply chain construction

The emergency logistics supply chain system lacks the specialized top-level design, but also lacks the unified strategic deployment, the operation has no rules to follow," the government, the enterprise, the army, the people "can not form the real resultant force. Only by combining government personnel, logistics expert consultants and relevant personnel in the field of major food and medical (pharmaceutical) enterprises, perfecting the top-level design of the emergency logistics supply chain system and forming a complete emergency logistics plan, can we provide the most basic guarantee for the smooth operation of the whole emergency logistics supply chain system.



Figure 1 Problems

3 Optimal Design of Emergency Supply Chain under Public Health Emergencies

Based on the various shortcomings exposed by the epidemic situation of new crown pneumonia and the thinking given to us, the following thinking framework for optimizing the emergency supply chain system is given.

The establishment of a perfect logistics system of emergency supply chain for public health emergencies is an important guarantee for the smooth development of emergency supply chain. We should constantly improve the emergency management system of medical materials and equipment, establish and optimize the identification system of public emergencies, and simultaneously construct the methodology and supply chain strategy of rapid analysis of emergencies under emergencies. The logistics system runs through the whole supply chain and the logistics behavior is carried out by the emergency supply chain logistics system. The research framework can be carried out around the links shown in figure 2.



Figure 2 Research Framework for Optimization of Emergency Logistics System

(1) Clarify the current situation of emergency supply chain system in domestic areas

Taking this public health emergency as the starting point, this paper combs the related elements such as medical devices, living materials, logistics enterprises, material suppliers and their logical relations, and clarifies the distribution of emergency materials in various regions at present. According to the development situation of the incident, the plan of coordinated material supply with the front-line medical team is formulated to ensure the followup operation organization, personnel scheduling, material management, information mechanism comprehensive plan and operation strategy. (2) Establishment of clusters of implementing professional systems

Analysing the logical relationships and key operational nodes of the processes involved in the emergency supply chain, such as medical personnel, medical supplies, funds, hospitals, charities and food materials, and establishing clusters of operational logic from a professional perspective, such as logistics system clusters, material procurement clusters, etc. Integrate each cluster to form emergency supply chain planning system. All logistics operation logic is formed into logistics system, which is managed by emergency supply chain planning system, and the whole supply chain system is opened. The professional system cluster framework is shown in figure 3.



Figure 3 Cluster Framework for Professional Systems

Under the government emergency supply chain dispatch cluster headquarters, there are 3 special departments and 8 special clusters, among which the information dispatch center, the supply chain expert advisory group and the system supervision department belong to the internal department of the general command center, Furthermore, there is a cluster of material suppliers, a cluster of reserve centres performing inventory procurement and distribution functions, a cluster of government departments at all levels, a cluster of logistics systems of logistics enterprises, a cluster of transportation and transportation responsible for the transit of materials, a testing body for the quality of materials, charitable organizations in various sectors of sectors of society and the main force — medical and health institutions that respond to public health emergencies. Each cluster represents different fields, exercises corresponding functions, and accepts the overall command of the cluster headquarters and the three major departments.

(3) Government-led Establishment of Unified Enforcement Rules and Joint Response Mechanism for Emergency Supply Chain System

The establishment of a perfect logistics system of emergency supply chain for public health emergencies is an important guarantee for the smooth development of emergency supply chain. To convene the government, expert consultants, logistics enterprises and other professional personnel, formulate emergency logistics system operating regulations, establish emergency supply chain planning system operating rules and standards, each professional cluster by professional teams to ensure the rapid and effective operation of each link, so that social enterprises and individuals in the face of public health emergencies, clear responsibilities, rules to follow, do not blindly follow.

(4) Integrating emergency logistics resources and

establishing emergency logistics information platform

In addition, the emergency supply chain system information mechanism should be established. The supply and demand data of each key node should be reported and processed in time, and the logistics system should disclose the storage data and material operation data in time. The necessary fields involved in the emergency logistics system are supported by big data technology and block chain technology, and a complete information management system of emergency supply chain system is formed by real-time data capture, analysis, integration and decision-making. Ensure that all parties in action can quickly clarify the supply and demand of materials and strategic distribution.

4 Bundles

General Secretary Xi Jinping stressed that it is necessary to improve the unified emergency material support system and regard emergency material support as an important part of the construction of the national emergency management system. The new epidemic situation has finally been controlled, but this epidemic examination has sounded the alarm bell for our country to step up the improvement of the emergency logistics supply chain system.

Supply chain logistics system is an important guarantee to deal with public health emergencies and economic and social operation quickly, and establish emergency supply chain logistics system in line with social development. By perfecting organization construction, cluster establishment, unified execution rules and logistics system as transportation guarantee, supporting big data cloud computing technology and block chain technology, setting up multi-party sharing platform of emergency logistics information, providing ideas for the construction and development of emergency supply chain system in China, laying the foundation for opening "big data war epidemic" model, we can deal with any public emergencies in the future more calmly and efficiently.

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