

[Anti-epidemic] On the Front Line - CDC Warriors Racing against the Novel Coronavirus

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As of February 1st, Chinese Center for Disease Control and Prevention has sent a total of 73 team members to every anti-epidemic battlefield in Hubei. They already got used to working in a laboratory with biosafety level 3 for 24 hours, receiving orders to rush to Wuhan by train urgently, putting down luggage instantly to join emergency briefing meeting, and even more used to going to many places with unknown risks to conduct investigations at any time. In a race against the epidemic, no matter it's Jinyintan Hospital, Huanan Seafood Market, or every place where patients have been living or have been, higher the risk, more likely their battle field.

The first group of experts from the center arrived Wuhan in early morning

It's December 31, 2019, the last day of the year. Chinese Center for Disease Control and Prevention, which is far outside the sixth loop road of Changping, Beijing, is preparing to welcome new year in tranquility. However, this tranquility was quickly broken, and the lights in office buildings and laboratories were turned on successively in early morning. The information of "unexplained pneumonia emerging in Wuhan" made everyone in Chinese Center for Disease Control and Prevention anxious. "Quickly set up a team of experts and carry out various tasks in a safe and orderly manner." With this instruction from Gao Fu, the director of the center, nine experts from Chinese Center for Disease Control and Prevention, together with experts in other fields, took the earliest flight to arrive in Wuhan and quickly joined forces with Hubei and Wuhan CDC to carry out investigation.

Winter in Wuhan is cloudy, cold and humid, and in chilly wind of early morning, Wuhan appears to be even more deserted. The previous investigation has shown Huanan Seafood Market as the origin of an unexplained pneumonia. At this time, Huanan Seafood Market has been closed by the local government. "Searching for the disease origin and culprit is our responsibility. We must get to the market as soon as possible and collect samples for testing."

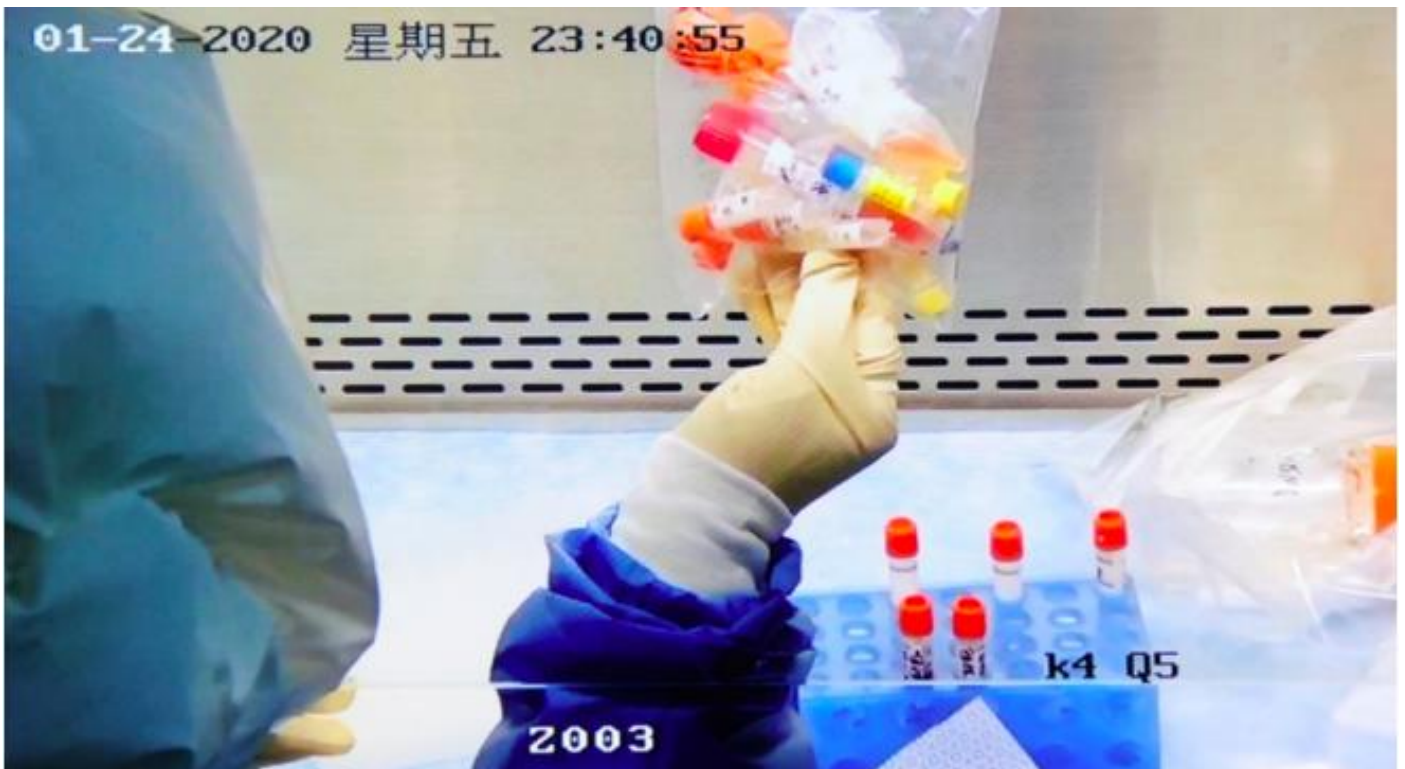
Huanan Seafood Market is located in Jianghan District of Wuhan, only 1.3 km from Hankou Railway Station. The opening of Hankou Station helped the area quickly recover and become prosperous. The emerging of epidemic and the government's decision to close the market urgently led to hasty evacuation of people from Huanan Seafood Market. Dirty water is flowing everywhere, and then seeps into the sewer instantly, heading to unknown destination, just like this unknown virus, we don't know where it comes from, where it's hiding, and where it will spread to. With no time to waste, the experts decided to enter the market quickly, dragged through messy stalls, carefully checked and recorded the location of the stalls, inquired in details the selling items and took samples from both the goods being sold and relevant environment.

At the same time, the national, provincial, and municipal CDC officers are joining their forces to quickly initiate and operate six tasks including setting up mixed groups, managing and analyzing data, conducting epidemiological investigation, laboratory testing, case management, emergency monitoring and technical plan formulation. With a large number of leads, the burden of arduous work quickly fell upon the front-line working group.

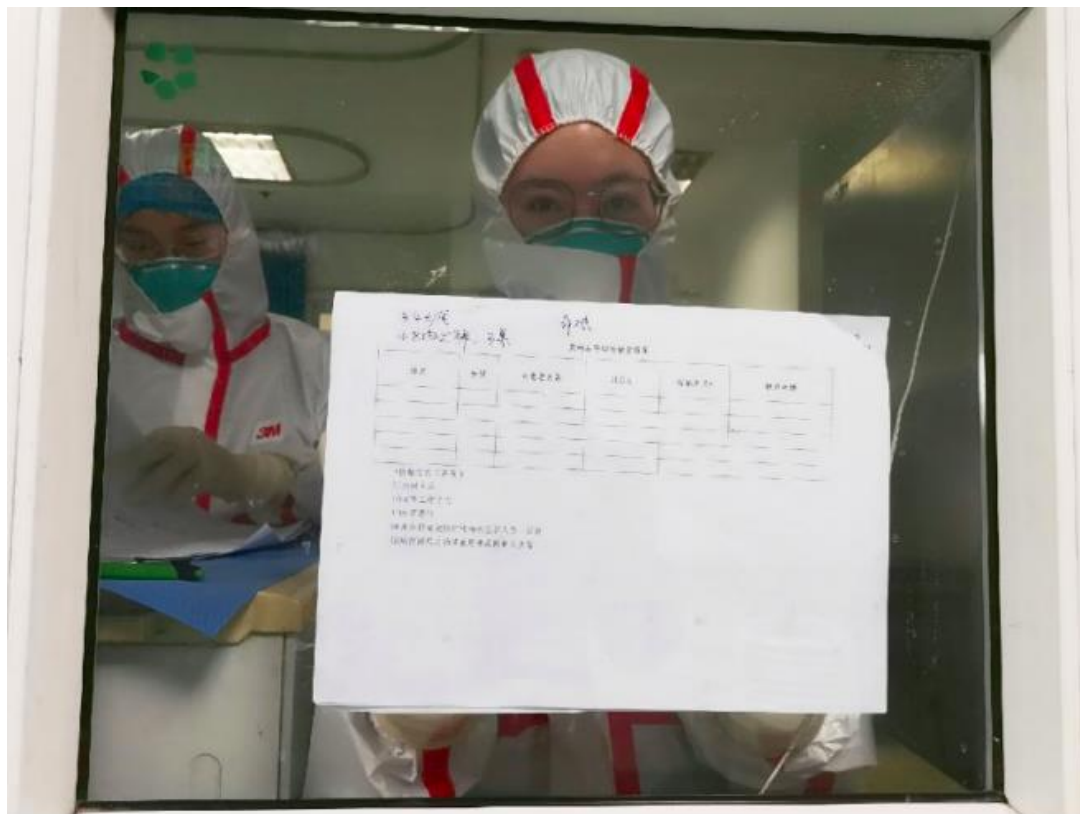


The first sample was shipped to Beijing immediately

On January 2nd, 2020, Wu Guizhen, secretary of the Party Committee of the Institute of Viral Disease of Chinese Center for Disease Control and Prevention, anxiously waited at the gate for the arrival of the first sample of the Wuhan pneumonia epidemic. At 12 PM, samples of 4 cases of virological pneumonia of unknown cause in Wuhan, which were sent by Hubei Provincial Center for Disease Control and Prevention, arrived at a laboratory of biosafety level three. Time is life. If you test one minute earlier, you can get results one minute earlier. With the reception of the first sample, the laboratory began to operate intensely and efficiently. Three hours after the arrival of sample, the positive results of real-time fluorescent quantitative (RT-PCR) testing were obtained; in order to further determine the pathogen, the sequence of the first batch of samples was determined within 24 hours, with full-length genome sequence of the virus being obtained from the clinical samples. The genome comparison results have shown that the virus is a novel coronavirus. On January 4th, a highly specific PCR detection test with significantly higher sensitivity than using reagents previously was successfully developed. Five days later, the Chinese Center for Disease Control and Prevention observed a typical coronavirus particle state under an electron microscope, and the virus was successfully isolated and cultured, which would provide the most important laboratory evidence for determining that the novel coronavirus infection was the cause of the clustered pneumonia in Wuhan. On January 12th, the virus was successfully isolated from environmental samples; on January 24th, the world's first message of the 2019-nCov virus strain was released.



Searching for the source of infection and trace-tracking the epidemic



Li Qun, director of the Emergency Center of Chinese Center for Disease Control and Prevention, can no longer recall how many epidemics he has dealt with, how many plans he has drafted, how many investigation reports he has written and how many first patients he has contacted within proximity during her more than twenty years of career. When being assigned with the task, he had no time to recall that winter of seventeen years ago, when he was traveling to and from the original place of SARS just like what he is doing right now. "Where does the virus come from? Will it be more serious than SARS and spread faster? What is the path of transmission? Everything should be based on data and the results of epidemiological investigation." These are the trickiest questions that he is facing.

Together with his colleagues, Li Qun rushed to Wuhan as early as December 31st, and immediately began to formulate the Contingency Monitoring Plan for Viral Pneumonia of Unknown Cause in Wuhan and the Management Plan for Close Contacts of Patients of Viral Pneumonia of Unknown Cause in Wuhan. In addition, his colleagues went to Wuhan Jinyintan Hospital in three groups to investigate all the 89 admitted patients.

The neighborhood of Huanan Seafood Market is densely populated, and most business owners choose to live nearby, where is bound to be another gathered place for the epidemic. The epidemiological investigation team also targeted the clinics around the market, focused on the origin of wild animals at Huanan Seafood Market to carry out traceability investigation, and conducted epidemiological investigation and sampling of workers at Huanan Seafood Market. Both the Management Plan for Close Contacts of Patients of Viral Pneumonia of Unknown Cause in Wuhan and Emergency Monitoring and Epidemiological Investigation Plan for Viral Pneumonia of Unknown Cause in Wuhan cover various aspects such as case monitoring, epidemiological investigation and management of close contacts. With a large number of careful and meticulous investigations and analyses, relevant investigations and research and risk assessment reports have been submitted successively to the decision-making departments. On-site investigation tasks are complex and arduous. Up to now, there are still 32 experts from Chinese Center for Disease Control and Prevention fighting at the upfront of the epidemic, conducting in-depth investigation of the epidemic situation and severe cases.

Time is life. This sentence can have a different interpretation for CDC personnel across the country. Buying time so that detailed epidemiological data and laboratory research can provide an important basis for decision-making; buying time so that every prevention and control measure can protect more people's health; buying time so that the risk of viral infection among front-line medical staff can be reduced.