

Public Outbreak Prevention and Control under the Pattern of World-class Port Group in Yangtze River Delta

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Abstract

In late 2019 and early 2020, the outbreak of COVID-19, this disaster has caused a huge losses of human life and property. While remembering the dead, we must learn the lessons of it to reduce the damage caused by the next similar disaster. This paper combines the outbreak of COVID-19 with the development of China's Yangtze River Delta, discusses the existing problems in the health prevention and control system of the Yangtze River Delta, and gives relevant solutions to these problems.

Keywords

Integration, COVID-19, Public health system, Public health prevention and control.

1. Development status of Yangtze River Delta integration and operation of existing epidemic prevention and control mechanism

1.1 The current situation of Yangtze River Delta integration

"Integration" refers to integrate the originally independent individual units into the same system environment to form a unified organic whole and play a greater role by using of some methods and means. The concept of "integration" exists in all aspects of society, such as integrated economy, integrated production, transportation and marketing, integrated management system and so on. Since the Yangtze River Delta port integration process not advancing, the Yangtze River Delta port group should also have some operational mechanism on integrated prevention and control in response to public emergency crisis.

With the deepening of port and waterway integration construction in the Yangtze River Delta, a lot of remarkable achievements have been made in various aspects.

For example, in terms of infrastructure capacity building, according to the statistics of the office of Shanghai Composite Port Management Committee: in 2018, the ports in the Yangtze River Delta completed cargo throughput in total 46.22 Billion tons, an increase over the previous year 2.4%. The proportion of cargo throughput of ports above designated size in the total cargo throughput of China is 34.62%, complete container throughput 9025,64 Mio TEU, up from last year 5.56%, accounting for the proportion of total container throughput in whole country as 35.97% (the above data include coastal and inland ports in Shanghai, Jiangsu and Zhejiang, excluding Anhui). As we all know, among all the ports in the world, the container throughput of Shanghai port in the Yangtze River Delta is the first and its cargo throughput is the second; the cargo throughput of Ningbo Zhoushan port in the Yangtze River delta is the first and its container throughput is the fourth in the world; while there are 800 million tons of ports in Jiangsu Province in the Yangtze River Delta, with cargo throughput and berths above 10000 tons. There are 300 million tons of ports along the river in Anhui Province, which also plays an important role in the Yangtze River Delta ports.

In terms of comprehensive service capacity, three provinces and one city in the Yangtze River Delta have made achievements in improving the comprehensive service capacity of ports and shipping. Among them, with the theme of "special action to improve shipping service level", Shanghai has carried out a series of work centered on key enterprises, institutions and shipping service function

aggregation areas of port and waterway, focusing on improving the comprehensive service capacity and level of hub port, building and realizing demonstration projects such as shipping service modernization and gathering platform of shipping service elements, so as to help Shanghai consolidate its role as China With the largest number of container routes, the most intensive flights and the widest coverage of international hub ports in the mainland, a number of international ports in Shanghai have also improved and enhanced their modern shipping service functions with the help of some national shipping functional organizations gathered in Shanghai, such as Waigaoqiao, Yangshan Lingang, beiwaitan, Lujiazui Yangjing, Wusongkou and other integrated air lines .Transportation service aggregation area. Jiangsu Province relies on the "construction of Nanjing regional shipping logistics center" to promote the construction of its port and shipping public service system. At present, Jiangsu Province has made remarkable achievements in information technology, and has realized the integration of port, waterway, transportation and other decentralized information data. Therefore, the information data integration of three provinces and one city in the Yangtze River Delta region is caused by the disunity of information data collection plat form. This is also a forward-looking experiment for the integration of information and data in the Yangtze River Delta region, and then the establishment of the Yangtze River Delta port and transportation management integrated service platform to provide more complete and convenient information support and services for many port and shipping enterprises. Based on the construction of Zhoushan river sea intermodal service center, Zhejiang Province is committed to improving the safety supervision system of river sea direct ships, establishing a crew of river sea intermodal ships and vigorously improving the river sea direct transportation service. And Zhejiang is also combining itself with the characteristics of shipping finance, Internet plus integrated shipping services, striving to build first-class international maritime service base, providing full range of logistics services for bulk commodities. Recently, Anhui Province has been regarded as a river sea intermodal hub in the middle and lower reaches of the Yangtze River, and has been added to the integrated construction system of the Yangtze River Delta to support the container transportation of inland branch rivers.

In terms of optimizing the business environment, the three provinces and cities all take the construction of a "single window" as the fulcrum, strive to speed up the service efficiency of port and waterway related businesses, optimize import and export port clearance process of the international ship, and reduce business processing time and costs. At present, Shanghai has realized the electronic inspection of international entry and exit ports, Zhejiang Province is also actively promoting the "single window" of the National Standard Version, and Anhui Province has continuously expanded the service function of the electronic platform in recent years.

In terms of green port and shipping, the Yangtze River Delta has formulated a detailed work plan, such as: actively promoting the adjustment of the transportation structure of collection and distribution ports, aiming to improve the construction of water transport transit infrastructure through the development of river sea direct and multimodal transport of bulk cargo; urging the Yangtze River Delta region to accelerate the implementation of the port shore power layout plan, and promoting the use of shore power by ships, one is to reduce the cost with the continuous policy of the central financial incentive fund, the other is to urge the construction and improvement of the quay ship shore power facilities; promote the new energy and clean energy port machinery and port vehicles and so on.

In terms of innovation and guidance, in order to meet the requirements of the Yangtze River green port and shipping development, adjustment of shipping structure mode and improvement of comprehensive information service efficiency, three provinces and one city have all started to tackle relevant technical problems: Shanghai has successfully developed 124teu ship type by relevant enterprises, which is a river sea direct container ship type, which meets the navigation regulations of Suzhou Yangshan direct ship. The key point of requirement is that it can reach the river and the sea, which solves the contradiction between the difficulty of entering the river and the difficulty of going to sea in Shanghai. It can be said that its application breaks the bottleneck of river sea intermodal transport and greatly improves the shipping capacity of the Yangtze River trunk line. At the same

time, Zhejiang Province also hopes to build its own river sea intermodal container fleet with the help of the of three main types of 10000 ton bulk carrier (I-type, II-type) and 738teu container ship from Zhoushan port to Wuhan port in Ningbo, aiming to establish a high-efficiency, safe, convenient, green and low-carbon Yangtze River Golden trunk line. In addition, with the help of its own software construction advantages, Jiangsu province takes information as the starting point, strengthens the integration of logistics supply chain, strengthens the rapid transformation from pure terminal operators to modern logistics service providers, and strengthens the communication and cooperation among various units of the Delta port and waterway, and information sharing [1].

In a word, the integration of the Yangtze River Delta is a long-term strategic goal. The existing Yangtze River Delta is still on the way of integration and has not reached the end point. Therefore, relevant government departments are making continuous efforts in comprehensive service, modernization and other aspects to strive for a higher level of integration of the Yangtze River Delta.

1.2 Operation of the existing epidemic prevention and control mechanism in the Yangtze River Delta

At the end of December 2019, China began to enter the first level emergency response. Various epidemic prevention and control policies came into effect immediately. The suddenly break out COVID-19 is a test for the Chinese government and a test for the integration of the Yangtze River Delta. Therefore, less than a month after Anhui Province was incorporated into the Yangtze River Delta integration region, the war began. In such a short preparation time, whether the three provinces and one city can quickly integrate, work together, and cross the difficulties has indeed aroused the concern of many people at home and abroad.

For a long time, the Yangtze River Delta has been one of the most active, open and innovative economic development regions in China, accounting for about 1 / 4 of the total economy of the country. Therefore, to prevent and control the epidemic situation in this area and stabilize the economy of the Yangtze River Delta is a major issue related to the Yangtze River Delta and the whole country.

Since the outbreak of the epidemic, three provinces and one city in the Yangtze River Delta region have jointly carried out a series of work on epidemic prevention and control, striving to make the most of the advantages of the Yangtze River Delta integration and overcome the difficulties altogether. In February 7, 2020, COVID-19 joint prevention video conference was held in three provinces and one city. After deliberation, five working mechanisms were formed at the meeting: 1) epidemic prevention and control information interconnection mechanism 2) major epidemic control measures mutual notification mechanism 3) important epidemic prevention materials mutual aid mechanism 4) epidemic prevention and control traffic integration linkage mechanism 5) COVID-19 treatment mechanism. On the 27th of the same month, three provinces and one city held another video conference to update the epidemic prevention and control measures according to the latest epidemic situation. The conference emphasized the idea of "one game of chess", continued to deepen the integration and cooperation mechanism, and established five new working mechanisms according to the current epidemic situation: 1) common mechanism for mutual recognition of health codes in the Yangtze River Delta 2) collaborative interaction of industrial chain resumption and production. Assistance mechanism 3) coordination and cooperation mechanism for enterprises to return to work and city employment 4) coordination and consultation mechanism for cross regional transportation and other infrastructure to accelerate the implementation 5) coordination and notification mechanism for regional economic policies in the special period of epidemic prevention and control [2]. It can be seen from this that at this stage, the governments of the Yangtze River Delta have been able to make use of the existing information, resources and other integrated advantages of the Yangtze River Delta, so that each region can understand the epidemic information of itself and other regions more accurately, communicate with each other more timely, grasp the overall situation more reasonably, so that the Yangtze River Delta epidemic prevention and control work can be more flexible to take different measures for different stages. We are doing what we mean.

In addition, Wujiang Taoyuan and Tongxiang Wuzhen, located at the junction of Jiangsu Province and Zhejiang Province, jointly implemented the "1 + 3 + n" epidemic joint prevention and control mode; paediatric experts in Shanghai, with the help of "Baiyulan Remote Consultation Platform", conducted remote consultation for 4-year-old children with fever in Jiashan, Zhejiang Province; Qingpu, Jiaxing and Wujiang, Jinshan and Pinghu, etc., all formed joint prevention and control mechanism; Songjiang, Shanghai, Huzhou, Zhejiang Province. The coordinated supply of non-woven fabrics, nose strips and other key epidemic prevention materials between Jinhua, Zhejiang Province; the realization of the main intersections in the Yangtze River Delta ecological green integration development demonstration area "Station merger, one station and two inspections", eliminate the "last kilometer"; Zhejiang port and shipping, in cooperation with the Yangtze River Delta region, establish the operation mechanism of the white list of inland transport ships[3], as well as all kinds of reflect that the integrated development of the Yangtze River Delta can make the joint epidemic prevention and control work of three provinces and one city more efficient and accurate.

Three provinces and one city have implemented the Yangtze River Delta integration into all aspects of the epidemic prevention and control work, and with the help of the Yangtze River Delta resources sharing, promote the sharing of resources such as medical treatment, traffic control, social prevention and control, material security, information publicity, and other resources, and carry out in-depth cooperation and exchanges, effectively improving the accuracy of epidemic prevention and control.

2. Challenges faced by Yangtze River Delta port group in response to the outbreak under the integrated mechanism

2.1 Case study on prevention and control of public health events

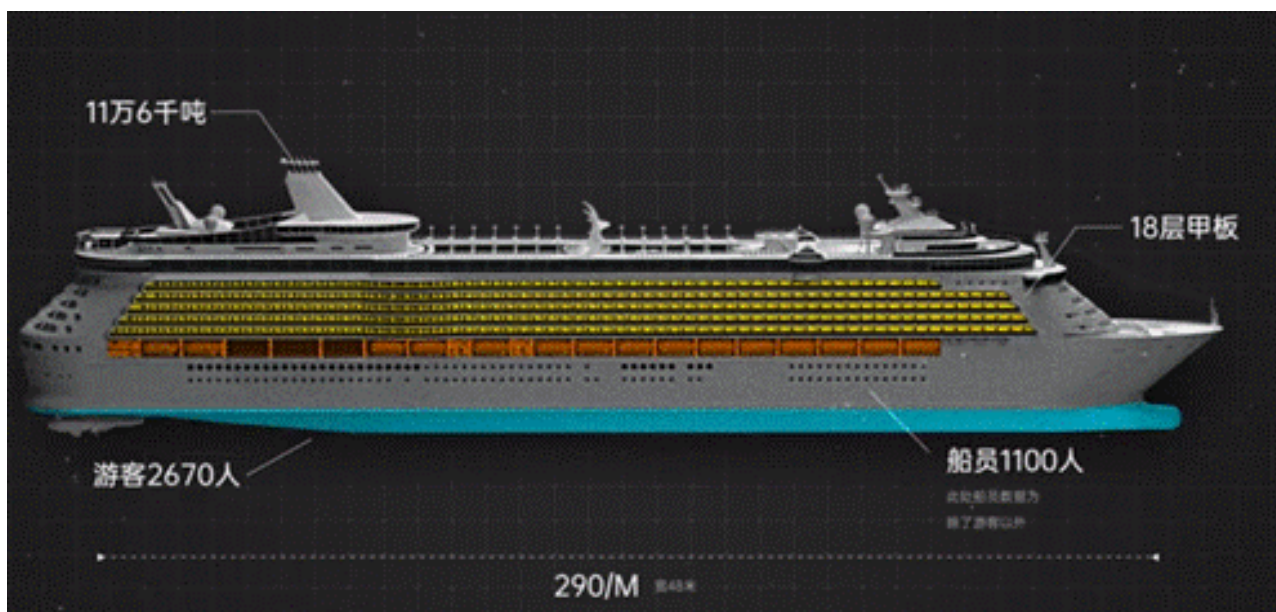


Fig.1

With the spread of the new coronavirus, some ships have also been infected. The most popular concern is the "Diamond Princess" (see Fig.1), whose operating company "Carnival Japan" is located in Japan, the flag state is Britain. The ship set out from Yokohama on January 20, 2020, passing through Kagoshima and Hong Kong, China (and on February 1, 2020, Hong Kong disembarking tourists were confirmed to be infected with the virus, the ship continued to sail without any epidemic prevention and control measures, and all the restaurants, entertainment places on the ship also continued to operate). After that, it passed via Vietnam, Taiwan, and Okinawa and stopped at Yokohama port in the evening of February 3. On the cruise ship, there are many collective activities and shared facilities between crew members and passengers. Until February 3, 2020, Japanese quarantine officers and other personnel did not go on board for inspection, and launched the "boarding

Quarantine". It was after February 5, 2020 that the epidemic prevention and control measures such as passenger cabin return isolation were completely taken(see [Fig.2](#)).

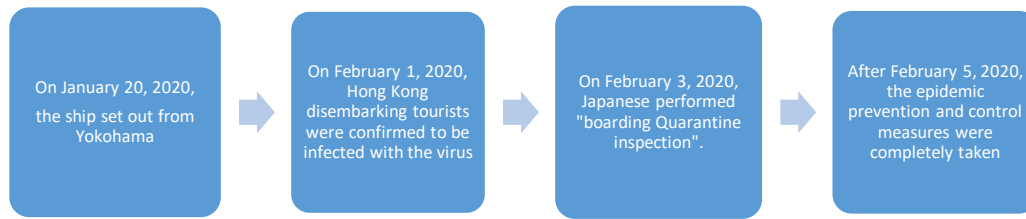


Fig.2

According to statistics, the cruise ship carries 2670 passengers and 1100 crew members. In terms of age, more than eight passengers on the ship become the elderly, while the age of the infected persons on the ship is just concentrated in the elderly over 50 years old, accounting for more than 86% of the total number of infected persons, among which the most infected persons are in their 70s, followed by the infected persons in their 60s. At present (as of the afternoon of February 19, 2020), a number of severe patients have been diagnosed, some of them are undergoing intensive treatment. COVID-19 is currently diagnosed in 25 countries from the nationality of the infected diamond. Among the 247 countries, the largest number is the Japanese, followed by the United States, with 77 people (see [Table 1](#) and [Table 2](#)). In addition, there are infected people from Canada, the Philippines, Australia and other countries and regions. Novel coronavirus COVID-19 was infected by 705 people in March 1, 2020 when 37711 of the crew were off the boat. The internal epidemic of the Diamond Princess Cruise was so serious that it was affected by many factors, and also exposed many deficiencies in the current ship epidemic prevention and port epidemic prevention.

Table 1 Distribution of nationality of 705 patients with COVID-19 confirmed

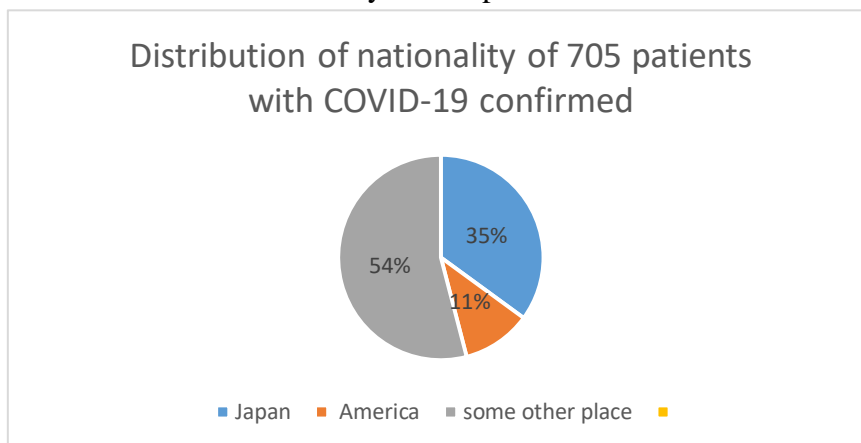
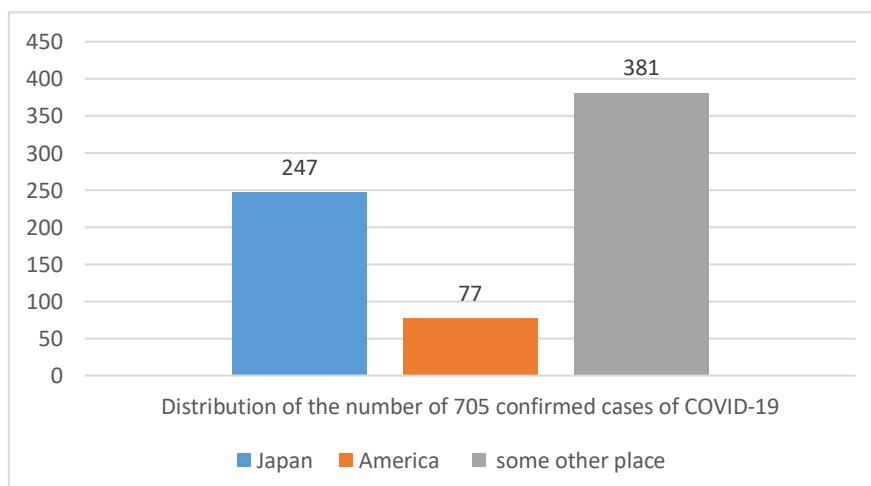


Table 2 Distribution of the number of 705 confirmed cases of COVID-19



At present, the international law uses the principle of "flag State" that ships on the high seas should be managed by their own countries; the United Nations Convention on the law of the sea stipulates that ships on the high seas are applicable to the "exclusive jurisdiction" of the flag state, so the flag state has the obligation to effectively exercise its jurisdiction and effectively supervise its administrative, technical and social matters, and the jurisdiction is only limited to criminal jurisdiction influenced by the result of criminal and civil jurisdiction related to debts and liabilities incurred during navigation in the territorial sea, and other countries are allowed to ban administrative authority only when there are piracy, slave trade, illegal broadcasting, statelessness and forgery of nationality, but the point is that these special circumstances do not include or involve epidemic. Situation of situation management and control.

The outbreak time of COVID-19 on the diamond pearl cruise ship was considered to have spread during the voyage, when it was sailing on the high seas. If the flag state is Britain, according to the provisions of international law, it should follow the principle that laws and administrative powers can not be applied. Therefore, Japan has no obligation and responsibility to control the epidemic situation of diamond pearl on the high seas. Britain, the country to which the obligation belongs, is thousands of miles away from the ship, and the number of passengers in the country is small, so it is difficult to manage the ship. In case of emergency, countries with close geographical distance do not have jurisdiction, and countries with jurisdiction are limited by distance and other factors, which makes the spread of ship epidemic opportunities.

In terms of port acceptance, a ship with an outbreak of disease is like a fire bomb that explodes at any time. Everyone avoid it and talk about how to accept it. Therefore, whoever has this hot potato will naturally hesitate. Since the diamond pearl incident, the Dutch cruise ship "Westin", which is operated by the United States Dutch American cruise company and travels around Asia, has also been refused entry. Since its departure from Taiwan on February 5, 2020, the vessel has caught up with the outbreak of the epidemic and has been unable to find a port to accommodate the landing. As a result, it wandered on the sea for a week until it was accepted by Cambodia. This time, the reason why Japan allowed the "diamond pearl" to dock is not an obligation under international law, but a judgment made by the fact that half of the personnel are Japanese.

In fact, many ships, like the diamond princess, have different countries of registry, operating companies and the countries near the coast at the time of the incident. Generally speaking, no country will be actively responsible for the ships of other countries whose nationals hardly ride or are geographically far away. What can be done is to provide humanitarian assistance. Although the United Nations Convention on the law of the sea requires flag States to be responsible for the ships under their jurisdiction, there are some difficulties due to geographical factors. This kind of "expedient nationality ship" has long been a stubborn disease.

2.2 Challenges facing the government

The outbreak of COVID-19 is very acute and infectious. Moreover, it is difficult and complicated to prevent and control epidemic diseases because of the unknown source and the uncertain transmission mode. This also makes the challenges faced by the government be revealed.

1. The public health protection and management awareness of the government and the masses is weak. The Yangtze River Delta is an important economic development area in China, so most of the local government staff are growing up under the traditional economic competition mode. In order to develop the city, now the provinces and cities have turned from the investment war to the population war. They have put in a variety of population introduction policies to attract foreign population to settle down and make the urban population more intensive, which brings about the epidemic prevention and control work a great challenge. And because the public health protection awareness of the masses and the government is weak, they do not realize the importance of public health care and health services at all, let alone a series of related hardware medical resources such as public medical facilities and medical resources, which also greatly increases the risk of epidemic infection.

In addition, the increase of migration and settlement population caused by population introduction policy also makes the migration population in traditional Chinese holidays even larger (the outbreak happened during the migration period of Spring Festival), which also promotes the transmission of new coronavirus. COVID-19 outbreak be taken by surprise, which undoubtedly exposed the short board in the traditional economic competition mode: if the investment and capital construction was done, the government officials were experienced and spoke with great interest, but the outbreak of the epidemic obviously brought a "surprise attack" to the government, which was a bit unprepared and impossible to guard against [4].

In this era of rapid development, the government and people are busy developing and seldom pay much attention to safety. Until the outbreak of the epidemic, we remembered the phrase "the body is the capital of revolution", but it is because of this epidemic that our government and people can see that their short boards are flashing red lights. This should also be considered by the three provinces and one city governments in the Yangtze River Delta. How to strengthen the public health protection and governance awareness of the masses and strive to achieve integrated development in the field of public health as soon as possible.

2. The current disease control system has not kept up with the needs of the times. Currently, COVID-19 has become a hot topic in public discussion. This also puts the old problem of the disease control system in the dark corner which is not regarded by the public and the government as the desktop. It also points out the problem of weakening the disease control department in the wave of reform of the career editing system [5].

Chinese current disease control system has been gradually established after the SARS period. It is divided into four levels from top to bottom: national, provincial, municipal and county. This disease control network system has lasted for nearly 17 years, but China has developed rapidly in these ten years, which has resulted in serious disconnection between disease control system and social needs. The existing control system can no longer keep up with the present. The needs of the people of the times, when the outbreak, it is particularly passive. In this epidemic prevention and control campaign, countless white clad soldiers bravely rushed to the front line. While reaping great results, they also killed 3123 people, and the number of them is likely to continue to rise. This is undoubtedly the painful lesson of the disengaging of the disease control system, so it has been proved that the time has come for the disease control system to have to be reformed.

3. In the decision-making of prevention and control, we must not make decisions that damage the long-term interests for the immediate interests. The development of regional integration in the Yangtze River Delta is a long-term strategic goal, so when the outbreak, it is inevitable to encounter the conflict between long-term interests and short-term interests. In order to prevent the further deterioration of the epidemic situation, the state has to implement strict accountability system, epidemic prevention and control responsibility system and overall responsibility system. The emergence of local cadres who are responsible for the confirmed cases in each district has led to the "one size fits all" policy. In order to effectively prevent the spread of new coronavirus and protect the local uninfected people in a short period of time, and make all areas completely closed, and people, information, materials and other non circulation, not only bring serious impact on the lives of some residents, but also bring inconvenience to the prevention and control of new coronavirus and the subsequent timely recovery of social and economic activities, which is to damage the short-term interests Long term benefits. Of course, this step was a step that had to be taken under the circumstances at that time. However, when the epidemic situation is under control, we should calm down and reflect on it. Next time there are such bad policy implementation conditions, how to improve this step so that the government policy is both effective and not rigid. If the consciousness of sharing and sharing is absent for a while and the self-protection is isolated blindly, not only the advantages of information and resource integration can not be fully utilized, but also the efficiency of integrated regional epidemic prevention can be reduced. In a word, the purpose of the prevention

and control system is to manage by region, not by region, not to enter into the decision-making mistakes.

4. At the same time, some cities are in epidemic prevention and control, and some cities are returning to work. The integration of the Yangtze River Delta has already become a national strategy. With the deepening of integration, the scope is also expanding. However, when it comes to the late stage of the epidemic and the stage of return to work, the promotion of policies in various regions is still a little uneven, let alone other regions. However, at present, "Health Code" is a positive and effective experiment, so that people everywhere can register and collect information independently. They can not only effectively manage the population, but also urge different regions to synchronously promote the epidemic prevention and control policy [6].

2.3 Port challenges

1. The integration of port and navigation information in the Yangtze River delta needs to be strengthened. Chinese measures against COVID-19 are the provinces and municipalities, and all regions are strictly closed. However, not all residential areas have special purchasing personnel. Therefore, this strict management has also cut off the living security of small number of area. Part of the small islands around Zhoushan City, Zhejiang Province, rely on two water routes to maintain the sufficiency of people livelihood materials and production materials necessary for key enterprises. Although Zhejiang port and waterway administration put forward the application for resumption of navigation in Shanghai as soon as the local epidemic situation improved, it still caused problems to the residents and enterprises on the island. If the Yangtze River Delta integration is carried out more deeply, this problem will be solved.

2. In terms of management, it is difficult to close the loop of prevention and control of epidemic situation at ports due to the large liquidity of ships. Due to the large liquidity of ships, scattered distribution of wharves and many ports involved, it is difficult for epidemic prevention and control to conduct centralized detection, health quarantine and isolation observation for the visiting crew of ships in all key epidemic areas and the staff (maritime affairs, pilotage, border defense, quarantine, etc.) who have to contact due to port business. Therefore, it is much more difficult for the port to form a management closed loop in the management of the imported epidemic prevention and control abroad than on land.

3. Port health prevention and control facilities need to be increased. On the one hand, the "diamond pearl" cruise ship carrying the epidemic is like a lighted bomb, which may cause a huge disaster at any time. In addition, the UK, which has jurisdiction over the ship in case of an outbreak of the epidemic, is not well managed due to geographical factors, which further worsens the epidemic on the ship. Until the Japanese port is accepted, the existing medical facilities near the port can no longer meet the demand, The waiting time for rescue on the passenger ship gave the virus a second fermentation time. On the other hand, both port operators and crew working places are relatively exposed, so the risk of front-line workers exposed to outdoor infection is further increased. If there is no effective health control measures, then port epidemic tackling will face a greater test.

4. The contradiction between the huge pressure on port production and the prevention and control of epidemic situation is prominent. Container throughput has been ten consecutive years. The Shanghai port has more obvious pressure. Container throughput in January and February is 3 million 610 thousand and 2 million 300 thousand TEUs, down from the same period. 10.6%, while Singapore port has 3.18 million and 2.9 million TEUs, up year on year 5.8%, in 2020, the year when Shanghai international shipping center was built. The pressure of business volume being overtaken is increasing sharply, so it is an urgent task for Shanghai port to return to work in an orderly manner to ensure the business volume is gradually restored. However, the intensity of epidemic prevention and control has a great impact on the progress of return to work, so the macro contradiction is objective.

2.4 Challenges for ships

1. At the same time of strengthening the effect of shore management, the attention of water side ship management is not enough. From the geographical location, the Yangtze River, the longest river in China, runs across China from west to East, and the main stream flows through 11 provincial administrative regions, including Qinghai, Tibet, Sichuan, Yunnan, Chongqing, Hubei, Hunan, Jiangxi, Anhui, Jiangsu and Jiangsu, which shows a wide range of radiation. The Yangtze River Delta is one of the most important and dense port clusters in China. It happens to be located in the golden place where the Yangtze River flows into the sea. If the epidemic situation is not strictly controlled, the virus will spread to nearly half of China land at an extremely terrible speed.

COVID-19 should be alert to all potential transmission methods. When the transmission mode is gradually determined, droplet transmission is an important way to spread COVID-19, so that the water can not only carry the ship, but also carry the virus, which becomes a transient hotbed of the virus. In addition, as Xu Guoyi, director of the office of Shanghai Composite port management committee, said, "the Yangtze River Delta region has a crisscross water network, densely distributed waterways, and its crew members live in ships and move around. Their health status has a significant impact on epidemic prevention and control." Although in order to do a good job of epidemic prevention and prevent the spread of the epidemic through the waterway, the port and shipping units in the Yangtze River Delta should take many measures simultaneously, including scientific supervision, external input prevention and internal diffusion prevention [7], but the focus of prevention and control is on the land side, and there are not many measures taken for the control of the epidemic on the water side, which may lead to the possibility of non direct contact and infection between ships, so in the prevention and control of the epidemic, especially. It is an epidemic spread by water media. While strengthening land side control, the importance of water side control should not be underestimated or ignored.

2. The ship auxiliary emergency facilities for epidemic infectious diseases are insufficient. First of all, no matter the crew, service personnel or passengers on the ship, most of them live in multi person living rooms such as two person room and four person room (see Fig.3 and Fig.4), while the balcony partition of the adjacent living room is short partition, without auxiliary facilities, these living rooms can be transformed into isolation rooms meeting the conditions of infectious disease isolation. Secondly, the ship ventilation and air exchange system adopts the mode of combining ventilation and return air. Due to the operation cost and safety and other reasons, the daily ventilation and air exchange of the ship is limited, far from meeting the air exchange requirements of infectious diseases. Therefore, the ship lacks the auxiliary facilities that can temporarily increase the ventilation and air exchange of the ship under special circumstances. Once there is an epidemic of infectious diseases on the ship. In case of an outbreak, ships are likely to further spread the outbreak due to the lack of auxiliary air exchange facilities.



Fig.3

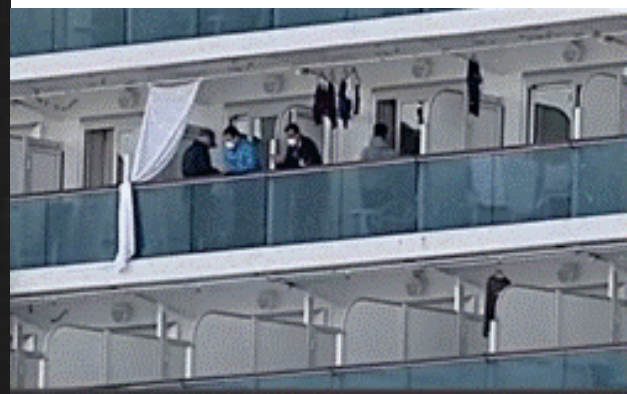


Fig.4



Fig.5

3. Distinguish clearly the service object and the epidemic prevention and control object. As we all know, the carrier of infectious diseases is human beings, and it is also spread among people. Because of the dense population, cruise ships are the most likely places to become epidemic areas. But in the outbreak of the luxury cruise ship, the crew and service personnel are just like the angels in white who are charging in the front line. They need to stick to their posts and frequently pass through every dangerous area of the ship to provide services for every passenger. Moreover, they usually focus on eating and sleeping activities (8), and their working environment is exposed (see [Fig.5](#)), which makes them the most easily COVID-19 is transmitted to passengers through dangerous infection. According to statistics, 81% of the confirmed cases of "diamond pearl" were found in the cabin of the crew and the previously confirmed cases. Therefore, in the work of ships, we should separate the work service object from the epidemic prevention object. In the case of epidemic situation, the passengers of ships are not the most dangerous people, and the infected cases, crew and other service personnel are the focus of attention.

3. Solutions to the integrated prevention and control of public emergencies in Yangtze River Delta Port Group

The integrated prevention and control management system is the integration of the organization system, operation mechanism, system and daily management system related to the prevention and control work, and is the basis for ensuring the integrated prevention and control response and the smooth development of daily prevention and control management work. Among them, a perfect organizational system is the basic organizational guarantee for effective response to public health emergencies, as well as an important guarantee for scientific command, coordination and management of prevention and control; the operation mechanism involves various responsibilities and corresponding norms in the whole process of prevention and control management, which is the basic basis for prevention and control. Only by establishing a prevention and control system with unified command, complete functions, efficient operation and strong guarantee, can we ensure that in case of public health emergencies, through the rapid response of each component of the prevention and control system, we can accurately start the corresponding prevention and control plans, so that the emergency materials to be prevented and controlled can play the most effective role, and effectively prevent and reduce the loss and impact of public emergencies. At present, we must focus on building a comprehensive prevention and control management system, accelerate the formation of a sound prevention and control organization system and scientific operation mechanism, and provide basic conditions for the construction of the Yangtze River Delta integrated prevention and control.

3.1 Establish public health prevention and control system

2019The outbreak of COVID-19 in December of 2008 is a major test of the public health governance system and governance capacity of the whole country. It is also a general test of the effectiveness of

public health risk prevention and control in the Yangtze River Delta region under the crisis. In the face of major public health emergencies, we should study and strengthen the prevention and control of the epidemic, establish and improve the supervision system and mechanism of public health prevention and control, and improve the ability and level of response to major emergencies as soon as possible.

The public health prevention and control supervision system based on the integrated prevention and control of the Yangtze River Delta is under the direct leadership and participation of the senior political leaders of the Yangtze River Delta, through the role of relevant policies, under the support of various resource support systems, through the integrated organization and social cooperation in the whole process of prevention and control management, to effectively prevent response, resolve and eliminate various crises, so as to protect public interests Benefit the safety of people property and realize the normal operation and sustainable development of society. The supervision system of public health prevention and control in the Yangtze River Delta should have institutions, mechanisms, systems and guarantees.

1.Organization

The three provinces and one city in the Yangtze River Delta region should establish a permanent public health supervision, control and management institution, and form a crisis prevention and control response network with the public health supervision, control and management institutions of other provinces and cities. The organization usually summarizes the experience and lessons of prevention and control of public emergency, develops prevention and control emergency management plans and various measures to prevent the occurrence of crisis. Once a public emergency occurs, the organization immediately becomes a unified command center to respond to the crisis, is responsible for commanding and coordinating various prevention and control emergency management organizations, and forms an efficient prevention and control rescue team.

2.There is a mechanism

First, education mechanism, strengthening prevention and control emergency management education, using various media and publicity means to cultivate the public awareness of crisis prevention, so that the masses can learn self-help and mutual help in the state of crisis, and how to cooperate with social assistance. The second is the cooperation and coordination mechanism. There should be no disconnection and blind area between the government and the government in the Yangtze River Delta. In the aspect of public crisis prevention and control and emergency management, the Yangtze River Delta should share resources as a whole, establish the cooperation mechanism between the government and the society in response to the crisis, and establish the prevention and control and emergency cooperation mechanism in the Yangtze River Delta.

3.There is a system

The Yangtze River Delta public health prevention and control supervision system should focus on investment and centralized management, avoid repeated construction, improve the level of technical maintenance and management, save resources, so that the discrete database and information resources can be linked and shared with each other. The establishment of the Yangtze River Delta public health prevention and control supervision system will greatly improve the comprehensive ability of the Yangtze River Delta integration in public services.

4.Guaranteed

First, there is a guarantee in policy, and the prevention and control management is included in the development strategy of the Yangtze River Delta integrated construction and development. On this basis, the prevention and control management strategy of the Yangtze River Delta is formulated. Second, there is material guarantee. In case of public crisis, we must make full material preparation, including technical preparation and prevention and control management material preparation. Prevention and control management materials are divided into two categories, one is the general materials needed for all kinds of crisis prevention and control, the other is the special emergency

materials for a certain crisis. Third, infrastructure protection, the Yangtze River Delta region to carry out crisis prevention and control infrastructure construction, because the backward infrastructure is often an important factor in the emergence and expansion of the crisis.

3.2 Establishment of the Yangtze River Delta port group epidemic prevention and control management organization

COVID-19 outbreak in China is a case of 2019 public health emergencies. The epidemic prevention and control management of the port group is not only the response after the outbreak, but also needs to be constructed from a systematic perspective to manage the epidemic prevention and control institutions.

The management process of the epidemic prevention and control management organization includes the whole process before, during and after the outbreak. By looking for the causes, essence and forms of the outbreak, and analyzing the consequences of them, we can reduce the risk and implement preventive measures to better manage the epidemic prevention and control. Effective epidemic prevention and

control management should include prevention, early warning, response, recovery and other links. Effective epidemic management needs to reduce the scope of the impact of the epidemic in order to quickly and effectively reduce the damage caused by public emergencies(see [Fig.6](#)).



Fig.6 operation diagram of Yangtze River Delta integrated prevention and control mechanism

3.3 Establish the mechanism of dealing with sudden epidemic situation

COVID-19 epidemic spread very rapidly, which has brought great challenges to the prevention and control work, and has also caused tremendous pressure on the economy and society. Although COVID-19 epidemic has been effectively controlled in China, the epidemic situation is still grim. The risk of imported cases is increasing. It is an important task to do well in epidemic prevention and control and ensure social life is running. In order to continuously deepen the integration and cooperation mechanism of the Yangtze River Delta and ensure the successful completion of the joint defense and control work, the following points should be achieved according to the current situation of the epidemic: 1) the general mechanism of mutual recognition of health codes in the Yangtze River Delta, the elimination of regional barriers, the avoidance of duplicate certification, and the

simplification of the process and complexity; 2) the collaborative and mutual aid mechanism of industrial chain resumption, timely economic recovery, and product assurance Smooth production and supply chain; 3) accelerate the implementation of cross regional transportation and other infrastructure collaborative consultation mechanism, provide basic guarantee for personnel flow and rescue material transportation, and improve the quality of prevention and control; 4) coordinate and report the regional economic policies in the special period of epidemic prevention and control, improve the use effect of information, and achieve a clear and accurate control; 5) establish foreign epidemic prevention input Risk analysis mechanism, timely access to input patient information, provide the latest data for prevention and control work to make effective decisions.

In addition to the above-mentioned working mechanism, the command center of the permanent epidemic prevention and control management organization of the Yangtze River Delta port group should achieve unified command, division of labor and cooperation, and hierarchical and classified treatment during operation. To summarize COVID-19 epidemic prevention and control practice, the Yangtze River Delta port group integrated prevention and control mechanism mainly integrates policy integration, information integration and material support integration. The Yangtze River Delta can set an example in the integration of regional public resources, including the joint tackling of serious and difficult diseases and core drugs, the joint prevention of public health and the overall allocation of major public health resources, and the coordinated response to major emergencies. Only with concerted efforts, can we truly play the great advantage of integration in the war "epidemic".

1. Policy integration

As a whole, the Yangtze River Delta should strengthen the government's responsibility of prevention and control when fighting against the epidemic. On the one hand, it should give the government emergency administrative power to meet the government's efficiency required for effective response to emergencies; on the other hand, it should prevent the abuse of public power, avoid good intentions to do bad things and go to extremes.

Formulate action policies to support the integrated epidemic prevention and control development of the Yangtze River Delta, conduct unified command of the prevention and control actions of three provinces and one city, actively coordinate and communicate, strengthen cooperation within the Yangtze River Delta region, issue relevant policies on port, shipping, agriculture, economy and medical treatment, cooperate with the epidemic prevention and control, and win the battle of epidemic and economy. The unified policy is the action guide of the whole Yangtze River Delta, which provides the direction for the prevention and control of epidemic, and also provides the impetus for the economic and social development.

2. Information integration

Give full play to the precision of data prevention and control. In response to a major outbreak, only when there is a "number" in mind can we see what is not present, what is not known, and what is not sprouting, so as to avoid being caught off guard and beyond prevention. Relying on the construction of Yangtze River Delta port big data platform, constantly improve the operation mechanism of the information platform, and optimize the operation process of the information platform. Using people in and out of the Yangtze River Delta to locate mobile phones Traffic data, payment information and other means are used to trace the source of infection, carry out contact estimation and epidemic situation prediction, and form "epidemic situation map"; by integrating multi-dimensional data such as health care, medicine, civil affairs, development and reform, and industry and information technology of three provinces and one city, we can understand relevant medical equipment, epidemic prevention materials, enterprise production capacity, logistics information, and form "guarantee operation map" of emergency materials. By comparing the matching degree of the two maps, we can see the loopholes, hidden dangers and problems in epidemic prevention and control. It is of great significance to enhance the scientific level of emergency decision-making and command and meet the information service needs of the public to strengthen the collection and application of data and expand the ability of the Yangtze River Delta region to predict future risks.

Yangtze River Delta port is an important gateway for China's trade in and out of the country. A large number of foreign ships come to the port every day, which is the key area for epidemic prevention and control. In the face of epidemic prevention and control, ports in the Yangtze River Delta should promote information standardization, realize information interconnection and exchange, share and exchange information resources, gather port shipping data such as traffic and logistics in the Yangtze River economic belt and the Yangtze River Delta, encourage the exchange of information in various ways, and promote the scientific collection, effective use, in-depth development, orderly exchange and safety management of information, We will improve the efficiency, efficiency and service level of the coordination of prevention and control of port epidemics in the Yangtze River Delta. At the same time, we should work out perfect information standards for future development, including basic standards, interconnection and exchange standards, application service standards, standard upgrading standards, etc., to build the Yangtze River Delta port big data platform.

In view of the epidemic prevention and control information, it is necessary to collect the global infectious disease information data, obtain the infectious disease epidemic data at home and abroad in real time, and achieve a comprehensive grasp of the epidemic situation. According to the data collected in real time, we can analyze the risk of epidemic transmission, give early warning for China according to the level of risk, and provide basis for relevant departments to make decisions, strive for effective time for epidemic prevention and control, and strengthen the quality level of epidemic prevention and control.

3. Material support integration

The prevention and control materials for public health emergencies include living materials and medical aid materials. Relying on the integrated construction and information integrated service platform in the Yangtze River Delta, the departments in the region should communicate and coordinate with each other in response to the epidemic prevention and control, implement joint prevention and control, establish the interconnection and sharing of war "epidemic" materials, fully guarantee the supply of important materials, and implement the important prevention and control in the Yangtze River Delta Exchange mechanism of mutual aid and mutual protection of epidemic materials.

In terms of medical aid materials, the Yangtze River Delta region should support key enterprises in epidemic prevention and control to expand production, systematically solve problems such as raw material supply, upstream and downstream cooperation and smooth logistics, and increase the production of key medical control materials in short supply with quality and quantity guaranteed.

In terms of the supply of living materials, we should strengthen the stable production and supply of agricultural products. We will support key agricultural livestock and poultry aquaculture feed, veterinary medicine, slaughtering, grain, oil and food processing and other enterprises to speed up the resumption of production, coordinate the internal transfer and external transportation of agricultural means of production in a timely manner, and make good arrangements for spring cultivation and agricultural production restoration.

In the aspect of transportation, we should make every effort to guarantee the logistics transportation. Since the beginning of the war on "epidemic", there have been material emergencies in many places in Hubei Province. The port and shipping departments of the Yangtze River Delta actively carry out multi department linkage and cooperation, improve the communication and coordination mechanism, and timely grasp the information of epidemic prevention materials, living materials and important production materials transportation needs. Meanwhile, according to the principle of "scientific and orderly, in accordance with laws and regulations", and in accordance with the requirements of "one break and three continuous", they actively respond, Simplify the examination and approval procedures, and ensure the smooth transportation of highway transportation network, postal express, necessary production and living materials, etc. Coordinate the corresponding provincial traffic, open a "green special channel" for water and land emergency supplies, and simplify the transit process to the maximum extent. In the aspect of water transportation, "zero waiting" shall be realized for the

transportation of key epidemic prevention materials on water. The transportation ships of key materials shall "give priority to entering and leaving the port, berthing and departing, loading and unloading, and inspection", so as to ensure the timely and rapid delivery of epidemic prevention medical aid materials and living materials.

4. Summary and suggestions

4.1 Conclusion

In today's world pattern, if China wants to further improve its international competitiveness, it must build its own world-class port group, stimulate economic vitality, and occupy a place in the Asia Pacific region and even in the world. The Yangtze River Delta is a trump card of China. As for China, the Yangtze River Delta is just like the New York New Jersey Port Group to the United States and the Tokyo Bay Port Group to Japan. These world-class port groups can improve the competitiveness of their own country externally, stimulate the economic vitality of the surrounding areas and even the whole country internally, and promote the development of world-class city groups.

Since 1996, the development of Yangtze River Delta has gone through many years. From the initial stage of exploration and promotion to the mid-term stage of substantive coordinated development, to the later stage of transformation and upgrading, to the current stage of high-level and diversification, the Yangtze River Delta region has achieved great achievements with the completion of the development goals of each stage. However, there is only a starting point and no end point for development. At present, compared with the world-class port groups of developed countries, there are many deficiencies in the Yangtze River Delta port group. There is still a long way to go in the future. There are still many challenges in the development path, especially in the construction of public health services.

COVID-19 is a sudden public health crisis. It is a "double-edged sword" which not only brings great challenges to the public health defense system of the Yangtze River Delta and even China, but also tests the effectiveness of the existing operational defense mechanism, finds out the shortcomings and shortcomings, and makes short board to speed up the integrated development of the Yangtze River Delta. In the process of Yangtze River Delta integration, we should not only attach importance to economic development, but also strengthen the construction of public health services. Using the information platform, the integration development of Yangtze River Delta should build the cooperation mechanism of interconnection, establish the Yangtze River Delta port group public health prevention and control information data collection, information data processing, information data analysis, prevention and control risk early warning and processing system. In response to public emergencies, policies, organizations and material support should be implemented. The integration of policy, information and prevention and control should be integrated into the Yangtze River Delta integration construction, to ensure its escort, to stabilize economic and social development, to make overall planning and overall design.

4.2 Proposal

1. In the new stage, we should continue to strengthen the pace of integration of the Yangtze River Delta, give full play to the advantages of integration of the Yangtze River Delta, integrate resources, optimize allocation, information exchange, joint anti epidemic, real-time follow-up of epidemic information, targeted epidemic work.
2. To establish a complete public health prevention and control system, and to update it in time. It can be directly led and participated by senior political leaders of the Yangtze River Delta, with the support of various resources, so as to realize the synchronization of the epidemic prevention and control in the Yangtze River Delta. In addition, the outbreak of COVID-19 is a reflection of the importance of the renewal of the air defense system, so there should be a specialized organization and timely mechanism. Perfect system and sufficient resources to ensure the public health safety in the Yangtze River Delta.

3. To increase the public health facilities of ports and ships in the Yangtze River Delta, the working environment of the front-line operators is exposed, the contact personnel are complex, and even the population density of some areas is too large. Therefore, the public health facilities and medical emergency facilities, such as cruise ships, should be reasonably arranged according to the information such as the type of ports and ships, the population density and the site structure, etc. Ships of disease type may be equipped with public health facilities and emergency medical supplies.

4. To strengthen the quality education of front-line staff, such as crew members, can provide them with knowledge brochures of common infectious diseases for reference, and can also provide them with centralized training, etc., so as to improve the awareness of public health and safety of front-line staff, on the one hand, and on the other hand, improve their ability to deal with public health and safety accidents.

5. When it is necessary to make a decision on the epidemic situation, we should calmly think about the relationship between long-term and short-term interests, comprehensive factors and individual factors, and make a reasonable decision. We must not enter into the decision-making errors, and lose big for small.

6. Expand the use area and application scope of security codes such as "carry on code", which can not only help to alleviate the rigidity of epidemic prevention and control work, but also provide convenience for the later rework production. The rework speed is the speed of economic revival in the Yangtze River Delta.

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