

COVID-19 Epidemic Control Measures in Emergency Response Action on a Construction Collapsing Accident in Quanzhou: Practice and Experience

At 19:00 on March 7, 2020, the Xinjia Hotel in Licheng District, Quanzhou City, Fujian Province, China experienced a building collapse. After the accident, the Ministry of Emergency Management of China dispatched a working group to the scene to guide the rescue. Fire & Rescue Corp of Fujian Province successively mobilized 1086 fighters from 11 detachments across the province, as well as rescue equipment and materials including life detectors, search and rescue dogs, devices for epidemic prevention, breaking & breaching, lifting & shoring, and washing & decontaminating. Large engineering machinery were also involved in rescue, and the emergency linkage mechanism is quickly activated to coordinate the authorities in public security, housing & construction, disease control, medical treatment, communication and other departments to participate into the collaborative rescue on site. In the spirit of life first, rescuers overcame the difficulties caused by COVID-19 epidemic and actively carried out rescue operations to have minimized accident losses and casualties. No secondary disasters occurred at the rescue site, and none of the rescuers were infected. The main methods of epidemic prevention and control are as follows:

I. To mobilize sufficient epidemic-prevention supplies

After the accident, all Fire & Rescue forces carried epidemic prevention materials and disinfection equipment in addition to rescue equipment to provide self-epidemic protection. Fujian Provincial Fire &

Rescue Corp also mobilized more than 2,200 sets of medical protective clothing, more than 20,000 N95 and medical protective masks, more than 1,000 pairs of goggles, 6,600 pairs of protective gloves, 2.7 tons of disinfectant, as well as public decontamination stations, personal decontamination tents and backpack-type spraying equipment and other resources. The responding authority fully committed to ensuring the safe and efficient conduct of rescue operations.

II. To divide prevention and control area scientifically

According to the needs of rescue action and epidemic prevention, the Fire & Rescue forces, together with the disease control and public security departments, divided the site into 4 prevention and control areas. The disease control authority carried out broad-brush spraying and spraying disinfection for each area from time to time.

Core Operation Area, which was the search and rescue action site of the collapsed building. The site command strictly controlled the number of rescuers in each search and rescue area and operation site, acting in teams with no more than 10 people each in principle. Before entering, all must strengthen personnel protection and conduct bodily safety inspection and registration.

Quarantined Operation Area, which was set up outside the search and rescue areas, and further divided into polluted area, semi-polluted area, decontamination area and clean area. Non-rescue personnel and vehicle equipment were strictly prohibited from entering. When rescue forces rotated, they must come through the contaminated area, semi-contaminated area and decontamination area in turns to carry out whole-body disinfection and equipment decontamination, collect and dispose disposable protective clothing, gloves and masks collectively, change the protective equipment and eventually, enter the clean area after the temperature measurement and stay organized to rest in batches.

Security Area, which was set in 30 meters perimeter around the

Quarantined Operation Area. by The public security authority controlled this area to maintain order on site, avoid personnel gathering, and promptly check, remind and correct unsafe behavior.

Perimeter Control Area, which was set at the entrance and exit of major roads around the accident site, controlled by the public security authority, prohibiting the entry and exit of all irrelevant personnel and vehicles, avoiding the large flow of internal and external personnel, and reducing the risk of epidemic prevention and control.

III. To take strict personnel protection measures

According to the on-site environmental conditions and the needs of rescue operations, under the guidance of the disease control authority, the level of protection measures was clearly defined in each area. Rescue personnel entering the core operation area, must wear N95 protective masks and goggles, take double protection of medical gloves and rescue gloves, and carry N95 protective masks and protective gloves along to ensure replacement at any time. People in the epidemic prevention and control area must wear a full set of medical protective equipment and commence disinfection and decontamination operations. People in other areas must wear medical protective masks, keeping a safe distance of 2 meters to reduce the risk of cross contact.

When the trapped survivors were found or rescued, the rescuers should try to minimize direct exposure with the rescued personnel and deliver or wear the medical protective mask to the rescued personnel in time. After the trapped personnel were rescued, they should be handed over to the on-site medical and disease control personnel for transfer and treatment. The contact bodily parts must be disinfected, protective masks and gloves should be replaced in time, and the site should be disinfected to avoid and reduce the chance of infection. For the protection of search and rescue dogs, the dogs should be decontaminated in time after each search; the dogs should be brushed and temperature tested every day; the

dog transport vehicles, dog cages and utensils should be disinfected, and clean dog food should be fed regularly and quantitatively. Clean drinking water and food could enhance resistance of dogs. The control of trainers and dogs should be enhanced; kennels and tents should be set up separately to prevent contact with other personnel and avoid cross-infection.

IV. To improve information sharing

At the scene of the accident, the Fire & Rescue force established the information sharing mechanism with the disease control department at the first time. They came across the records and reports related to isolation observation, comprehensively understood the physical condition of the isolated observation personnel, and marked them in the rescue chart to accurately guide the search and rescue. At the same time, the disease control department is required to perform nucleic acid detection on the rescued personnel, report the results to the on-site headquarters in time, adjust the rescue strategy in a timely manner, strengthen personal protective measures, and prepare for the response.

V. To manage prevention in personnel delivery

At the scene of the accident, the disease control and medical personnel wore a full set of medical protective equipment. When the trapped personnel were found, they followed up synchronously and cooperated with Fire & Rescue personnel to implement life support measures. After rescuing personnel, they applied masks to the rescued ones in time and spray alcohol with an atomizing sprayer for disinfection. With the cooperation of the rescuers, they used medical stretchers to transfer the personnel to the ambulance and transported them to the designated hospital for treatment. For the victims found, after confirming the absence of vital signs by the medical staff on site, the funeral service personnel with full body protection should transport the deceased to the designated place, and the personnel, vehicles and equipment should be

disinfected in all directions afterwards.

VI. To make strict camp management and control measures

Each Search Teams set up rescue camps in the **Security Area**, demarcating the functional divisions of command, communication, catering, rest, equipment and medical treatment. There was only one entrance at the campsite. Specific person was assigned in charge of temperature measurement and whole-body disinfection of the entrance and exit personnel, who was also responsible for keeping shift personnel lists. Every day, the campsite was fully disinfected. Before entering the camp, the rotating staff from the front must conduct a secondary temperature test and a second disinfection of personnel and equipment, and arrange meals and rest in batches. An independent tent was set up outside the camp for temporary isolation of rescued survivors before sending to the hospital. During the rescue, the on-site headquarters also organized medical personnel and volunteers to take measures such as monitoring body temperature and providing preventive medicine to ensure the health of rescuers and provide psychological counseling in due course.

VII. To carry out close follow-up health checks

After the rescue, the on-site command team organized the disease control department to fully cleanse the rescuers and vehicle equipment. After each search team returned to base, they would go to the pre-set observation point for 14 days of quarantined observation, and perform physical examination screening and nucleic acid detection within 2 days upon return. During the isolation period, they would conduct 2 rounds of nucleic acid detection per person to ensure the prevention and safety controllability.