

Study on the Collaboration Mechanism of Emergency Management in the Guangdong-Hong Kong-Macao Greater Bay Area during the COVID-19 Epidemic Outbreak

Qingman Li^{1,a,*}, Xiaoyu Lin^{1,b}, Zhaoxuan Li^{1,c}

¹Shenzhen University, Shenzhen 518000, China

^a2019031015@email.szu.edu.cn, ^b2019031248@email.szu.edu.cn, ^c2019031101@email.szu.edu.cn

*Corresponding author

Abstract: The outbreak of COVID-19 epidemic in late 2019 posed a serious threat to human health and social order. The Collaboration Mechanism for Emergency Management of Public Health Emergencies in Guangdong-Hong Kong-Macao Greater Bay Area was established in 2005. In the face of the outbreak, whether the effectiveness of the system has met the original expectations of the system designers and whether there is a need for further improvement needs to be judged in the context of the effectiveness of the outbreak response in the Greater Bay Area. Through tracking and observing a series of collaborative measures in the Greater Bay Area in response to the COVID-19 epidemic outbreak, it can be found that there is still a lack of collaborative thinking, a lack of collaborative institutions, an inadequate collaboration mechanism and a low level of mutual trust. In the future, the Greater Bay Area can further enhance the level and efficiency of collaboration in terms of establishing a clear division of labour for emergency linkage system, improving the mechanism for disclosure of government information and establishing an adequate mutual trust mechanism.

Keywords: Guangdong-Hong Kong-Macao Greater Bay Area; COVID-19; Public health emergency; Collaboration Mechanism of Emergency Management

1. Preface

In December 2019, the COVID-19 Epidemic Outbreak was extremely dangerous and widespread. With the movement of people, the outbreak is spreading across geographic boundaries and there is an urgent need for effective coordination between governmental emergency management mechanisms. The outbreak is not only a threat to human health, but also a “28-day quarantine circle” for people who work and live in the Guangdong-Hong Kong-Macao Greater Bay Area — for many people who work in Hong Kong and live in Shenzhen, it takes 14 days to enter Hong Kong from Shenzhen and another 14 days to return to Shenzhen from Hong Kong, turning a one-day commute into a long journey of 28 days. In February 2022, the epidemic situation in Hong Kong became critical, with patients having difficulty finding a bed, and there were cases of Hong Kong people being smuggled into the Pearl River Delta region of Guangdong, with the epidemic situation in Shenzhen in particular worsening. The frequent interactions and closely connected geographical locations within the Guangdong-Hong Kong-Macao Greater Bay Area make it highly necessary for the three regions to collaborate in emergencies. But uncoordinated and unrecognised policies on epidemic prevention and control will pose heavy obstacles to the prevention and control of the epidemic.

The Guangdong-Hong Kong-Macao Greater Bay Area is the first regional collaborative innovation system in China. The close interaction between Guangdong, Hong Kong and Macao and the uniqueness of “one country, two systems” in the Greater Bay Area have created an urgent need for an efficient the collaboration mechanism of emergency management in the Greater Bay Area. And the COVID-19 Epidemic Outbreak is a major test and an important review of the current mechanism in the Greater Bay Area.

Since 1 July 2017, General Secretary Xi Jinping attended the signing ceremony of the “Framework Agreement on Deepening Cooperation among Guangdong, Hong Kong and Macao to Promote the Construction of the Greater Bay Area”, the collaborative development of the Greater Bay Area has only

just begun to take shape, so there are very few studies dedicated to the emergency coordination mechanism of the Greater Bay Area. Of the few results, academic research has focused on two main areas. The first is regional emergency linkage. For example, Wang Wei-quan and Tao Dong proposed that linkage should be carried out for different stages of the epidemic life cycle from the structural and functional perspectives. Wu Xiaotao and Wu Liping used the Delphi method to identify the nine main influencing factors of regional emergency linkage for outbreaks and their correlation. The second is the collaboration mechanism for the prevention and control of infectious diseases. Xing Yiqiang proposed improving the information notification mechanism for infectious disease outbreaks and establishing communication and joint prevention mechanisms for entry-exit inspection and quarantine departments.

In contrast to the lagging academic research, the practical sector has started exploring the construction of an emergency collaboration mechanism at an earlier stage. The earliest document is the “Cooperation Agreement on Emergency Response Mechanism for Public Health Emergencies” signed by Guangdong, Hong Kong and Macao in 2005. So, in the face of this sudden public health outbreak, how did Guangdong, Hong Kong and Macao collaborate with each other? How effective is the collaboration and what are the problems? How can the Greater Bay Area solve the difficult problem of the “a long journey of 28 days”? Has the Collaboration Mechanism of Emergency Management, which started in 2005, achieved the desired results originally expected by the designers of the system? Is there still room for further improvement? A series of questions need to be followed, observed and examined.

2. Data examples and case studies: manifestations of the lack of emergency collaboration mechanisms

2.1. Data examples: taking the passage volume as the object of study

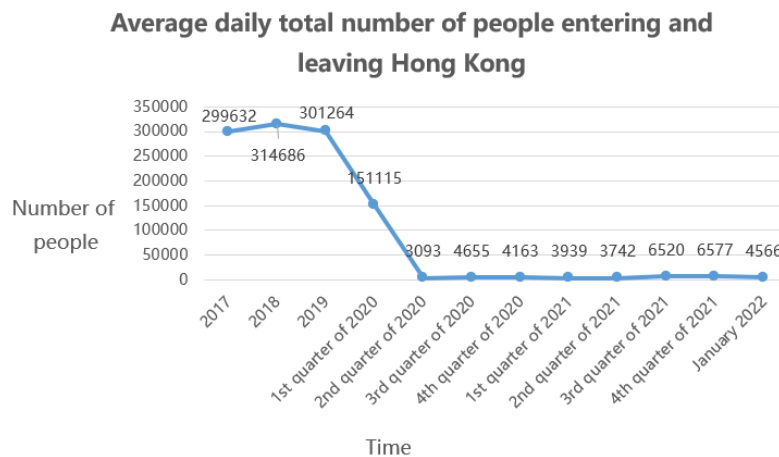


Figure 1: Average Total Daily Arrivals and Departures in Hong Kong

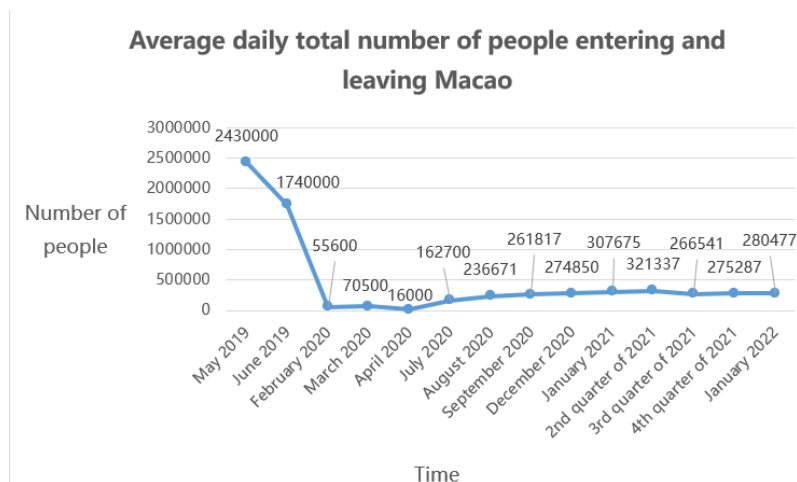


Figure 2: Average Total Daily Arrivals and Departures in Macao

From these graphs above, it can be seen that the flow of people through Hong Kong and Macao's border control points was relatively stable from 2017 to 2019, but dropped sharply in the first quarter of 2020, indicating the impact of the measures at both ports on the flow of people in the early stages of the epidemic. After the second quarter of 2020, the epidemic was under control and people were returning to work, but the tight control measures at the ports prevented the flow of people from returning to normal, and even by January 2022, the average daily total number of people crossing the border in each of Hong Kong and Macao could not reach the pre-epidemic level. This shows that the collaboration mechanism of emergency management in the Greater Bay Area has been lacking since the outbreak, and the movement of residents in the three regions has been severely disrupted, so the emergency cooperation mechanism needs to be improved. With the epidemic stabilised and the immediate need to resume work, why has the flow of people between Hong Kong and Macao remained low at the beginning of the epidemic? Was there a lack of collaboration and communication? To find the answer, the authors have found the following examples to study.

2.2. Case study - "McRefugees" in the context of the epidemic

The governments of Guangdong, Hong Kong and Macao imposed quarantine measures, turning the "one-hour living circle" into a "28-day quarantine circle", which had a serious impact on the large number of people who lived in Hong Kong and worked in Shenzhen. They were faced with unemployment, homelessness and had to rest at McDonald's, which is open 24 hours a day, at night, thus becoming "McRefugees".

The "one-hour living circle" has made "two city living" possible: many grassroots people in Hong Kong who are engaged in cleaning, construction, transportation, etc. cannot afford to pay rent in Hong Kong and choose to live in Shenzhen where the rent is lower; while the "28-day quarantine circle" has blocked the livelihood of these people: under the compulsory quarantine measures, these people have lost their jobs and cannot afford to pay high rent, so they have to live in low-cost rental housing in poor conditions, or even sleep on the streets and become "refugees", suffering unbearably.

What happened to the "McRefugees" is a sign of the seriousness of the problems with the functioning of the mechanism. The Collaboration Mechanism of Emergency Management in the Guangdong-Hong Kong-Macao Greater Bay Area was established to control the epidemic while minimizing the inconvenience caused by the control measures to the movement among the three regions. But in the face of the sudden outbreak of the epidemic, the mechanism appeared to be so ineffective that it failed to achieve the purpose for which it was established. This shows that there are problems with the mechanism itself and its operation that need to be addressed.

3. Basic introductions of the Collaboration Mechanism of Emergency Management in the Guangdong-Hong Kong-Macao Greater Bay Area

3.1. Development line: 2005-2019

The construction of the mechanism began with the signing of the "Cooperation Agreement" in 2005. On 14 July 2005, experts from Guangdong, Hong Kong and Macao held a meeting on the prevention and control of infectious diseases and reached consensus on the following matters: (i) improving the mechanism for exchange and notification of information on infectious diseases; (ii) promoting cooperation in scientific research on the prevention and control of infectious diseases; (iii) promoting training and mutual visits of infectious disease professionals; (iv) building a public health emergency response system and a system for the admission and treatment of infectious diseases; (v) strengthening the prevention and response to influenza pandemic; and (vi) exchange and cooperation in clinical diagnosis and treatment. Accordingly, Guangdong, Hong Kong and Macao have started to build the basic framework of a collaboration mechanism for public health emergencies.

Between 2006 and 2019, the mechanism has also been continuously developed through various means such as meetings, joint exercises and renewal of cooperation agreements under the close contact of the governments of the three regions. On 25 February 2019, representatives from the three regions of the Greater Bay Area jointly signed "Consensus on Hygiene and Health Cooperation in the Greater Bay Area of Guangdong, Hong Kong and Macao" at the Second Greater Bay Area Hygiene and Health Cooperation Conference.

Development line

- ▼ 2005
 - Three regions reached consensus on collaboration mechanism of emergency and signed Cooperation Agreement
 - Experts from the three regions held a meeting and reached six consensus
- ▼ 2006
 - Three regions held the first joint response exercise on prevention and control of major infectious diseases
- ▼ 2008
 - The third joint exercise was held to test the cooperation and collaboration mechanism among the three regions in the event of an avian influenza case
- ▼ 2009
 - Three regions signed a document to establish an expert group for the fight against Influenza A (H1N1)
- ▼ 2011
 - The three regions continued to implement their Cooperation Agreements and continued to build their emergency response systems
- ▼ 2013
 - The three regions strengthened cooperation in the prevention and control of Avian Influenza A and continued to implement the Cooperation Agreement
- ▼ 2018
 - Cooperation Agreements renewed in three regions
- ▼ 2019
 - Three regions held meetings and signed consensus on cooperation
 - Three regions conducted joint health emergency drills

Figure 3: Development Line Chart

3.2. Main content of the mechanism

Summarizing the above documents, the main content of the the Collaboration Mechanism of Emergency Management in the Guangdong-Hong Kong-Macao Greater Bay Area include:

(1) Information notification mechanism, meaning that in the event of a public health incident, Guangdong, Hong Kong and Macao should : work together to conduct surveillance and early warning and joint analysis; identify cases and communicate information in a timely manner across the territory; adopt new information technology to achieve a more real-time and comprehensive exchange of information.

(2) Activation of the response mechanism, which means that in the event of a public health emergency, the hygiene authorities of Guangdong, Hong Kong and Macao will immediately take a series of public health measures to ensure early detection, early quarantine and early treatment.

(3) Internal assistance mechanism: When a public health emergency occurs, Guangdong, Hong Kong and Macao will co-ordinate and support each other in terms of manpower, technology and materials.

(4) Assistance mechanism, which means that when the epidemic is under control in the Greater Bay Area, but the epidemic is serious in other regions of China or other countries and help is urgently needed, Guangdong, Hong Kong and Macao can negotiate and jointly send emergency rescue teams to meet the urgent needs of other regions. This will also help to improve the international image and enhance the international influence of the Greater Bay Area.

(5) Lessons learned and aftercare, which means that after the epidemic is over, Guangdong, Hong Kong and Macao will, on the one hand, analyse and summarize the problems that emerged during the collaboration and propose countermeasures to solve them; on the other hand, they will summarise the innovative measures that emerged during the epidemic and gain valuable practical experience, thereby

improving the mechanism. The three regions will also need to cooperate in the aftercare after the epidemic is over, such as the proper relocation of a large amount of medical equipment.

3.3. Basic features

Comparing the two documents in 2005 and 2019, it can be seen that although the 2019 "Consensus on Hygiene and Health Cooperation in the Greater Bay Area of Guangdong, Hong Kong and Macao" is not the same document as the 2005 "Co-operation Agreement on Emergency Response Mechanism for Public Health Emergencies", and the years of signing are long apart, the contents and guidelines are very similar in general terms. Both documents include six cooperation initiatives, which are related to: (i) improving the exchange and notification mechanism for infectious disease epidemics; (ii) promoting cooperation in scientific research on infectious disease prevention and control; (iii) promoting training and exchange visits of professionals in infectious diseases; (iv) building a public health emergency response system and a system for the admission and treatment of infectious diseases; (v) strengthening the prevention and response to influenza pandemics; and (vi) exchange and cooperation in clinical diagnosis and treatment. However, many of the six cooperation initiatives are very general and not detailed enough, and the mechanism lacks systematization, which to a certain extent weakens the enforceability of the two documents and may even prevent the mechanism from being fully operational.

First of all, the cooperation is not sufficiently detailed and specific, making implementation difficult. For example, the internal assistance mechanism stipulates that the three regions should send professional staff to deal with incidents, but it does not specify which agencies should send professional staff. Another example is that the document clearly states the need for "cooperation in on-site investigation and collaborative traceability, emergency response and risk control, response escalation and integrated response", but does not specify how the cooperation should be carried out and by which organizations.

Additionally, the collaboration mechanism is loose and lacks systematization, and it is unable to "move the whole body with one hair". The mechanism stipulates that "the three regions reached a consensus and signed a cooperation agreement", but it has not yet been presented in a standardised and institutionalised form. For example, in the existing documents, there is still a lack of a permanent emergency management coordination institution for decision-making, division of labour and unified command, making it difficult for the three regions to cooperate physically in the prevention and control of the epidemic.

Last but not least, the collaboration mechanism is still in a state of improvement. First, the current collaboration mechanism lacks an early warning and emergency response system and does not stipulate specific measures for early warning. Secondly, there is a lack of a "permanent body". The joint public health emergency response teams formed by the three regions are temporary and do not necessarily work together smoothly, and it is difficult to ensure that professionals are available in a timely manner when emergencies occur. Thirdly, the emergency response agencies do not maintain liaison with disease experts and are unable to ensure that relevant experts are available in a timely manner. Fourthly, there is a lack of an emergency response system: the only provision for emergency response is to "strengthen drug surveillance in all regions", but there is a lack of financial support, resources and occupational safety and security for first responders. Fifthly, there is a lack of cooperation with the third sector and a lack of attention to the role of citizens in crisis management.

In summary, by combing the development line and basic contents of the collaboration mechanism in the Greater Bay Area from 2005 to 2019, it can be found that the development of the mechanism has been relatively slow, the main contradiction between the need for efficient cooperation and the relatively backward development of the mechanism still exists, and the main problem of the lack of systemic and enforceable mechanism remains the same.

4. Operational Effectiveness: Collaboration Mechanism of Emergency in the Guangdong-Hong Kong-Macao Greater Bay Area during the Epidemic

After the outbreak of the COVID-19 epidemic, did the mechanism work smoothly and achieve the desired results? To this end, the authors have collected and collated public information on the collaborative measures implemented by the three regions during the epidemic, in order to get a glimpse of the operational effectiveness of Collaboration Mechanism of Emergency in the Guangdong-Hong Kong-Macao Greater Bay Area under the epidemic in a small way. (In the following diagrams, measures in the mechanism that are not actually operational are marked in dark grey, innovations in practice are

marked in yellow, and a “√” indicates that the area is functioning well.)

4.1. Information Notification Mechanism

	Ideal operating situation	Actual operating situation
Information Notification Mechanism	<ul style="list-style-type: none"> • The three governments searched for cases in each area and informed the outbreak or incident at the first time 	<ul style="list-style-type: none"> • Ideal results in practice
	<ul style="list-style-type: none"> • New technologies such as information platforms and risk communication technologies in the three regions are used for information exchange and joint monitoring and early warning and joint analysis. 	<ul style="list-style-type: none"> • A joint prevention and control mechanism was established in Zhuhai and Macao, and a information communication mechanism between the two places was set up for timely notification of the epidemic • A joint prevention and control working group was set up to organize video conferences on joint prevention and control of the epidemic and to share announcements

Figure 4: Information Notification Mechanism

In this epidemic, the governments of the three regions actively investigated cases and reported relevant information as soon as possible. It can be seen that the cooperation in “investigating cases and reporting information about the epidemic” has been implemented in this epidemic. However, the public health platforms of the three regions and the infectious disease trend information platform have not been used for information exchange in this outbreak. Only Zhuhai and Macao have temporarily established a joint prevention and control mechanism to study and establish an information communication mechanism.

4.2. Mechanism of Activating the Contingency

	Ideal operating situation	Actual operating situation
Mechanism of Activating the Contingency	<ul style="list-style-type: none"> • Follow-up actions • Treatment of confirmed patients • Medical surveillance for those suspected of having the disease 	<ul style="list-style-type: none"> • Ideal results in practice
	<ul style="list-style-type: none"> • restrict the movement of people between the three regions 	<ul style="list-style-type: none"> • Collaboration on port control, and the desired results are achieved in practice • Innovations such as the “Health Declaration and Notification Mechanism”, “Borrowed Quarantine” in Zhuhai and Macao, and “Exemption from Quarantine and Mutual Recognition of Quarantine Measures” in Shenzhen and Hong Kong have emerged

Figure 5: Mechanism of Activating the Contingency

In the specific operation of activating the response mechanism, Guangdong, Hong Kong and Macao have not only promptly launched four public health measures, including follow-up actions, treatment of confirmed patients, medical surveillance of suspected infected persons and restriction of movement of people between the three regions, but have also innovated on specific measures to “restrict the movement of people between the three regions”. Specifically: real-time notification and inspection: the three ports strictly control the epidemic prevention and control, real-time notification of the number of people entering and leaving, and conduct health checks. Early detection of cases and follow-up, Zhuhai and Macao reached a consensus on the cooperation of health declaration and notification mechanism, and the entry and exit passengers should declare health forms for customs clearance, so as to detect and follow

up cases as soon as possible. Borrowed quarantine: Zhuhai and Macao conducted “borrowed quarantine”: that is, if they want to enter Macao, they must undergo 14-day medical observation at a designated place in Zhuhai City. Exempt from quarantine: the exemption from quarantine between Shenzhen and Hong Kong means that after 14 days of medical observation in Shenzhen, there is no need to be quarantined again in Hong Kong, etc. This also means that Hong Kong, etc. recognizes Shenzhen's quarantine certificate, that is, mutual recognition of quarantine.

4.3. Internal Assistance Mechanism

Ideal operating situation	Actual operating situation
Human and technical: <ul style="list-style-type: none"> • Joint formation of emergency response teams for public health emergencies • Collaboration on cross-border referrals • Mutual dispatch of professional staff to handle incidents • Collaboration of the three regions in on-site investigation and coordinated source tracing, emergency response and risk control, response escalation and overall response • Exchange and collaboration among professionals of the three regions in medical technology • Strengthening coordination, collaboration and response of the joint handling and follow-up of drug safety emergencies in the three regions 	Human and technical: <ul style="list-style-type: none"> ✓ Collaboration on cross-border referrals between Zhuhai and Macao in designated public hospitals
Science and technology collaboration	✓ Science and technology collaboration: <ul style="list-style-type: none"> • Macau core made in Zhuhai • Research and development in Shenzhen and Hong Kong shared by Guangdong
Supplies: <ul style="list-style-type: none"> • Mutual support for epidemic prevention supplies in the three regions 	Supplies: <ul style="list-style-type: none"> Official: <ul style="list-style-type: none"> ✓ The three governments donated and deployed epidemic prevention equipment and supplies to each other Folk: <ul style="list-style-type: none"> • Donations from private individuals and organisations

Figure 6: Internal Assistance Mechanism

After the outbreak of the COVID-19 epidemic, Guangdong, Hong Kong and Macao have mainly adopted the above measures in the field of internal assistance mechanisms. In the above specific operations, it can be seen that the cooperation between the three regions is mainly reflected in scientific and technological cooperation and mutual assistance of medical materials, but the cooperation in manpower and overall response is still insufficient, which is embodied in: (1) No exchange of professionals to participate (2) Failure to jointly form an emergency response team for public health emergencies; (3) Failure to demonstrate the cooperation of the three regions in on-site investigation and coordinated source tracing, emergency response and risk control, response escalation and overall response.

4.4. Basic Experience

To sum up, through the analysis of the effectiveness of the mechanism's operation, it can be found that in response to the epidemic, although there are some shortcomings in the operation, the Guangdong-Hong Kong-Macao Greater Bay Area has also taken some innovative measures that go beyond the existing mechanism. We can summarize the basic experience to help improve the mechanism. In terms of information reporting, Zhuhai and Macau have established a joint prevention and control mechanism and established a Zhuhai-Macao joint prevention and control working group to study and determine the information communication mechanism for epidemic prevention and control between the two places, and strengthen information exchange on epidemic prevention and control. Based on this practical experience, the Guangdong-Hong Kong-Macao Greater Bay Area can further build a joint prevention and control mechanism. In terms of port control, Zhuhai and Macao have implemented a “health declaration and notification mechanism” to facilitate follow-up actions. This specific measure provides guidance for the implementation of port control measures. In terms of mutual recognition of information, the “borrowed quarantine” adopted by Zhuhai and Macao and the “exempt from quarantine and mutual recognition of

quarantine measures” adopted by Shenzhen and Hong Kong reflect the effectiveness of the mutual recognition mechanism for information communication in the collaboration mechanism of public health emergency in the Guangdong-Hong Kong-Macao Greater Bay Area. It is also conducive to the travel and economic development of citizens in the Guangdong-Hong Kong-Macao Greater Bay Area, and is an excellent answer to the problem of “28-day quarantine circle”. Based on this practical experience, the Guangdong-Hong Kong-Macao Greater Bay Area can further optimize the measures of “restricting the movement of people”, so as to effectively curb the spread of the epidemic and reduce the inconvenience caused by this measure to the citizens of the Guangdong-Hong Kong-Macao Greater Bay Area.

However, the innovative measures were created to make up for the lack of the mechanism. The epidemic situation was raging, and the formulation of innovative measures was relatively hasty, failing to take into account the deep-seated problems of the cooperation between the three regions. Hong Kong's “exemption from quarantine and mutual recognition of quarantine measures” was forced to suspend the implementation. ⁽¹²⁾ In the early stage of the epidemic, the production of the “Hong Kong version” of the health code was frequently delayed. On December 10, 2021, The Hong Kong Health Code has just been launched to join the Health Code system and data mutual recognition mechanism between Guangdong and Macau, and to interface with the Health Code colour determination criteria to comply with the health declaration and exemption from mandatory quarantine requirements for entry into Guangdong Province or Macau to complement the customs clearance of Guangdong, Hong Kong and Macau. On October 26, 2021, the Hong Kong government announced that it will tighten the quarantine exemption group measures for arrivals from other places, and the epidemic prevention arrangements will be in line with the mainland.

The implementation of innovative collaboration measures is slow, and collaboration measures are not sensitive enough to respond to public health emergencies. It is necessary to analyze the reasons behind the obstacles to the implementation of innovative collaboration measures, find solutions, and incorporate innovative measures into the collaboration mechanism for improvement. It is more in line with the social reality of Guangdong, Hong Kong and Macao.

5. Problem Analysis: Exploration of the Reasons Behind the Little Effect of the Mechanism Operation

5.1. The need for collaboration is not obvious, and there is a lack of collaborative thinking

For any regional collaboration, there is a problem: when the members of the collaboration can basically deal with the problem by relying on their own internal strength, do they need to collaborate with other members? Obviously, if the cooperative body is well organized and operates efficiently, the collaboration will definitely produce the effect of “1+1+1>3”. In this case, even if a single member can solve the problem alone, the effect of the collaboration can make the solution process smoother and more efficient. And for the problem of epidemic control, there is no the most perfect solution, only a more perfect solution.

In this epidemic, Guangdong, Hong Kong and Macao have each taken rapid response measures, which have achieved certain results locally. The respective measures of the three regions are relatively complete and purposeful, so the need for collaboration does not seem to be obvious. But on the other hand, Zhuhai and Macau, because of their close geographical location and more cooperation in various aspects, cooperated and interacted very frequently during this epidemic, and established a joint prevention and control mechanism between Zhuhai and Macau. Therefore, it is not difficult to conclude that the need for collaboration is not created on the basis of nothing. The need for collaboration and collaborative thinking go hand in hand. If Guangdong, Hong Kong and Macao cooperate frequently in various fields ordinarily, a habitual collaborative thinking has been formed, and there will be a clear need for collaboration and active implementation in the event of a public health emergency outbreak.

The lack of a well-established emergency coordination mechanism is not a single problem highlighted by the Guangdong-Hong Kong-Macao Greater Bay Area at the level of public health emergency management. In fact, it is a common problem of the Guangdong-Hong Kong-Macao Greater Bay Area as a regional cooperative in various fields. To solve the problem of the lack of collaboration mechanism of public health emergency, we should think from the root of why it is difficult for all regional collaborators to grasp the breadth and depth of collaboration? In the problem of “collaboration” between regional economies, the primary problem to be solved is that the three regions complement each other's advantages and help each other's disadvantages, but this still remains at the level of looking at each

regional unit separately, and has not risen to the level of collaboration with a holistic thinking. The high-level problem to be solved by “collaboration” is to promote the integration of policies and mechanisms in the Greater Bay Area, to promote some things that cannot be undertaken independently or that will lead to unsatisfactory results, to obtain some overall results, and ultimately to make the focus of collaboration changes from the sum of the development effects of the three regional body units to the overall development of the regional body. “If the previous cooperation between Guangdong, Hong Kong and Macao is characterized by complementary advantages, each with their own abilities, and each with its own brilliance, then the future development should move towards the integration of advantages, collaborative efforts, and joint creation.” (Chen Xian, 2017)

5.2. There are differences between practice thinking and actual combat thinking

The difference between practice thinking and actual combat thinking is also a reason that affects the effectiveness of the collaboration mechanism of emergency in the Guangdong-Hong Kong-Macao Greater Bay Area. As mentioned above, from 2005 to 2019, Guangdong, Hong Kong and Macao held several joint exercises with the theme and purpose of emergency collaboration, and formed a collaborative thinking in the process. However, when faced with the epidemic in reality, local governments do not think of cooperation at first. This is also “human nature”, that is, do your best to deal with the epidemic first, and then ask other members of the cooperative for help or when it is difficult to deal with it. Help other members of the group only after you cope well and develop experience.

Therefore, under the premise of following this reasonable common sense, it is necessary to develop sensitivity and quick response to collaborative thinking when a health emergency breaks out. Although the magnitude and scale of the COVID-19 outbreak are unprecedented in history, we must not panic because of this. The Greater Bay Area must have accumulated some experience in the previous joint exercises, which can provide guidance for dealing with the COVID-19.

5.3. The level of mutual trust among the three regions is relatively low, and the obstacles to in-depth cooperation are large

In the face of the COVID-19 epidemic, collaboration mechanism of emergency in the Guangdong-Hong Kong-Macao Greater Bay Area cannot operate, and the implementation of innovative measures has been hindered, exposing the shortcomings of mutual trust in the Greater Bay Area. Specifically: 1. In the early stage of the epidemic, the mainland support team could not enter Hong Kong. 2. The implementation of the mutual recognition and quarantine policy of Shenzhen and Hong Kong as well as Zhuhai and Hong Kong is suspended. 3. In the early stage of the epidemic, the production of the Hong Kong version of the “health code” was frequently delayed, and the implementation of the mutual recognition of health codes in Guangdong, Hong Kong and Macao was hindered. 4. The implementation of the general inspection is hindered, and rumors are prevalent in Hong Kong. This series of incidents shows that the issue of mistrust hinders the development of collaboration, and to a certain extent, it also led to the out-of-control epidemic in Hong Kong, and the three regions were forced to suspend mutual recognition and quarantine measures.

It can be seen that if the three regions lack mutual trust, even if there are more collaborative measures and means, they will be stranded due to lack of trust. Therefore, the issue of mutual trust between the three regions needs to be solved urgently.

6. Mechanism Optimization: Establishing an efficient Collaboration Mechanism of Emergency in the Greater Bay Area

6.1. Establishing a Clear Division of Labour for Emergency Linkage System

In the face of public health emergencies, it is necessary for Guangdong, Hong Kong and Macao to mobilise and strengthen the collaboration of government departments and local institutional organisations in the three regions, thereby forming a more complete emergency linkage system. Specifically, the emergency linkage system is divided into four sub-systems: prevention and monitoring system, decision-making and implementation system, information communication system and logistical support system.

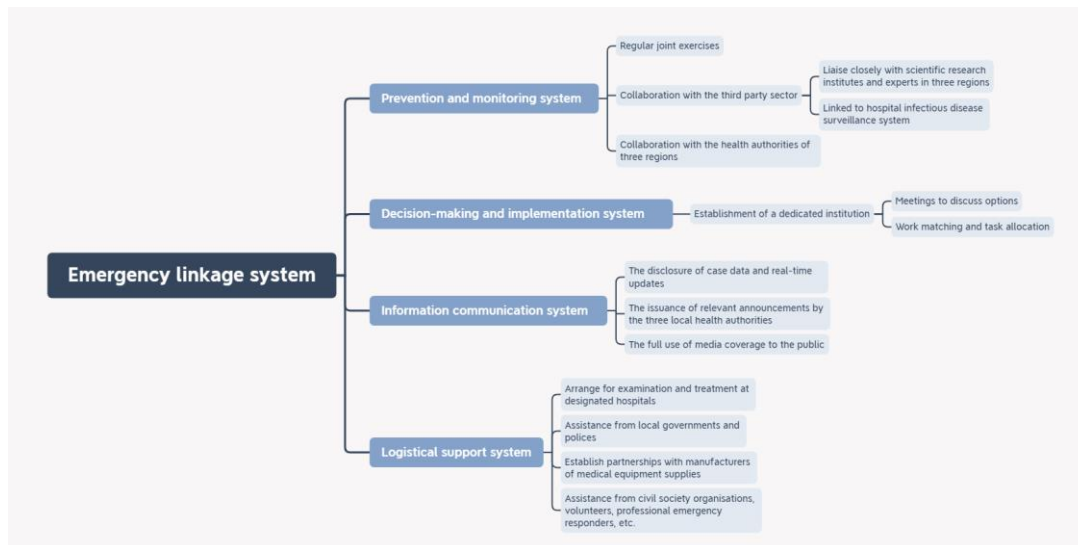


Figure 7: Emergency Linkage System

The work of the prevention and monitoring system consists of three main components: regular joint exercises, collaboration with the third party sector and collaboration with the health authorities of three regions. The three health authorities should hold regular joint drills for emergency response in terms of public health events to prepare for public health emergencies. At the same time, the three governments should collaborate with the third party sector, which refers to the scientific research institutes, experts and hospital infectious disease surveillance systems in the three regions, to establish a framework for collaboration between the government and NGOs in emergency response. It is important to both liaise closely with scientific research institutes and experts in the three regions to obtain scientific evaluation and technical support, and to integrate experts from different fields into different network systems and teams so that the network of experts tends to specialise and carry out emergency work more efficiently. In addition, the health authorities of the three regions should collaborate on prevention and control, share information and exchange experiences in order to jointly respond to public health emergencies.

The decision-making and implementation system is based on the establishment of a dedicated emergency coordination body that meets to discuss plans, interface with work and allocate tasks. This body sits at the top core of the system and plays a decision-making role, and the effectiveness of a public health emergency depends on its ability to act quickly, decisively and in an efficient manner. Therefore the emergency coordination body needs to make a selection of personnel and refine the departments. In the event of a public health incident, the emergency coordination body should immediately hold an emergency meeting and, based on the experience gained from previous exercises and the cooperation agreement document, develops an immediate and scientifically sound emergency plan that can be implemented, and liaise with the liaison and communication department and assign the developed emergency plan to the liaison and communication department for implementation in the three regions.

The information communication system consists of three main components: the disclosure of case data and real-time updates, the issuance of relevant announcements by the three local health authorities in response to public health emergencies and the full use of media coverage for effective publicity to the public.

The logistical support system consists of four main components: arranging for examination and treatment at designated hospitals, assistance from local governments and polices, etc., partnerships with manufacturers of medical equipment supplies, and assistance from civil society organisations and volunteers. At the same time, a group of organisations involved in emergency and relief work in the Guangdong-Hong Kong-Macao Greater Bay Area can be linked up, drawing on the World Health Organisation's back-up partnership planning. Each of these organisations will hold a roster of professional emergency responders who can be readily mobilised as well as arranged to work in the event of a public health emergency.

6.2. Improving the Mechanism for Disclosure of Government Information

While reports and articles related to the Cooperation Agreement document can be found on the Internet, the full content of the document cannot be found. The joint measures to combat the epidemic in the

Guangdong-Hong Kong-Macao Greater Bay Area are closely related to the rights and interests of the public. Therefore, local governments should disclose as much administrative information as possible that can be used by citizens and civil society organisations in their production and lives, so as to solve the problem of opaque information disclosure and protect public rights and interests.

6.2.1. Improving the Government's Information Disclosure

To improve the government's information disclosure work, the first step is to do a good job of completing relevant information and updating the content of documents in a timely manner. In terms of completing relevant information, the webmasters of relevant government websites should re-import old document data to fill in the missing document data; in terms of updating the content of documents, the content of the Cooperation Agreement should follow the development of social life and be continuously improved to meet the development and changes of the administrative system and health system in the Guangdong-Hong Kong-Macao Greater Bay Area, etc. Secondly, external supervisory power should be strengthened by setting up a competent body independent of the subject of disclosure and a specialised supervisory body to oversee the government's information disclosure work, so as to foster a virtuous cycle of a well-functioning mechanism and active disclosure of documents by the government.

6.2.2. Expanding the Ways of Information Disclosure

With regard to the types of decision to be made in response to an application for disclosure, current legislation in China only provides for three forms of disclosure, non-disclosure and notification that the information does not exist. Although the Government Information Disclosure Regulations mention partial disclosure of divisible information, they do not provide for this as a form of decision, and only stipulate that this practice can be used in practice. However, administrative authorities can legislate for "partial disclosure" as a form of decision to meet the needs of citizens for the information requested as far as possible. Thus, if a Cooperation Agreement contains certain content that is not suitable for disclosure, it may be disclosed by removing that content and stating to the applicant that certain content has been removed from the document being disclosed.

6.3. Enhance Mutual Trust Among the Three Regions and Establish an Adequate Mutual Trust Mechanism

Inter-regional cooperation in the Guangdong-Hong Kong-Macao Greater Bay Area is carried out under the One China Principle, but Hong Kong and Macao are under the system of "one country, two systems", with different systems and jurisdictions, and there are major problems of mutual trust, which is similar to the research basis of the theory of Mutual Trust in International Cooperation. so it can be borrowed from the theory of Mutual Trust in International Cooperation to try to solve the problem of inter-regional cooperation among Guangdong, Hong Kong and Macao. In the theory of Mutual Trust in International Cooperation, it is advocated that the promotion of effective inter-regional cooperation requires attention to three points: firstly, trust is the basis for enabling cooperation, and cooperation can only be reached if trust is first established; secondly, on the basis of recognizing the importance of trust, it is emphasized that trust is reached from repeated interaction, and the possibility and necessity of introducing a third party to participate in the interaction is not denied; finally, the correct interpretation of "signals", emphasizing that misjudging and distorting the signals of cooperation released by the other parties, even if they are weak, can undermine the achievement of trust.

Taking the mutual trust between Hong Kong and the Mainland as a breakthrough, the three-step model of the theory of mutual trust in international cooperation is applied to the mutual trust between the governments of Shenzhen and Hong Kong, and corresponding measures are compiled: First, strengthen the foundation of trust in cooperation. The influence of the opposition, "Hong Kong independence" forces and international anti-China forces is undermining the cultural identity of Hong Kong people and the foundation of trust between the two regions. On the one hand, it is necessary to win the hearts and minds of Hong Kong people, squeeze the space of "Hong Kong independence" forces inside and outside Hong Kong to strengthen cultural identity, and promote cultural exchanges between the three regions, especially to enable compatriots in Hong Kong and Macao to better understand the Mainland and enhance their sense of cultural identity, so as to promote trust between the three regions. On the other hand, it is also necessary for Hong Kong to improve its own political environment, so as not to destroy its uniqueness and at the same time to improve efficiency and reduce the occurrence of incidents such as obstruction of proceedings. Secondly, it is important to strengthen interaction to promote the achievement of trust. In this regard, both the Central Government

and Guangdong Government have made great efforts. This should also continue to seek areas of future cooperation to eliminate mistrust through practical actions. Finally, it is important to interpret the "signals" correctly and reduce the number of "voices" that misinterpret and distort them. Only when the right voices guide Hong Kong people forward will it be more conducive to cooperation between Hong Kong and other places, and even to the development of Hong Kong itself. This requires not only the attention and efforts of the Central Authorities to the issue of education in Hong Kong, but also the further consideration of the Hong Kong authorities.

7. Conclusion

The New Coronavirus epidemic is a great challenge to the Community with a shared Future for Mankind. As one of the world's four major bay areas, the Guangdong-Hong Kong-Macao Greater Bay Area, within a heterogeneous cluster of cities with two social systems and three legal systems, how to take advantage of regional synergy advantages to deal with the New Coronavirus epidemic is an important answer to the builders of the Greater Bay Area and the people of the Greater Bay Area. The Guangdong-Hong Kong-Macao Greater Bay Area Collaboration Mechanism of Emergency is in a nascent but not fully developed, and the development route is not clear. This article traces the development, main contents and actual operational effectiveness of the mechanism. By exploring the basic experience and deep-rooted problems in the operation of the mechanism, and by drawing on the experience of collaborative mechanisms outside the region, we propose suggestions for optimizing the Guangdong-Hong Kong-Macao Greater Bay Area Collaboration Mechanism of Emergency, aiming to provide a model for regional collaboration in emergency management of public health emergencies.

References

- [1] Wang W Q, Tao D. *Regional Emergency Coordination Mechanism and Efficiency Optimization in Covid-19 Prevention and Control [J]. Journal of Shenzhen University (Humanities & Social Sciences)*, 2020, 37(02): 117-123.
- [2] Wu X, Wu L. *Empirical Study on Influencing Factors of Regional Emergency Response [J]. Journal of Catastrophology*, 2011, 26(3): 139-144.
- [3] Xing Yiqiang. *A pilot study on improving the cooperation mechanism of prevention and control of infectious diseases in Guangdong, Hong Kong and Macau [J]. Journal of Jinan University (Philosophy and Social Sciences)*, 2006, 28(03): 106-109.
- [4] Xin-Yu L I, Wang Q Y, Liang W N. *Mode of the European Centre for Disease Prevention and Control and Its Implication [J]. Chinese General Practice*, 2007, 10(17): 1413-1415.
- [5] Zhang Lei. *The EU Response Mechanism for the COVID-19 Epidemic and Its Limits [J]. International Forum*, 2020, 22(04): 116-132+159-160.
- [6] Min L V, Wang Q Y, Liang W N. *Laws and Regulations on Prevention and Control of Infectious Diseases in Japan [J]. Chinese General Practice*, 2007, 10(17): 1409-1410.
- [7] Wang T-B, Peng Q-H. *Thinking about collaborative health emergency protection in large cities [J]. Medical Journal of the Chinese People's Armed Police Forces*, 2012. 06. 003
- [8] J. F. SHANG. *Construction of Novel Coronavirus Pneumonia Emergency Management System Based on Multi Agent Cooperation Mechanism. Indian Journal of Pharmaceutical Sciences* Volume 83, Issue Spl Iss 4 (Clinical Research). 2019.
- [9] Bo Fan; Ruoxuan Liu; Kun Huang; Yuxuan Zhu. *Embeddedness in cross-agency collaboration and emergency management capability: Evidence from Shanghai's urban contingency plans. Government Information Quarterly* Volume 36, Issue 4. 2019. PP 101395
- [10] Cao Yulong; Shan Jiao; Gong Zhizhong; Kuang Jiqiu; Gao Yan. *Status and Challenges of Public Health Emergency Management in China Related to COVID-19. Status and Challenges of Public Health Emergency Management in China Related to COVID-19. Frontiers in Public Health. Volume 8, 2020. PP 250*
- [11] Shaylika Chauhan. *Comprehensive review of coronavirus disease 2019 (COVID-19). Biomedical Journal* 2020.