

*Regular Article*

## **Public Health and Ethical Considerations on the Quarantine of Diamond Princess**

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### **Abstract:**

Japan experienced a sharp increase of coronavirus disease 2019 (COVID-19) patients with the case of the cruise ship Diamond Princess docked at Yokohama. The Japanese government decided to take the massive quarantine measure to prevent the spread of the coronavirus in the country. However, the quarantine measure must be justified with an ethical point of view since it imposed the threat to human rights. We used an analytic tool for public health ethics to discuss the case with ethical considerations, focusing on burdens of people on board and ways to minimize them. Although the quarantine on the ship was proved to be effective in controlling the virus, it is important to further discuss and seek the intervention that is evidence based, fairly implemented and socially acceptable.

### **Keywords:**

public health ethics, ethics framework, COVID-19, quarantine, Diamond Princess

## **1. Introduction**

### **1-1. Background**

The outbreak of novel coronavirus infectious disease (COVID-19) caused by SARS-CoV-2 started in Wuhan, China, in December 2019 (Wu, Leung and Leung 2020), and it has spread all over the world. As of September 1st, 2020, the total 25892040 people have been infected worldwide and 860322 of whom died of the disease. Japan has confirmed the total 68392 cases with more than 1200 death cases (Johns Hopkins Coronavirus Resource Center 2020).

### **1-2. Overview of Diamond Princess Cruise Ship Case**

The first case Japan faced this disease was a luxurious travel ship, called Diamond Princess that came back to Yokohama port with a number of passengers infected with SARS-CoV-2. The cruise ship embarked on a trip from Yokohama city, Japan on January 20th, 2020 and had a total of 3711 people onboard, 2661 of whom were passengers and 1045 were crews, from 57 countries. During the journey, a passenger, who got off in Hong Kong on January 25th, had respiratory symptoms on the ship, and was tested positive for COVID-19 on February 1st. The

information was notified to Japan next day and an anchorage quarantine measure was initiated. All passengers and crew members then underwent the initial health evaluation, the infection tests and their close contacts records were collected from February 3rd to 5th and they found 10 positive cases (The Ministry of Health, Labour and Welfare 2020). After a course of inspections, the government adopted a mandatory quarantine measure on the ship from February 5th to 19th. On February 7th, thermometers were distributed to all passengers and crews to self-monitor their body temperature twice a day. The Fever Call Center (FCC) was also established on the cruise ship dedicated to calls from anyone who had suspicious symptoms. Finally, after 14 days of quarantine, people who had met the criteria of disembarkation left the cruise ship.

It is important to distinct the technical differences between the public measure of quarantine and isolation. Quarantine is defined as “separation and restriction of the movement of people who were exposed to a contagious disease to see if they become sick.” On the other hand, isolation is defined as “separation of sick people with a contagious disease from people who are not sick” (Centers for Disease Control and Prevention 2017). On the ship, those who were tested positive were transferred to hospitals for insolation and care, and the rest were kept on board for quarantine.

The basic ethical principle for public health is ‘Harm Principle,’ and it helps us to address to what extent it is possible to restrict the freedom of individuals to achieve public health goals. The original libertarian, John Stuart Mill said in his book, “On Liberty”, that the harm principle is the notion that “the only purpose for

which power can be right fully exercised over any member of a civilized community, against his will, is to prevent harm to others” (Mill 1977: 223). Thus, in the context of quarantine, the authority must clarify the situation that people who may have the virus are likely to harm the uninfected individuals. It is also important to note that they must justify the liberty violation of people in quarantine. However, to date, little is known about the extent to which the Japanese government exercised COVID-19 quarantine on the ship with ethical considerations.

This article paid attention to quarantine on the cruise ship from the ethical perspective because quarantine imposes a heavy burden on individuals in terms of their freedom, thus it requires the ethical considerations to justify beyond mere medical effectiveness (Wynia 2007).

### **1-3. Objective**

Given the significance of addressing the public health ethics in quarantine on the ship, it is important to examine how the quarantine measure should be ethically justified in the public health emergency. Therefore, this article aimed to analyze the response of the Japanese government to Diamond Princess Cruise Ship case from an ethical perspective.

### **1-4. Analysis Tool**

We analyzed the case of Diamond Princess using an analytic tool for public health ethics created by Kass (2001). She suggests a 6-step framework that guides public health experts or policy makers to choose a course of action that is ethically sound. She has applied

this framework to the case of avian influenza and discussed the ethical issues of its pandemic preparedness program (Kass 2015). This framework helps them to realize the moral issues surrounding public health work and consider how to respond to them.

The first step of the framework is goal identification. Public health work should aim at reducing morbidity or mortality of diseases. Second, public health professionals ought to examine if interventions are sufficiently supported by data or evidence to reach goals, because the most of public health programs are based on certain assumptions that they will achieve their stated goals at the end. Then, the third step is to identify what kind of burdens or harms could occur through the public health works. She presents three categories of burdens: risks to privacy and confidentiality, risks to liberty and self-determination and risks to justice. Fourth, it is important to consider whether the burdens of interventions can be minimized without reducing its efficacy greatly. The penultimate step of the framework is the fair distribution of benefits and burdens, which corresponds to the ethic principle of distribution justice. This asks us to treat people in a way that does not leave and discriminate specific group of people. Finally, it is ethically required to compare whether the expected benefits outbalance the burden of people.

The information of Diamond Princess Cruise Ship for the analysis was collected from the official reports of the Ministry of Health, Labour and Welfare and the National Institute of Infectious Diseases (NIID).

## 2. Ethical Evaluation Based on the Framework

### 2-1. Public health goal of the quarantine

In the context of quarantine, the purpose is to limit the spread of the disease by separating those who may carry the virus from uninfected people (Ries 2006). However, the Japanese government did not clearly explain the purpose of the quarantine measure on the cruise ship. According to the Quarantine Act (1951) in Japan, quarantine should be done to prevent the inflow of epidemics into Japan. The article 1 of the Quarantine Act (1951) states that “the purpose of this Act is to prevent infectious disease-causing pathogens that are not native to Japan from entering the country via marine vessels or aircrafts as well as to ensure that necessary measures are taken to prevent other infectious diseases involving vessels or aircrafts.” Ultimately, the quarantine measure ought to aim protecting health of Japanese citizens and minimize the spread of the disease as much as possible.

One of the possible reasons behind the government’s decision is that they had already predicted the spread of the virus within the ship. NIID (2020a) said that SARS-CoV-2 had been already spread in the cruise ship before it arrived at Yokohama port on February 3rd, 2020 based on their epidemiological analysis data. One recent study also revealed that the COVID-19 outbreak has already expanded to most of the decks before the arrival and quarantine (Tsuboi, et al. 2020). It may have happened possibly via recreational activities and communal spaces which were available to all passengers before quarantine (Rich 2020).

## 2-2. Effectiveness of the quarantine on achieving its goal

Kass (2001: 1778) argues that “as a rule of thumb, the greater the burdens posed by a program the stronger the evidence must be to demonstrate that the program will achieve its goals.” Selgelid (2009) also mentions that authorities should explain public health measures with the higher level of evidence when the basic the human right is at stake. Here arises another question: what kind of and how much of evidence is enough to justify the quarantine measure?

While researchers emphasize the importance of the strong scientific evidence, the effectiveness of quarantine has not been proved yet. Moreover, the case of Diamond Princess occurred in the early phase of the global COVID-19 pandemic when the available information in controlling the virus spread as well as the characteristics of the virus was extremely scarce. Although quarantine was implemented in the past pandemics such as AIDS and SARS (Hoffman 2004; Gostin, et al. 2003), the outbreak on the cruise ship was a unique environment and there was no case of such quarantine caused by the emerging infectious disease (Tsuboi et al. 2020).

With this situation in mind, the effectiveness of quarantine depends heavily on outbreak stage and the transmission characteristic (Gostin et al. 2020). Even though the high level of evidence is ideal, if the society faces a greater risk, public health officials may have to use lower level of evidence before imposing coercive measures, such as quarantine (Selgelid 2009).

## 2-3. Known or potential burden of the quarantine

For the quarantine measure, the costs for liberty and self-governance are the most obvious threat to people during quarantine since it imposes a paternalistic compliance (Kass 2001). Their autonomy was threatened during on the board quarantine. Moreover, they were also exposed to physical and psychological risks.

First of all, there was a possibility of getting infected by SARS-CoV-2 despite the government’s attempt to control the disease. Although those who had been infected were sent to hospitals, there was still a chance people remained would get infected. NIID (2020b) reported that the specimen of SARS-CoV-2 on the ship was found mostly from the floor and pillows from passenger cabins. This evidence suggests that the passengers and crews were exposed to the high-risk environment. In addition, those who had underlying medical conditions were facing the greater danger. Their medical supplies such as medications of diabetes or high blood pressure were running out during quarantine and some of them could not receive them for a certain period of time (The Asashi Shimbun 2020b).

Another burden people under quarantine faced was that quarantine placed a tremendous psychological strain on the individuals. People on the ship was under the stress of restricted movement and had to bear the fear of SARS-CoV-2. According to the report from the Disaster Psychiatric Assistance Team (2020), over 100 people were exposed to the severe stress condition and they needed to receive psychological care immediately. The crew members were under the double stress because they had a sense of responsibility as a crew and

anxiety of the infection risk (The Japan Times 2020).

In addition to physical and psychological threats being on the ship, medical workers who have engaged in Diamond Princess response faced on-the-job harassment (The Japanese Association for Disaster Medicine 2020). They performed daily health examination and inspections of the individuals on board, prescription of necessary medications and medical transport of those who were tested positive (Anan et al. 2020). Although their works were essential to the quarantine management, the Japanese Association for Disaster Medicine (2020) reported that some medical workers who were dispatched to the cruise ship were being discriminated. They said at least one of workers had been called an “infection source” or “germs” by their colleagues, and other workers could not go onto the property of hospitals where they work. On top of them, some of their children were being asked to stay home from their kindergartens (The Japanese Association for Disaster Medicine 2020).

#### **2-4. Minimization of burdens**

Kass (2001: 1780) said “if two options exist to address a public health problem, we are required, ethically, to choose the approach that poses fewer risks to other moral claims, such as liberty, privacy, opportunity, and justice, assuming benefits are not significantly reduced.” Therefore, in addition to the effort of minimizing burdens, the Japanese government is required to consider a measure that is the most ethically acceptable. Were there other options in the case of Diamond Princess case?

One possible option would be to quarantine on the land. However, it is important to remind that Yokohama, where the cruise ship arrived at, is the second populated city in Japan. The other possibility was to order home quarantine to those who did not present the symptoms. Quarantine at home is a preferred method to control the outbreak because it is voluntary participation and requires less liberty restriction (Certon and Landwirth 2005). However, in the case of Wuhan, China during COVID-19 outbreak, the high transmission to family members was reported after the home quarantine started (Xu, et al. 2020). Therefore, the home might not work as the segregation facility in terms of protecting people who have not been infected the virus.

Consequently, in order to minimize burdens of quarantine, it is important to maximize the quality of life (QOL) of the passengers and crew members to assure their rights of reasonable lives. To maximize the QOL, the officials must protect passengers and crew members and ensure that they stay healthy including food, water, place to rest, good medical care, sanitary facilities and good hygiene (Nakazawa, et al. 2020).

As for the burden of medical workers, it is important to consider the level of risk that they have to take by going into the cruise ship to save lives of others. This poses the fundamental question in regard to their duties to treat. Even though health care professionals might have a strong moral obligation to serve and accept the extraordinary situations like pandemics (Kotalik 2005), it is by no means the society can disrespect the quality of their lives for the sake of saving the rest of citizens (Pahlman, Tohmo and Gylling 2010). The

society should specify the threshold of duty because risk-taking commitment of health care professionals should not be taken for granted (Selgelid and Chen 2008). If the society requires medical workers to serve their duties, it is the government that has responsibility to support their works so that they can fully engage in their roles without any disadvantages.

### **2-5. Fair implementation of the quarantine**

This part of framework corresponds to the notion of ‘Distributive Justice’, which requires the fair distribution of burdens and benefits in societies (Rawls 1999). Kass (2001: 1781) said neither public health burdens and benefits should be provided disproportionately, and the unfair distribution has to be justified with the scientific data.

NIID (2020a) admitted that they could not isolate everyone to private cabins, and most people stayed in double rooms during quarantine on the cruise ship. Given that the specimens of SARS-CoV-2 were highly found in passenger’s cabins (National Institute of Infectious Diseases 2020b), people who had to use their shared rooms were at higher risk of infection. This shows that the government could not distribute the resources equally, and some people had to sacrifice more than others. However, at the same time, it was impossible to provide a single room to every single people practically considering the number of cabins the cruise ship owned.

As for the screening evaluation, the government could not initially perform COVID-19 testing to all members on board due to the capacity limitation. Thus, they had to prioritize some passengers to allocate the

resource. The priority of the screening was based on age and comorbidities because more than 30% of passengers were over 70 years old. Passengers aged over 80 years prioritize first, followed by those in their seventies and so on (National Institute of Infectious Diseases 2020a). NIID explained that the elderly and people with complications were prioritize because they were more vulnerable to SARS-CoV-2 and the transmission of the virus would cause severe health conditions.

According to “The Difference Principle” proposed by John Rawls in his book, “A Theory of Justice”, those who were advantaged least should receive the greatest advantage (Rawls 1999: 53). In the case of Diamond Princess, people who had to stay in the cabins with negative result of inspections and crew members who were obliged to continue working can be regarded as the least-advantaged in terms of burdens during the quarantine. Therefore, in order to justify the inequality of their rights and liberties, it is also important to further the argument that aims to equally maximize the position of the least advantaged.

### **2-6. Balance between the benefits and burdens of the quarantine**

In a general sense, quarantine must be the last resort in response to the public health emergency because it requires legal, ethical and logistical challenges (Gostin, et al. 2020). It is essential to consider whether benefits of the individuals outweigh their burdens.

In contrast, when the decision has to made in a situation like COVID-19 where little is known about its

risks, authorities might not have enough time to compare and test the all available options. In fact, the Japanese government had initially limited eligibility for the inspections to those who had the symptoms before the quarantine (The Asahi Shimbun 2020a), but they switched to perform the systematic screening inspections after the several confirmed cases on the ship. This suggests that it was difficult for them to evaluate the possible impact of the outbreak on the ship.

There are several researches that have examined the efficacy of quarantine aboard (Zhang et al. 2020; Mizumoto and Chowell 2020; Nishimura 2020; Tsuboi et al. 2020). Although their results are not precisely corresponding, the overall results suggest that the number of confirmed COVID-19 cases on the ship were gradually decreased after the initiation of quarantine. Nishimura (2020) said that the movement restriction led to reducing the case of secondary transmissions on board. Tsuboi et al. (2020) discussed that the set of countermeasures such as the early isolation of infected people, thermometer distribution, the establishment of FCC and the systematic testing may have contributed to the reduction of transmission.

Lastly, Nakazawa et al. (2020) point out that the importance of 'Procedural Justice' in the government's decision of quarantine aboard the ship. Although the epidemiological effectiveness of an intervention was revealed retrospectively, the ethical consideration during quarantine is also significant to make a better decision. The Procedural Justice is a concept that "requires a society to engage in a democratic process to determine which public health functions it wants its

government to maintain, recognizing that some infringements of liberty and other burdens are unavoidable" (Kass 2001: 1781). It opens the discussion on what benefits a society should gain through a public health and why it cannot be obtained by other methods.

### 3. Discussion

This article examined the ethical issue on quarantine in Diamond Princess Cruise Ship by using the public health ethic framework. The argument highlighted that although the human rights of people during quarantine were at stake to some extent, the response of Japanese government included the ethical considerations to maximize the benefits of the individuals on board with the effort of isolation of infected people in the early stage, prioritizing those who were the most at risk and providing the minimum quality of living conditions to passengers. To make the government led intervention better, it is important to proceed the highly burdensome measure like quarantine on the cruise ship with its transparency and accountability. Moreover, the ethical justification for the burdens and benefits of interventions should be prioritize including the principle they base on.

This study has limitations. The whole argument relies on one framework. This might have narrowed the perspective of the evaluation process. In addition, the available data for the analysis was limited, and we could not conduct interviews with those who were involved in this case.

Despite the limitations above, this article may present some insights to the public health work. To our

knowledge, this is the first article that specifically focuses on the quarantine on Diamond Princess Cruise Ship from an ethical point of view. The authors believe that this article provides some insights on quarantine during pandemics and similar situations where the society has to balance the benefits and burdens of quarantine. Nevertheless, the further ethical discussion is warranted to seek the practical measure to maximize the benefits for those who involved the case and overcome unprecedented challenge of quarantine.

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