

Thought on Establishing the Joint Prevention, Control and Disposal Mechanism of Medical Waste Under the COVID-19 Epidemic

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Abstract. A range of shortcomings was exposed in China's medical waste disposal capabilities in responding to public health emergencies under outbreak of the novel coronavirus pneumonia (COVID-19) epidemic. Especially, the traditional medical waste disposal capacity allocation and the prevention and control mechanism oriented to "a single city" have been far from meeting the needs of medical waste disposal and management during the emergency period. Therefore, suggestions on establishing the regional joint prevention, control and disposal mechanism of medical waste were put forward in this paper with reference to the ideas of China's existing regional joint prevention and control mechanism for air and water pollution, which covered the aspects of establishment of coordinating agencies, cross-regional collaborative disposal, cross-regional joint response to emergencies, cross-regional collaborative management and effectiveness evaluation.

Keywords. COVID-19, medical waste, joint prevention, control and disposal, mechanism

Separate collection, safe temporary storage, timely transportation and harmless disposal of medical waste play an important role in fighting against the COVID-19 epidemic [1]. The sharp increase in the amount of medical waste posed a severe test to the disposal capacity of medical waste [2] during the epidemic, especially at the beginning of the epidemic. A range of shortcomings were exposed in China's medical waste disposal capabilities in responding to public health emergencies, such as insufficient centralized disposal capacity in some regions, obviously insufficient emergency handling equipment reserves, and lack of cross-regional dispatching mechanisms. It was clearly required at the meeting of the Political Bureau of the CPC Central Committee held on February 21 that more efforts should be made to speed up fixing the shortcomings in the collection and disposal of medical waste and hazardous wastes. Ministry of Ecology and Environment of the People's Republic of China proposed that cities and towns with insufficient medical waste disposal capacity may coordinate with other cities in the province or those with surplus medical waste disposal capacity in neighboring provinces to establish a cross-regional coordination mechanism for emergency disposal of medical waste [3]. 10 departments including the National Health Commission also put forward

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the guiding opinions on “the establishment of a collaborative mechanism and an interest compensation mechanism for the cross-regional centralized disposal of medical waste” [4]. Thus, establishing a regional joint prevention, control and disposal mechanism of medical waste and enhancing of cross-regional medical waste disposal are important measures to promote the construction of the national medical waste disposal system after the outbreak, and as well as inevitable requirements for pushing forward the construction of the national ecological environment governance system and the modernization of governance capabilities.

1. Necessities to Establish a Regional Joint Prevention, Control and Disposal Mechanism of Medical Waste

1.1. Inevitable Requirements for Enhancing the Capacities to Prevent and Control Environmental Risks in Health Emergencies

A great number of transport vehicles and mobile emergency disposal facilities across the country have been mobilized to Hubei to assist in medical waste disposal after the outbreak. For instance, the medical waste disposal capacity of Wuhan increased from 50 tons/day before the epidemic to 262.8 tons/day during the epidemic after support from other cities and resource allocation, which basically met the medical waste disposal requirements for epidemic prevention and control in the city. However, the regional cooperation, with hurried response and inadequate preparation, had many shortcomings, especially in terms of information sharing, resource allocation, and supervision of disposal process. It can be seen that the traditional medical waste disposal capacity allocation and the prevention and control mechanism oriented to “a single city” have been far from meeting the needs of medical waste disposal and management during the emergency period. Therefore, the regional joint prevention, control and disposal mechanism of medical waste should be established, cross-regional cooperation and emergency drills should be carried out in terms of construction of long-acting collaboration mechanisms, joint prevention and control warnings, resource allocation and information sharing, and collaborative emergency disposal, and the schemes and preparations should be made to in advance to improve the national capacities to prevent and control environmental risks in health emergencies.

1.2. Urgent Need to Jointly Cope with the Transboundary Pollution Incident of Medical Waste

In recent years, the medical waste has frequently polluted the environment due to cross-regional illegal transfer, disposal and dumping [5]. The investigation and prosecution of transboundary pollution cases of medical waste become more difficult because the original linkage mechanism of the municipal-level ecological environment departments has been difficult to fit with this new situation, the new cross-regional (cities or provinces) cooperation mechanism has not been established, and supervision authorities failed to make the concerted efforts. The establishment of a regional joint prevention, control and disposal mechanism is conducive to enhancing the capacity to cope with the cross-regional emergent environmental incidents and effectively curbing the occurrence of illegal transfer, disposal and dumping of medical waste.

1.3. Basic Requirements of Establishing a Sound Environment Supervision System of Hazardous Wastes and Enhancing the "Three Capabilities" of Hazardous Wastes

With regard to medical waste, a category of hazardous wastes, its environment supervision capability, utilization and disposal capability and environmental risk prevention capability (referred to as "three capabilities") should also be included in the hazardous waste environment supervision system. It was required that "Regional and departmental joint prevention, control and disposal mechanism should be established. Local eco-environmental departments at all levels should strengthen the environment supervision and management of hazardous wastes in accordance with relevant environmental protection laws and regulations, and establish cooperation mechanisms with relevant administrative departments in charge of development and reform, health, transportation, public security and emergency, and enhance information sharing and collaboration." [6] It can be seen that the establishing a regional joint prevention, control and disposal mechanism of medical waste and strengthening the regional joint management and control of related departments are inevitable requirements to enhance the construction of "three capabilities" for hazardous wastes.

1.4. Important Measures to Create an Ecological Security Pattern of Super Urban Agglomerations and a Good Regional Ecological Environment

The production of medical waste is closely related to geographical and population distribution. The regions that are more economically developed and densely populated may enjoy higher medical and produce more medical waste. Especially at the outbreak of any infectious disease, these regions bear higher pressure on medical waste disposal and risk prevention and control and are exposed a range of problems in the construction of disposal capacity and the prevention and control mechanism carried out based on administrative divisions. For this purpose, the establishment of a cross-regional trans-department joint prevention, control and disposal mechanism of medical waste and integration of regional resources, information and supervision in key densely populated regions such as Beijing-Tianjin-Hebei Region, Guangdong-Hong Kong-Macao Greater Bay Area, the Yangtze River Delta, Changsha-Zhuzhou-Xiangtan Region, and Chengdu-Chongqing Region cannot only reduce the environmental risks of daily disposal and management and improve the efficiency of collection, transportation and disposal of medical waste during epidemic prevention and control, but also act critical role in guaranteeing the ecological safety of super urban agglomerations and building the good regional ecological environment in China.

2. Current Situation of Cross-Regional Joint Prevention, Control and Disposal of Medical Waste in China

2.1. Lack of Corresponding Policy and Legal Support at the National Level

All provinces and cities have been making gradual efforts to push forward the joint prevention and control of hazardous wastes in their respective areas after the management idea of "establishing a joint prevention and control mechanism for departments and regions" [7] was put forward for the first time, but the research on the

corresponding laws, regulations, policies and standards has been very lagging, especially in existing environment-related laws such as the Law on the Prevention and Control of Environmental Pollution by Solid Waste of the People's Republic of China and the Regulations on Administration of Medical Waste, no requirements for joint prevention and control of hazardous waste or medical waste have been specified. The lack of upper-level policies and laws will lead to a lack of subjective thinking in the implementation of regional joint prevention and control policies for medical waste, and no corresponding binding force has been formed [8], and it is also difficult to form any concerted efforts in collaboration among various regions and departments.

2.2. Insufficient Basic Research and Lack of Scientific Research Support

Cities and provinces have made efforts to establish the medical waste disposal capacity allocation and the prevention and control mechanism oriented to “a single city” before the outbreak of COVID-19, and neither the state nor local has carried out any research on the cross-regional joint prevention and control mechanism for medical waste. Therefore, the emergency management and treatment equipment (such as transfer vehicles, transfer cases, and emergency treatment facilities) for medical waste disposal in Wuhan and even the entire Hubei province were in obvious shortage after the outbreak of COVID-19. During the peak outbreak period, the “crammed” approaches that depend on large-scale administrative means got stuck in a passive state due to such problems as untimely scheduling, uncoordinated resource allocation, and disordered management in the process of transferring emergency treatment facilities from other cities and provinces to Hubei [9]. This outbreak revealed the fact that the basic research on joint prevention and control of medical waste in China is in shortage, and the guidance documents issued by the Ministry of Ecology and Environment, the National Health Commission and other departments are insufficient to fully support the needs of regional joint prevention and control for medical waste.

2.3. Difficult to Achieve Cross-Regional Collaborative Disposal

China has accelerated to push forward the construction of medical waste disposal capacity and regulate the treatment and disposal behavior during the “12th Five-year Plan” period [10]. However, a cross-regional collaborative disposal mechanism has not been established across the country up to now, especially in densely populated regions, the cross-regional collaborative disposal, joint law enforcement, information sharing and unified monitoring and supervision mechanisms still cannot meet demand, and a cross-regional emergency prevention and control system has not been established. In addition, the problem of medical waste “Not In My Back Yard” is extremely prominent, and a good cross-regional cooperative disposal and benefit compensation mechanism has not been established, leading to the cross-regional collaborative disposal difficult to develop.

3. Suggestions for Establishing a Regional Joint Prevention, Control and Disposal Mechanism of Medical Waste

Practice has proved that regional joint prevention and control acts as a “trenchant edge” in coping with regional air and water pollution, in order to achieve the objective

mechanism of “unified planning, unified monitoring, unified supervision, unified assessment, and unified coordination” [8, 11]. Therefore, the suggestions on establishing the regional joint prevention, control and disposal mechanism of medical waste were put forward in this paper with reference to the ideas of China’s existing regional joint prevention and control mechanism for air and water pollution, which covered the aspects of establishment of coordinating agencies, cross-regional collaborative disposal, cross-regional joint response to emergencies, cross-regional collaborative management and effectiveness evaluation.

3.1. Establish a Coordination Mechanism and a Cross-Regional Long-Acting Joint Prevention, Control and Disposal Mechanism

Centered on key densely populated regions such as Beijing-Tianjin-Hebei Region, Guangdong-Hong Kong-Macao Greater Bay Area, the Yangtze River Delta, Changsha-Zhuzhou-Xiangtan Region, and Chengdu-Chongqing Region, a regional coordination organization for joint prevention, control and disposal should be established, Composed of main administrative leaders in different regions, and relevant administrative departments at all levels in charge of medical treatment and public health, ecological environment, and road transportation, the organization should be responsible for developing the regional joint prevention, control and disposal working mechanism for medical waste, directly mobilizing the relevant departments and enterprises in the region, and taking unified action to guarantee the achievement of the medical waste disposal objectives in the region in daily and public health emergencies. At the same time, joint conferences should be held regularly to discuss and pragmatically push forward the specific work in regional joint prevention, control and disposal of medical waste.

3.2. Coordinate Regional Planning and Establish a Cross-Regional Collaborative Disposal Mechanism

It is necessary to set up regional collection, transfer or disposal of medical waste facilities following the principle of “prepared all the time rather than not prepared due to not always used” after comprehensively considering the geographical location distribution, serving population and occurrence of epidemic situation, so as to realize the “full coverage” of the regional collection, transfer and disposal system of medical waste. Proper measures should be taken such as introducing new technologies, and updating equipment and facilities, disposal methods should be optimized, and shortcomings should be resolved to greatly enhance the disposal capacity and emergency disposal capacity of existing medical waste centralized disposal facilities, and standardize the disposal of various types of medical waste. Great efforts should be made to explore the establishment of a collaborative mechanism for the cross-regional centralized disposal of medical waste and improve the efficiency of cross-regional disposal in emergency situations.

3.3. Improve an Emergency Management System and Establish a Cross-Regional Joint Response Mechanism for Emergencies

The reserves of emergency disposal facilities system, emergency operation disposal team and expert guidance team should be incorporated into the national ecological environment risk prevention and control system. A good job should be done on a daily

basis in reserves at the regional level of emergency disposal facilities and equipment (including suppliers) and the suppliers of on-site emergency operation companies, to ensure that the emergency equipment may be directly put into use once an emergency occurs. Great efforts should be made to establish a coordination mechanism of expert teams and emergency drill systems at the national and regional levels, and regularly carry out relevant emergency drills, including unified decision-making and command, information exchange and mutual reporting, joint monitoring and disposal, and unified deployment of personnel and resources.

3.4. Break Administrative Restrictions and Establish a Cross-Regional Collaborative Management Mechanism

A regional supervision big data platform for production, storage, collection, transportation and disposal of regional medical waste with comprehensive information, complete elements, efficient disposal and scientific decision-making should be established by virtue of the big data technology. A coordinated and normalized, high-quality regional information disclosure system should be established to improve the regional medical waste management-related information sharing mechanism. A cross-regional law enforcement linkage working mechanism should be established to carry out cross-regional medical waste disposal special supervision and law enforcement inspection. A compensation mechanism for cross-regional centralized disposal of benefits should be established. According to the principle of "whoever benefits is responsible for the compensation", the ecological compensation should be made for areas receiving the medical waste in the forms of investment in infrastructure construction, direct financial subsidies and disposal surcharges.

3.5. Implement Examination and Evaluation, and Establish an Effectiveness Evaluation Mechanism for Cross-Regional Joint Prevention, Control and Disposal of Medical Waste

Great efforts should be made to develop standards and methods for evaluating the effectiveness of cross-regional medical waste supervision measures, and establish a mechanism for evaluating the effectiveness of cross-region medical waste supervision measures. The disposal and management capacities of enterprises that centrally dispose of medical waste should be evaluated, if they fail to meet the requirements of the corresponding standards and the proper rectification results are not achieved, the entrusted disposal contract should be terminated and a new disposal company should be introduced. The cost assessment of the medical waste disposal industry should be carried out, and the current disposal cost levels under different disposal technology routes should be fully considered to speed up the rationalization of medical waste disposal charges across the country. The management authority and responsibilities of the relevant regions and departments, the examination and evaluation criteria for joint prevention, control and disposal responsibilities, as well as the relevant system regulations for accountability, rewards, and punishment should be clearly defined. It is necessary to strengthen the effectiveness examination and evaluation, strictly claim responsibility and accountability, and take forced actions on joint prevention, control and disposal.

4. Conclusion

The Central Committee of the CPC and the State Council have attached great importance to the disposal of medical waste and quickly issued a range of important policies since the outbreak of COVID-19. In particular, General Secretary Xi Jinping put forward in that “completing the working mechanism of integrated prevention and treatment, joint prevention and control, and mass prevention and control” [12] should act as specific measures to improve the national public health emergency management system, which further clarified the status of the joint prevention, control and disposal mechanism of medical waste in the national governance capacity construction work, and provided a new starting point and opportunity for China to accelerate the establishment and implementation of the regional joint prevention, control and disposal mechanism of medical waste at this stage. In this paper, the suggestions on establishing the regional joint prevention, control and disposal mechanism of medical waste were put forward from perspectives of establishment of coordinating agencies, cross-regional collaborative disposal, cross-regional joint response to emergencies, cross-regional collaborative management and effectiveness evaluation based on the ideas of China's existing regional joint prevention and control mechanism for air and water pollution, providing a reference for improving the prevention and control capacity against medical waste disposal risks and improving China's medical waste emergency management system.

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