

# Audit Report on Status of MERS-CoV Prevention and Response

Disclosed on January 14, 2016

## I . Audit Background

- The National Assembly of the Republic of Korea called for an audit to assess the government's response to MERS-CoV after the outbreak and to analyze factors contributing to the initial spread.

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| <ol style="list-style-type: none"><li>1. To find out fundamental reasons behind the widespread MERS-CoV, including the government's inefficient early response and the decision to not disclose information</li><li>2. To examine whether the government well managed issues related to the ΔΔ Medical Center</li></ol> |
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- Accordingly, the Board of Audit and Inspection (BAI) audited 18 government agencies including the Ministry of Health and Welfare (MOHW) and Korea Center for Disease Control and Prevention (KCDC) from September 10 to October 29 in 2015.
- The focus of the audit is to examine the fundamental reasons on why the health authorities failed to take appropriate measures to respond to MERS-CoV at the initial stage and consequently to prevent its further spread at the national level.
- BAI investigated problems and issues raised by the media and the National Assembly and reviewed "Measures to Reform National Infection Prevention and Control System" released on September 1, 2015, for the purpose of immediate and efficient response to emerging infectious diseases.

## II. Major Audit Findings

① **(Inadequate initial response for the prevention of MERS-CoV)** As KCDC downplayed the severity of the virus, it was ill-equipped to deal with the virus infection crisis. The Center had sufficient time to establish necessary measures and received advice on infection prevention and control from many home and abroad experts. But it developed inadequate guidelines and implemented insufficient epidemiological investigation into the first confirmed case.

- With the increased number of reported MERS-CoV patients in foreign countries, the possibilities of the virus inflow in Korea escalated. The first case of person-to-person transmission of MERS-CoV was confirmed in September 2012.
  - \* In 2014, an estimated 430 thousand people visited the Middle East. As of April 2015, 23 countries reported 1,126 confirmed cases, including Malaysia and the Philippines.
- Even with advice from the World Health Organization (WHO) and domestic experts, Korea Centers for Disease Control and Prevention (KCDC) showed a disregard for the risks involved with this infectious virus. It also failed to research or analyze the spread of the virus and the overseas response to it.
- In July 2014, the KCDC narrowly defined close contact as “anyone who has been within 2 meters of a person infected with the virus for more than an hour.” This definition skipped necessary procedures, such as analyzing the criteria adopted by WHO and Centers for Disease Control and Prevention (CDC) and seeking advice from experts.
- The KCDC performed infection verification testing 34 hours after receiving a report on the first patient.
  - Though confirming through the hospital's surveillance cameras that the patient had contact with a number of people at the hospital, KCDC underestimated how contagious MERS-CoV is and limited the quarantine line only to the ward where the patient was staying, isolating 20 people,

including the medical team. It terminated the epidemiological investigation, not considering that other patients who stayed at a different ward on the same floor where the first confirmed case occurred could be infected.

- Some patients infected with the virus after having contact with patient #1 were not subject to quarantine control, and they visited other hospitals, such as the ΔΔ Medical Center, causing massive tertiary infection.
  - \* Patient #14 spread the virus to 81 people at ΔΔ Medical Center
  - \* Patient #15 transmitted the virus to 6 people at H Hospital.
  - \* Patient #16 infected 13 and 10 people at D Hospital and G Hospital, respectively.

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② **(Failure to prevent widespread contamination)** The widespread of MERS-CoV resulted from a lack of active response and inadequate disinfection

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- The first patient had been admitted to □□ Hospital (room #8104) before he was diagnosed at ΔΔ Medical Center with the first case of MERS in South Korea on May 20. After his diagnosis, the MERS Response Task Force under the MOHW (hereinafter, “**MERS Response T/F**”) set the range of close contacts as those who had been in the same room (#8104) with the first case in □□ Hospital. As people and patients in other rooms nearby were missing from the contact tracing list, the MERS Response T/F did not monitor them and a patient from room #8103 was later confirmed as the sixth case on May 28. This meant that the range of close contact that the health authority initially set was wrong, and thus, the initial stage of disinfection failed.
- In the meantime, it turned out that patient #14 and four other people missing from the list of those who should be in quarantine had already visited seven medical institutions between May 28 to 31, resulting in a significant increase in number of secondary contamination cases (primarily in hospitals). Overall, the MERS Response T/F did not take infection prevention and control measures even after they realized that their existing countermeasures had not been enough to curve the spread of infection. The MERS Response T/F did

not disclose that it was ΔΔ Medical Center until June 7, and the release of the list of patient #14's close contacts was delayed.

- The MERS Response T/F did not actively trace the potential patients even after receiving data from the hospital, leading to the mass spread of the virus.
- While ΔΔ Medical Center received the full list of 678 people with their addresses and contact information on May 31, only a part of the list (information on 117 people) was handed in to the authorities. The authorities, however, did not notice that the submitted list was incomplete nor take instant follow-up measures. The MERS Response T/F did not share the close contact list with municipal/provincial public health centers until they were reprimanded by the Minister of Health and Welfare. Exposed patients and suspected people were quarantined a week after exposure.
- As a result, patient #76 who had come into contact with patient #14 visited ○○ Hospital, which resulted in 12 cases of quaternary infection cases, and among them, two deaths.
- The lists of close contacts that hospitals submitted did not include family members of the patients, and among 90 confirmed cases related to the ΔΔ Medical Center, 40 people were diagnosed with MERS though they were not even categorized as a close contact.

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**③ (Related to the ΔΔ Medical Center) Investigation on issues raised by the media and National Assembly**

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- The ΔΔ Medical Center did not inform its medical staffs of the fact that the first confirmed patient had been admitted to □□ Hospital. When patient #14, who had also visited □□ Hospital came to ΔΔ Medical Center, medical staffs provided care for the patient in their crowded emergency rooms, which resulted in mass nosocomial infections. If medical staffs had been aware that patient #14 stayed at the same hospital (□□ Hospital) as patient #1, they would have treated patient #14 from a quarantined room.
- The government's belated disclosure of information on the hospitals and the MERS confirmed patients aggravated the situation. While a doctor working

at the ΔΔ Medical Center was confirmed as the #35 MERS patient around 11 pm on June 1, the authorities announced the news on June 4 rather than immediately disclosing the information with the accurate date of confirmation.

### III. Major Audit Results

- The BAI detected 39 problems from the following entities: the Ministry of Health & Welfare (10 cases), Korea Centers for Disease Control and Prevention (22 cases), the Ministry of Public Safety and Security (2 cases), local governments including the Seoul Metropolitan Government (5 cases).
- Considering that this audit is associated with issues that have a direct impact on the lives and security of citizens, BAI is determined to raise awareness in the public sector by holding those in charge more accountable for their actions that which undermine the public health practice.
- **(Request for Warning)** The BAI requested the director of KCDC to systematically research novel infectious diseases, such as MERS-CoV, and to implement comprehensive preventive measures for infectious diseases by developing appropriate response guidelines for MERS-CoV.
- The BAI advised that the Minister of Health and Welfare disclose accurate information, such as the name of the hospital where the infection occurred, to respond in a timely manner, and to stem the spread of viruses.
- **(Notification)** To prevent the spread of infection among patients and between patients and staff, BAI urged the director of KCDC to prepare measures to ensure that the information on patients is being promptly shared among the medical teams.
- The BAI notified the Minister of Health and Welfare to take appropriate disciplinary action that abides by the relevant law against ΔΔ Medical Center for the late submission of the list of people who had contact with patient #14.
- \* Please refer to the Key Audit Findings of "Reference 1" for detailed audit results.

## Reference 1 : Key Audit Findings

### (1) Insufficient preliminary research on MERS-CoV and establishment of inadequate guidelines

- The first case of person-to-person transmission of MERS-CoV was confirmed in September 2012, and the potential introduction of the virus into Korea increased with the growing inbound and outbound traffic across the border.

\* An estimated 430 thousand people entered the Middle East in 2014. As of April 2015, 23 countries had reported cases of MERS-CoV infection, in a total of 1,126 confirmed cases. Infected countries in Southeast Asia were Malaysia and the Philippines.

- The WHO and internal experts of South Korea each made 8 and 2 recommendations, respectively, to the Korean government on the importance of research on the virus and measures to prevent nosocomial infections.
- The KCDC did not conduct research nor analyze the spread of the new viral disease or on how various countries are fighting the virus, while running the MERS-CoV task force since June 2013.
- Given that MERS-CoV, a novel infectious disease originating from abroad, has a case fatality rate of 34.4%, it is essential to control the infection with early quarantining of individuals who have had close contact with a confirmed case of the virus.

■ In the case of the United States, the first MERS infection case occurred in the state of Indiana in May 2014. The CDC and other public health officials took proactive measures to prevent nosocomial transmission by implementing immediate quarantine for 50 medical staff who had contact with the infected patient, managing to contain the spread of the virus.

- However, when KCDC created guidelines on infection control and prevention in July 2014, it narrowly defined potentially contagious individuals (who had **close contact**\* with an infected person) without

analyzing the guidance established by the WHO or CDC, and without asking for advice from experts.

\* Close contact is defined as being within approximately 2 meters of an infected person for a prolonged period of time (more than an hour).

- ▲ Despite the initial epidemiological investigation into the first confirmed case of the virus, KCDC did not include 48 people who had contact with patient # 1 in the list of individuals at risk of contracting MERS. Among them, three people were confirmed positive for the virus. Consequently, along with a case of tertiary transmission being reported, the health authority demonstrated a failure to brace for the spread of the infectious disease.

(2) **Relaxed quarantine rules and insufficient provisions regarding information on MERS-CoV**

- Initially, KCDC requested every individual returning from the Middle East to fill out a current health status questionnaire. However, since June 2014, it has limited the target group to only those with symptoms upon arrival. It was not until May 20, 2015, that KCDC provided information on MERS through announcements in airports or flights for passengers entering the Middle East.
- Public health officials shirked their duties of checking whether municipal/provincial health centers provided nearby hospitals with necessary information (promotional materials on MERS-CoV, criteria for diagnosis, and reporting of infectious diseases). It resulted in delayed diagnosis and reporting of the infected.

<ul style="list-style-type: none"><li>■ BAI confirmed that the Gangdong-gu Public Health Center neglected its duties by not distributing 1,000 copies of the promotional materials on the MERS-CoV disease, leaving them in the basement of the Health Center for over two years (from August 2013 to October 2015).</li></ul>
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- ▲ Patient #1 began showing symptoms of the virus from May 11 and visited three medical facilities, after arriving in Korea from the Middle East on May 4. With no information on the novel virus, doctors were not able to diagnose the disease and implement immediate reporting of the suspected patient.

**(3) Inadequate actions for infection prevention and control (delaying MERS testing after receiving reports on suspected patients)**

- At around 10 a.m. on May 18, Gangnam-gu Public Health Center (GPHC) reported a patient with suspicious symptoms to KCDC. Since the suspected patient's symptoms were associated with those experienced by MERS-CoV patients, KCDC should have taken proper measures for infection prevention and control, such as implementing diagnostic testing and performing an epidemiology investigation.
  - \* After diagnosing the patient suspected of being infected with the virus, ΔΔ Medical Center reported to KCDC that the patient developed symptoms of pneumonia within 14 days after arriving from the Middle East, and requested confirmatory testing for the virus.
- However, KCDC refused this request on the grounds that the patient returned from Bahrain, a country with no confirmed cases, and urged the GPHC to withdraw the report.
- The KCDC deployed an epidemiology investigator to ΔΔ Medical Center, where the suspected MERS cases occurred, but the investigator did not investigate the patients with symptom nor their casual/close contacts.
- ▲ The KCDC collected clinical specimens from the patient at 8 p.m. on May 19, 34 hours after receiving the initial report. The patient was confirmed at 6 a.m. the next day to have the virus, on May 20. This negligent attitude of KCDC hampered the timely implementation of infection control measures.

**(4) Inappropriate quarantine measures for people who had contact with the patient #1**

- After consulting with ΔΔ Medical Center on May 20, KCDC identified people who had contact with patient #1 through contact tracing and divided patients and medical personnel exposed to patient #1 into 5 and 3 groups, respectively. The KCDC placed Group 1 and 2 of exposed patients and Group 1 of exposed medical workers in quarantine.
- The KCDC informed the public health center of a list of 27 ΔΔ Medical

Center personnel who will be subject to a two-week isolation period. The KCDC asked ΔΔ Medical Center to take the prime responsibility for care and monitoring of the remaining 453 suspected patients, and of the medical workforce. The KCDC withdrew the epidemiological investigator from ΔΔ Medical Center without implementing subsequent actions, such as contact tracing or delivering lists of people exposed to infected persons to public health centers.

\* The Minister of Health and Welfare ordered KCDC to secure the list of people who came in contact with patient #1 on May 27, and KCDC did not notify the list to public health centers despite receiving it from ΔΔ Medical Center the very next day.

▲ As a result, a nurse (patient #78), who was a close contact of patient #1, continued working at the hospital until June 4, 3 days before the test confirmed positive. Also, since KCDC has not notified the relevant health centers of information on exposed patients, etc., the centers could not take necessary measures, such as isolation.

**(5) Inadequate initial epidemiological investigations due to the inflow of infectious disease**

- On May 20, KCDC implemented the initial epidemiological investigation into □□ Hospital, only identifying 20 close contacts, including medical personnel and those who stayed in the ward where the virus-infected patients stayed. In this process, KCDC failed to identify and monitor people who had casual contact with those of confirmed cases.
- The KCDC found out that patient #3 stayed 2 meters apart from patient #1 in room #8104, and determined that patient #1 did not spread the virus to patient #3 via droplet transmission, as droplets can only travel about 1.5 m.
- The KCDC initially disregarded the severity of the virus outbreak, not analyzing how patient #3 became infected with the virus nor investigating the casual contacts of the patient.
- After examining the security footage of □□ Hospital for May 21, KCDC

could determine the casual/close contacts of patient #1. The patient had come in contact with many people in multiple locations, such as the blood-sampling room and nurse's station. Nevertheless, KCDC terminated the contact tracing investigation, neither counting these people as casual or close contacts nor identifying potentially infected individuals.

\* During the audit period, BAI examined the surveillance camera footage, and stated that 197 people had casual contact with patient #1. Three among them received positive results in testing for MERS.

- A total of 16 suspected patients have not remained under quarantine and were transferred to other hospitals, such as the ΔΔ Medical Center; out of the 16 confirmed cases, 10 showed symptoms before May 21, and the rest after May 22. In the aftermath, the number of confirmed cases increased exponentially.

#### **(6) Failure to prevent nosocomial transmission**

- The BAI investigated whether ΔΔ Medical Center shared the information on infectious diseases and patients' medical history with its medical staff in a timely manner to prevent the spread of the infectious disease.

- It was found that ΔΔ Medical Center did not inform its medical staff of patient #1's (confirmed with MERS-CoV on May 20) hospital stay at □□ Hospital from May 15 to 17. When patient #14, who had also been admitted to □□ Hospital from May 21 to 25, came to ΔΔ Medical Center on May 27, the medical staff did not think of patient #14 as being a possible MERS case.

\* According to Article 47 (1) of the Medical Service Act, ΔΔ Medical Center created its own Infectious Disease Control Regulation, requiring the Medical Service Center to conduct training for medical personnel of and persons working for the Center, monitor nosocomial transmission, and share information necessary to prevent the spread of infectious diseases.

- As a result, the medical staff treated patient #14 from crowded emergency rooms for three days, leading to the mass spread of the virus – 81 additional cases.

## **(7) Disclosure of information regarding MERS-affected hospitals**

- When a patient, admitted to □□ Hospital from May 15 to 17, was confirmed as the first case of MERS on May 20, the MERS Response T/F set the range of close contact as those who had been in the same room (#8104) as the first patient. As a patient in room #8103 became diagnosed with the MERS on May 28, the MERS Response T/F realized that their initial range of close contact was too narrow to cover all the exposed patients that need to be traced. However, they did not take immediate proactive and corrective actions or measures to prevent the spread of the virus.
- In the meantime, several people, including patient #14 (who had come in contact with the first confirmed case, and thus should have been quarantined) paid a visit to seven hospitals from May 28 to 31, resulting in a significant number of secondary cases in hospitals.
- The epidemiological investigation for tracing the possible patients was time-consuming and not very effective nor efficient in containing the spread of MERS. Still, the MERS Response T/F did not consider disclosing the information of medical facilities exposed to MERS and other places visited by the MERS patients until May 31.
  - \* Experts recommended the authorities to take additional countermeasures to find hard-to-trace patients on May 30.
- With the increase in tertiary transmission cases since June 1, voices inside the government, the media and civil organizations were raised to ask for the disclosure of MERS-related information, including the names of hospitals and the duration of stay of the MERS patients. Still, the authorities did not consider sharing the information.
- The authorities disclosed the name of □□ Hospital on June 5 and shared information related to 24 more hospitals exposed to MERS on June 7.
  - \* At first, MOHW refused to share information as they underestimated the virus' infectivity, and operated with the belief that people would be put in a state of confusion and that some patients would be refused treatment if the MERS-related information was disclosed. The MOHW continued to keep its stance unchanged until the President ordered the information to

be shared on June 3. It took four days for MOHW to prepare additional quarantine facilities and guidelines for reporting MERS cases before a disclosure of information was made available on June 7.

- The MOHW shared a part of the MERS-related information that included periods of exposure and names of the hospitals, while still excluding the contact list. Also, among 330 general hospitals, only 96 hospitals hiring infectious disease specialists were provided with information, which was ineffective and inefficient information sharing.

#### **(8) Disclosure of information regarding MERS patients**

- With no epidemiological relations between patient #1 (confirmed on May 20) and patient #42 (confirmed on 29 May), the MERS Response T/F knew that tertiary transmission had occurred, but did not take any responsive measures against it.
- Rather, the MERS Response T/F hid this information from the public and later claimed that patient #42 was diagnosed with MERS on June 6, when in actuality, the patient had been diagnosed on May 29.
- The MERS Response T/F also refused to disclose the fact that a doctor at ΔΔ Medical Center was diagnosed as being MERS case #35 on June 1. As the public and media raised their voices to criticize the government, the authorities gave a statement that the doctor was confirmed as having contracted MERS on June 4, which was inaccurate information.
- ▲ Consequently, the government provoked public distrust by keeping them from the truth and missed the golden time to have the early response system be effective in preventing tertiary infection (from May 29 to June 2).

#### **(9) Mismanagement of contact list of confirmed case (#14)**

- After the diagnosis of patient #14 on May 30, the Minister ordered the MERS Response T/F (at a daily briefing session) to identify those who had come in contact with the confirmed patient and to take follow-up measures.

However, the MERS Response T/F did not actively trace the possible patients.

- While the medical center did not submit information on the remaining 561 people, the MERS Response T/F were not aware of it, and even after receiving the full list on June 2, the MERS Response T/F did not share it with the municipal/provincial public health centers until June 7, after it was requested by the Minister.
- \* On May 31, the medical resources team of the T/F received a partial contact list (117 people). The list was shared with the planning team and on-site monitoring team, but not with the data input team. Accordingly, the information provided was not recorded in the database, nor shared with the local/community healthcare facilities.
- o As a result, tracing and quarantining the exposed patients was delayed by a week. During that time, patient #76 who had come in contact with patient #14 visited ☉☉ Hospital, resulting in 12 quaternary infection cases, and among them, two deaths.
- o Also, the contact list submitted by the hospital did not include family members of the patients who visited the emergency room where patient #14 was treated. This meant that there was a loophole in the contact list. Among the people omitted from the contact list, 40 people were diagnosed with MERS, though they were not recognized as close contacts, and six of them died.

**(10) MOHW's inappropriate supervision over medical institutions**

- o With the diagnosis of patient #14 on May 30, the Minister ordered the epidemiology investigators to identify those who had come in contact with the confirmed case to take follow-up measures, such as tracing and quarantine.
- From May 31 to June 2, the epidemiology investigators requested ΔΔ Medical Center on five occasions to submit the list of possible patients who came in contact with patient #14 with their contact numbers and addresses.

- The Minister of Health and Welfare, or a relevant Mayor/Do Governor may provide guidance or issue an order to medical institutions or medical personnel, if considered necessary, for policies on public health and medical services, or if a serious hazard occurs or is likely to occur to public health. (*Article 59 (1), Medical Service Act*)
- Medical personnel, the heads of medical institutions, etc. prescribed in the Medical Service Act, shall actively cooperate with the State and local governments that perform the affairs of the surveillance, prevention, and control of the outbreak of infectious diseases and epidemiological investigations. (*Article 5, Infectious Disease Control and Prevention Act*)

- The ΔΔ Medical Center composed the full list of 678 people with their addresses and contact numbers, but submitted only a partial list (data on 117 people) on May 31. They refused to share the remainder of the contact list with the reasoning that it will take until June 2 to check the electronic medical records of the remaining 561 people.
- ▲ This led to delays in tracing and monitoring the 561 people.

**(11) Inefficiency in utilizing negative pressure beds and infectious disease specialty rooms**

- From 2006 to 2010, KCDC provided KRW 27.2 billion to 19 medical institutions to operate 599 infectious disease specialty rooms, including 480 isolation beds and 119 negative pressure beds to treat patients with respiratory infectious diseases (airborne contagious diseases).
- As KCDC allowed hospitals to have negative pressure beds in multiple-occupancy rooms, 79 beds among the 119 negative pressure beds were put in multiple-occupancy rooms. In cases where more than two beds were in the same room, however, only one bed was utilized for patient accommodation in order to prevent contamination between patients in the same room.

- \* For example, G Medical Center had five negative pressure beds (four beds in two double-occupancy rooms and one bed in a single-occupancy room). Only three beds could accommodate patients while the other two beds remained unavailable.
- It was not required for hospitals to have an infectious disease specialist when establishing negative pressure rooms supported by KCDC. Among 19 hospitals, three hospitals installed negative pressure rooms without specialists who can treat patients with infectious disease.
  - \* On June 15, a MERS patient was admitted to D Medical Center, but was transferred to K Hospital the next day as D Medical Center did not have an infectious disease specialist.
- Overall, negative pressure beds and rooms were not efficiently utilized in treating patients.

**(12) Regional infectious disease hospital and infectious disease control institutions**

- To strengthen the infrastructure for responding to the outbreak of infectious diseases, KCDC designated 77 hospitals as regional infectious disease hospitals and equipped them with facilities to treat patients with infectious diseases. However, 17 out of 77 designated hospitals had no infectious disease specialists and thus did not contribute to treating MERS patients.
- Although Seoul Metropolitan and Gyeonggi Province have 6 and 15 regional infectious disease hospitals respectively, they did not check whether those hospitals were able to treat MERS patients and designated only 8 hospitals (3 in Seoul, 5 in Gyeonggi Province) as infectious disease control institutions. Thus, 42 quarantine facilities installed by the national budget in 13 regional hospitals remained unutilized.
- Some regional hospitals falsely reported that they did not have enough rooms to accommodate MERS patients while other hospitals illegally altered the facilities. As a result, some hospitals, despite being designated as regional infectious disease hospitals, did not contribute to treating MERS patients.

## Reference 2 : Review on “Measures to Reform National Infection Prevention and Control System”

- On September 1, 2015, the MOHW announced its “Measures to Reform National Infection Prevention and Control System” for the purpose of providing immediate response to emerging infectious diseases using a total of 48 main tasks.
- The BAI reviewed whether this package of measures would be effective and if any improvements needed to be made. As a result, BAI provided recommendations regarding the seven tasks as follow.

	<b>Tasks</b>	<b>Findings and Recommendations</b>
1	Infectious disease control manual	BAI found that KCDC had distributed MERS guidelines containing inappropriate information, and recommends that KCDC amend its MERS guidelines to provide practical information tailored to national circumstances. MOHW had superficially conducted emergency response training with no specific infectious disease outbreak scenarios. BAI recommends MOHW to enhance its disaster preparedness through simulation training.
2	Diagnostic facilities and laboratories	Proper collection of specimens is the most important step in the laboratory diagnosis of infectious diseases, as a specimen that is not collected correctly may lead to false negative test results. In cooperation with research institutes of public health and environment, KCDC needs to expedite testing time and enhance the quality of test results through proper specimen collection.
3	Infectious disease information system	It is necessary for KCDC to provide information of close contacts and suspected cases via an information system to the Ministry of Public Safety and Security (MPSS, currently incorporated into the Ministry of

		Interior and Safety: MOIS) so that 119 rescue teams (under MPSS) can protect themselves with personal protective equipment when transferring possible patients.
4	Quarantine facilities	KCDC currently allows medical institutions to have negative pressure beds in multiple-occupancy rooms. According to the related laws and regulations, however, a negative pressure bed should be installed in a single-occupancy room.
5	Disinfection facilities	Referring to exemplary cases in the U.S., Japan, U.K., etc., MOHW needs to set an adequate and specific ventilation standard to eliminate environmental factors contributing to transmission.
6	Evaluation on infectious disease control	As emergency centers are high-risk for infectious disease transmission, MOHW should include the evaluation of emergency center operations as one of the mandatory accreditation standards for medical institutions.
7	Testing areas at major airports	BAI recommends KCDC to amend its MERS guidelines so that suspected patients can get tested at the testing center in Incheon International Airport Quarantine.

- Also, BAI demanded the concerned authorities to prepare further measures that were not included in the current measures.

1	<p>It was found that municipal/provincial public health centers did not provide nearby hospitals with necessary information, such as promotional materials on novel infectious diseases, criteria for diagnosis, and reports of suspected/confirmed cases. Particularly, the Gangdong-gu Public Health Center kept materials in its storage for more than two years without distribution.</p> <p>→ BAI recommends that KCDC supervise municipal/provincial public health centers to monitor whether necessary information and guidelines regarding infectious diseases are delivered to nearby medical institutions</p>
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2	<p>In accordance with the Standard Manual for Infectious Disease Crisis Management, KCDC imposed crisis alert levels based on the range of areas affected by the virus, not on the severity of the virus. The KCDC did not raise the alert level, considering low community transmission of MERS-CoV. Under these circumstances, the Korean government failed to ensure consistency in its response to the virus, resulting in public distrust.</p> <p>→ The BAI recommends that the Ministry of Health and Welfare establish measures, including detailed criteria, into the “Standard Manual for Infectious Disease Crisis Management” to ensure that crisis alert levels are determined based on particularities of each virus. Accordingly, the Ministry can issue an accurate crisis alert in the event of an infectious disease outbreak.</p>
3	<p>As MOHW provided only a basic plan for infectious disease control and prevention without detailed guidelines for specific implementation plans that are to be individually established and performed at the municipal/provincial level, local autonomies made poor implementation plans and failed to carry out major tasks.</p> <p>→ The BAI recommends MOHW to ensure that local autonomies make sound implementation plans and to monitor whether such plans are carried out.</p>