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CHINA

At Outbreak's Center, Wuhan Residents Question Accuracy of Virus Tests

Locals, doctors say nose and throat swabs are at times throwing up false negatives; medical experts fear outbreak is larger than Chinese data show

By [Chao Deng](#)

Feb. 11, 2020 3:50 pm ET

WUHAN, China—Coughing badly, Zhu Chunxia sat on a sidewalk in the rain on Monday, awaiting transport to a facility where her apartment complex's residential committee said she could be treated for the new coronavirus sweeping through this central Chinese city.

The ride never came. Though her doctor was almost certain she was infected with the virus, a throat-swab test she had taken came back negative, which meant the facility wouldn't take her.

"They said we didn't qualify," said the 36-year-old mother of two girls. "They wanted positive results."

In Wuhan, the epicenter of a viral outbreak that has sickened more than 44,000 people and killed more than 1,100, doubts are proliferating among residents over the accuracy of the testing kits that Chinese health authorities are using to diagnose cases.

Medical experts around the globe have expressed fears that the scale of the outbreak could be much larger than Chinese data suggests—in large part because of concerns about potential flaws in testing. Independent experts say many tens of thousands of Wuhan residents are likely infected by the coronavirus, while the city's government puts the tally at less than 20,000.

Only one in 19 infected people in Wuhan was being tested and confirmed, according to an estimate by Imperial College London as of Jan. 31.



Medical staff examine X-rays at Tongji Hospital in Wuhan.

PHOTO: CHAO DENG/THE WALL STREET JOURNAL

The possibility of large numbers of undiagnosed, and thus untreated, coronavirus cases has inspired calls from doctors and epidemiologists for Chinese hospitals to use chest scans in diagnosing the new virus, instead of relying on swab tests, which medical professionals believe are finicky and unlikely to pick up on infections in the lower part of the lung.

Wuhan's top Communist Party official, Ma Guoqiang, cast doubt on the swab test at a press briefing on Monday, urging those with negative results to try again to be sure.

“One needs to wait one day later, to get another negative, in order to rule out [the virus],” he said.

China's National Health Commission said last week that chest scans could be used to diagnose cases in Wuhan's surrounding province of Hubei. Authorities, however, still only consider a patient a confirmed case if he or she tests positive for the virus—and that by and large requires taking a nucleic-acid test. With hospital beds limited, authorities have given preference to patients testing positive for coronavirus, and doctors continue to order such tests.

The nucleic-acid test—using nasal or throat mucus collected with cotton swabs—is being widely employed in China to diagnose coronavirus cases because it is fast and can be performed by regular hospital staff, including nurses. Still, improper technique can lead to negative tests, say doctors.

“The sampling staff is seriously inadequate,” said one doctor at a large hospital in Wuhan who declined to be named. “Not all the people are professionals.”

Subpar testing is an urgent concern for those researchers studying how to fight the virus, as well as for ordinary people trying to gauge their risk of exposure. For now, both groups are dependent on the official figures provided by Chinese authorities.



A nucleic acid extraction kit in the making in Sichuan province this week.

PHOTO: LIU KUN/ZUMA PRESS

Chinese hospitals have focused on treating confirmed patients, often neglecting those who can't prove they have the virus. People who are misdiagnosed sometimes return home, get more sick and infect others around them. Some return to clinics for additional testing, heightening the risk of being further exposed to the virus.

There is also a financial burden for those who suffer from the virus without testing positive for it.

Wang Hongyan, whose husband tested negative despite a lung infection, said her family paid 10,000 yuan (\$1,430) for medical care and were unable to receive the subsidies granted to confirmed coronavirus patients.

“Right now there are a lot of fake negatives,” said Ms. Wang. “You come to the hospital and 90% of the people around us are like this.”

In Wuhan, locals have been especially suspicious of the city's official data because they see an overstretched hospital system, with many feverish residents choosing to try to recover on their own. The Wall Street Journal found half a dozen patients in Wuhan with

clear symptoms of a viral infection who at one point during their illness had tested negative for the coronavirus. Some tested positive on subsequent tests.

When 57-year-old Weng Wanjin fell into a coma at home, his wife, Hu Lihua, found someone to rush him to a hospital. Scans showed a serious lung infection but the test didn't detect the virus.

"When we got the first result, the doctor said it was impossible," Ms. Hu said. The doctor recommended they get a second test. Two days later, on Feb. 7, the results confirmed the doctor's suspicion.

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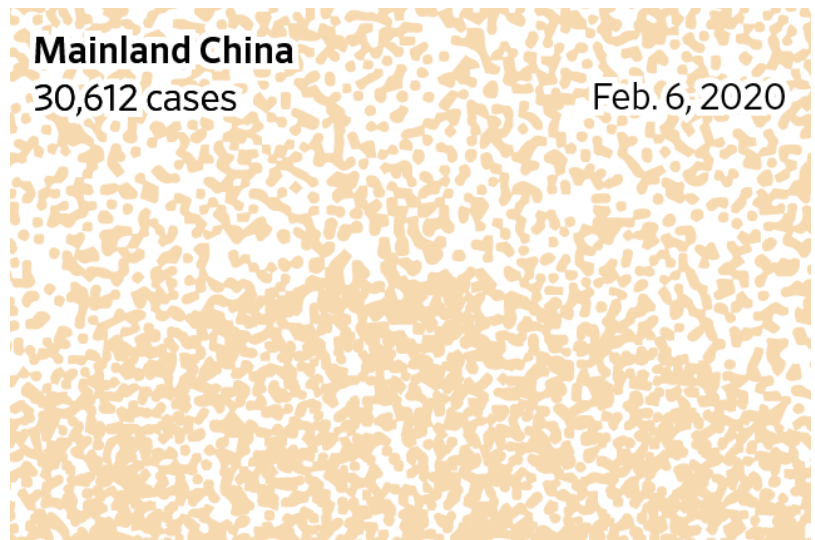
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Some feel certain they were infected but haven't gotten confirmation. Wan Pei, a telecommunications worker, quarantined his 54-year-old mother in a hotel at the request of her residential committee, local authorities who are helping to manage health care and quarantines. The mother didn't get admitted into a hospital because a nasal nucleic-acid test showed virus levels short of the threshold for a positive result.

Her next two tests, via throat-swabs, came back negative again. That is despite a Jan. 30 chest X-ray showing infection in both lungs that the hospital report said was "in accordance with the symptoms of viral pneumonia."

<https://www.wsj.com/articles/at-outbreaks-center-wuhan-residents-question-accuracy-of-virus-tests-11581454218>

Even when performed correctly, the throat-swab test might be inadequate because it is designed to pick up infections in the upper airway, doctors say. Detecting infections lower down requires inserting an endoscope into the lungs, a specialized and more invasive process that is too demanding for Wuhan's hospitals to perform on a mass scale.

"The more you go down, the more likely it is" to be accurate, Peng Zhiyong, a doctor from Central Hospital of Wuhan, said at a Hubei province media briefing. "But we can't do it."

Mr. Peng said only 30% of patients may test positive in the upper respiratory tract.

In some cases examined by the Journal, patients who came out negative on the nucleic-acid test were diagnosed by their doctors as having viral infections in the lower lung.

It isn't yet known whether the new virus tends to infect the lower part of the lung more often, as happened with severe acute respiratory syndrome, or SARS. John M. Nicholls, a pathologist at Hong Kong University whose team is looking into that question, says the current outbreak would be more difficult to manage if that turns out to be the case.

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"There is a chance that it would cause more severe damage than if it was just the airway, leading to a high mortality," he said.

Doctors and scientists said quality control is also a problem. Chinese authorities fast-tracked approvals for some coronavirus kits, certifying certain types in a matter of days.

Close to 100 companies in China say they have developed testing kits for the virus, according to state media. One medical diagnostics company, Guangdong-based HybriBio Ltd., told the party-controlled Chaozhou Daily that it had donated 3,000 unapproved testing kits to local health authorities.

"Due to the urgency, these products haven't been registered," HybriBio executive Li Liejun told the newspaper.

As a result, some tests are less reliable than others, experts say.

“There are differences in the quality of dyes [and] other components that are used,” said W. Ian Lipkin, an epidemiologist at Columbia University.

Ms. Zhu, the mother who waited on the sidewalk, had sought out doctors after suffering from a fever and a bad cough. When a chest X-ray on Feb. 2 showed an infection in both of her lungs, the doctor recommended she get tested for the virus.

“The doctor said I had the virus,” Ms. Zhu said, “that there’s a 99% chance.” Two days later, her test showed up as negative. Her husband, Yu Xiang, tested positive, even though his symptoms at the time were milder than hers. He was admitted to a field hospital housing coronavirus patients.

Ms. Zhu sent her daughters to stay with relatives and is now waiting at home for the result of a second test.

—Kersten Zhang contributed to this article.

Write to Chao Deng at Chao.Deng@wsj.com

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CHINA

In Wuhan, China's Virus Outbreak Overwhelms Residential Committees

Local Communist Party committees have been helping to figure out who needs to be quarantined and hospitalized; 'We're not doctors,' says one representative

By [Chao Deng](#)

Feb. 14, 2020 4:50 pm ET

WUHAN, China—Local Communist Party representative Xiao Lifang has been working nearly nonstop since the outbreak of a deadly virus here, helping to figure out who needs to be quarantined or hospitalized, checking temperatures, and delivering food and medicine to the thousands of residents she oversees.

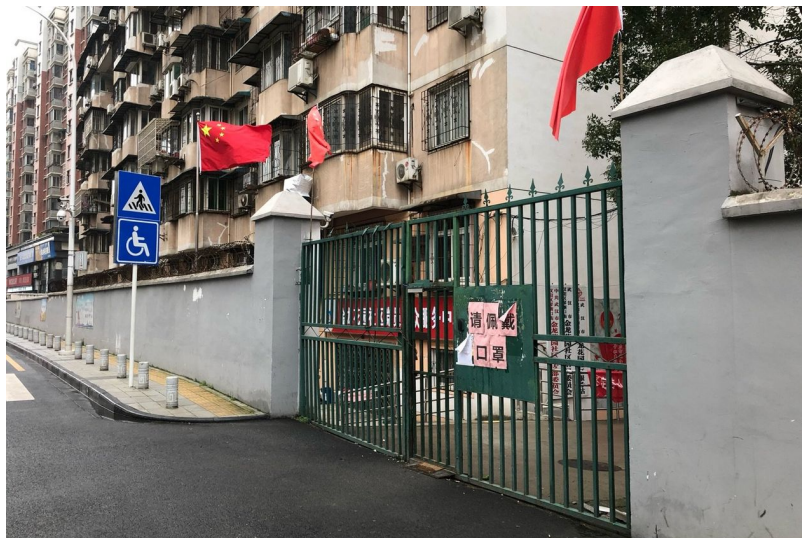
“Everything is dumped on the *shequ*,” she said, using the Chinese word for community committee. “We’re not doctors.”

A legacy of the Mao era, community committees serve as the government’s neighborhood watchdogs, carrying out Communist Party mandates, resolving disputes and maintaining grass-roots social order. But they have been thrust to the front line of the fight against the coronavirus that has infected nearly 36,000 in Wuhan and overwhelmed local officials and the health-care system in this city of 11 million.

Ms. Xiao and her team of nine workers have worked in shifts around the clock at a spartan office to assist 3,700 people living in the Golden Dragon Garden residential complex. They have comforted family members, delivered vegetables, arranged car rides, and answered the constant phone calls from residents who need help.

On Friday, she stood outside her office in a thick hooded, knee-length coat and a surgical mask, describing the worst moments of the outbreak. “This ear hurt,” she said, pointing to her right side. “My arm didn’t have enough strength to hold up the phone. I had to charge my phone again and again.”

Ms. Xiao and her team have kept temperature records for all of the residents. They have also made in-person visits to peoples' apartments, even as they were unsure if they themselves could get infected with the virus.



The gate at the front of the Golden Dragon Garden residence, where Xiao Lifang and a team of nine have been working in shifts around the clock.

PHOTO: CHAO DENG/THE WALL STREET JOURNAL

The virus has now infected more than 63,000 people across China and killed at least 1,380. The majority of cases have been in Wuhan's surrounding province of Hubei. The number of documented infections in the province jumped by more than 18,000 on Wednesday and Thursday after authorities adopted a broader diagnosis classification.

Straining to keep up, the government has added thousands of beds by opening treatment centers and repurposing hotels as quarantine centers. It has tasked community committees with categorizing and isolating residents in different facilities depending on the severity of their exposure.

“No one should be left behind,” the province’s outbreak response team said last week after announcing the new policy. Residents who didn’t comply would face legal punishment, it added, without offering specifics.

Families have chafed at having overworked committee staff involved in making health-care decisions.

At a different apartment complex in Wuhan’s Chezhan neighborhood, the residential committee first decided to quarantine Zhu Qingmei at a hotel without medical care, she said, even though she was so sick that she had trouble breathing.

As the 55-year-old's illness worsened and she was confirmed to have the virus, Ms. Zhu asked to be admitted to a hospital. Her residential committee instead arranged for her to go to a convention center that had been turned into a field hospital for patients with milder symptoms.

Ms. Zhu waited for hours at the back of a pickup truck at the field hospital's entrance before medical staff inside found out her blood oxygen levels were dangerously low and sent her to a hospital that specialized in ear, nose and throat care. She spent two days there before finally being transferred to a hospital designated to treat the coronavirus.

"It was like they just wanted to finish their task," she said. "When I came out of the field hospital, it was like I lost half my life. I couldn't speak and breathing was difficult."

The Chezhan district committee, which oversees Ms. Zhu's apartment complex, declined a request for an interview. A spokeswoman for the committee said some cases might have been mismanaged, but only because officials were overwhelmed.

Health officials worry that the overburdened system is exposing healthy people to the virus.



A community worker signing residents out of their compound.

PHOTO: CHAO DENG/THE WALL STREET JOURNAL

Earlier this month, one residential committee accidentally sent a confirmed case for quarantine to a hotel that was meant only for people who had been in close contact with virus patients. A driver assigned by the committee, who was wearing only a surgical mask for protection, had picked up a mother who had been infected, instead of her daughter who didn't have symptoms.

"It's such a mess," said Mr. Xia, a district health commission officer who was on duty at the hotel. He declined to give his first name. "It's going to get others infected."

The city fired the director of one district committee for mismanaging dozens of critically ill patients, according to the city's party-run Changjiang Daily newspaper. It reprimanded and gave a disciplinary warning to two others, one of them for mistakenly sending severely-ill patients to the wrong hospital. Officials "should make disease prevention the most important political task," it said.

At the Golden Dragon community, one resident took to the social-media platform Weibo to complain that the committee had refused to quarantine her and her husband, who were both sick. "The virus isn't scary so much as people's intentions," she wrote. "Do you want to quarantine me or have me die?"

The committee later arranged for the resident's husband, 44-year old Xu Weijie, to move to a hotel for monitoring and quarantine.

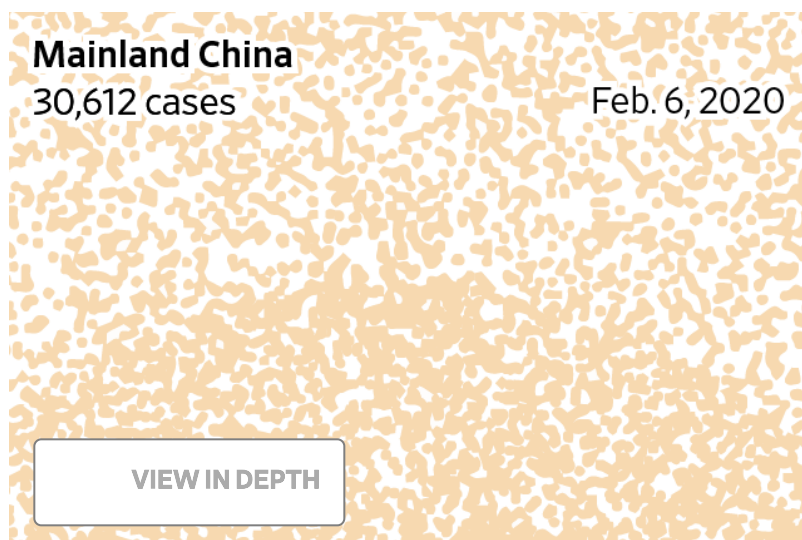
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While admitting to struggles, community committees said they had assisted many in need. There has been progress, with nearly 1,500 seriously-ill coronavirus patients getting admitted to hospitals in a matter of two days, Wuhan's former Communist Party secretary, Ma Guoqiang, said earlier this week.

Reinforcements have recently begun to arrive as the government brings in workers from state-owned enterprises and volunteers to help.

In Golden Dragon, about 40 residents have come down with fevers since the outbreak began, according to the community committee. Roughly half had regular colds while another 10 were confirmed to have the virus that causes Covid-19 and put in hospitals. Nine other suspected cases were either put in hospitals or transferred to hotels for testing.

Ms. Xiao said she started her job on the committee nearly two decades ago, not long before China suffered an outbreak of severe acute respiratory syndrome, or SARS. This outbreak has felt more serious, she said. Hubei registered only seven infections and one death from SARS in 2003.

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Ms. Xiao, the committee's party secretary, said she is in touch with every sick patient through [WeChat](#), a popular Chinese app, and her team rejoices each time an infected resident is able to secure a hospital bed.

Looking back, she said, she's not sure how she and her team got through the previous weeks. Trying to contain the outbreak has been grueling and terrifying, according to Ms. Xiao, who said she typically doesn't get home until midnight. After walking in the door, she sprays her clothes down with alcohol and takes a shower, worried she'll bring the virus back to her family.

She said she has noticed a change among residents recently. There is less fear, and the discussions in the WeChat group are starting to return to the mundane topics of everyday life, like how to bake cakes and cook pizza.

Still, she feels the battle against the virus is far from over. "I'm scared to be optimistic," she said.

—*Kersten Zhang contributed to this article.*

Write to Chao Deng at Chao.Deng@wsj.com

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WORLD

One Doctor's Life on the Coronavirus Front Lines. 'If We Fail, What Happens to You All?'

Short on supplies and sleep, medical staff are being stretched to the limit to stop a pandemic no one fully understands

March 4, 2020 12:54 pm ET

Driving one evening in Wuhan, China, last month, Zhang Xiaochun pulled her car to the side of the road. She was on the verge of a breakdown.

She'd been working nonstop for days at the center of China's coronavirus outbreak, where she is a doctor. Both of her parents had Covid-19, the disease caused by the virus, as did many of her colleagues. The number of sick and dying was climbing. And on this day, Dr. Zhang had forgotten about her 9-year-old daughter, who was home alone and scared—and who, at that moment, wasn't picking up the phone.

Dr. Zhang's eyes welled up, but she had no energy to cry. "My tears wouldn't flow," she said in an interview on Feb. 18.

Around the world, doctors are being stretched to the limit. Short on supplies and sleep, they're being asked to stop a global pandemic that no one fully understands. Adding to that strain, they're risking their own health while they diagnose cases and attend to sick patients—along with the health of their spouses, children and other close family members.

High-Speed Trains, International Flights: How the Coronavirus Spread



With the virus now growing more quickly outside China than inside, it's a problem other countries will increasingly face.

In China, more than 3,000 doctors have been infected, according to official data, and at least 22 have died. Some medical professionals believe the numbers are even higher, adding uncertainty for doctors elsewhere confronting the virus. Untold numbers of family members have fallen ill.

Chinese doctors are working shifts of 10 hours or more. Many stay in the same hazmat suits the entire time, without food, water or bathroom breaks. Disrobing to eat or go to the bathroom could risk exposure. Medical workers are requesting psychological help to try to deal with the stress.



Medical workers attended to a patient in Wuhan, Feb. 6.

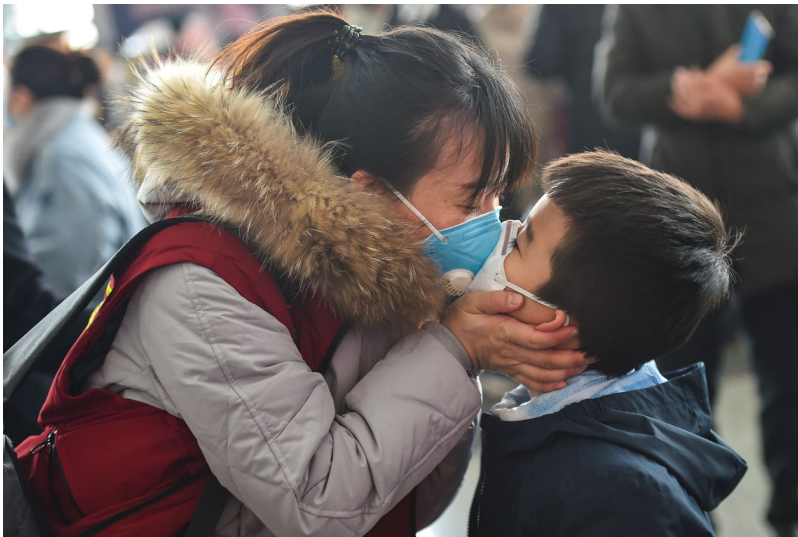
PHOTO: CHINA DAILY/REUTERS

Infectious-disease doctors around the world are trained to handle highly contagious illnesses, and know the risks. But the current outbreak is spreading so quickly that it's forcing hospitals to deploy staff with limited experience in infectious diseases and, sometimes, insufficient gear to keep them safe. Some hospitals can't find enough staff willing to take on the risk.

In South Korea, some nurses and support staff quit when the outbreak spread, their families begging them to resign. Iran has faced equipment shortages while its deputy health minister—himself a surgeon—has been infected with the virus.

Doctors in China say conditions have improved significantly since the early days of the outbreak. Roughly 42,000 medical staff from around the country have descended upon Wuhan and the surrounding Hubei province to provide relief. That includes around 4,000 military doctors in one of China's largest-ever mobilizations of military medical resources.

Wuhan has 53,000 beds in hospitals and temporary medical and quarantine facilities for treating patients with the coronavirus, with a goal of adding 17,000 more, according to an official media briefing on Feb. 20. Crowds and lines at fever wards have subsided as the rate of infections has slowed. Yet around 100 new cases are still emerging in Hubei province every day. An exhibit hall-turned-hospital that Zhongnan Hospital oversees had just one CT scanning machine during a recent tour by officials, according to state media.



A medical team member kissed her son before leaving for Hubei province at Wusu International Airport in Taiyuan, China, on Feb. 20.

PHOTO: CHAI TING/XINHUA/ZUMA PRESS

Liu Fan, a 59-year-old nurse at Wuhan Wuchang Hospital, one of the main coronavirus crisis centers in Wuhan, died from the virus even though she wasn't working in a fever ward, according to a Weibo post by the hospital. Her parents died from the virus a few days before her, and her brother, a local film director, died the same day she did, according to Chinese media.

In the early days of the outbreak, Wuchang Hospital's 51-year-old director, a neurosurgeon named Liu Zhiming, had warned colleagues about working too hard and burning out. He worried their immunities would decline.



Wuchang Hospital's Liu Zhiming.

PHOTO: ROPI/ZUMA PRESS

On Jan. 24, a chest scan showed he had a serious infection himself; he later tested positive for the virus. As Dr. Liu lay in intensive care, he kept fielding calls and asking about patients, while colleagues grew more anxious.

"I'm worried I can't do anything," Dr. Liu texted them, according to an account in official Chinese media. In another message, he said that "if it were any other illness, I would persevere and fight with everyone while sick."

His wife, Cai Liping, a head nurse at another hospital, implored Dr. Liu to let her visit, but he kept saying no, according to official Chinese media. She asked him to call her every day

at 2 p.m. to reassure her he was OK. She reminded him to breathe oxygen and not be afraid.

On Feb. 18, Dr. Liu died. A colleague sobbed while telling the media: “We really wanted to give him a farewell, but we had so much work to do.”

Many of the heaviest burdens are falling on younger doctors and nurses, who are seen as better suited for high-risk situations, because of their stronger immune systems.

One doctor, Peng Yinhua, died at just 29 years old, according to state media. He was working in a respiratory and critical care unit, and had postponed his wedding celebration to stay on the job. Li Wenliang, the Chinese ophthalmologist turned folk hero who died after warning about the dangers of the virus, was in his early 30s. Both doctors' wives were pregnant.



A memorial for Li Wenliang.

PHOTO: GETTY IMAGES

Dr. Zhang, who worried about her 9-year-old daughter and sick parents, was more prepared for the crisis than most. A radiologist at Zhongnan Hospital, a 3,300-bed facility overlooking a lake in central Wuhan, she had served on the front lines of SARS in 2003, as well as after China's deadly Sichuan earthquake in 2008.

On Dec. 31, Dr. Zhang was on her first day of vacation and planning to take a trip with her parents and daughter to their hometown in Inner Mongolia. That morning, her superiors called, ordering her to attend an emergency meeting.

Two patients at Zhongnan had lung infections reminiscent of SARS. Word was spreading among staff that a mysterious illness was sweeping through a seafood market on the west

side of town.

At the meeting, hospital officials issued new guidelines for staff to disinfect their spaces, unlock windows to ensure circulation of fresh air, and begin wearing goggles and other protection in some areas.

Dr. Zhang's colleagues had asked her to consult on the two patients' X-rays, and she was worried about what she saw. She warned colleagues that if a virus had spread from animals to humans, then human-to-human transmission would be easy.

She also spoke to the hospital's Communist Party secretary to explain her fear of another epidemic. Some people thought she was being alarmist, she says.

With the hospital short on supplies, Dr. Zhang made homemade masks out of gauze for her parents and daughter, just like she'd learned to do during SARS. The family canceled their holiday.



Zhang Xiaochun working in her hotel room, Feb. 18.

PHOTO: THE WALL STREET JOURNAL

A few days later, a technician in the imaging department discovered he had been infected. Sick patients began pouring in. Soon dozens of staff were sick at Zhongnan, and other Wuhan hospitals, as well.

Most days, Dr. Zhang reviewed chest X-rays, a relatively low-risk job. Some days, she'd don a hazmat suit and tend to patients herself.

Worried she might bring the virus back home, and overloaded with work, she began sleeping on an office sofa. She barely had time to eat and shower.

She figured her parents, who lived in her home, could take care of her daughter. Her husband was living and working hundreds of miles away and unable to join them after authorities announced a strict quarantine of Wuhan in late January.

Then Dr. Zhang's 69-year-old mother admitted to feeling sick. Dr. Zhang convinced her parents to get tested for the virus. For her mother's first visit to the hospital, Dr. Zhang had her meet nearby, so her mother could put on protective gear before going in.

Both parents came up negative using the nucleic acid test, a finicky diagnostic tool test that regularly produced false negatives. Their CT scans told a different story.

"When I saw it, I knew," Dr. Zhang said, recalling her mother's first chest scan. "My heart sank." Her father, who had been reluctant to get tested, had a lung infection that turned out to be even worse, though he showed no obvious symptoms at the time.

All along, the family worried about the youngest member, Dr. Zhang's daughter. Dr. Zhang had been too scared to check her daughter, until the girl volunteered. "Scan me! It'll be OK," she said.

Her lungs were normal.



A medical worker took a break during her night shift at a community health-service center in Wuhan, Feb. 9.

PHOTO: CHINA DAILY/REUTERS

Still, Dr. Zhang was facing a crisis. Her husband was away, her parents were sick and contagious, and she was needed at the hospital. There was no one to take care of her daughter, whose school was closed.

Dr. Zhang planted her in the family's living room with instructions to look after herself—and to stay away from her grandparents, who quarantined themselves in other rooms.

The 9-year-old learned how to heat up canned congee, placing it at each grandparent's door.

As her parents' conditions worsened, Dr. Zhang struggled to get them admitted to a hospital. Beds were limited and authorities were unwilling to make arrangements for people whose nucleic acid tests had come back negative.

With help from a colleague, Dr. Zhang got hold of some medicine, including antiretroviral medication for HIV that researchers are testing as a treatment for the coronavirus. Her parents suffered side effects, including nausea.

Then, 10 quarantine spots opened up for family of Zhongnan Hospital staff, in an empty building slated for demolition. Dr. Zhang raced to grab a number to reserve a spot, while a colleague ran to guard two beds inside.

The new location wasn't designed to provide any medical treatment, but getting a room for her parents was a relief for Dr. Zhang. Although authorities had publicly announced there were no more beds there, scores of people had gathered there anyway, desperate to get space.

"Some people were clutching their stomach, others holding their heads and others coughing uncontrollably," said Dr. Zhang. Her heart broke.

After the chaos that day, she suddenly remembered her daughter back home. She tried calling and pulled over her car. She was overwhelmed with feelings of guilt and hopelessness.

It took a moment for her to calm herself down. She told herself: "It would be a disaster for the family if I couldn't pull it together."



Medical workers in Wuhan, Feb. 8.

PHOTO: GAO XIANG/XINHUA/ZUMA PRESS

Arriving home, Dr. Zhang pushed open the door to find the lights out.

In a panic, she called out for her daughter. A faint voice replied from the dark as her daughter stirred from a nap. She had been hungry without food at home, and had little energy to do anything but lie down and sleep.

Her daughter ate the meal her mother had brought, pleading for things to be different. She asked why her mother had to be at work all the time.

“I was afraid to be alone at home today,” Dr. Zhang’s daughter told her.

Dr. Zhang felt terrible but tried to coax her daughter to understand. “You need to grow up,” she said. “If you don’t grow up, Mom will be even more worried.”

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Eventually, her daughter said, “Mom is so strong, I’ll be too,” though she admitted she was still scared. Dr. Zhang tucked her daughter in for the night, letting her watch cartoons from her bed.

Dr. Zhang knew then she needed to find some way for her husband to join her in Wuhan. The couple applied for special permission from the government; two days later, he got approval to drive the roughly 14-hour journey into the city.

On Feb. 3, Dr. Zhang took to her social messaging account to call for the use of chest X-rays in diagnosing Covid-19, instead of lab tests that were resulting in so many false negatives. She raised the alarm on cross-infection within families, recommending the government make use of hotels and school dormitories to quarantine suspected cases.

Speaking up was no small risk for Dr. Zhang, who went back and forth over whether to post the night before. Even Dr. Zhang's friends were worried about her post, she said. Authorities had detained people for speaking up about the outbreak in its early days.

The next day, China's National Health Commission incorporated the use of chest scans in diagnoses in Hubei province. Days later, authorities reclassified more than 13,000 suspected instances of the virus as confirmed cases. That meant many more patients could have a better chance of access to treatment, including hospital beds and quarantine locations as they opened up.

Friends sent screenshots of the good news to Dr. Zhang. She worried about a shortage of CT scanners and called up manufacturers that could produce portable machines. She helped coordinate with staff at other facilities to ensure they had enough equipment and technicians.



A sports stadium that was converted into a makeshift hospital in Wuhan, March 1.

PHOTO: CHINA DAILY/REUTERS

For Dr. Zhang, the outbreak has felt never-ending. Her hospital oversees three separate coronavirus facilities with 5,400 beds.

At its own campus, Zhongnan worked to add 2,000 new beds, up from a few hundred for coronavirus patients previously. With their offices being repurposed for patients, Dr.

Zhang and her colleagues moved into a hotel, where they work and sleep.

Dr. Zhang believes it will take months for hospitals to work through all the infected patients. Letting down their guard could lead to a resurgence in cases.

One night, Dr. Zhang returned to her hotel carrying half a dozen lunch boxes for her colleagues. She says her back felt like it would split in two, and she had developed a persistent cough.

A hotel security guard checked Dr. Zhang's temperature and asked her to log what time she entered the building. She had completely lost track of time.

"I'm fine," she said, as the guard raised a thermometer to her forehead. It was normal.

"If we fail, what happens to you all?" she said, walking away.

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