

# Research on the Problems and Countermeasures of Emergency Management System for Public Health Emergencies

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## Abstract

Public health emergencies are a direct threat to people's lives and health, and have become a hot issue of general concern to society. The emergency management system plays a key role in the response to public health emergencies. This paper focuses on the experience of three typical countries in emergency management systems for public health emergencies, and objectively analyses the shortcomings of emergency management systems for public health emergencies in China. On this basis, specific suggestions are made to improve the national emergency management system for public health emergencies in five areas: consolidating the rule of law for emergency management of public health emergencies; establishing a centralised, unified and efficient emergency command system; strengthening the comprehensive coordination capacity of various departments and clarifying their functions; co-ordinating the deployment and improving the level of public health emergency supplies; strengthening the introduction of professional and technical talents and enhancing the scientific and technological support capacity of public health. The Government should also strengthen the introduction of professional and technical personnel and enhance public health science and technology support capacity.

## Keywords

Public health emergency; Emergency management system; Countermeasures research.

## 1. BASIC EXPERIENCE OF TYPICAL COUNTRIES WITH EMERGENCY MANAGEMENT SYSTEMS FOR PUBLIC HEALTH EMERGENCIES

Due to differences in political systems, economic development, geography and culture, there are obvious differences in the emergency management systems of Western and Chinese countries.

In the United States, the emergency response system for public health emergencies is divided into a three-tier system of "federal-state-local", including the federal disease control and prevention system (CDC), the regional hospital emergency preparedness system (Health Resources and Services Administration (HRSA1)) and the urban health care system (local public health system). The top-down subsystem consists of the federal disease control and prevention system (CDC), the regional hospital emergency preparedness system (Health Resources and Services Administration (HRSA) ①) and the urban medical emergency system (local public health agencies (MMRS))[1]. The US health emergency management system focuses on a comprehensive response to emergencies, with the following salient features: First, it focuses on a government-wide response and multi-departmental coordination. The federal crisis response system has a strong command function, in which the Department of Defense, the Emergency Management Agency and the Department of Health are involved; each state has established a strategic management, comprehensive coordination and systematic assessment mechanism for public health risk prevention. Secondly, it focuses on the combination of level and warfare and

the effective use of resources. The federal government allocates funds to equip and subsidise major hospitals to establish medical emergency network systems, including existing infectious disease hospitals and infectious disease departments in general hospitals, which normally operate according to market needs and can be immediately converted into emergency hospitals at the request of the government in the event of an epidemic [2].

Japan is a country with a relatively robust emergency management system. The Japanese public health emergency management system is also divided into national (Ministry of Health, Labour and Welfare) - prefectural - municipal [3]. Japan's public health crisis management system consisting of a three-tier system at the national, governmental and local levels. With the development of the times, Japan has gradually established a comprehensive and integrated emergency management system from the central government interacting with the local government up and down, and the local government combining with social organisations, together with citizen participation [4].

The UK has a centralised system of government with local autonomy, giving more devolved powers to localities to manage. The emergency management system in the UK is set up under the administrative system of government. The UK does not have a separate emergency management agency, but relies on the corresponding emergency management responsibilities involved in each government department, with a reasonable division of labour each doing its own job and integrating national efforts to respond to emergencies. The UK's emergency management system for public health emergencies is composed of the Department of Health and the National Health Service (NHS)[5]. The Ministry of Health NHS forms the main body of management and services for public health emergencies. In the UK, the principle of territorial jurisdiction is applied, with routine events as well as general emergencies being managed and responded to autonomously by local governments; for larger-scale emergencies, the central government plays a command and coordination role, giving full play to the resilience of local governments in the face of emergencies and integrating national efforts; when major emergencies occur, they are managed directly by the central government, and a complete emergency organisation and operational process has been established. In the event of major emergencies, the central government directly manages the situation and has established a complete emergency organisation and operational process, as well as matching regulations and policies, material reserves and rescue concepts, enabling governments at all levels to respond effectively to various unexpected emergencies.

## **2. SHORTCOMINGS OF THE EMERGENCY MANAGEMENT SYSTEM FOR PUBLIC HEALTH EMERGENCIES IN CHINA**

### **2.1. The Legal System Is Not Sound Enough**

The work procedures stipulated in the Prevention and Control of Infectious Diseases Law, the Emergency Response Law, the Emergency Regulations for Public Health Emergencies and other relevant laws, regulations, plans and standards are not clear; the normative requirements are not connected, and there is a lack of operable regulations on how to carry out emergency response [6]. For example, by analyzing the current provincial legislation, it is found that most of the provisions are still based on the principle of regulating the content of the requirements, and the treatment lacks a clear direction, but only plays a certain role in guiding aspects and policies to promote and guide, and the specific operational processes and mechanisms still require specific provisions from the administrative departments, and the responsibilities and authorities between the various subjects are not effectively connected, resulting in a lack of rigor in laws and regulations. The cost of violating the law is not high, and the practical applicability of the legislative provisions is not strong, making it difficult to implement them effectively in practice, and there is the problem of a broken emergency management process. In

many places, there is a lack of awareness of emergency response in accordance with the law, a lack of performance of duties, lax enforcement of existing laws and regulations, and a lack of practical grasp of training and exercises for emergency plans.

## **2.2. The Command System Needs to Be Further Improved**

China's health emergency command system is the highest authority and command structure for public health emergencies, and undertakes the decision-making and deployment of important response measures in the disposal of public health emergencies. However, the increasing frequency of public health emergencies has also revealed that the current emergency command system in China still has problems in the following areas: public health emergencies are mainly undertaken by health and health departments. First, the public health emergency command system was less activated and less mature before the occurrence of public health emergencies. After the outbreak, the command system for public health emergencies was established on an ad hoc basis, and the degree of specialization, integration and efficiency of level-playing conversion needs to be improved; secondly, there is a lack of mechanism to guide and supervise the relationship between the responsibilities of local authorities in dealing with major public health emergencies. Thirdly, the legal provisions for isolation and treatment, medical observation, administrative requisition and traffic control during the handling of public health emergencies are not clear, which increases the arbitrariness of local emergency command, such as arbitrary restrictions on traffic and blocking of roads in villages.

## **2.3. Insufficient Comprehensive Coordination Capacity and Unscientific Institutional Settings of Emergency Departments**

The public health special emergency management system is an integral part of the comprehensive emergency management system, but it is not better organically combined when public health emergencies occur. The Ministry of Emergency Management, established in 2018, mainly undertakes the responsibility of comprehensive response to natural disasters and comprehensive production safety, with weak comprehensive coordination functions for large emergencies and insufficient comprehensive protection capacity for health emergencies, and in the public health joint prevention and control mechanism The relationship between the "general" and the "sub" has yet to be rationalised. At the local level, emergency management departments have been set up in provinces, cities and counties, but they are only temporary, non-permanent institutions, not permanent ones. The personnel are all temporarily formed by various departments, which may miss the best disposal period when a public health emergency occurs and may lead to low efficiency in emergency management, causing significant losses.

## **2.4. The Material Security System's Ability to Cope with Risks Needs to Be Improved**

General Secretary Xi Jinping pointed out that a unified emergency material security system should be established and improved, taking emergency material security as an important element in the construction of the national emergency management system, and in accordance with the principles of centralized management, unified allocation, service in peacetime, emergency in times of disaster, combination of procurement and storage, economy and efficiency, and improving relevant working mechanisms and emergency plans as soon as possible. However, after the occurrence of public health emergencies, the emergency material security system has also revealed some problems: firstly, the emergency material reserve is an important part of the emergency material security, especially in case of public health emergencies, which plays a key role. However, it is faced with a fragmented management system for emergency supplies reserves. Although several rounds of institutional reform have been carried out over the years, the basic principle of the professional assignment of material reserves has not changed, and the management of the reserves involves many links, many departments, poor linkage between functional departments, and a lack of effective coordination

mechanisms, making the emergency materials present a situation of "separate administration and separate warfare". Even the central and local emergency supplies reserves lack a linkage mechanism. Secondly, the emergency supplies reserve model is not sound. There are three types of emergency supplies reserves in China: contract reserves, production reserves and physical reserves. However, from the current situation, physical reserves account for a large proportion, while contract reserves and production reserves account for a small proportion. This has led to a large gap in medical supplies such as various types of medical masks and protective clothing when sudden public health events occur, revealing that China has relied excessively on daily emergency supplies reserves in response to prolonged major public health events, and that information on agreed supply and production reserves of enterprises is imperfect [7].

### **2.5. Shortage of Professional and Technical Talents as Well as Incomplete Information Support**

There is a serious loss of key personnel in the national CDC system, a lack of specialized emergency personnel for public health emergencies, and some health emergency managers are not strong enough to perform their duties. In terms of staffing in the health system, the number of medical personnel working in public health departments such as infection control and preventive health departments is low, few members of the leadership team of public hospitals have a public health background, and the grassroots network of community health service centres is not fully functional. In terms of information technology support, the degree of use of advanced information technology such as big data, artificial intelligence, telemedicine, 5G technology and cloud platforms is not yet sufficient, the construction of public health infrastructure such as internet hospitals and smart hospitals is insufficient, and public health information technology needs to be better integrated into integrated planning at the level of smart cities and big data governance. There are certain barriers to public health data and information, and the self-built platforms of various departments at all levels are relatively fragmented, with insufficient collaboration and sharing [8].

## **3. SUGGESTIONS FOR A SOUND EMERGENCY MANAGEMENT SYSTEM FOR PUBLIC HEALTH EMERGENCIES IN CHINA**

### **3.1. Consolidate the Rule of Law Guarantee for Emergency Management of Public Health Emergencies**

First, improve the procedural norms for public health emergencies. Give full play to the role of the Regulations as the "pillar and foundation", focus on the weak links in prevention and control, fill in the shortcomings, strengthen the weak points, revise and improve public health-related laws and regulations, establish a sound supporting system, build a systematic and complete, scientific and standardized, effective system of laws and regulations, and improve the law enforcement mechanism with clear powers and responsibilities, standardized procedures and strong implementation. We will also improve the enforcement mechanism with clear powers and responsibilities, standardized procedures and strong enforcement, so as to promote departments to perform their duties in accordance with the law and enterprises to comply with the law. Second, specific analysis of specific problems and updating of legislative concepts. It is important to understand the needs of the region's political, economic and legal systems for legislative improvement and adjustment, and to organically integrate legislation with the specific requirements of public health emergencies and emergency management in the region under the provincial legislative space, summarise the practical experience of emergency management in the region, grasp the local characteristics, analyse the regional level of medical and health care and public health response capacity, and fundamentally regulate and avoid unnecessary legislation. The third is to enhance citizens' awareness of the law. Thirdly, to

enhance citizens' awareness of the law, so that in the face of public health emergencies, citizens can comply with laws and regulations and do not know the law and break it.

### **3.2. Establish A Centralized, Unified and Efficient Emergency Command System**

First, there should be a strong leadership core when a public health emergency occurs. Immediately after the occurrence of an emergency event, the management state should be entered, and the leadership command system should be clear, systematic and orderly, smoothly organized and powerfully implemented in the emergency disposal; secondly, it should assume the function of a comprehensive hub for emergency work, give full play to the comprehensive coordination ability and the ability to coordinate the emergency resources of the whole society, in the areas of plan management, production management, emergency rescue, emergency place preparation and coordination of protection units, without making the incident to expand and reduce the degree of damage. Third, strengthen the integration and synergy of the emergency command system. Clarify the relationship between top and bottom emergency command authority and responsibilities, and explore the internal integration of grassroots emergency command mechanisms from the bottom up. In terms of the relationship between upper and lower command authority and responsibility, the central level command system should focus on mobilisation and coordination, while the local level can take on more specific decision-making and command functions. Fourth, strengthen the professional level of emergency command. Field command is the "nerve endings" of the emergency command system, and is the basis and key to determining the effectiveness of the emergency command system. To improve the level of professionalism of the emergency command system, we must put the foothold on the construction of the on-site emergency command system. At the same time, professionals also play an important role in the emergency command system. According to the principle of "professional things are done by professionals", professional emergency command personnel should be trained. To meet the business needs of emergency command work, pre-appointment training and on-the-job training should be carried out to improve the professionalism of emergency command personnel and to address the problem of panic in responding to major emergencies. Again, strengthen the construction of emergency "commanders" and "commanders", and promote the professionalization of emergency command teams.

### **3.3. Strengthen the Comprehensive Coordination Capacity of Various Departments and Clarify Their Functions**

First, the emergency management under the social governance system in the new era should be adapted to the needs of "all-hazard" and "big emergency", and under the framework of unified leadership, comprehensive coordination, classified management and graded responsibility, not only should there be "specialized Under the framework of unified leadership, comprehensive coordination, categorized management and hierarchical responsibility, it is necessary to have a "specialized" department to focus on emergency response in specialized areas, and a "permanent" department to coordinate the construction of the city's "big emergency" system, and to fully consider the emergency response needs of public health emergencies in the comprehensive planning of the city's big emergency work[9]. Second, build a public health governance system led by the party committee, with government responsibility and participation from multiple parties, focusing on adhering to and strengthening multi-level and multi-departmental joint prevention and control, and establishing a sound institutional and functional system with clear and interlinked division of labour in prevention and control, regulation, law enforcement and protection.



### **3.4. Coordinate the Deployment and Enhance the Level of Public Health Emergency Material Security**

First, establish a joint management mechanism for emergency supplies reserves. The government needs to establish a linkage management mechanism for emergency supplies reserves between the central and local governments, between government departments and between regions, to carry out dynamic management of emergency supplies, which is conducive to the emergency deployment of emergency supplies, to ensure that emergency supplies from various regions and departments can be transported to the place of accident in an efficient and orderly manner, to strengthen common management and win-win situation, to effectively integrate resources from all parties, to produce a scale effect, to avoid duplication and to improve the security of emergency supplies. Second, a rational allocation of emergency supplies reserve model. When the government conducts contract reserves and production reserves, it chooses enterprises with strong strength, strong business capacity, good reputation and large scale, signs contracts to clarify the rights and obligations of both parties, and regularly checks the enterprises' emergency supplies reserves and production operations to scientifically adjust the categories and quantities of reserves and enhance the effectiveness of reserves[10]. Third, enhance the reserve of social emergency supplies. After the occurrence of public health emergencies, social emergency supplies reserves will play an increasingly important role in emergency relief in China. Through publicity and education, the government will encourage the market, social organisations and citizens to increase their awareness of the need to stockpile emergency supplies on a daily basis. Finally, it is recommended that under the national and provincial unified deployment, the mechanism of emergency production, government procurement, storage rotation, transfer and call, logistics and distribution of materials be improved, the top-level design be optimised, a graded and diversified material reserve system be constructed, and the capacity of public health emergency material reserves be improved.

### **3.5. Strengthen the Introduction of Professional and Technical Talents and Enhance the Capacity of Public Health Science and Technology Support**

First, increase investment in human resources for health emergencies, and effectively enrich the staff teams of health emergency management systems, disease control systems, and medical treatment systems by increasing or transferring staffing. The number of staff positions should be able to meet the basic needs of health emergency duty, management and rescue and treatment duties. Strengthen the construction of relevant disciplines and vigorously train public health physicians and health emergency management professionals. Second, support for scientific and technological innovation in public health and health safety in the field of disease control should be increased to break through core key technologies. CDC departments that are in a position to do so should be built as preventive medicine institutes (institutes) with a high level of specialisation. Third, we should support front-line clinical technology innovation and promote effective treatment options in a timely manner. Full use should be made of modern information technology, relying on national health information platforms and smart city platforms, etc., to enhance the level of information and intelligent services for health emergencies.

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