

Emergency Intelligence Support System Management from the Public Perspective

-- Taking the 2020 New Crown Epidemic Prevention and Control as An Example

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Abstract

COVID-19 is the most widely affected global epidemic in the past hundred years. During the outbreak period, the governments and media at all levels in China reported the development of the disease in a timely manner, actively promoted the development trend and the surrounding epidemic situation for the public, and made full use of intelligent information technology to help the epidemic screening and tracking. It actively provided information and technical support for medical treatment and epidemic prevention and control, and fundamentally realized the disclosure of epidemic information and smooth transmission of epidemic related information. All these show the role of emergency management system, but there are problems and deficiencies. The research and management of emergency intelligence support system for major public health events has certain practical significance. Taking COVID-19 as an example, improving the emergency management level of major epidemic events has certain guiding significance for our emergency intelligence research management.

Keywords

New crown epidemic situation; Information service; Information; Emergency management system.

1. Preface

New Coronavirus pneumonia is the most widely affected global epidemic in the past hundred years. It is a serious crisis and severe test for the whole world. Human life safety and health are facing a major threat. In the face of the unknown, sudden and menacing natural disasters, China resolutely launched the war of epidemic prevention and control. With firm courage and determination, China took the most comprehensive, strict and thorough prevention and control measures to effectively block the transmission chain of the virus. At present, we are in the era of big data and intelligence, and the overall driving mode and response paradigm of emergency management are changing, towards the direction of active, comprehensive and whole process emergency "intelligence".

The novel coronavirus pneumonia prevention and control is not only a direct battle in the field of medical and health, social governance, but also an information warfare and intelligence war, which involves data collaboration, information disclosure, data opening, public opinion control, intelligence analysis, citizen information literacy, knowledge popularization, intelligence think tanks, decision support and so on. In such a new environment, intelligence and intelligence resources are undoubtedly indispensable elements in the war. Emergency decision-making and emergency prevention and control is the central link of epidemic emergency management, and the premise of scientific and effective decision-making and prevention and control is to quickly,

accurately and completely control the data and information related to the epidemic, and form intelligence through certain mining and interpretation.

2. Literature Review

From the relevant literature, as early as the 1980s and 1990s, public crisis information management and other related fields have become the focus of the international community. At the domestic level, since the end of the 20th century, there have been some scattered researches on emergency information and emergency knowledge. However, from the perspective of pure emergency intelligence intervention, the related research mainly emerged in three major projects related to emergency intelligence approved by the National Social Science Fund in 2013. They are respectively the major project "Research on rapid response intelligence system for emergency decision-making" sponsored by Professor Su Xinning of Nanjing University, Professor Li Gang of Wuhan University presided over the major project "Research on the construction of smart city emergency decision-making information system", and Professor Yao Leye of Sichuan University presided over the key project "rapid response information system for emergency decision-making interdisciplinary comprehensive integration and empirical research". Domestic scholars have done a lot of research on the information system of public health emergency decision-making. Zeng Ziming and Huang Chengying believe that the information system of public health emergencies for epidemic control includes four elements: intelligence, personnel, institutions and technology, which is divided into five layers: intelligence collection, intelligence processing, intelligence storage, intelligence analysis and intelligence service. The operation mechanism is different in the incubation period, outbreak period and recovery period of epidemic situation, and needs technology, specification and service. Privacy and security are guaranteed in three aspects; Jiang Xun and Zhu Xiaofeng think that the emergency intelligence service system should include four layers of structure, including thematic data layer, system layer, service layer and user layer, and describe the composition and function of each layer.

After that, the academic circles, especially the information science circles, set off a research upsurge of emergency intelligence. As a new interdisciplinary research direction, emergency intelligence is gradually recognized and accepted in related fields, and injects new intelligence vitality into academic journals, academic conferences and other academic stages. In view of the good foundation and service experience of intelligence circles in similar directions, some scholars have proposed that the field of emergency intelligence is expected to become the next research field of information science after scientific and technological intelligence and competitive intelligence.

3. Problems of Information Support System for Major Epidemic Prevention and Control

The novel coronavirus pneumonia outbreak is a public health emergency, and it is a major category of emergency management. Emergency management is the means of human society to deal with emergencies, and the emergency intelligence we want to mention is the navigation tool and intelligent engine of this means. Emergency intelligence generally refers to the information and knowledge about emergencies obtained and refined through various ways or means. This epidemic prevention and control has exposed many problems in information and intelligence management. It is not only a problem in the field of public health emergency prevention and response, but also reflects the core of the whole emergency management - lack of intelligence. There is a lack of intelligence in emergency management. We support the improvement of emergency management ability.

3.1. The Intelligence Awareness of Emergency Business Subject Needs to Be Improved

Especially in the big data environment, the "big intelligence concept" is not followed up enough. The application logic of traditional emergency management is mainly system driven, and data-driven or intelligence driven is not the main or difficult to become the core. Even though some specific emergency response is applied to data and information management thinking, it is not satisfactory in intelligence "volume" and intelligence "quality", and the level is not high.

3.2. The Intelligence Reserve and Intelligence Preparation of Emergency Management Are Still Insufficient

The implementation of emergency response generally depends on the information resources such as emergency plan and emergency knowledge base. However, the existing emergency management is obviously insufficient in the "stock" of intelligence resources. In addition, the intelligence resource base of all kinds of business departments at all levels, non-governmental organizations, Internet and data service companies, and academic communities has not been well understood in the early stage. There are doubts about the standardization, reliability, and availability of all kinds of relevant emergency big data in emergency situations, and the computable data resources are relatively limited, It is difficult to support the intelligence needs of rapid response.

3.3. The Means of Emergency Intelligence Collection and Analysis Are Relatively Backward

From the process point of view, intelligence collection and analysis are the key to the whole "product output" of emergency intelligence. In this epidemic prevention and control work, we can see that a lot of epidemic data collection is still based on traditional manual collection, a large number of non-technical means such as telephone communication and wechat collection exist, and the overall statistical method is relatively backward. At the intelligence analysis level, due to the lack of professional intelligence analysis talents and think tank research and judgment team of CDC and other institutions, and the lack of information mining ability, they are often helpless in the face of a large number of epidemic data.

3.4. There Are Many Obstacles in the Collection and Sharing of Emergency Information

Due to the inherent institutional factors of "vertical strong horizontal weak" in China's emergency management, multi-layer logic and multiple institutions are involved inside and outside the system, and the information system and information resources of various departments are built separately, the problem of collaborative sharing of emergency information has not been well solved. This epidemic incident involves different functional departments, such as the Commission of health, the center for Disease Control and prevention, and hospitals. Most of the internal information system resources of these organizations are self built and self used. The ownership of resources seems "clear", but it has formed a logical and physical "data island". In actual combat, there is a lack of a channel to support authority based remittance.

4. Emergency Intelligence Support System for Major Epidemic Prevention and Control

Specifically, it analyzes from five aspects: support object, support process, organization structure, intelligence subject and intelligence work process. The emergency intelligence support system for major epidemic prevention and control is based on the information demand of China's epidemic prevention and control. Based on the evolution cycle of the epidemic, the

major epidemic prevention and control emergency intelligence think tank consortium with multiple knowledge subjects as the main body of intelligence support, which transmits, stores and analyzes the data and information related to the epidemic in real time, and produces, archives and shares intelligence on this basis, It also provides an organic whole of information support for the prevention and control of major epidemic incubation period, outbreak period, spread delay and recovery period through the collaborative emergency information support organization structure. Provide information programs for government agencies, military, medical and health institutions, ensure decision-making behavior of decision-makers, and promote effective and stable implementation of various prevention and control measures; To provide high-quality epidemic prevention and control information for the media and the public, and maintain social stability and public safety.

Therefore, these organizations need to rely on intelligence to make active decisions and command the overall situation in the emergency intelligence support system. They need to invest human and material resources to collect and analyze data and information, and organize relevant scholars to interpret and make decisions. The other is the passive recipients of intelligence such as social organizations, the public and the media. When they passively receive the information of epidemic prevention and control, they can respond flexibly and quickly, carry out certain early warning and prevention, organize mobilization, and timely feed back the information they have collected, so as to make up for the deficiencies and defects of the government and other organizations in the work of the information security system, To better assist in major epidemic prevention and control. In the process of emergency intelligence support, the evolution of epidemic situation is the same as the life cycle of emergencies, which is mainly divided into four stages: incubation period, outbreak period, extension period and recovery period. The process of emergency intelligence support can also be divided into four stages: epidemic prevention and control early warning, epidemic prevention and control preparation, epidemic prevention and control implementation and epidemic prevention and control end.

In order to build an information support system for real-time operation of epidemic prevention and control, it is necessary to design an effective organizational structure and clarify the functional composition and hierarchy of different departments in the organization. In the vertical organization chart, the intelligence of the "national high-end emergency intelligence support think tank" is reported to the "joint defense and control mechanism of the State Council", and then the mechanism feeds back to the support think tank. The think tank gives guidance to the provincial intelligence emergency intelligence unit, and the joint defense and joint control mechanism provides guidance for the "new crown epidemic prevention and control command of the provincial level". Then the provincial command of the local emergency intelligence support think tank and the local COVID-19 prevention and control command work guidance, and then carry out intelligence report and feedback between them. In the horizontal organization chart, the "epidemic prevention and control headquarters" assigns tasks to local working groups and publishes core information to the public, and then their information is fed back to the "emergency intelligence support think tank". By constructing a horizontal and vertical combination process framework, the author not only ensures the strictness of the organization, controls the quality of information transmission and guarantee, but also helps to realize the rapid and effective dissemination of epidemic prevention and control information and apply it to all levels to promote the rapid response of all levels, with a certain dynamic and flexible characteristics.

5. Suggestions and Summary

5.1. Build the Intelligence Resource Base

Intelligence resources are the basis of emergency management intelligence work in the big data environment, and the "source of wisdom" of intelligent emergency. From the epidemic prevention and control work, we can see that the key information and intelligence are strategic resources, whether from the perspective of business data analysis or government information disclosure. We need to systematically find out, evaluate, sort out and classify the emergency data and information of all kinds of organizations at all levels based on the intelligence needs and practical intelligence problems in emergency practice. The details include the stock, availability, computability, controllability and expansion space of intelligence resources. To do this work well, we need top-down driving and bottom-up support, so as to depict the "panorama" of intelligence resources. And then on this basis, further transformation and building of intelligence resources.

5.2. Promote the Development of More Advanced and Characteristic Emergency Intelligence Technology

Emergency intelligence technology is developing towards integration, collaboration and intelligence. In this context, the first step in the field of emergency intelligence is to continuously digest the new generation of information technology and transform it into technology "that is, combat power" and "potential", that is, to build the core content of the emergency intelligence technology system under the existing "digital intelligence" technology framework, actively "catch up" and "make up lessons", and free from repetitive and inefficient intelligence work. At the same time, it is necessary to construct a technical framework in line with the characteristics of the overall intelligence enabling, and do a good job in the characteristics of emergency intelligence situation awareness, emergency intelligence scanning, emergency intelligence insight and other technical innovation. For example, the technical thinking and operation process under the emerging intelligence service logic, such as engineering intelligence and parallel intelligence, is a good reference path for emergency intelligence technology.

5.3. Promote the Professional Construction of Intelligence Team in the Field of Security Emergency

Other departments in charge of emergencies can also follow this idea of professional construction of intelligence team, and effectively support emergency intelligence management by formulating relevant system and certification system, cultivating and introducing professional data and intelligence analysis talent resources. Of course, in some fields, such as the medical field related to this epidemic, the cultivation of intelligence talents is a relatively long cycle and high elimination rate process, which depends on a highly specific and sustainable talent cultivation mechanism.

5.4. Do A Good Job of Emergency Knowledge Popularization under the Public Domain Intelligence

From the perspective of the big intelligence system, there is still a public domain direction for emergency intelligence, in which the popularization of emergency knowledge is a core issue, but this field of public domain intelligence communication has not attracted people's attention. Emergency knowledge popularization generally refers to making the public understand the scientific knowledge related to safety and emergency by means of dissemination, popularization and education, so as to help the public improve their disaster prevention awareness and emergency response ability. For emergency intelligence, doing a good job of emergency knowledge popularization is not only the necessary functional component of

emergency intelligence system, but also the concentrated embodiment of human attributes of emergency intelligence.

5.5. Summary

In order to deal with this kind of emergencies more quickly in the future, this paper studies and constructs an emergency intelligence service mode based on epidemic prevention and control, which needs real-time monitoring, rapid response, and scientific and reasonable organization for decision-making and information transmission and application. However, major epidemic prevention and control is only a small type of emergencies, and the construction of emergency intelligence service mode based on emergencies is a very complex systematic project, which needs to be constantly updated and improved combined with the actual situation. By clarifying the objects of emergency support, integrating emergency intelligence into the specific process of epidemic evolution, and providing intelligence support for major epidemic prevention and control through a reasonable organizational structure, we can provide more scientific and reasonable guidelines for epidemic prevention and control in response to public health emergencies.

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