

**Post-pandemic testing of SARS-CoV-2 in Huanan Seafood Market area in Wuhan,  
China**

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## **Abstract**

76 days after the COVID-19 epidemic was contained in Wuhan, the Chinese government carried out a citywide SARS-CoV-2 nucleic acid testing for all the residents from May 14<sup>th</sup> to June 1<sup>st</sup>, 2020. Our hospital tested 107,662 residents around Huanan Seafood Market, uncovering a positivity rate of 0.006%.

**Keywords:** asymptomatic; infectious; COVID-19; Huanan Seafood Market

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After three-month nationwide efforts and lockdown of the city of Wuhan for 76 days from January 23<sup>rd</sup> to April 8<sup>th</sup>, 2020, the SARS-CoV-2 epidemic in Wuhan was contained. On April 26<sup>th</sup>, 2020, the number of both hospitalized COVID-19 patients and daily new cases in Wuhan decreased to zero. However, sporadic cases have been reported since May 11<sup>th</sup>, 2020, more than a month after the lockdown were lifted. One possibility was that patients who were discharged might have positive results for SARS-CoV-2 nucleic acid again[1]. Chinese government decided to carry out a citywide mass nucleic acid testing of SARS-CoV-2 for all of the citizens in Wuhan city. The purpose is not only to understand possible asymptomatic transmission, but also to prepare for resumption of normal life including work and school.

Here we report the results of the mass nucleic acid testing of 107,662 residents living in Jiangnan District, where the Huanan Seafood Market was located. The Huanan Seafood Market was the possible point of origin of the COVID-19 pandemic and has been closed since the outbreak of COVID-19. Jiangnan District, located in the central area of Wuhan city, has a total population of 683,492. On February 22<sup>nd</sup>, 2020, there were 7,099 confirmed COVID-19 patients in this District, one of the hardest-hit areas at that time. From May 13<sup>th</sup>, 2020 to May 26<sup>th</sup>, 2020, all of the 683,492 residents were tested for SARS-CoV-2 nucleic acid by reverse transcription-polymerase chain reaction (RT-PCR). Among them, 107,662 residents were tested at our hospital, Wuhan Red Cross Hospital. The test was all-inclusive testing for all residents regardless of gender and age. Among them, 51% were male. The median age was 42 years (range, 4-102 years). 10% were under 20 years old and 15% aged from 20 to 29. People who range from age 50-59 accounted for 17%. 23,696 (22%) of them were over 60 years old, including three over 100 years old.

Among the 107,662 residents we tested, six were tested positive for SARS-CoV-2, accounting for 0.006% (equivalent to 60 cases per million). These six patients lived at least

1.5 kilometers away from the Huanan Seafood Market and none of them clustered together (Figure 1). Of the six patients, 5 (83.3%) were male and 4 (66.6%) were over 50 years old. The youngest one was an eighteen-year-old man. They were asymptomatic, with no respiratory symptoms or abnormal CT chest findings. Three of them were diagnosed with COVID-19 in March and were discharged after negative testing and resolution of symptoms in April 2020. These three recovered patients had recurrence of positive SARS-CoV-2 nucleic acid testing without any symptoms (Table 1).

Combining serology antibody testing with RT-PCR results may enhance COVID-19 detection sensitivity and accuracy during the mass testing. As reported, IgM peaks between days 5 and 12, then IgM drops slowly and IgGs reach peak concentrations after day 20[2]. Of the six SARS-CoV-2 nucleic acid positive patients, five had antibody IgM and IgG tests: two were positive for both IgM and IgG antibodies, two were IgG positive only, and one was IgM positive only; the sixth one did not have antibody tests done. The close contacts of the six patients did not have any positive results by either RT-PCR or antibody tests, which was same as other sporadic cases the entire Wuhan city.

At present, the proportion of asymptomatic patients in the whole population of Wuhan city is quite low. As reported on June 2<sup>nd</sup>, 2020, 9,899,828 people underwent mass SARS-CoV-2 nucleic acid testing in Wuhan from May 14<sup>th</sup> to June 1<sup>st</sup>, 300 asymptomatic patients were identified, with a detection rate of 0.003%. 1,174 close contacts were traced and their RT-PCR results were all negative[3]. Both asymptomatic patients and close contacts have been quarantined for medical observation. An important finding is that the positive rate of our study near Huanan Seafood Market was 0.006%, double the rate of 0.003% in the entire Wuhan city. As Huanan seafood market was the possible point of origin of the COVID-19 outbreak in China, it's understandable that the number of patients in the surrounding area (Jiangnan District) was higher than other areas. Overall, 0.006% was still a very low

positivity rate. Therefore, Jiangnan District, like the rest of Wuhan city, was not considered a high-risk area.

Such an unprecedented mass testing of nearly 10 million people provides important information for global prevention of SARS-CoV-2. One major goal of testing would be to identify infected people with no symptoms, to understand if they still spread the virus[4]. It's reassuring that the 1,174 close contacts were all tested negative. Besides, it has been reported that the SARS-CoV-2 viral culture tests of the 300 asymptomatic patients were all negative, implying no infectivity[5]. As recent reports of new cases of Xinfadi Market in Beijing and new imported cases remind continuous caution, everyone needs to be aware of the importance of self-protection. Perhaps the occurrence of sporadically confirmed cases in general populations will be a feature for a long period of time to come. To prevent the "second wave" of COVID-19, wearing face mask and other personal hygiene practice should become a routine in the coming days.

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**Table 1. Basic information of the six asymptomatic COVID-19 patients with positive SARS-CoV-2 RT-PCR results in the general survey around Huanan Seafood Market.**

Patient	Age (years)	Gender	Previously diagnosed COVID-19 patients	Date of discharge	Newly diagnosed COVID-19 patients	CT images	IgM	IgG	Close contacts
1	58	male	/	/	May 20,2020	Normal	-	+	healthy
2	60	female	Feb 5,2020	Mar 8,2020	May 17,2020	Normal	+	+	healthy
3	65	male	Feb 11,2020 (only by clinical diagnosis)	Not been hospitalized, only self-quarantine	May 17,2020	Normal	/	/	healthy
4	18	male	/	/	May 17,2020	Normal	-	+	healthy
5	34	male	/	/	May 22,2020	Normal	+	-	healthy
6	69	male	Feb 8,2020	April 27,2020	May 25,2020	Normal	+	+	healthy

**Figure 1. Distances of the six positive patients between their Home addresses and Huanan Seafood Market in Wuhan.**

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Figure 1

