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Public Health and International Obligations of States: The Case of COVID-19 on Cruise Ships

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Abstract: Against the backdrop of the COVID-19 outbreak onboard the cruise ship *Diamond Princess*, both the flag State and the port State should act according to international obligations during the sailing stage, quarantine period after ships' berthing, and the time when the quarantine period expires. However, the potential danger of the absence of a "genuine link" between the cruise shipowners and the flag State, the lack of coordination of jurisdiction in different sea areas and between different States, and also the lack of special or systematic regulations for infection prevention and control (IPC) at sea and for cruise ships increase the risk of a State's breach of international obligations. Therefore, it is deemed necessary to improve the responsive measures in international law. This paper, after review and analysis, sheds light on various recommendations on how to improve the responsive measures in international law, including (i) strengthening of the jurisdiction of the flag State, (ii) establishment of a special international cooperation mechanism with an alliance between the WHO and the IMO, and (iii) construction of an IPC mechanism for home ports of cruise ships.

Keywords: cruise ships; public health emergency of international concern (PHEIC); international obligations; rule of law; COVID-19

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1. Introduction

After the COVID-19 pandemic spread over China and other regions from December 2019, the World Health Organization (WHO) listed COVID-19 as a public health emergency of international concern (PHEIC) on 31 January 2020, and as a pandemic on 11 March 2020 [1]. The virus also hit cruise ships, such as the *Diamond Princess*, with the number of infection cases increasing sharply during the quarantine period. The aforementioned situation rapidly stirred up international concern as it became a "large-scale human-to-human transmission place outside the land". While attention was paid to the life and health of the isolated people, many States were more concerned about whether the countermeasures of the relevant States, such as the port State and flag State, were appropriate and sufficient in the context of current international law.

In retrospect, this paper will review the concrete infection prevention and control (IPC) measures taken by States and their effects, in order to analyze (i) whether the actions of these States are in accord with the related international law of the sea, maritime law and public health law, and (ii) how to improve the current legal mechanisms to effectively control the spread of infection onboard in future.

2. Review of the Diamond Princess Case

2.1. States' IPC Measures on the Cruise Ship

2.1.1. Quarantine Onboard

On 3 February 2020, the cruise ship berthed at its home port, Yokohama Port, Japan [2]. Passengers retained on the ship were instructed to stay in their cabins from 5 February for 14 days, and were allowed to leave the cabin for about one hour a day. Besides, the patients who tested positive by reverse transcription-polymerase chain reaction (RT-PCR) were taken off the cruise ship and isolated in a hospital in Japan [3]. Since 11 February 2020, the Japanese Ministry of Health, Labour and Welfare (MHLW) allowed disembarking of elderly passengers and those with pre-existing conditions from the cruise [4].

2.1.2. Virus Detection

The MHLW began to test passengers onboard for virus infection before the cruise ship berthed at Yokohama Port and passengers were officially quarantined. During the quarantine period, in addition to virus detection, the temperatures of passengers were measured on a daily basis.

2.1.3. Information Release

After the cruise ship docked at Yokohama Port, especially after the formal isolation period, the MHLW announced, mainly on the official website, the daily increase of infection cases onboard as well as the entertainment and medical measures taken for the isolated people.

2.1.4. Evacuation of Nationals

Near the end of the quarantine period, China, the United States, the UK, Canada, Australia, and other States took measures to keep their infected citizens in Japan for further treatment and sent chartered airplanes to take other uninfected citizens back to their own homelands.

2.2. The Problems Contained in These Measures

2.2.1. The Isolation Decision Was Not Timely

The basic reproduction number (R_0) of COVID-19 ranges from 2 to 3.5, which is higher than those of SARS and MERS previously transmitted in many States [5]. According to the interim guidance of the WHO, in order to get early recognition of possible COVID-19, once a case is found, immediate isolation of patients with suspected disease in an area separate from other patients (source control) is needed [6]. Such a measure should be adopted for cruise ships too. The first confirmed case was diagnosed on 1 February and the lockdown decision was made on 5 February, during the 4-day “window period”. The captain waited nearly 48 h to inform the *Diamond Princess* crew and its passengers about what he had learned, which left the virus with ample time to spread [7]. The model research suggests that transmission mainly occurred before the onboard lockdown [8]. Japanese public health expert Shigeru Omi, head of the Japan Community Health Care Organization, said that, “most passengers were infected before the start of the quarantine” [9].

2.2.2. The Isolation Measures were Not Professional

The first problem was the air conditioning system. After the pandemic outbreak on the cruise ship, there was a claim that there was no obvious sign that the ship's air conditioning and wastewater systems had exacerbated the virus transmission [10]. Yet according to some reports, the cruise ship circulated 70% of the air supply to the cabins by

circulating the air discharged from other cabins. The air conditioning systems that circulate air inside buildings have been widely adopted in domestic commercial facilities and hospitals, and experts' groups pointed out that "the virus may spread" through them [11].

Second was the problem of the air density of the cruise ship. The first infected passenger was reported 4 days before isolation. As there are many public places on a cruise ship, the virus may have been brought into other passengers' rooms through public gathering before the lockdown. Most of the cruise cabins were airtight, which was not conducive to the dissipation of virus; it may seem obvious to say that a virus will spread more easily in confined spaces [12].

Third was the insufficiency of isolation rooms. The cruise ship had 1337 passenger cabins in total, 748 of which had private balconies. The remaining passengers were isolated for 14 days in a small confined space without natural light. The accommodation of crew was even worse, with one room for two and no windows [7]. Such isolation conditions may exert great pressure on the physical and mental health of the isolated people.

Fourth, there was no distinction between isolated spaces. According to the control and disposal of SARS and other infectious diseases, zone separation is usually needed, but on the *Diamond Princess* cruise ship, there was no distinction between infection-free "green zones" and potentially contaminated "red zones", and people were coming and going between the zones with and without personal protection equipment. The lack of zone separation extended to the ship's medical center and even to the medical officer, and only a zone for taking off protective gear such as gowns contaminated by sample collection was provided and clearly separated from other business areas [13].

Fifthly, the case screening was not effective enough. As the rigid isolation conditions on the cruise ship were not as good as those on land, it should have been a top priority to make virus detection in time and take appropriate isolation measures. However, 8 days after the cruise ship was isolated, only 19% of people had been tested. When the quarantine expired, Japan admitted that it had missed the detection of 23 people [14].

2.2.3. The Information Disclosure Was Not Transparent

The information released by the MHLW and the cruise company was limited to the data statistics of daily new cases. Except for invoking the national law of Japan, there was no official explanation about the international legal basis and implementation effects of onboard ship isolation [15]. The isolated passengers publicly petitioned, pointing out that they did not know the specific content of any assistance [16].

From the above analysis, the media claimed that the spread of infection was caused by the failure of onboard lockdown [17].

3. Analysis of International Obligations of States for IPC on the Cruise Ship

3.1. The Performance of International Obligations of States

3.1.1. The Sailing Stage of the Cruise Ship

Under the international law of the sea and maritime law systems, the International Convention for the Prevention of Pollution from Ships (MARPOL) [18], the International Convention on Tonnage Measurement of Ships [19] and other maritime conventions primarily regulate the management of the flag State in respect of the safety of ships and crew and the prevention of marine environmental pollution without involving health and IPC issues of ships.

The cruise ship may pass through different sea areas such as high seas, exclusive economic zones, contiguous zone, territorial sea, and internal waters (port of call) of coastal States on the voyage. According to the United Nations Convention on the Law of the Sea (UNCLOS) [20], the system of exclusive economic zones does not involve IPC issues. The system of contiguous zones endows coastal States with the right to exercise the control necessary to (a) prevent infringement of its sanitary laws and regulations

within its territory or territorial sea, (b) and punish infringement of the above laws and regulations committed within its territory or territorial sea. The system of territorial seas and internal waters stipulates that the coastal State may adopt laws and regulations in respect of all or any measures for the prevention of infringement of the sanitary laws and regulations of the coastal State. Foreign ships exercising the right of innocent passage through the territorial sea shall comply with all such laws and regulations. In this regard, the coastal State has the right to prohibit foreign ships from entering its territorial sea and internal waters for public sanitary reasons.

The Convention and Statute on the International Regime of Maritime Ports (CSIROMP) [21] provides that a contracting State may prohibit the entry or transit of passengers or goods, in case of any emergency affecting the safety of the State or the vital interests of the country.

The UNCLOS and CSIROMP are the main conventions in the law of the sea which may refer to IPC issues. The systems of contiguous zones, territorial seas and internal waters mainly stipulate the rights but not the obligations of the coastal State to refuse the ships which violate its sanitary laws to transit or enter these waters, and these rights derive from territorial, quasi-territorial, or extra-territorial principles [22]. The CSIROMP also endows the port State with similar rights. The main regime to bind States to fulfill their obligations is that of the high seas in the UNCLOS, which provides that:

1. Ships shall sail under the flag of one State only and, save in exceptional cases expressly provided for in international treaties or in the convention, shall be subject to its exclusive jurisdiction on the high seas;
2. Every State shall effectively exercise its jurisdiction and control in administrative, technical, and social matters over ships flying its flag;
3. In particular, every State shall assume jurisdiction under its internal law over each ship flying its flag and its master, officers, and crew in respect of administrative, technical, and social matters concerning the ship.

The above articles do not clearly define if the flag State is responsible for public health issues which occur on ships on the high seas, or if the public health issues are contained in the aforementioned social matters. In this regard, the International Tribunal for the Law of the Sea (ITLOS) explained as follows:

The ship, everything on it, and every person involved or interested in its operations are treated as an entity linked to the flag State. The nationalities of these persons are not relevant [23].

The opinion of ITLOS contains the meaning that when public health events occur on ships on the high seas, the flag State assumes the main responsibility for IPC.

The first infected passenger on the cruise ship *Diamond Princess* was confirmed on 1 February 2020. Between 1 February and 3 February, the cruise ship was in the voyage from Okinawa Port to Yokohama Port in Japan. Although the specific coordinates of the route have not been released, according to the route map [24] and the scope of the exclusive economic zone claimed by Japan [25], the sea areas of the navigation of the cruise ship may involve the high seas in addition to the internal waters (Okinawa Port, Yokohama Port), territorial sea, and exclusive economic zones of Japan. As a contracting party to the UNCLOS and the CSIROMP, Japan may not have had any obligations regarding the IPC issues, but may have had rights to refuse the cruise ship to berth.

The situation of the UK, as the flag State, however, may be different. The cruise ship sailed to the high seas after the pandemic occurred and COVID-19 was declared a PHEIC on 31 January 2020. The first infected passenger was confirmed on 1 February 2020. Thus it could be suggested that the UK may have had cause to infer the infectivity and seriousness of the pandemic situation onboard the cruise ship. As a contracting party to the UNCLOS, the UK should have taken measures in accordance with its IPC obligations, besides organizing an evacuation flight to bring 35 passengers from the cruise ship

back to the UK [26]. The inaction of the UK during the “window period” from 1 February to 5 February indicated that it may have failed to take effective measures.

3.1.2. After Reaching the Port

As mentioned above, Japan has the right to refuse entering or berthing of ships which are in breach of its sanitary law. Even though Yokohama Port was the home port of the cruise ship, the “home port” is mainly a commercial rather than legal concept; it fails to set legal obligations for the home port State. During the adverse time and the urgency of the situation caused by COVID-19, a ban has also been imposed by various countries on the entry of containers and vessels that are being operated from other ports [27]. Nevertheless, once Japan accepts the berthing of a cruise ship, it should be regulated by the International Health Regulations (IHR) [28] and fulfill its international obligations.

First of all, for the conveyances, IHR stipulate that conveyances with “clinical signs or symptoms and information based on fact or evidence of a public health risk, including sources of infection and contamination” are “affected conveyances” and the “competent authority may implement additional health measures, including isolation of the conveyances, as necessary, to prevent the spread of disease”. For the passengers and travellers, IHR also provide that State parties shall not refuse passengers’ embarking or disembarking on public health grounds except due to the need to respond to a PHEIC. If there is evidence of an imminent public health risk, the State party may enforce additional established health measures that prevent or control the spread of disease, including isolation, quarantine, or placing the travellers under public health observation. The *Diamond Princess* was regarded as an “affected conveyance” because of its infection cases and Japan had the right to take isolation measures; COVID-19 was listed as a PHEIC and Japan could implement additional measures under IHR to prohibit passengers from embarking or disembarking and place them under public health observation. IHR also provide that States parties shall base their determinations of above additional health measures upon:

- (a) Scientific principles;
- (b) Available scientific evidence of a risk to human health, or where such evidence is insufficient, the available information including from WHO and other relevant inter-governmental organizations and international bodies;
- (c) Any available specific guidance or advice from WHO.

“Scientific principles” means the accepted fundamental laws and facts of nature known through the methods of science, and “scientific evidence” means information furnishing a level of proof based on the established and accepted methods of science. Under these three requirements, the “scientific” standards mainly aim to avoid unnecessary interference with international traffic and trade, when States prevent, protect against, control, and provide a public health response to the international spread of disease [29]. In the interim guidance published by the WHO, it also requires that State parties implementing any additional health measure that significantly interferes with international traffic (such as refusal of entry or departure of international travellers and/or ships, or their delay for more than 24 h) shall provide to the WHO the public health rationale and relevant scientific information [30].

The joint statement of the IMO and WHO also explains Article 43 as measures interfering with international maritime traffic subject to provisions of the IHR, including the specific requirements set out in Article 43 [31].

The *Diamond Princess* was not engaged in trade transportation, and the Yokohama Port was the port of destination, so the isolation measures taken by Japan did not in fact interfere with trade and traffic significantly.

Secondly, Annex 1 of the IHR provides: (a) core capacity requirements for surveillance and response; and (b) core capacity requirements for designated airports,

ports, and ground crossings. The requirements for a public health response at the primary level and even at the intermediate level are contained in part (a) of Annex 1. The requirements listed in part (b) of Annex 1 for ports to respond to events that may constitute a PHEIC mainly include the capacity to provide an appropriate public health emergency response by establishing and maintaining a public health emergency contingency plan, and the assessment, care, and isolation of affected persons (There are seven requirements which includes (a) to provide appropriate public health emergency response by establishing and maintaining a public health emergency contingency plan, including the nomination of a coordinator and contact points for relevant point of entry, public health and other agencies and services; (b) to provide assessment of and care for affected travellers or animals by establishing arrangements with local medical and veterinary facilities for their isolation, treatment and other support services that may be required; (c) to provide appropriate space, separate from other travellers, to interview suspect or affected persons; (d) to provide for the assessment and, if required, quarantine of suspect travellers, preferably in facilities away from the point of entry; (e) to apply recommended measures to disinsect, derat, disinfect, decontaminate or otherwise treat baggage, cargo, containers, conveyances, goods or postal parcels including, when appropriate, at locations specially designated and equipped for this purpose; (f) to apply entry or exit controls for arriving and departing travellers; (g) to provide access to specially designated equipment, and to trained personnel with appropriate personal protection, for the transfer of travellers who may carry infection or contamination.). In this regard, IHR stipulate that each State party shall send to WHO a list of ports authorized to offer issuance of Ship Sanitation Control Certificates and the provision of the services referred to in Annex 1.

Yokohama Port, the home port of the *Diamond Princess*, was in the list of ports authorized to issue ship sanitation certificates [32], thus the port also satisfies the requirements for responding to a PHEIC. According to the indicators in part (a) of Annex 1, and the requirements in part (b) of Annex 1, [33] the Yokohama Port may need to develop a public health emergency contingency mechanism which is capable of accommodating thousands of passengers and crew of ships such as the *Diamond Princess* in isolation on land [9].

3.1.3. After the Quarantine Expired

After the end of quarantine, Japan, the port State, was not relieved of its obligations. According to IHR, the port State is responsible for monitoring baggage, cargo, containers, conveyances, goods, postal parcels, and human remains departing from affected areas, so that they are maintained in such a condition that they are free of sources of infection or contamination, including vectors and reservoirs, and for supervision of service providers for services concerning travellers, baggage, cargo, containers, conveyances, goods, postal parcels, and human remains at points of entry, including the conduct of inspections and medical examinations as necessary. In other words, Japan has an obligation to ensure that the health testing of the disembarking persons and medical service providers is carried out so as not to spread the virus to areas outside the cruise ship.

As mentioned above, Japan missed virus detection in 23 quarantined persons and allowed the staff members of the cruise ship to return to work directly without taking any isolation measures. Some of them who tested negative in the first place were later tested positive after returning home due to the virus latency, which may have caused the spread of the virus inside and outside Japan [34].

3.2. The Legal Problems Reflected in the Performance of International Obligations of States

3.2.1. The Potential Danger of Registration to the “Genuine Link” Principle

According to the United Nations Convention on Conditions for Registration of Ships of 1986 [35], the “genuine link” principle requires the nationals of a State of registration to participate in the ownership and manning of ships so as to realize the duties of the flag State to exercise effectively its jurisdiction and control over ships. Contrary to the “genuine link” principle is open registration or the flag of convenience, in which system the crewing and ship ownership by foreign nationals is allowed, and the States with open registries lack either the political will or administrative competence to effectively enforce and impose national requirements or international maritime laws and standards [36]. The largest States which almost exclusively cater for foreign ships are Panama, Liberia, Bahamas, Marshall Islands, Malta, Cyprus, Isle of Man, Antigua and Barbuda, Bermuda, etc. [37]. With open registration, the wider shipping community is concerned about the safety implications of registers without any substantive national attachment between shipowner and flag State, because in case of public health incidents and other emergencies, an “ambiguity” in jurisdiction easily appears.

Until now, the above convention of 1986 has not entered into force, so the State parties are not bound by the “genuine link” principle. This principle is also stipulated in the UNCLOS, which provides that:

Every State shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships have the nationality of the State whose flag they are entitled to fly. There must exist a genuine link between the State and the ship.

However, this provision does not specify the definition of the “genuine link” principle, which weakens the binding force of it. Just as the ITLOS concluded that the purpose of Article 91 was not to establish criteria by reference to which the validity of the registration of ships in a flag State may be challenged by other States, the determination of the criteria and establishment of the procedures for granting and withdrawing nationality to ships are matters within the exclusive jurisdiction of the flag State. Therefore, it is hard to say open registration is illegal in international systems.

The *Diamond Princess* cruise ship was registered in the UK. Even though the UK does not adopt the flag of convenience, the registration system of the State is much more open under the amendment of the Regulations of Registration of Ships with the foreign shipowners allowed (From the Merchant Shipping Act of 1995 and the Merchant Shipping (Registration of Ships) Regulations of 1993, to The Merchant Shipping (Registration Of Ships) (Amendment) Regulations of 2019, the UK Registry of Shipping and Seamen (the UK Registry) has expanded eligibility for the UK flag in order to accept a wider category of shipowners.). Being operated by a US company and sailing on Asian seas, the UK’s jurisdiction over the cruise ship may have been weakened by these objective conditions.

3.2.2. The Lack of Coordination of Jurisdiction in Different Sea Areas and between Different States

As mentioned above, except on the high seas and internal waters where the port of call for ships is located, the current international law system has no explicit provisions under which the State should bear responsibility when public health emergencies happen on ships in different sea areas. Japan’s *Nikkei Business Daily* pointed out that in the *Diamond Princess* event, the UK should have been the main responsible State; this point referred only to the high seas but not other sea areas [38]. Different legal systems for different sea areas are disintegrated, which makes it difficult for various States to exercise effective and timely jurisdiction after a pandemic outbreak.

Another defect is the weak coordination of jurisdictions between different States, especially between the flag State and port State. In the UNCLOS, there is a relevant stipulation that:

A State which has clear grounds to believe that proper jurisdiction and control with respect to a ship have not been exercised may report the facts to the flag State. Upon receiving such a report, the flag State shall investigate the matter and, if appropriate, take any action necessary to remedy the situation.

This article may provide a solution to link the flag State and other States and urge the flag State to exercise its jurisdiction, but there are still some doubts on whether the right to report under Article 94(6) alone would be adequate to secure effective implementation of the duties of the flag State even on the high seas [39]. After the pandemic outbreak on the cruise, the port State, flag State, the State of the cruise operator and of nationality of people on the ship were involved. These States need to help control the pandemic situation onboard the cruise ship to the fullest extent possible to prevent its spread in the global scope. Due to the lack of coordination between these States, effective cooperation was not realized and many ships that were refused entry to a port of call were afloat at sea. For instance, as a consequence of the COVID-19 crisis, Malta and Italy declared their ports not to be places of safety, and Alina Miron pointed out that “the obligation of disembarkation after mass rescue has too often been the victim of lack of solidarity among the Mediterranean States” [40].

3.2.3. The Lack of Special or Systematic Regulations for IPC at Sea and on Cruise Ships

The *Diamond Princess* was not the first cruise ship with a large scale pandemic outbreak. During the (H1N1) 2009 influenza pandemic, many passengers were infected on the Australian cruise ship *Pacific Dawn* [41]. The failure to respond to the high risk of the developing pandemic (H1N1) led to a widespread dissemination of the virus, particularly in Victoria [42]. Cruise ships are all highly crowded so that the registration mechanism, the construction structure of cruise ships, the lifestyle onboard, and the complexity of the port State control mechanism can lead to an increasing risk of large scale spread of infectious disease, which requires special or systematic IPC regulations. The lack of these regulations is due to the following factors.

First, the lack of laws formulated by the WHO. The Constitution of the World Health Organization (The Constitution of the World Health Organisation (New York, 22 July 1946, in Force 7 April 1948) 14 UNTS 186 [IHC]. Amendments adopted by the Twenty-sixth, Twenty-ninth, Thirty-ninth and Fifty-first World Health Assemblies (resolutions WHA26.37, WHA29.38, WHA39.6 and WHA51.23) came into force on 3 February 1977, 20 January 1984, 11 July 1994 and 15 September 2005 respectively and are incorporated in the present text.) endows the WHO with the right to adopt conventions, agreements, and regulations as well as to make recommendations to members. However, legally binding instruments usually take a long time to come into force, which makes it hard to adapt to public health emergencies which are variable and sudden. The WHO has traditionally appeared to play an inactive legislative role [43].

International public health law also does not pay enough attention to the characteristics of the ocean and cruise ships. The history of international public health law shows it mainly applies to the land, including the ports where public health events such as plague, yellow fever, and cholera have occurred, but not to the ocean [29]. The international law of the sea and maritime law focus on States’ activities, such as the development of marine resources, navigation safety, and the protection of marine environment, but rarely IPC issues.

Therefore, the differences between highly crowded cruise ships which have higher requirements for IPC issues and general ships are also overlooked. For instance, IHR treat ships as a means of transportation without further distinguishing between the two kinds of ships. Annex 1 of IHR, which proposes seven core capacity requirements for designated ports’ response to a PHEIC, does not take the construction of home ports into consideration and thus it fails to guide the port State to take IPC measures onboard cruise ships. The WHO published two interim sets of guidelines to control the COVID-19 spread on ships, which only provide guidance for general ships and ports [44].

4. Further Improvement of the Rule of Law

1. The Strengthening of Jurisdiction of the Flag State

As mentioned above, the “ambiguity” of the jurisdiction of the flag State is an important reason for the pervasion of the pandemic on cruise ships. The fundamental measure is the application of the “genuine link” principle and strict national registration in order to establish the effective jurisdiction of flag States over ships. However, because of the low taxes, lower crewing costs, less regulatory control, and relative anonymity, open registration is of great attraction to shipowners. Besides, the problem of flags of convenience seems, broadly, to derive from international competition in the shipping and fishing industry, in which case, it is debatable whether the tightening of the requirement of a genuine link would provide an effective solution [45]. Therefore, appropriate solutions to strengthen jurisdiction of the flag State should be further considered.

At present, the port State is mainly in charge of health and quarantine matters when a ship berths at the port. When ships sail on the high seas, and in the exclusive economic zones of other States, the flag State should be asked to fulfil the international obligations of IPC on ships. The Paris Memorandum of Understanding on Port State Control can be regarded as a reference. The port State can conduct inspections on ships of other States at the port. These inspections examine compliance with requirements pertaining to the condition of the ship, its equipment, operations, and social conditions. In case of non-compliance, ships can be refused entry to a port, inspected at length, or detained when attempting to enter a port [46]. The memorandum was reached to maintain the flag State’s important role in enforcing sustainable shipping, such as ensuring the safety of life at sea, the protection of the marine environment, and the provision of decent working and living conditions for seafarers. Similar inspections could also be agreed for IPC issues onboard cruise ships.

2. The Establishment of Special International Cooperation Mechanism with Closer Coordination and Cooperation between WHO and IMO

In response to the COVID-19 pandemic, the IMO and WHO cooperated to issue a Joint Statement on the Response to the COVID-19 Outbreak, insisting on the necessity to avoid severe disruption of maritime traffic, and the two international organizations will consider further cooperation in the future.

In light of the large number of maritime conventions concluded over the years, systems for the positioning of ships, flag State control (FSC) and port State control (PSC), were established by the IMO to ensure it is capable of implementing the obligations of conventions rapidly through the emergency response mechanism of the concerned States. Accordingly, the ideal mode of the cooperation mechanism should be jointly led by the WHO and the IMO to organize the Cruise Lines International Association (CLIA) and International Groups of P&I Clubs (IG) to establish a special international cooperation mechanism for cruise IPC so as to construct the information notification mechanism between the maritime departments of the flag State, the State of the cruise operator, traditional or regular ports of call and expected ports of call, and IPC coordination between maritime departments of ports of call and the local health and pandemic prevention departments on land.

Thus, the relevant experience of the WHO in response to PHEICs will be utilized sufficiently to play an active role in global information sharing and the coordination of IPC measures. It will also make up for the disadvantage that the WHO cannot be granted enough legislative power because most State parties are endeavoring to maintain freedom of action in public health, for fear of economic and social consequences [47], and fully utilizes the IMO’s sufficient network resources in ship management and control to make the IPC measures better suited to the characteristics of ships and marine activities.

Based on the authorization of the IMO’s member States, it is the WHO and not the IMO that is mainly responsible for the sanitary and anti-pandemic affairs of ships (In the Convention on the International Maritime Organization of 1948, the mainly matters au-

thorized by Member States to IMO include the co-operation relating to technical matters of all kinds affecting shipping, the highest practicable standards in matters concerning the maritime safety, efficiency of navigation and prevention and control of the marine environment, etc.). Due to the suddenness and precariousness of the pandemic outbreak onboard cruise ships and the severity of the consequences, the attempt at collaboration between the IMO and the WHO can be mostly limited to cruise ships while the WHO is still in charge of other ship-related matters.

3. Construction of an IPC Mechanism for the Home Ports of Cruise Ships

The *Diamond Princess* is certainly not the only ship that has been affected by COVID-19. More than half the passengers onboard a small cruise ship touring the Antarctic were recently discovered to have caught the disease, for instance, and another Italian cruise ship was quarantined in Nagasaki, Japan, with 48 staff testing positive for COVID-19 [12]. Moreover, the cruise ship *Costa Serena*, with 3706 passengers and 1100 crew members onboard, was launched from Tianjin International Cruise Home Port in China on 20 January 2020, with 15 people on the ship developing feverish symptoms. The cruise ship then returned to the Dongjiang Harbor Area of Tianjin Port. The enforcement department of Tianjin Municipality boarded the cruise ship and tested all passengers on the cruise ship. No infection case was found so all people onboard disembarked. In this case, China acted more rapidly than Japan, but if there were people infected, it is difficult to guarantee that Tianjin home port could have provided sufficient medical equipment and isolation facilities for the nearly 5000 people on the cruise ship.

Under the impact of the pandemic, home ports are running at a low capacity, and the storage facilities have been highly overcrowded, thus the maritime transport and shipping industry is faced with major challenges during these challenging times. To achieve the highest level of effectiveness in response to the COVID-19 outbreak on cruise ships, an IPC program with a dedicated and trained team or at least an IPC focal point should be in place and supported by national and facility senior management [48].

Based on the incidents of the cruise ships *Diamond Princess* and *Costa Serena*, coastal States should make up for the shortcomings of the pandemic prevention and isolation facilities in home ports of cruise ships as soon as possible and strengthen the construction of medical and health institutions and emergency isolation places near home ports. A home port of cruise ships must have a pandemic prevention and isolation place that is able to accommodate all passengers and crew of at least one cruise ship and meet the requirements of the WHO on pandemic prevention. During periods without a pandemic, this place could be leased to other institutions to operate business hotels or be used as office places. Once a pandemic breaks out, the isolation function should be restored unconditionally. The minimum standards for pandemic prevention and control of home ports should be “no rejection” and “no infection”, thus playing an irreplaceable role in the recovery of the global cruise industry. Ultimately, security systems of emergency disposal with timely and appropriate isolation and nearby medical treatment should be developed for both non-pandemic and pandemic use in home ports. Additionally, the WHO may adopt new appendices to direct development of an IPC mechanism for the home ports of cruise ships.

5. Conclusions

Based on the case of the *Diamond Princess* and problems presented in controlling the spread of the COVID-19 pandemic—such as the isolation decision not being timely, the isolation measures not being professional, and information disclosure not transparent—the international obligations of states regarding IPC on cruise ships should be scrutinized. From the case of the *Diamond Princess*, it is obvious that the States’ performance of international obligations in the stages of sailing, reaching the port, and on the quarantine period expiring is inconsistent with international law or lacks an international legal basis, which reflects several legal problems, such as the potential danger of registration to the

“genuine link” principle, the lack of coordination of jurisdiction in different sea areas and between different states, and the lack of special or systematic regulations for IPC at sea and on cruise ships. To further improve the rule of law, it is advised to strengthen the jurisdiction of the flag State, establish a special international cooperation mechanism with closer coordination and cooperation between the WHO and the IMO, and construct an IPC mechanism for the home ports of cruise ships.

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