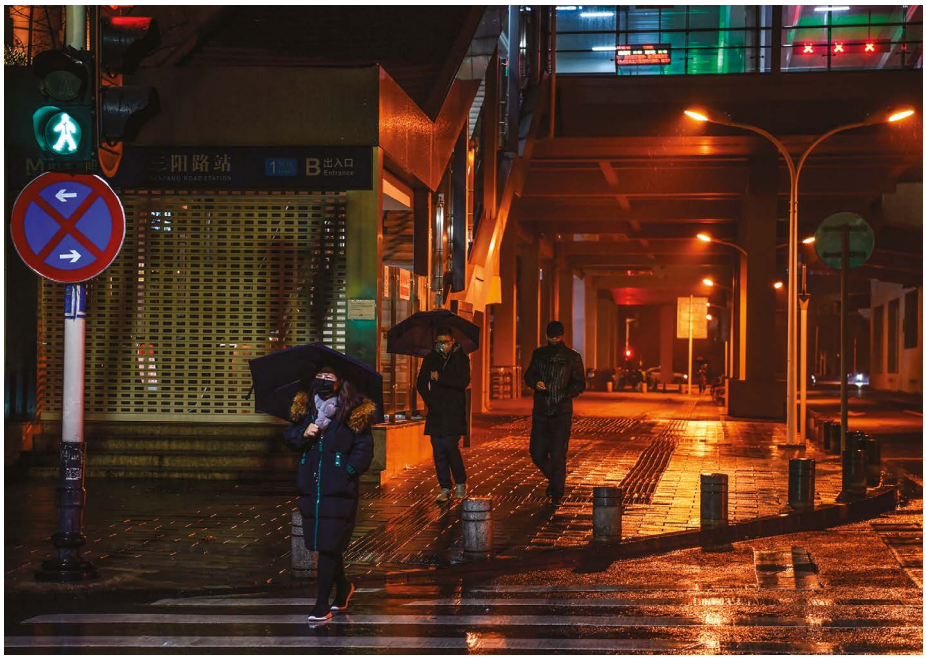

HECTOR RETAMAL/AFP/GETTY

The city of Wuhan, China, is on lockdown in an attempt to halt the coronavirus outbreak.

in 2017. SARS and the new virus are part of a subgroup known as betacoronaviruses. Fieldwork in the wake of the SARS outbreak has found such viruses only in mammals, Cui says.

What can we learn from the virus's genetic sequence?

Genetic sequencing of the Wuhan coronavirus offers clues to its origins and spread. Labs in China and Thailand have sequenced the genomes of more than 20 strains found in infected people and have made them publicly available. That's "pretty remarkable", says Trevor Bedford, an evolutionary geneticist at the Fred Hutchinson Cancer Research Center in Seattle, Washington, who is analysing the sequences as they come in. "People are extremely fast and excellent about data sharing," he adds.

Bedford and other geneticists are using the data to determine when the virus emerged — current estimates point to November 2019. Viral sequences, Bedford adds, could identify any genetic changes that might have helped the virus make the jump from animals to humans. And if there is extensive human-to-human transmission, Bedford and other geneticists will be looking for signs that the virus has gained further mutations that are enabling it to spread more efficiently in humans.

Bedford cautions that any conclusions are preliminary, because so few data are available. "Adding a few key samples can change the story significantly," he says.

Can a drug be developed to treat the coronavirus?

No drugs have been shown to be effective in treating SARS or other coronavirus infections in humans, and no vaccines aimed at preventing these infections have been licensed.

A team at China's National Engineering Research Center for the Emergence Drugs in Beijing is working on finding therapies that would work by blocking the receptor on human cells that the virus latches on to and uses to infect the cells. A comparison of the SARS and new China virus sequences, published on 16 January, found that they probably bind to the same receptor. The team is hoping to revive efforts to develop treatments for SARS and adapt them in a bid to develop a drug that could work against the latest virus.

Another researcher who has been developing drugs for coronaviruses since the SARS outbreak is hoping to test drug candidates in animal models of the Wuhan virus (see 'Q&A: Rolf Hilgenfeld').

> **"People are extremely fast and excellent about data sharing."**

Chinese authorities are also testing whether existing HIV drugs can treat the infection. Ritonavir and liponavir, which are approved to treat HIV, are being given to people with pneumonia caused by the coronavirus, according to media reports and a 26 January statement by the Beijing branch of China's National Health Commission.

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Q&A

Rolf Hilgenfeld

Structural biologist Rolf Hilgenfeld has been trying to develop a cure for coronaviruses since the 2002–03 outbreak of severe acute respiratory syndrome (SARS). Hilgenfeld, who is based at the University of Lübeck in Germany, is hoping to get into the locked-down city of Wuhan in China to test drug compounds in animals infected with the new coronavirus. He tells *Nature* about his quest.

Why are you visiting China?
After this virus emerged, I contacted collaborators in Wuhan. I have two compounds to test against the new virus, so I am seeking collaborators who have samples of the virus.

At what stage of development are your compounds?
We have been preparing them for testing in a mouse model of Middle East respiratory syndrome (MERS). In cell culture, we know they work against the SARS and MERS coronaviruses.

Could they help to subdue the new virus?
The problem with antiviral drugs is that when the compound is ready, there are no patients. After six months, we could have data showing that one of our compounds works against the new virus, and would be able to develop a drug. But if the outbreak is over, there will be no patients, so how can you do clinical trials?

What do your compounds do?
They are active against coronaviruses and a family of enteroviruses, which include hand, foot and mouth disease. Every year, half a million children get enterovirus-71, so we'd aim to go into clinical trials for these diseases. We can involve pharma. If we have something approved for those, we can use the drug in the next coronavirus outbreak. The compounds are directed at viral proteases, which have common features in coronaviruses and enteroviruses.

Interview by David Cyranoski
This interview has been edited for length and clarity.