Webinar Summary: Japan's Response to COVID-19

Professor Oshitani's talk:

Professor Oshitani began his presentation by describing his background, having been involved in WHO responses to various emerging diseases over the years, including in Southeast Asia during the 2003 SARS and 2004 avian influenza outbreaks, in Mongolia and the Philippines during the influenza pandemic of 2009, and in West Africa during the Ebola outbreak in 2014, among others.

The first information on the COVID-19 outbreak was posted on the WHO website on January 5 2020, Professor Oshitani said, and by mid-to-late January scientists knew that the causative agent for the disease was SARS-CoV-2, closely related to the causative agent of the SARS virus of 2003. The National Institute of Infectious Diseases had developed its own PCR system by this time, and distributed limited amounts of the PCR reagent to public health laboratories around the country.

Following the first diagnosed case in Japan on January 15, there were several sporadic cases from mid-January to early February, usually imported from travellers from Wuhan, China. From February 13, a larger number of locally-acquired cases were diagnosed in a range of Japanese prefectures, particularly in the northernmost prefecture of Hokkaido. There was a snow festival at that time in the city of Sapporo in Hokkaido, and it is thought that the spread started from Chinese tourists at this festival, Professor Oshitani said. Cases then spread to very remote areas of the prefecture, but even in these remote places, doctors were able to diagnose the cases early on, demonstrating the good access to healthcare enjoyed almost everywhere in Japan. This first outbreak, triggered by imported cases from China, was almost under control by mid-March.

There followed, however, a sudden increase of infections triggered by cases imported from other countries including the US, the UK and other European countries, as well as Southeast Asian countries. This led to a large outbreak of COVID-19 in Japan from mid-March onwards. At that time, COVID-19 was almost under control in China and Singapore, which had implemented strict testing measures and lockdowns. But PCR capacity in Japan was fairly limited, and restrictions in the legal system meant that strict lockdown measures like those in China were impossible to replicate. Thus, Professor Oshitani said, the government decided to set the objective of maintaining social and economic activities as far as was feasible while suppressing COVID-19 transmission as much as possible, an objective which remained the same at the time of the webinar. From the outset of the epidemic, the government's aim was suppression, rather than containment.

Professor Oshitani said that, based on his experiences dealing with the SARS outbreak in 2003, he could see several similarities between SARS and COVID-19. They are closely related viruses, and both started in Southern China. But there are also a number of significant differences. COVID-19 has spread far more widely: with the SARS outbreak, there were 8,096 cases and 774 deaths worldwide before it was contained in July 2003, while with COVID-19, there have so far been over 170 million cases, with 3.8 million deaths worldwide (as of June 2021), and the pandemic is ongoing.

Furthermore, there are significant clinical and epidemiological differences as well, Professor Oshitani explained. The major difference is in the respective clinical severity of the diseases: most SARS cases had very severe symptoms, with a high fatality rate of roughly 10%. The severity of most cases meant infections and chains of transmission were easy to identify, and consequently easy to interrupt and contain. With COVID-19, however, there are many mild or asymptomatic cases, meaning that it is difficult to identify and interrupt the chain of transmission. Furthermore, the timing of infectivity is different: with SARS, infected individuals are not infectious during the early stage of the illness, but only when they have severe symptoms, meaning possible infectivity will be obvious and therefore easily avoided through isolation measures. But in the case of COVID-19, infected

individuals are infectious from the early stages of the illness before any symptoms become apparent, meaning individuals are likely to spread the disease before they realise they have it. This is another reason why it has been so difficult to contain.

By mid-February 2020, Japanese scientists had already identified from preliminary data an important epidemiological characteristic of COVID-19, which is that most infected individuals do not pass on the virus, but rather a small proportion of individuals pass on the virus many times at super-spreader events, leading to large clusters of cases. In turn, these clusters lead to further clusters, causing a large outbreak. These are the conditions in which large outbreaks occur.

Professor Oshitani said that Japan had been taking a different approach to contact tracing from most other countries. The majority of countries have been using 'prospective' contact tracing, which tracks the contacts of confirmed cases to see if there are any symptomatic or positive cases among the infected individual's close contacts after the point of identification. Japan has also been engaging in 'retrospective' contact tracing: in this technique, health professionals analyse an infected individual's activities over the two weeks before identification, attempting to ascertain the cluster or common source of infection for this individual. Using this meticulous contact tracing method, health professionals were able to identify many clusters which had led to large numbers of cases, which allowed for the identification of subsequent transmission chains.

Common characteristics of the clusters were also identified, Professor Oshitani went on, and were detailed in a public health message. The public were warned to avoid the 'Three Cs' – closed spaces, crowded places, and close contact settings. Further risk factors were identified, including singing, indoor exercise, and nightlife settings, as clusters had been found in bars and karaoke venues. Furthermore, it was identified that more than 40% of COVID-19 clusters were caused by individuals in the pre-symptomatic period, which makes controlling the spread of the disease very difficult.

The first wave occurred in March 2020, Professor Oshitani said, and the Japanese government declared a state of emergency on April 7, leading to a decrease in cases. After that, cases increased from mid-June, leading a second wave in the summer. The wave started from clusters in the large nightlife areas in Tokyo, particularly from host and hostess bars with big crowds. This meant that many of the infected individuals were young people in their 20s and 30s. This caused problems because patrons of host and hostess bars are usually not open and honest about their attendance at such establishments, meaning retrospective contact tracing is more difficult without accurate information. Because many of the infected cases were young people, they often had only mild or even asymptomatic responses to the illness, adding further difficulties to contact tracing. From the nightlife areas, the virus spread to households, workplaces, schools, hospitals, and so on. Then the third wave struck at the end of November, and a second state of emergency was declared on January 7 2021. But cases increased again in the spring, and Japan is currently under its third state of emergency.

The data show that cases are mainly focused in metropolitan areas, with more than 20% of Japan's cases occurring in Tokyo. Professor Oshitani explained that in other prefectures, there have been far smaller numbers of cases than in the metropolitan areas, except for Okinawa Prefecture (the island chain at the southern end of the Japanese archipelago) which has a high rate of cases due to large numbers of tourists from metropolitan areas like Tokyo and Osaka.

Professor Oshitani explained that the challenge the Japanese government faced was how to limit the spread of COVID-19, especially in big metropolitan areas, given that the legal system in Japan does not give the government the power to implement strict lockdowns like those imposed in other countries. In effect, the state of emergency was more of a request to the public to change their behaviour and avoid risky environments, rather than an enforceable set of rules. In fact, Professor Oshitani said,

many people had already been changing their behaviour voluntarily before the state of emergency was called, probably as a response to news reports of increasing cases and struggling hospitals. The relatively low mortality rate in Japan depended on the initiative of the Japanese people and their compliance with the government's 'request', rather than obedience to a strict legal lockdown.

The big concern coming up is the mass gathering events in Tokyo, the Olympics and Paralympics, Professor Oshitani said. On the morning of the webinar, the COVID-19 expert committee had presented its risk assessment framework to the government and Olympic committee, expressing its concerns about the scheduled events. Many countries around the world are experiencing alarming rises in cases, particularly as the Southern Hemisphere goes into its winter. Many countries also do not have access to vaccines, particularly in Africa, where even healthcare workers are frequently unvaccinated, due to a serious vaccine disparity between wealthy and poor nations. This is not only a problem for Japan, but also for the countries with limited vaccine access, which could be at risk if athletes bring back the virus from Japan having contracted it at the Olympic Games.

Furthermore, there are now a number of dangerous variants emerging, including the Delta variant, which originated in India and is now spreading in Japan. Although the state of emergency had recently been lifted in Tokyo, cases were comparatively high, at over 400 per day. Preliminary data from the UK suggest that the Delta variant is even more infectious than other strains, such that there is a real possibility of a large outbreak in Tokyo even before the opening ceremony of the Olympics. Professor Oshitani concluded by predicting that Tokyo would probably have to go back into a state of emergency around the time of the Olympics to contain the spread of the virus.

Conversation between Professor Oshitani and Professor Brunner

Professor Brunner: Could you explain the specific aspects of behaviour in Japan that have led to very low numbers of cases and rates of infection?

Professor Oshitani: As mentioned earlier, Japan was constrained by its legal system from imposing a strict lockdown, and also due to privacy laws was unable to track people's whereabouts via their mobile phones. Thus, the government had to rely on voluntary change from its citizens. Though it was a challenge to get young people to change their behaviour, there is very strong peer pressure in Japanese society. Therefore, when there were trends of increasing cases and high numbers of severe cases of hospitalisation, many in Japan felt pressured by society into changing their behaviour to reduce the chances of infection.

I strongly believe that the resilience of local people is key in responding to this kind of emergency. People in Japan are used to many natural disasters – volcanoes, typhoons, earthquakes, tsunamis, and more. Local people across Japan are consequently very resilient, and are trying to find the best solution to this new danger.

Professor Brunner: It is clear that Japanese people responded to the data and the pattern of the epidemic. Is it also possible that Japan is somehow sensitised to the dangers of epidemics through the SARS pandemic of 2003?

Professor Oshitani: Some other Asian countries changed their mindsets after domestic outbreaks of SARS in 2003, but in fact Japan had no confirmed cases of SARS. South Korea even changed its legal system after an outbreak of Middle East Respiratory Syndrome (MERS) in 2015. But Japan has not had a comparable epidemic in the last two decades, so has not changed its mentality in this way.

Professor Brunner: Japan has a remarkably low death rate compared to many other countries. Why is this?

Professor Oshitani: One reason for the low death rate is the comparatively low incidence of transmission and cases in Japan. Furthermore, there is good access to healthcare almost everywhere in Japan, as well as good communication and knowledge-sharing among doctors in the clinical network, allowing for effective improvement of treatment.

Professor Brunner: Are data available on rates of hospitalisation in Japan?

Professor Oshitani: There are several systems monitoring hospitalisation rates, as well as the number of patients in intensive care and those who require ventilation, which post data on the Ministry of Health, Labour and Welfare's website every day.

Professor Brunner: The vaccination rate in Japan is currently about 16%, compared to about 60% in the UK. Could you give us a brief update on the vaccination situation in Japan?

Professor Oshitani: The first challenge was in the procurement of the vaccine. Although several pharmaceutical companies in Japan are trying to develop their own vaccine, currently the only available fully-tested vaccines are imported products, which it took the government some time to procure. Another issue was the time it took to license the vaccine. Furthermore, many Japanese people are very cautious about vaccines – the roll-out of the HPV vaccine for young girls has been highly curtailed by public concerns, for instance. This hesitancy, combined with the relatively low mortality rate, has meant that Japan has been cautious in its implementation of the vaccine programme.

Professor Brunner: How is the world to understand the Japanese public health debate around holding the upcoming Olympics?

Professor Oshitani: Although COVID-19 cases are decreasing in Japan, they are still high, particularly in Tokyo. It is a serious challenge to control the spread of COVID-19 in metropolitan areas, especially Tokyo, and the previous outbreaks and waves spread to the rest of Japan from Tokyo. So our concern is that an outbreak in Tokyo as a result of the Olympics would spread to many other prefectures. The data last year also showed that transmission increased during the summer, with infection rates rising tenfold from mid-June to late July in Tokyo. Because of the hot and humid nature of the summer weather, many people stay inside (where there is air-conditioning) which may lead to more transmission of the virus. Thus, summer in Tokyo is already a dangerous time for viral transmission, even without the Olympics.

Professor Brunner: Why is the testing rate in Japan relatively low?

Professor Oshitani: One reason is that we are not testing old people, just people we believe to have a high probability of positivity. Furthermore, we have kept COVID-19 at relatively low levels despite the low rate of testing. We believe that testing alone does not help much in minimising the spread of COVID-19, but that it is more important to identify clusters of COVID-19 infections early.

Q&A session with the audience

Guest: Is there a threshold level of infections at which Japan is likely to ease immigration restrictions? And is there any plan to allow fully vaccinated individuals to enter Japan, perhaps using vaccine passports?

Professor Oshitani: The government is currently considering the use of vaccine passports, although I do not know what conclusion they will reach. But many of the domestic spikes in the disease correlated closely with imported cases, so I think we have to be very careful about opening the borders.

Guest: Now that the highly infectious Delta variant is spreading in Japan, do you think there will be a sharp pick-up in infections – perhaps a fourth wave?

Professor Oshitani: According to our projections, the Delta variant could lead to a significant COVID-19 outbreak by the end of July, which is one of our main concerns regarding the Olympics. We don't yet know how big the impact of the variant will be on COVID-19 transmission in Japan, but it is a serious possibility that it could contribute to a sharp increase in cases.

Guest: Japan's hospitals were almost overwhelmed by COVID-19 despite the relatively low number of cases. What shortcomings do you think this has revealed in Japan's healthcare system?

Professor Oshitani: One problem is that many hospitals in Japan are privately run, and initially some of these private hospitals were not willing to accept COVID-19 patients because of financial concerns, although this is now becoming less common. Another problem was that hospitals were trying to accommodate even the less severe cases, which led to them being overwhelmed, particularly during significant spikes in infection.

Guest: Is it the case that there is less 'intimate contact' between young Japanese people than those in other countries, and that this is one reason why the virus has been spreading less widely?

Professor Oshitani: I am not sure how much difference there is between Japan and other countries regarding 'intimate contact' among young people, but it is documented that young people's social patterns are different, which may affect transmission patterns. The data suggest that COVID-19 transmission occurs mainly between people of the same sex in Japan, even among young people, and it seems that transmission of COVID-19 is usually through coughs or sneezes in closed settings, rather than 'intimate' settings.

Guest: COVID-19 is especially dangerous for older people, and so it is perhaps surprising that there has been such a low mortality rate in Japan given the very large proportion of elderly people in the country. What might be the reasons for this?

Professor Oshitani: There are probably a number of factors. Although there have been outbreaks in nursing home settings, there have also been efforts to reduce such outbreaks through extensive testing, limiting visitor numbers, and precautionary measures among staff. Furthermore, elderly people in Japan tend to be very cautious, and this was true at the beginning of the pandemic before many others were worried; self-imposed distancing measures among this age group may be another factor.