Addendum

Japan's cluster-based approach

○ Counter-cluster measures concern conducting an active epidemiological investigation to ascertain the origin (source of infection, etc.) of the cluster of infections (outbreaks) and to take measures promptly so that the further spread of infections can be minimized and delayed. In Japan, it is believed that effective counter-cluster measures led to the following results.

(i) **Large-scale spread of infection** caused by a chain of clusters of patients **was prevented**.

(ii) **Common sources of infection (the environment of 3Cs – closed spaces, crowded places, and close-contact settings) were identified** through early, proactive epidemiological investigation. By raising awareness of these sources alongside additional factors such as singing and talking loudly, we were able to **effectively deliver a message to citizens about avoiding as much as possible environments where clusters of infected patients (outbreaks) can occur**.

(iii) By tracing the links of each infected person with a focus on clusters, the **epidemic situation in each region was estimated more accurately**. In other words, an increase in the number of "sporadic cases" whose links could not be traced was considered to indicate the spread of infection in a certain region, and this approach **led to the early strengthening of regional measures**.

○ That said, two characteristics should be noted.

(1) The spread of infection from China (the first wave) and the spread of infection from Europe, etc (the second wave) were detected early.

○ In the first epidemic wave from January to February which originated in China, 149 cases of infections were reported in Japan by February 25, including clusters of infected patients (outbreaks)[1] as a result of the counter-cluster measures implemented by public health centers.

Cumulative No. of cases	Japan	Germany	France	UK	US	Italy	S. Korea	Taiwan
As of Feb. 18	60	15	12	9	15	3	31	22
As of Feb. 25	149	15	12	13	53	229	892	30

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[1] (Source) Created based on the following website for countries other than Japan:
https://ourworldindata.org/

○ One factor behind such early reporting was that in preparation to host the Olympic and Paralympic Games, the concerned authority revised the criteria for suspected disease surveillance for early detection of unknown infectious diseases and called for early and broad reporting of suspected cases.

○ Meanwhile, in developed countries such as European countries and the US (excluding Italy where a serious local epidemic had already begun), as shown in the table above, few domestic infection cases had been detected at that point of time.

○ In reality, however, considerable spread of infection may have been already occurring beneath the surface in these countries, but the infections were not detected. By the time the infections were noticed, a rapid spread of infections had been exploded in Europe and the US after mid-March onward.

○ A **reason behind Japan's early detection of infection** was that **medical care is easily accessible** in Japan even in rural areas, and when an infectious disease such as COVID-19 was suspected due to a fever, respiratory symptoms, etc., doctors **performed chest x-rays, CT tests, as well as PCR tests, resulting in the early detection of infection**.
In fact, the first domestic case, which was confirmed on January 16, was found by a doctor who suspected infection and conducted a PCR test at his descretion.

(2) Effective counter-cluster measures were taken.

○ As described in (1), Japan succeeded in detecting new infections and clusters of patients earlier than other countries. By gathering these cases, the Expert Meeting **recognized from early on** [2] that this infectious disease has the characteristic that **approximately 80 percent of the people who are confirmed to be infected**, regardless of illness severity, **do not infect anyone else**, and that the characteristics clearly differ from those of the influenza virus, which is transmitted to others by many of those infected.

○ In other words, we had the perspective that this infectious disease spreads mainly by forming clusters, and that **by suppressing the clusters**, the **spread of infection could be considerably reduced** (as far as counter-cluster measures are taken).

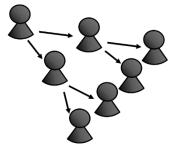○ Additionally, analyses of early active epidemiological investigations **enabled us**

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[2] The Expert Meeting showed this view publicly on March 2.

to analyze the settings in which clusters are likely to occur, **leading to the discovery of the effective measures of avoiding the "3Cs,"** which other countries did not recognize.
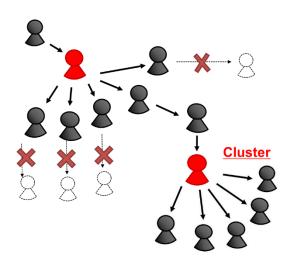
Characteristics of COVID-19 transmission

○ **Influenza** (H1N1 in 2009)
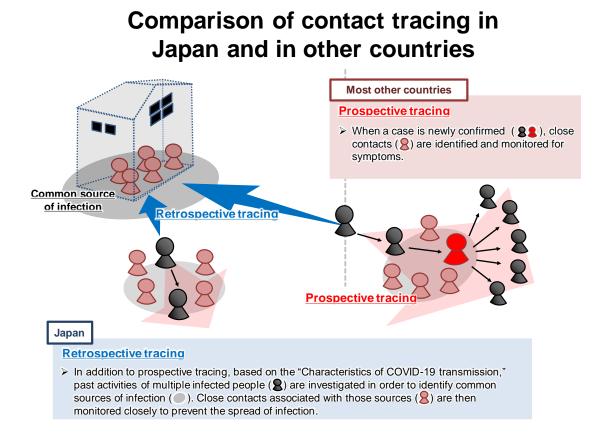
One infected person infects one or more people.

○ **COVID-19**

Regardless of illness severity, **four out of five (approx. 80%) infected people (👤) do not infect anyone else.** **The remaining one (approx. 20%) infects someone else, and an even smaller minority infects multiple people (👤), leading to the formation of clusters**

○ Contact tracing in other countries is "prospective" tracing, which begins with newly confirmed cases, identifies close contacts, and searches for future infection cases.

○ Japan performed such tracing too, but in Japan, based on the characteristics of this infectious disease, especially **when multiple infected people have been observed**, we additionally **focus on identifying common sources of infection**. In other words, when infected people were discovered, common sources of infection were identified retrospectively, which led to the early discovery of the concept of the "3Cs" that were common to such sources of infection. Additionally, from early on, emphasis was placed on conducting proactive epidemiological investigations thoroughly for those at the common source. Such retrospective tracing was based in part on investigation methods traditionally used by public health centers for tuberculosis patients, etc.

○ In other words, Japan's measures are characterized by the aim to go back to the source of infection based on retrospective tracing so that the subsequent chains of infection are not missed. As a result, Japan focused on (i) identifying the

source of infection early, (ii) identifying those associated with the source of infection early, and consequently (iii) providing medical care early, which (iv) led to making early efforts against the spread of infection.

Comparison of contact tracing in Japan and in other countries

Most other countries

Prospective tracing
➤ When a case is newly confirmed (👥), close contacts (🧍) are identified and monitored for symptoms.

Common source of infection

Retrospective tracing

Prospective tracing

Japan

Retrospective tracing
➤ In addition to prospective tracing, based on the "Characteristics of COVID-19 transmission," past activities of multiple infected people (🧍) are investigated in order to identify common sources of infection (⚫). Close contacts associated with those sources (🧍) are then monitored closely to prevent the spread of infection.

○ As mentioned above, in Japan, **by tracing the links of each infected person with a focus on clusters, the epidemic situation in each region was estimated more accurately**. In other words, an increase in the number of "sporadic cases" whose links could not be traced was considered to indicate the spread of infection in a certain region, and this approach led to the early strengthening of regional measures.

○ Meanwhile, based on genetic analysis, the cases that entered from abroad are known to have largely influenced the spread of infection in Japan. Thus, **as a result of cases entering from abroad at a larger scale, many sporadic cases occurred in different regions** as the second wave from Europe, etc. In the surge of the number of new infections, such sporadic cases whose links could not be traced were also increased rapidly, which made a response based on the declaration of a state of emergency became unavoidable on April 7.