COVID-19 Special Issue 3

# Introduction of the 9-1st Edition of the COVID-19 Response Guidelines

**Sookkyung Park[1], Beuniel Ko[1], Sunja Kim[1], Yonehee Kim[1], Donghoon Min[1], Minu Yeom[1], Haewon Lee[1], Eunhee Cho[1]**
[1]Guideline Management Team, Central Disease Control Headquarters

## Abstract

Due to the rapid global spread of coronavirus disease 2019(COVID-19), many countries adopted various strategies and developed interim guidelines to reduce the transmission of severe acute respiratory syndrome coronavirus 2(SARS-CoV-2), the strain of coronavirus that cause COVID-19. Likewise, Korea revised its guidelines based on trend in patient outbreaks, related policy changes, resource storage status, and scientific evidence. However, SARS-CoV-2 is a new strain of coronavirus that had not been previously identified in humans. Accurate information about the virus was unavailable, and no effective vaccine or treatment, so continuous management and response preparation were necessary.

This article presented the interim set of guidelines for staff at local and state health departments based on what was known about COVID-10. One major revision was the case definition, which was formulated on current available information and revised as new information was gathered. For example, COVID-19's timeline and spread was traced from the Huanan seafood market to the province of Hubei to mainland China and finally, to nations outside of China.

The guidelines included response systems for COVID-19 control, case definitions, reporting systems for COVID-19 cases, epidemiological investigations, response management for patients under investigation (PUI), and for confirmed and suspected cases, as well as death, laboratory, environmental and resource management. The guideline's appendix and frequently asked questions(FAQs) provided additional information needed to respond to COVID-19 in the field.

This article recommended that, to defeat COVID-19, countries must make a concerted and determined approach to prepare and, respond.

**Keywords :** COVID-19, response guideline

# Introduction

Patients with pneumonia from an unknown cause were first identified in Wuhan, China in December 2019, after which a new coronavirus was isolated in China on January 7, confirming the emergence of a novel coronavirus disease. Starting in Thailand on January 13, patients with the novel coronavirus were reported in countries outside of China, including Japan and South Korea, through travel. The World Health Organization (WHO) declared an Public Health Emergency of International Concern (PHEIC) on January 30. The WHO named this novel coronavirus disease, which was first reported in Wuhan, China, as coronavirus disease 2019 (COVID-19) on January 11, and the International Committee on Taxonomy of Viruses named the novel coronavirus as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In South Korea, the disease has been referred to as coronavirus disease-19 (corona19) since February 12. As COVID-19 spread rapidly in other countries, the WHO declared

it to be a pandemic on March 11. Currently (as of Aug. 31 10 AM CET) 25,085,685 cases have been reported from 216 countries and regions, with 843,927 deaths (WHO webpage).

Since the first case was reported in South Korea on January 20, 2020, the spread of COVID-19 led to the announcement of crisis alert level 4 and the implementation of social distancing measures. As of midnight on Aug. 31, 19,947 cases have been reported, including 324 deaths. Sporadic infections in the community have been regularly reported.

The Korea Centers for Disease Control and Prevention distributed a document entitled "Information on the response procedure to pneumonia from unknown cause in Wuhan, China (for local governments)" on January 4 when the government recognized the cluster of pneumonia cases with no known cause in Wuhan, China. The guidelines have been continuously revised according to case trends, changes in policy, and changes in the response situation both domestically and internationally.

This article presents the main changes in the guidelines so far and the main content of the "COVID-19 response guidelines (9-1st edition) (for local governments)."

# Result

## History of establishment and revisions to the guidelines

Table 1. Major revision of case definition(1st–4th edition)

| | Suspected case | Patient under investigation(PUI) |
|---|---|---|
| 1st (Jan. 4) | · A person who develops **a fever or severe respiratory symptoms** (e.g., pneumonia) within 14 days of visiting the Huanan seafood market | · A person who develops **a fever or respiratory symptoms** (e.g., cough, shortness of breath, etc.) within 14 days of visiting the **Huanan seafood market**<br>· A person who develops **a fever or severe respiratory symptoms** (e.g., pneumonia) within 14 days of visiting **Wuhan** |
| 2nd (Jan. 8) | · A person who develops **pneumonia or symptoms of suspected pneumonia** (e.g., shortness of breath with fever) within 14 days of visiting the Huanan seafood market | · A person who develops **a fever or respiratory symptoms** (e.g., cough etc.) within 14 days of visiting the **Huanan seafood market**<br>· A person who develops **pneumonia or symptoms of suspected pneumonia** (e.g., shortness of breath with fever) within 14 days of visiting **Wuhan** |
| 3rd (Jan. 17) | · A person who develops pneumonia or **symptoms of suspected pneumonia** (e.g., shortness of breath with fever) within 14 days of visiting Wuhan<br>· A person who develops the following symptoms within 14 days of contact with a confirmed case during the confirmed case's symptomatic period<br>– **a fever or respiratory symptoms** (e.g., cough etc.), pneumonia or **symptoms of suspected pneumonia** (e.g., shortness of breath with fever) | · A person who develops **a fever or respiratory symptoms** (e.g., cough etc.) within 14 days of visiting Wuhan |
| 4th (Jan. 27) | · A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of visiting Hubei province | · A person who develops **pneumonia** within 14 days of visiting **Mainland China** |

From the 1st edition (published on January 4) to the 4th edition (published on January 28), the main content of the guideline was case definitions for reporting and response. The case definitions were updated according to changing epidemiological information. The epidemiological relationships of suspected cases and PUI (patient under investigation) were expanded from initial visits to the Huanan Seafood Market to Wuhan, and eventually Hubei Province and China as a whole.

After the crisis alert level was raised to level 3 ("Orange") in South Korea and the WHO announced an Public Health Emergency of International Concern (PHEIC), guidelines regarding testing, isolation, release from isolation, and contact tracing were included in the 5th edition (published on February 6)

Definitions of PUI were re-added to the 6th edition (published on February 19) in order to detect cases early, so the population eligible for testing expanded. Specific guidelines on patients who require hospitalization and evidence for infectious disease control measures and disinfection were clarified as well.

In the 7th edition (published on March 2), details on epidemiological investigations, release from isolation, and the

Table 2. Major revision of case definition(5th–8th edition)

| | Suspected case | Patient under investigation(PUI) |
|---|---|---|
| 5th (Feb. 6) | · A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of visiting Mainland China<br>· A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of contact with a confirmed case during the confirmed case's symptomatic period<br>· A person who is suspected of having COVID-19, according to a physician's judgement | - |
| 6th (Feb. 19) | · A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of visiting Mainland China (including HongKong, Macau)<br>· A person who has unknown pneumonia that requires hospitalization according to a physician's judgement | · A person who develops a fever or respiratory symptoms (e.g., cough, etc.) within 14 days of visiting countries, territories or areas with reported COVID-19 cases<br>· A person who is suspected of having COVID-19, according to a physician's judgement |
| 7th (Mar. 2) | · A person who develops a fever or respiratory symptoms (e.g., cough, shortness of breath, etc.) within 14 days of contact with a confirmed case during the confirmed case's symptomatic period | · A person who is suspected of having COVID-19 (unknown pneumonia etc.), according to a physician's judgement.<br>· A person who develops a fever or respiratory symptoms (e.g., coughing, shortness of breath, etc.) within 14 days of visiting countries with local transmissions of COVID-19<br>· A person who develops a fever or respiratory symptoms (e.g., cough, shortness of breath, etc.) within 14 days and is epidemiologically related to domestic COVID-19 outbreaks |
| 8th (May 18) | · A person who develops symptoms within 14 days of contact with a confirmed case during the confirmed case's symptomatic period<br>· Main symptoms: fever, cough, shortness of breath, chill, myalgia, headache, sore throat, loss of taste/smell sense, or pneumonia etc. | · A person who is suspected of having COVID-19, according to a physician's judgement<br>· A person who develops symptoms within 14 days of overseas travel<br>· A person who develops symptoms within 14 days and is epidemiologically related to domestic COVID-19 outbreaks |

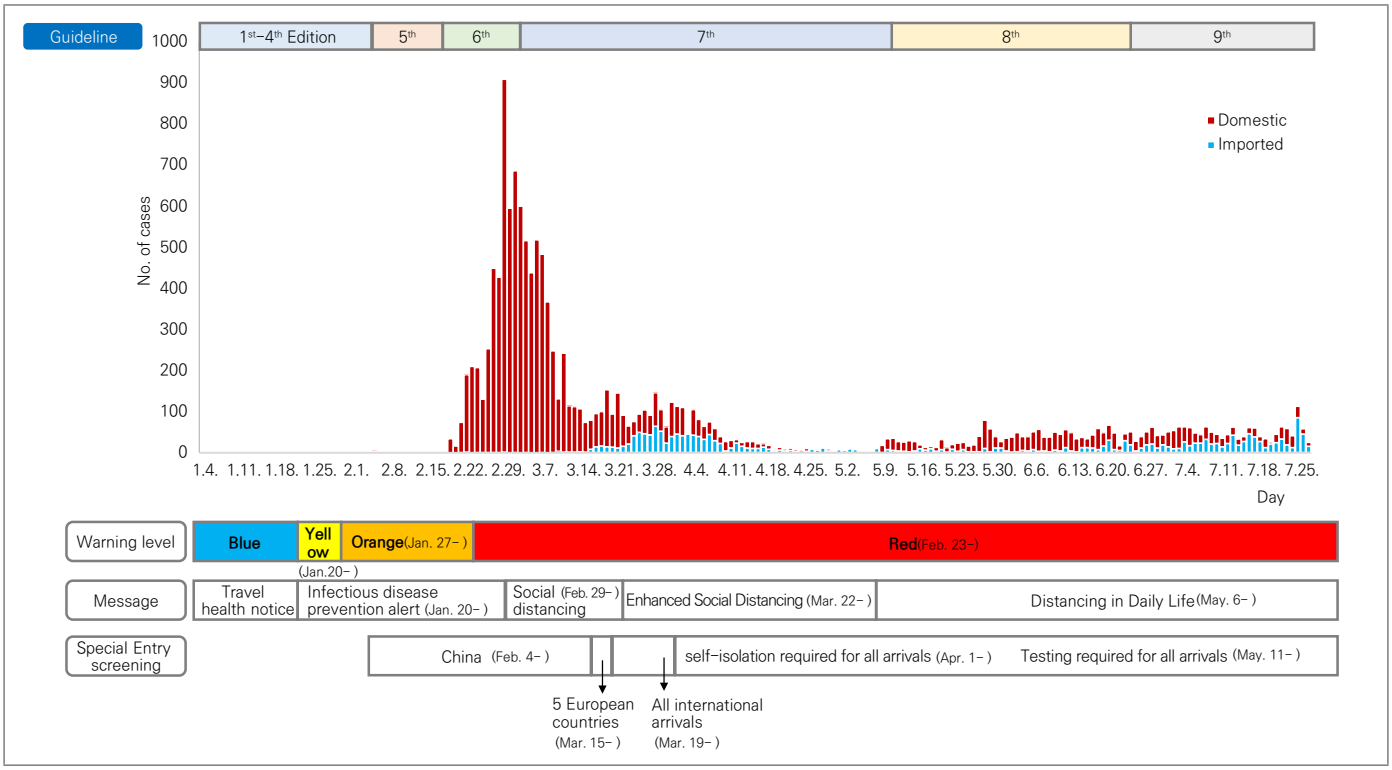


Figure 1. COVID-19 in South Korea (–July 27, 2020)

isolation period were specified after the crisis alert level was raised to level 4 (“Red”), and principles regarding strengthening the management of confirmed cases and the protocol to be followed after death were added. The guideline for release from isolation was updated in the 7-1st edition (published on March 6), according to which asymptomatic positive cases are released from isolation 3 weeks after a positive test result if clinical improvements are observed without additional testing requirements. Criteria and implementation guidelines regarding the range and method of isolation in communal facilities (cohort isolation) were added to the 7-2nd edition (published on March 12), and the previous guideline regarding release from isolation upon clinical improvement without testing was removed. Instead, the testing requirement for contacts of confirmed cases before release was expanded to include co-residents (family members living together) in the 7-3rd edition (published on March 15). A self-management mobile application was added to the methods of monitoring individuals in isolation in the 7-4th edition (published on April 2), and guidelines for managing PUI in the screening process were also added. In the same edition, the definition of contacts was expanded from those in contact 1 day before the onset of symptoms to contacts within 2 days before symptom onset, and guidelines to manage at a port of entry(POE) were strengthened.

The range of clinical symptoms expanded to include loss of taste and smell in the 8th edition(published on May 11), and monitoring guidelines were strengthened for community outbreak situations. The testing requirement for contacts of confirmed cases before release was expanded from coresidents and medical staff to include residents and workers of residential care facilities and students and teachers.

Guidelines for release from isolation based on clinical progress were added to the release guidelines based on testing in the 9th edition (published on June 25), and the process for transfers was improved in order to ensure efficient supply of hospital beds when the number of cases spikes. Moreover, the testing requirements for contacts of confirmed cases before release were expanded to those over the age of 65, and a new clause was added, allowing a caretaker to be isolated with children, those with mobility issues, and those with mental health issues.

## Main content

The Korea Centers for Disease Control and Prevention designated COVID-19 as a "Class 1 infectious diseases-emerging infectious disease syndrome" for its response and is updating its guidelines after professional consultation from related academic and other professional groups based on the national and international literature, guidelines, epidemiological data, and response process according to policy directions.

The main content of the current 9-1st edition of the COVID-19 response guidelines is as follows.

### A. Response system

In order to prevent the spread of infectious disease through the early detection of cases, rapid epidemiological investigations, and management of patients and contacts, central organizations such as the Central Disaster and Safety Countermeasure Headquarters (Prime Minister), Central Disaster Management Headquarters (Ministry of Health and Welfare), Central Disease Control Headquarters (Korea Centers for Disease Control and Prevention), and the Pan-government Countermeasures Support Headquarters (Ministry of Interior and Safety) were established, and each organization is executing its specific tasks. Local governments have also organized rapid response teams and patient management teams in preparation for cases while performing tasks such as situation evaluation, epidemiological investigations, field control, and management of local medical personnel and resources.

### B. Definition of cases and person with suspected exposure to an infectious diseases

Case definitions are written according to the results of epidemiological investigations, and the scale of the outbreak in South Korea, and the legal definition of a person with suspected exposure to an infectious diseases is also included.

Cases refer to those with a confirmed infection of the pathogen responsible for the disease based on testing regardless of clinical symptoms. Suspected cases are those who experience clinical symptoms of COVID-19 within 14 days of contacting a case. PUI refer to cases with clinical symptoms of COVID-19 who have an epidemiological relationship based on a doctor's opinion, a history of overseas travel, or a community outbreak. The main clinical symptoms are fever, coughs, difficulty breathing, chills, muscle aches, sore throat, loss of smell and taste, and pneumonia. A person with suspected exposure to an infectious diseases is defined as those who have or are suspected to have come into contact with patients, probable cases, and those who have the pathogen or those who are suspected to be infected due to risk exposure from staying or transferring through areas managed under the quarantine law.

### C. National Infectious Diseases Reporting System (NIDS)

According to law infected cases should be reported by the medical institution that first identified the patient through this system based on the case definition criteria (test results, contact with cases, clinical symptoms, and epidemiological relationships). The initial report form includes infection-related information such as personal information, date of symptom onset, date of testing, and hospitalization; hospitalization information; and suspected infection region, which is additionally confirmed by local health centers. PUI not included in the current law are also checked through data reported in the current system.

### D. Management of port of entry (POE)

The need to strengthen the management of entries from abroad increased as cases of COVID-19 spread throughout the world, including Europe and the United States. In the process of entry, symptomatic persons and asymptomatic persons are handled after they are checked for a fever and they submit health status questionnaires. Symptomatic persons are tested while they are temporarily quarantined at the quarantine office. Asymptomatic persons and those who test negative are isolated for 14 days at home or at isolation facilities after downloading a mobile monitoring application. All entries should be tested within 3 days of entry.

### E. Epidemiological investigations

According to the law on infectious disease prevention and control, the community health center that first identifies the case carries out contact tracing with the guidance of the city or province rapid response team after notifying the case. Close contacts of cases, such as family members, coresidents should first be isolated at home. When there is exposure at hospitals or

Table 3. Change in the Isolation Release Criteria for the Confirmed Cases

| Previous release (Edition 8-1) | Latest release (Edition 9) |
|---|---|
| 【Standards for isolation release of asymptomatic confirmed cases】<br><br>① Two consecutive negative results from PCR tests taken at least 24 hours apart, on the 7th day after the case was confirmed<br>② If the result of the PCR test is positive on the 7th day after the case was confirmed, the next test date should be 7 days after the last test(i.e. 14 days from the confirmed date)<br>→ If the result is positive, the next test date should be determined by medical staff<br>→ Two consecutive negative PCR results at least 24 hours apart | 【Standards for isolation release of asymptomatic confirmed cases】<br><br>Must meet ONE of the following conditions:<br>① Symptom based: 10 days have passed since the case was confirmed, and no clinical symptoms during this period<br>② Test based: 7 days have passed since the case was confirmed, and two consecutive negative PCR test results(after the 7 days) at least 24 hours apart |
| 【Standards for isolation release of symptomatic confirmed cases】<br><br>Must meet BOTH of the following criteria, after at least 7 days since onset of illness<br>1) Not taking antipyretic, no fever and improvement of clinical symptoms, AND<br>2) Two consecutive negative PCR results at least 24 hours apart | 【Standards for isolation release of symptomatic confirmed cases】<br><br>Must meet ONE of the following conditions:<br>① Symptom based : 10 days have passed since onset of illness, and for at least 72 hours after, meet BOTH of the following criteria:<br>1) No fever without antipyretic<br>2) Improvement of clinical symptoms<br>② Test based: 7 days have passed since the onset of illness, AND no fever without antipyretic and improvement of clinical symptoms, AND afterwards, two consecutive negative PCR test results at least 24 hours apart |

* Polymerase chain reaction (PCR)

communal facilities, a risk exposure situation evaluation should be carried out, and when necessary, epidemics control officers can investigate the case's detailed routes of movement and plan to test every contact according to the applicable regulations. Epidemiological investigations of hospitals or communal facilities can result in temporary closure, disinfection, investigation and classification of contacts, and management and monitoring of contacts based on the city or province epidemics control officer's or epidemiological investigator's investigation of the case's activities in the 14 days before symptom onset and assessment of the risk level.

### F. Responses to confirmed cases, suspected cases, and PUI

The main responses include monitoring of isolated persons, isolation and hospitalization, release from isolation, and the procedure to follow if the case tests positive again on PCR after release from isolation.

- Suspected cases must undergo 14 days of isolation from the contact date even if the test results are negative.

- For PUI, international travel records are checked through systems at screening centers, and an examination and test are conducted after understanding the individual's history of international and domestic travel, contact with cases, and clinical symptoms through history-taking.

- When hospitalization of cases is required, the severity of the case and hospital bed capacity should be checked before hospitalization. When hospitalization is not required or when a hospitalized patient meets the discharge criteria, treatment can continue at a residential treatment center. At these centers, attending medical staff monitor symptoms twice a day.

Starting in the 9$^{th}$ edition, clinical symptom-based criteria for release from isolation were added to the existing testing-based criteria, so release from isolation is possible when either clinical progress occurs according to the responsible doctor's discretion or the testing criteria are met.

- When a doctor decides that a patient can be transferred to another hospital or ward, or to a residential treatment center, based on the patient's status, inpatient treatment notice should be re-issued. If the patient refuses, fees (out-of-pocket and required items not covered by national health insurance) that are incurred from the day after the re-issuing of inpatient treatment notice is not covered as isolation hospitalization fees and need to be paid by the patient.

- Contacts of cases must isolate at home if no COVID-19 symptoms are present and are released from isolation 14 days after the date of contact with the case. Even if the initial test result is negative, isolation at home and active monitoring continue for 14 days. Those who work in medical facilities, live or work in social welfare residential facilities, students and teachers, coresidents of cases, and those who are older than 65 need to be tested on the 13$^{th}$ day of isolation to confirm negative results before being released from isolation at noon on the 14$^{th}$ day.

### G. Management of deaths

In order to prevent spread of theinfection, information about immediate and effective management of the bodies of deceased individuals who were confirmed to have COVID-19 should be given, along with funeral support. The protocol for the deceased with COVID-19 is cremation, and support is provided for management of the body and the funeral after discussion with the family. The local government covers funeral-related costs for COVID-19 related death according to the infectious disease prevention and control law.

### H. Management of laboratory testing

Sample collection for confirmatory testing is conducted in a dedicated space at screening centers or separated from other spaces in the hospital. A sample is collected from the upper respiratory tract, and when cough and sputum present, a sample is also collected from the lower respiratory tract. The collected sample is placed in a medium for virus transportation and sent to a designated testing facility with the infectious disease testing request form. The institution that requested the test is notified of the results, and the hospital that receives the test results inputs and reports the results through the national infectious disease reporting system.

### I. Management of the environment

Information about the immediate and appropriate disinfection of communal facilities, public facilities, and other spaces occupied (lived in) by the patient is provided. Disinfectants approved and registered with the Ministry of Environment should be selected, and information about the amount to use, directions for use, and precautions for each product should be given so that users can follow the appropriate protocols. Appropriate disinfection involves first, adequate ventilation so that pathogens in the air can be expelled, second, cleaning the walls within arm's reach and all frequently-touched surfaces with a cloth(fabric, etc) wet with the prepared disinfectant, leave it for 10 minutes at least, and then wipe it with a cloth dampened with clean water. The method of spraying the disinfectant should not be applied to the disinfection of surfaces, because it increases the risk of generation and inhalation of infectious aerosols, and its disinfecting effect is insufficient due to the unclear scope of contact between the disinfectant and applied surfaces. Spraying of disinfectant is not recommended since the risk of inhaling pathogen-containing aerosols increases and the contact range is not clear. Personal protective equipment should be worn according to the appropriate precautions, the locations where disinfection is carried out should be adequately ventilated, and the criteria for reopening a disinfected facility for use should be determined taking into account the characteristics of each type of disinfectant used, the purposes of the facility.

### J. Management of resources

When cases are identified, hospital beds should be allocated and managed according to the local situation after evaluating the severity of the case and whether the patient falls into high-risk categories such as those with pre-existing diseases. City and provincial patient management teams should take stock of public hospitals, negative pressure rooms in private hospitals, private rooms, equipment for intensive care, and personnel, and should manage resources so that the high-risk population according to severity criteria are prioritized for the allocation of hospital beds.

In appendices and a FAQ, further information that is useful in practice when responding to COVID-19 is provided.

# Conclusion

COVID-19 is the third pandemic that has occurred in the 21st century, after the novel influenza in 2009 and MERS in 2015. Although much remains to be learned about this virus, it poses a significant threat to public health, as cases have continued to be reported from many countries around the world and the fatality rate is high among older individuals. Experts are predicting that as countries are starting to relax travel bans and trade expands, the possibility of are surgence of cases is high. Concerns

continue as effective vaccines or treatments do not exist or are in the developmental stages and natural antibody formation is not effective.

In South Korea, the intense social distancing measures put in place on March 22 were relaxed on May 6, but small cluster outbreaks and infections in the community have continued to be reported. Spread by asymptomatic cases is of concern. Despite the proactive preparation after MERS, which included the deployment of a rapid testing system, a response preparation plan, stockpiling medical resources, and simulation training, there are limits to the degree to which it is possible prepare for a new infectious disease, of which the characteristics are not clearly known. A more detailed response system in anticipation of the post-COVID-19 era is necessary.

The effective management of quarantine so far can be contributed to multisectoral cooperation, the dedication of medical staff, the efforts of local government officers, and the civic culture of the population. However, in order to respond to the ongoing pandemic, worldwide efforts are required. The COVID-19 response guidelines in South Korea have been updated rapidly according to policy directions, resource stockpile status, and domestic and international research results and guidelines. The guidelines will continue to be updated rapidly, in an evidence-based manner, according to changing knowledge regarding the characteristics of SARS-CoV-2, the epidemiological characteristics of COVID-19, and vaccine and treatment development.

① **What was previously known?**

COVID-19 spread from Huanan Seafood Market in Hubei Province, China to the entire world, resulting in an ongoing pandemic.

② **What is newly learned?**

South Korea government policies have been updated according to the situation around the world. The guidelines have been updated according to the resource stockpile status and domestic and international research results. The main updates over time are presented in this article.

③ **Implications?**

South Korea's COVID-19 response guidelines have been updated to respond to COVID-19 in a timely manner and have been translated and utilized by other countries.

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