NEWS · 11 MARCH 2020

CORRECTION 31 JANUARY 2020

Coronavirus latest: WHO describ pandemic

Updates on the respiratory illness that has infected ten and killed several thousand.

A sign directs patients to coronavirus services at a the University College Hospital in London. Credit: Isabel Infantes/AFP /Getty

Here's the latest news on the outbreak.

11 March 16:35 GMT – Coronavirus outbreak is a pandemic, says WHO

After weeks of resisting mounting pressure from scientists, politicians and others, the World Health Organization in Geneva has decided to describe the coronavirus outbreak as a pandemic.

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The race to unravel the United States' biggest coronavirus outbreak

The declaration comes after a 13-fold rise in the number of cases outside of China and a trebling of countries affected in the last two weeks – but does not change WHO strategy for tackling spread of the virus, director-general Tedros Adhanom Ghebreyesus said in an 11 March press briefing.

"WHO has been assessing this outbreak around the clock and we are deeply concerned both by the alarming levels of spread and severity, and by the alarming levels of inaction," said Tedros Adhanom Ghebreyesus.

"Describing the situation as a pandemic does not change WHO's assessment of the threat posed by this coronavirus. It doesn't change what WHO is doing, and it doesn't change what countries should do," Tedros said. "Pandemic is not a word to use lightly or carelessly. It is a word that, if misused, can cause unreasonable fear, or unjustified acceptance that the fight is over, leading to unnecessary suffering and death."

Many scientists had been calling for the change in language for weeks – after large outbreaks were detected in South Korea, Iran and Italy. At the time, some researchers suggested that countries would soon move from efforts that involve containing as many new cases as possible to social-distancing measures, such as school closures, that do not rely on knowing who is infected with the virus and who is not.

The virus is now in more than 100 countries. It has infected some 120,000 people, killing more than 4,000 of them. Several nations have closed schools in a bid to stop the virus, and Italy has entered an unprecedented countrywide lockdown.

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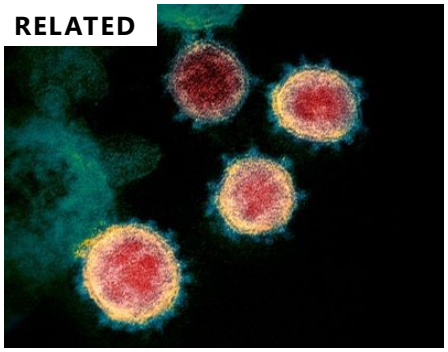

Why does the coronavirus spread so easily between people?

"This is not just a public health crisis, it is a crisis that will touch every sector — so every sector and every individual must be involved in the fight," said Tedros.

Researchers have been working rapidly since the outbreak came to light in January to characterize the virus, work out why it is so infectious, find out where it came from, and help with diagnosing infections.

11 March 12:30 GMT – Transgenic animals for coronavirus research in high demand

Labs are scrambling to get their hands on transgenic animals that can be used to study the coronavirus and test drugs and vaccines. Ordinary mice seem to be resistant to infection by this coronavirus, so researchers conduct studies in rodents that produce a human version of the protein ACE2, which the virus uses to enter cells.

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Labs rush to study coronavirus in transgenic animals – some are in short supply

But these mice — originally developed for research into severe acute respiratory syndrome, or SARS — are in short supply. One US breeding facility, the Jackson Laboratory — has received requests for 3,000 mice, and is now establishing a colony of these animals.

Researchers have also already reported initial results from studies in monkeys infected with coronavirus. The animals seemed to experience only a mild illness, similar to that of many humans. Scientists are now seeking animal models to mimic the more severe version of the illness.

11 March 07:30 GMT – Major chemistry meeting among cancelled scientific conferences

The American Chemical Society (ACS), the world's largest scientific society, cancelled its meeting in Philadelphia, Pennsylvania, on Monday, 13 days before it was due to begin on 22

March.

The conference is one of a growing number of scientific meetings and conferences being cancelled because of coronavirus outbreaks. Governments and health officials are increasingly calling for the restriction of large gatherings, in an attempt to reduce the virus's spread.

The ACS said the decision to cancel was based on several factors, including a rise in COVID-19 cases in the greater Philadelphia area and input from members who were increasingly concerned about travelling to and attending a large meeting. About 800 participants had already cancelled their registrations before the announcement, an ACS press officer told *Nature*.

The American Physical Society's huge March Meeting was also cancelled last week, about a day before it was due to begin. Scores of other meetings are being postponed or being held virtually.

10 March 03:30 GMT – Call for more funding

At least US$8 billion is needed to address the most pressing threats posed by the new coronavirus, says the Global Preparedness Monitoring Board (GPMB), an independent group co-convened by the World Health Organization and the World Bank Group to combat public-health emergencies.

The money is needed in addition to the tens of billions of dollars already pledged by the International Monetary Fund, the World Bank Group and individual governments.

The GPMB released a report on 9 March calling on advanced economies, such as the members of the Group of Seven and Group of 20 industrialized nations, and financial institutions, to provide money to address five priority areas. These include strengthening weak health-care systems; supporting the World Health Organization's efforts to help vulnerable countries; developing diagnostics, therapeutics and vaccines; strengthening regional surveillance; and ensuring that sufficient protective equipment is available for health workers.

9 March 04:00 GMT – Global cases pass 100,000

The number of known global cases of COVID-19 passed 100,000 over the weekend. On 8 March, the World Health Organization reported 105,586 confirmed cases across more than 100 countries and territories. Although the outbreak has been slowing in China, where it originated, the country still accounts for almost 80% of confirmed cases.

6 March 11:30 GMT – US Congress approves US$8.3 billion for coronavirus response

The United States Congress has passed an emergency spending bill that will allocate US$8.3 billion for the country's coronavirus response. The House of Representatives passed the bill in a near-unanimous vote on Wednesday afternoon; the Senate followed suit on Thursday.

The bill will provide more than $3 billion to the Centers for Disease Control and Prevention, the National Institutes of Health, and the Food and Drug Administration for research on diagnostics, therapeutics and vaccines. Each US state will reportedly receive at least $4 million for state and local government responses. The bill also includes a provision to ensure that an eventual vaccine is affordable.

Other funding will contribute to the global coronavirus response and provide support for small businesses that are struggling in the wake of the outbreak. The bill will now go to President Donald Trump to be signed.

Elsewhere, the US National Science Foundation in Alexandria, Virginia, opened up a Rapid Response Research funding mechanism for non-medical coronavirus-related research. Such calls are often used to award funding for work exploring the impacts of natural disasters such as hurricanes and wildfires, and allow for an expedited review of research proposals.

5 March 15:30 GMT – China study suggests children are as likely to be infected as adults

Children are just as likely to become infected with the new coronavirus as adults, finds one of the most detailed studies yet published on the spread of the virus, known as SARS-CoV-2. The analysis — based on data from Shenzhen in China — provides a partial answer to one of the

most pressing questions surrounding the outbreak: the role of children.

Previous studies have suggested that kids are much less likely than other age groups to develop severe symptoms when infected by the coronavirus. But it was not clear whether this was because they weren't getting infected or because they were fighting off the infection more effectively.

"Kids are just as likely to get infected and they're not getting sick," says Justin Lessler, an infectious-disease epidemiologist at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland. He co-led the study with three other epidemiologists — Qifang Bi, also at Johns Hopkins, Ting Ma at the Harbin Institute of Technology in Shenzhen and Tiejian Feng at the Shenzhen Center for Disease Control and Prevention. They posted the analysis to the medRxiv preprint server on 4 March.

The study is unique in that it looked at not only people who were infected with the virus, but also large numbers of their close contacts, some of whom were infected and many of whom were not. The researchers followed 391 people who were diagnosed on the basis of their symptoms, and 1,286 of their close contacts to see whether these contacts tested positive for the virus even if they didn't show symptoms. Overall, the team found that children under 10 who had potentially been exposed to the virus were just as likely to become infected as other age groups, with between 7% and 8% of contacts of known cases later testing positive.

The authors also found that people who lived in the same household as someone infected with the virus were about six times more likely get infected than those who made contact with an infected person in other settings.

"This may be the first clear evidence that children are as susceptible as adults to SARS-CoV-2 infection," says Ben Cowling, an infectious-disease epidemiologist at the University of Hong Kong. He wonders whether the fact that outbreaks haven't been observed in schools could be down to the fact that children's symptoms are mild.

Lessler says it's still not clear whether children are important in transmitting the virus, as they are for influenza; children routinely develop flu symptoms and are common hubs in chains of

transmission. “That’s one of the current critical remaining questions and we’re trying to figure out how to answer it,” he says. “I have a 7-month-old and a 6-year-old and I can’t imagine that, if they have any virus at all, they’re not getting it on somebody.”

The study could have important implications for slowing the spread of the virus through measures such as school closures. “Once we say containment is not an option, we can’t ignore the kids,” says Lessler.

“This is a key piece of data that may support school closures as an effective intervention,” Caitlin Rivers, an epidemiologist at Johns Hopkins Bloomberg School of Public Health, said in a tweet on 5 March.

5 March 12:55 GMT – World Bank pledges US$12 billion for coronavirus response

On 3 March, the World Bank Group pledged up to US$12 billion, including $8 billion in new funding, to support countries dealing with the coronavirus outbreak. The funding will be fast-tracked and consists of grants and low-interest loans, as well as technical support.

Most of the package is earmarked for strengthening health systems and improving access to treatment. The World Bank said it would prioritize funding for countries at high risk and with low capacity to deal with the outbreak. Half of the pledged money is from the International Finance Corporation, and is intended to strengthen global supply chains and support key industries such as pharmaceuticals.

4 March 12:00 GMT – Repurposed drugs in coronavirus spotlight

Drugs used to treat HIV and an experimental antiviral drug developed to fight Ebola virus are among those that are rapidly being tested against the new coronavirus. There are no approved treatments for diseases caused by coronaviruses. But hundreds of clinical trials of drug candidates are planned or underway, with much of the focus on remdesivir, a candidate drug originally developed to

More than 80 clinical trials launch to test coronavirus treatments

treat the Ebola virus.

The drug, developed by the pharmaceutical firm Gilead Sciences of Foster City, California, is being tested in partnership with Chinese health authorities in randomized, controlled trials; two of these are set to finish in April. The compound works by trying to prevent the replication of the virus. "Remdesivir has quite high efficacy across all different coronaviruses and therefore it is one of the prime candidates to start being tested," says Vincent Munster, chief of the viral ecology unit at the US National Institutes of Health.

2 March 21:00 GMT – Infections worldwide top 90,000

The number of people worldwide who have been infected with the coronavirus has passed 90,000. More than 3,000 have died since the outbreak began in December. The vast majority of cases — more than 80,000 — have occurred in China, but around 60 other countries are now also dealing with outbreaks. Many nations are preparing for a global pandemic, as reports of cases caused by spread within communities — rather than being imported from China — rise.

South Korea, Italy and Iran are fighting the largest outbreaks outside China.

pid spread. A line chart showing coronavirus case numbers in China and other countries from
ı to 3 March.

Source: Johns Hopkins University

2 March 20:45 GMT – WHO raises alert to 'very high'

At a press briefing on 29 February, the World Health Organization (WHO) announced that it had raised the global alert for COVID-19 to the highest possible level, short of calling it a pandemic. The virus has now spread to some 60 locations outside China, with new cases detected in Ireland, Monaco, Azerbaijan, Qatar and Ecuador.

The global alert for the spread and impact of the coronavirus outbreak increased from 'high' to 'very high'. The alert remains 'very high' in China.

The global change was based on an assessment by WHO epidemiologists, which took into account the continued increase in the number of cases and affected locations, and the difficulties that some regions, including Iran and Italy, are facing in containing the spread of the coronavirus.

Tedros Adhanom Ghebreyesus, director-general of the WHO, said at the briefing that most cases were linked and could still be traced to known contacts or clusters, with no evidence of the virus spreading freely in communities. "As long as that is the case, we still have a chance of containing this virus, if robust action is taken to detect cases early, isolate and care for patients and trace contacts," said Tedros.

The organization therefore once again resisted declaring the outbreak a pandemic. Mike Ryan, director of the WHO's emergencies programme, said that such a decision would mean that efforts to contain and slow down the spread of the virus have failed, which has proved to be untrue in China, Singapore and other regions.

The WHO is still holding out hope that the virus can be contained, but we have probably crossed that threshold, says Adam Kamradt-Scott, a global health-security researcher at the University of Sydney, Australia.

Some countries have already begun to prepare their pandemic plans, which is an important precautionary measure, says Nigel McMillan, an infectious-disease researcher at Griffith University in Brisbane. Australia, for example, initiated its coronavirus emergency response on 27 February. The WHO is being overly cautious in not declaring a pandemic, says McMillan.

2 March 20:30 GMT – Transmission details emerge from WHO China analysis

China has mounted "perhaps the most ambitious, agile and aggressive disease containment effort in history" against a new infectious disease, the World Health Organization (WHO) said in a report released on 28 February, after nine days of meetings and site visits in China from 16

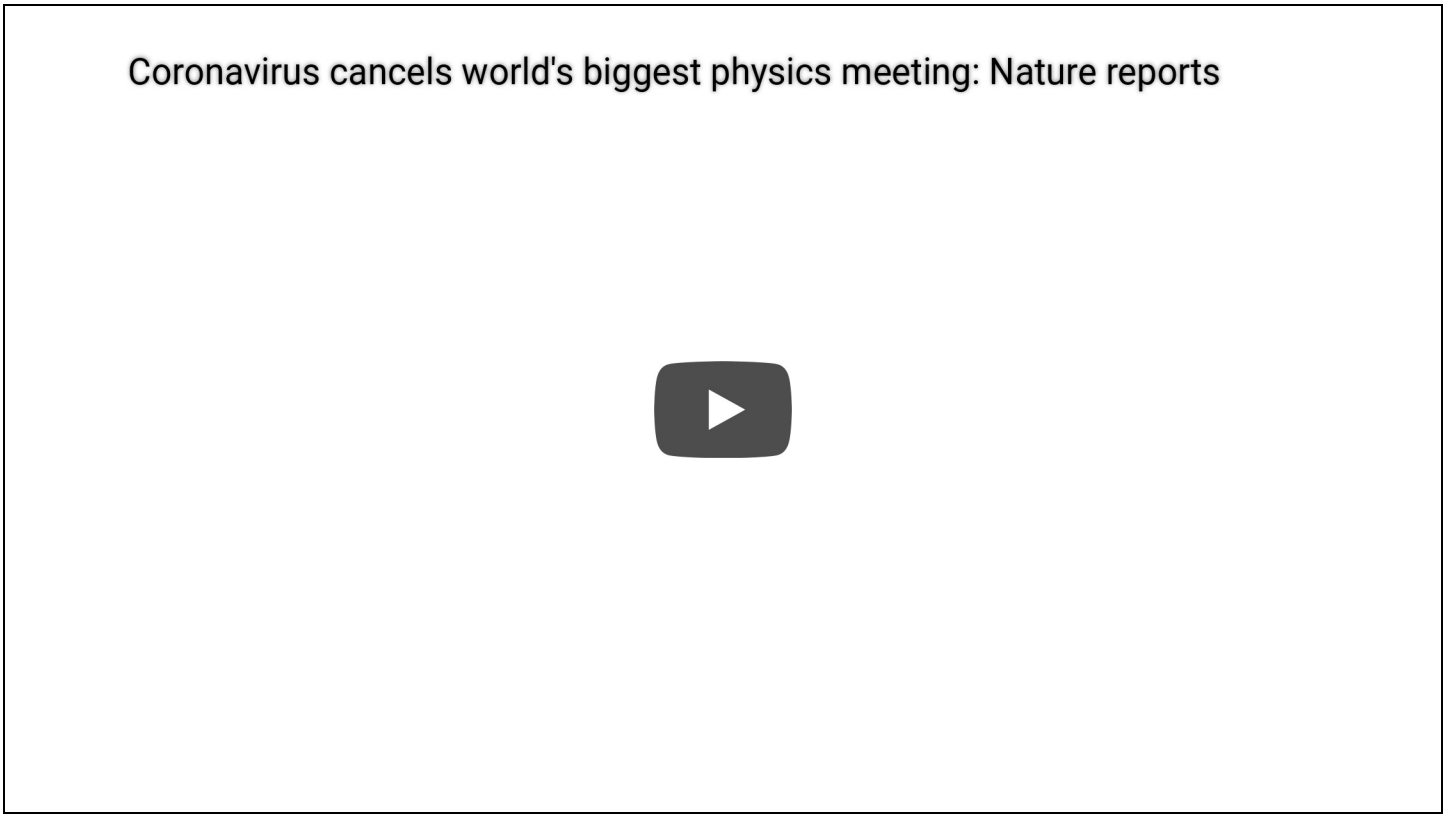
to 24 February. The report analyses data from the outbreak in China, and recommends steps that the country and others should take to curb COVID-19.

Daily reports of new cases are declining in the country, the WHO confirmed — so much so that authorities are now having problems recruiting participants for the more than 80 clinical trials there that are testing potential treatments for the coronavirus. Some experimental treatments should be prioritized over others, the health agency recommended.

The report's analysis of data from China finds 99.9% similarity between the 104 strains of the coronavirus, named SARS-CoV-2, collected from people between December 2019 and mid-February 2020. This means that the virus is not mutating significantly. The median age of people infected is 51 years. And most cases of spread from person to person have been in hospitals, prisons or households, which implies that close contact is often required for the virus to spread between people. Airborne spread is not believed to be a major driver of transmission, the report says. In one preliminary study from the province of Guangdong, people in the same household as someone with COVID-19 had a 3–10% chance of being infected.

The WHO credits China's ability to rein in the epidemic to a variety of measures. One is that 1,800 teams of epidemiologists have rapidly tracked tens of thousands of contacts of people infected with the virus in Hubei province, where the outbreak emerged. Up to 5% of these contacts ended up having the disease and were diagnosed quickly. And the report says the lockdown on travel out of Hubei — an unprecedented measure in a province of this size — curbed wider spread of the disease to China's 1.4 billion citizens.

2 March 17:45 GMT — Coronavirus fears cancel huge physics meeting



Senior *Nature* reporter Davide Castelvecchi reports from Denver, Colorado, where the world's biggest physics meeting has been cancelled because of coronavirus fears.

The meeting was scheduled to host 11,000 attendees. Some researchers are finding other ways to share their work, including informal meet-ups and virtual talks.

Several other scientific meetings have also been cancelled, as virus outbreaks emerge and escalate in countries around the world.

28 February 12:45 GMT — Coronavirus spreads to sub-Saharan Africa

The coronavirus outbreak has spread to 46 countries other than China — and now seems to be spreading faster outside China than inside.

Several nations reported their first infections this week; cases included the first to be confirmed in sub-Saharan Africa, in Nigeria. The Nigeria Centre for Disease Control reported the case on 27 February and said it was working to trace the infected person's contacts. Health authorities and researchers have feared the virus's spread to African countries including Nigeria, where weak health systems could quickly be overwhelmed by a local outbreak.

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This Nigerian doctor might just prevent the next deadly pandemic

The World Health Organization reports that more than 82,000 people worldwide have now been infected — more than 3,600 of those outside China. Cases in South Korea, which is handling the world's second-largest outbreak, have exploded to more than 2,300.

China's outbreak seems to be slowing, with the daily number of new cases dropping. Authorities reported 327 new infections nationwide on 27 February. A week earlier, on 20 February, that figure had been around 900. Outside China, about 750 new cases were reported on 27 February.

26 February 18:30 GMT — Brazil reports first case in South America

A case of COVID-19 has been confirmed in Brazil — the first in South America. On 26 February, Brazil's minister of health, Luiz Henrique Mandetta, confirmed that a man who travelled to northern Italy between 9 and 21 February has the disease. Italy's outbreak has escalated to 324 cases and 12 deaths, according to a virus tracker maintained by Johns Hopkins University in Baltimore, Maryland.

The Brazilian case is in a 61-year-old man who sought care for a fever, cough and sore throat yesterday at a hospital in São Paulo, where he tested positive for COVID-19. Officials say he is in stable condition and will be quarantined at home for 14 days. "We should only take those with severe respiratory conditions to the hospital," said Mandetta in a tweet.

Algeria, Greece, Afghanistan, Bahrain, Iraq and Oman have all reported their first cases within the past two days. The virus's appearance in South America now means that it has spread to every continent except Antarctica.

25 February 22:30 GMT — Trump requests emergency funding for coronavirus response

The administration of President Donald Trump has requested up to US$2.5 billion to fund the US response to COVID-19. In a 24 February letter to Congress, the Office of Management and

Budget requested $1.25 billion in new funding and proposed to make up the rest by repurposing funds allocated to other programmes, including $535 million assigned to the Ebola response.

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Time to use the p-word? Coronavirus enters dangerous new phase

Democratic legislators immediately criticized the requested sum as overdue and insufficient. The US government has allocated several times that figure for past outbreak responses: Congress approved about $5.4 billion for the 2014 Ebola outbreak, and in 2009 about $7.7 billion was directed to the H1N1 influenza pandemic response.

Public-health policy analysts expect the government to make some funds available, but it's unclear how much will be appropriated, and how soon. "My expectation is that something will eventually be passed," says Josh Michaud, a public-health policy analyst at the Kaiser Family Foundation, a non-profit organization in Washington DC. "What eventual form that is and whether it conforms to the risk that coronavirus poses is another question."

25 February 21:00 GMT – Researchers anticipate unstoppable spread

Despite the World Health Organization's decision not to describe the escalating coronavirus outbreak as a pandemic, some scientists say that the spread is already moving into a new, dangerous phase. They say measures to limit spread will have to shift from containment to mitigation, as countries including Iran, Italy and South Korea report growing outbreaks with hundreds of infections.

25 February 18:30 GMT – 'There is lots of anxiety': a scientist's view from South Korea

Chemist Bartosz Grzybowski discusses his experiences in South Korea in the midst of the coronavirus outbreak.

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Bartosz Grybowski is a crystal chemist in South Korea, where cases of the coronavirus have surged.

Crystal chemist Bartosz Grzybowski talks to the *Nature Podcast*'s Nick Howe about how the surging outbreak in South Korea is affecting daily life as a researcher. Grzybowski is at the Ulsan National Institute of Science and Technology, about 60 kilometres from the city of Daegu, where most of the country's coronavirus cases have occurred. He says panic and fear reign – but the nation seems well prepared.

24 February 16:30 GMT – WHO says outbreak isn't a pandemic

At a press briefing on 24 February, the World Health Organization (WHO) said that, despite the spread of the disease, the coronavirus outbreak does not yet amount to a pandemic. "Using the word pandemic now does not fit the facts, but it may cause fear," said WHO director-general Tedros Adhanom Ghebreyesus.

"For the moment, we are not witnessing the uncontained global spread of this coronavirus, and we are not witnessing large-scale severe disease or death," said Tedros. "Does this virus have pandemic potential? Absolutely. Are we there yet? From our assessment, not yet."

Mike Ryan, director of the WHO's emergencies programme, justified the organization's position by explaining that the virus's transmission remains poorly understood – and it seems that the rate of new infections is declining in China. He advised countries to focus on treating patients and reducing the chance of people spreading the virus to others.

24 February 14:00 GMT – Cases outside China are rising

The number of cases of COVID-19 outside China jumped over the weekend, with Italy, South Korea and Iran reporting new infections. Kuwait, Bahrain, Afghanistan and Iraq also

confirmed their first cases on 24 February.

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Coronavirus: hospitals must learn from past pandemics

Officials in Iran have reported up to 61 cases and 12 deaths. But the figures have been in flux, and case numbers will probably rise in the coming days, given that the number of deaths compared to overall cases is much higher than reported in other countries.

South Korea had confirmed 833 infections and 8 deaths as of 24 February, according to a virus tracker maintained by researchers at Johns Hopkins University in Baltimore, Maryland.

The virus is also spreading in Italy, where 230 people have been infected and 5 have died, according to the tracker.

At a meeting organized by the African Union on 22 February, Tedros Adhanom Ghebreyesus, the director-general of the World Health Organization, said he was especially worried about the rise in cases in Iran, South Korea and Italy. "The increasing signs of transmission outside China show that the window of opportunity we have for containing this virus is narrowing," he said.

Meanwhile, more than 77,000 people have been infected in China, and the death toll there has passed 2,500.

20 February 13:30 GMT — Coronavirus death toll passes 2,000

More than 2,100 people worldwide have now died from COVID-19, the disease caused by the new coronavirus. On 20 February, Chinese authorities reported that 2,118 people there had died from the illness. Infections worldwide have topped 75,000; more than 74,000 are in China.

20 February 13:00 GMT — China's case-counting methods raise concerns

Scientists have questioned the way in which China is counting cases of the coronavirus. China's official reports on the number of infections have not been including people who have tested positive for the virus but have no symptoms. Researchers fear the practice is masking the epidemic's true scale — but some public-health experts say China is right to prioritize tracking ill people who are spreading the disease.

ɛdical staff members working at a computer in an exhibition centre converted into a hospital ir ɹhan, China

Medical staff working in an exhibition centre converted into a hospital in Wuhan, China Credit: AFP/Getty

18 February 11:00 GMT — Has the outbreak in China peaked?

A study of nearly 45,000 confirmed COVID-19 cases in China suggests that the outbreak might already have reached its climax. The report, from the country's Center for Disease Control and Prevention, says that the peak — the day with the highest number of new infections — occurred around the end of January. The number of new laboratory-confirmed cases per day declined from then to 11 February, the end of the study period. However, the number of new suspected cases and cases diagnosed by physicians using chest scans, known as clinically diagnosed cases, stayed at roughly the same levels.

The latest data on coronavirus infections in China appear to show a decline in new cases, said Tedros Adhanom Ghebreyesus, director-general of the World Health Organization (WHO), at a press briefing on 17 February, the same day the Chinese report was released. But he said the trend must be interpreted cautiously. "It's too early to tell if this new reported decline will continue," he said. "Every scenario is still on the table."

Raina MacIntyre, a physician and epidemiologist at the University of New South Wales in Sydney, Australia, agrees

that the data need to be considered with caution, but says the general trends are informative. The WHO's reports also show a decline in new cases reported per day in China and worldwide, she says.

But the extended Chinese holiday period that ended on 9 February means there might be another increase in new cases around 21 February, as people return to work. "Often with epidemics we see more than one peak," says MacIntyre.

Epidemiologists have been trying to estimate roughly when the outbreak will peak, so public-health officials can prepare hospitals and work out when it will be safe to lift travel restrictions in Wuhan and several nearby cities.

Some models suggest that the climax will happen any time now. Others say that it is months away and that the virus will infect millions — or, in one estimate, hundreds of millions — of people before then. This model assumes that many more people have been infected than is reflected by official counts, but that these people have no symptoms or are not ill enough to seek medical treatment.

anning electron microscope image shows SARS-CoV-2.

The coronavirus SARS-CoV-2, shown in a scanning-electron-microscope image. Credit: NIAID-RML/de Wit/Fischer

17 February 00:30 GMT — First case in Africa detected

The first case of the new coronavirus has been reported in Africa — in a person in Egypt. The country's health ministry and the World Health Organization said on 15 February that the case had been detected as a result of Egypt's programme to trace visitors who had come from affected countries. The person tested positive for the virus but had no symptoms. They are currently being isolated and are in a stable condition.

Researchers have been apprehensive about the virus arriving in Africa, and about its potential to spread there. Vittoria Colizza, who models infectious diseases at the Pierre Louis Institute

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Scientists fear coronavirus spread in countries least able to contain it

of Epidemiology and Public Health in Paris, told *Nature* that she's most concerned about seven African nations that have a moderate risk of importing the virus, but whose weak health-care systems, low economic status or unstable political situation make them highly vulnerable. These countries are Nigeria, Ethiopia, Sudan, Angola, Tanzania, Ghana and Kenya.

Transmission electron microscope image shows SARS-CoV-2

Electron-microscope image of the new coronavirus, now designated SARS-CoV-2. Credit: NIAID-RML/de Wit/Fischer

14 February 14:00 GMT – Chinese cases spike after diagnosis change

A sudden spike in new coronavirus cases reported in China this week shocked some researchers. But the huge bump in numbers isn't a sign that the epidemic is worsening, say others; it is instead the result of authorities changing how cases are confirmed.

On 12 February, Hubei province reported nearly 15,000 new cases of COVID-19, the disease caused by the coronavirus, representing a 33% jump in total infections worldwide in a single day. Total infections in China now number around 64,000, with more than 1,300 deaths.

But most of the Hubei cases – about 13,000 – have been reported as a result of a new policy that means physicians in the province can diagnose suspected cases of COVID-19 on the basis of chest scans, rather than having to wait for genetic tests to confirm the presence of the virus, which can take days.

The policy was established in response to pleas from doctors who are overwhelmed by patients with respiratory diseases, and don't have time to wait for lab results, says Wu Zunyou, chief epidemiologist at the Chinese Center for Disease Control and Prevention, who helped design and implement the policy. "The clinicians in Hubei made a very strong request

to modify the criteria because of their heavy workload," he says. Now they can care for people more quickly and ensure they are properly isolated to protect others, says Wu. "We need to save lives."

The policy makes sense from a medical point of view, says Michael Mina, an infectious-disease immunologist and epidemiologist at the Harvard T.H. Chan School of Public Health in Boston, Massachusetts. "Triaging based on symptomatic evaluation and physical exam is the bedrock of hospital-based and clinical triage," he says.

The new diagnosis method was listed in updated disease-reporting guidelines issued last week. It applies only to Hubei, where the virus originated in the city of Wuhan. Wu says that other provinces aren't as overwhelmed with cases so will still need to confirm suspected cases with genetic tests or lab cultures of the virus taken from patients.

The Chinese state media outlet Xinhua urged calm after the spike was reported. "Although the figures rose, it does not mean that the epidemic in Wuhan has deepened," it said.

On 14 February, Chinese authorities revealed for the first time the number of infections in medical staff. They said 1,716 health workers had contracted the virus, 6 of whom had died.

13 February 12:15 GMT — Chinese virologists raise concerns about virus name

Some researchers in China are unhappy with the designated name for the new coronavirus, SARS-CoV-2. They worry that the use of 'SARS-CoV' will confuse the public and impede efforts to control the pathogen's spread.

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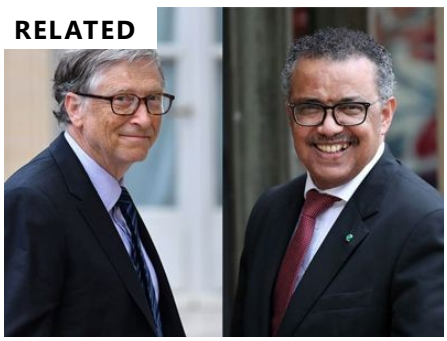

On 11 February, the International Committee on Taxonomy of Viruses announced the name, which was chosen on the basis of an analysis of the new coronavirus's evolutionary history and the pathogen that causes severe acute respiratory syndrome (SARS), called SARS-CoV. Classification rules and established naming practice also informed the decision.

As coronavirus spreads, the time to think about the next epidemic is now

Although the two viruses belong to the same species, SARS-CoV-2 spreads much faster than SARS-CoV but is less deadly, says Shibo Jiang, a virologist at Fudan University in Shanghai. SARS-CoV retreated in the summer, but nobody knows what the new virus will do in the coming months, he says. People might think it will behave similarly and stop taking precautions come summer.

Scientists also worry about the potential social and economic impact for China of revisiting the bad memories associated with SARS. "That name can cause panic to people, and may cause gross economic loss to the affected countries when the virus is circulating," says Guo Deyin, a virologist at Sun Yat-sen University in Guangzhou.

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Coronavirus: hospitals must learn from past pandemics

On 9 February, virologists in China suggested in a paper in *Virologica Sinica* that the latest virus be called transmissible acute respiratory syndrome, or TARS-CoV.

Sun Caijun, an infectious-disease researcher also at Sun Yat-sen University, says that he would have preferred the virus be named clustered acute respiratory syndrome coronavirus (CARS-CoV) or rapid spread respiratory syndrome coronavirus (RARS-CoV), given the virus's quick spread.

Not everyone is bothered by the designated name. Lijun Rong, a virologist at the University of Illinois in Chicago, doesn't think it will affect the public's response to the outbreak. People just want the virus to go away as quickly as possible, he says. "A name is just a name."

13 February 12:00 GMT – Listen: coronavirus gets formal name

Nature's European bureau chief Nisha Gaind and *Nature Podcast*'s Nick Howe discuss the naming of the new coronavirus disease and the suggestion that the pathogen might have originated in pangolins.

Listen: *Nature* reporters Nisha Gaind and Nick Howe discuss the latest news from the coronavirus outbreak.

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13 February 03:00 GMT – Researchers worry cases are going undetected in some regions

Cases of the new coronavirus, which is now known as SARS-CoV-2, might be going undetected in some nations considered at high risk of an outbreak because they are reporting fewer cases than expected or none at all, say scientists. Infections have been detected in 24 countries outside China so far.

Researchers are using flight data to create models of the virus's possible spread around the world. One model identified 30 countries at risk of importing SARS-CoV-2, on the basis of the large number of flights from Wuhan, the outbreak's epicentre, and from other cities in China with lots of travellers from Wuhan. But several of those countries, including Thailand, Vietnam, Cambodia and Malaysia, have reported fewer cases than the model predicts. Indonesia, another country at risk, has yet to report a single case.

The possibility of unreported cases is particularly concerning in countries with weaker health-care systems, such as those in southeast Asia and Africa, which could quickly be overwhelmed by a local outbreak. No cases have been reported in Africa so far, but some countries there, such as Nigeria, are at particular risk because of strong business ties to China.

12 February 17:45 GMT – WHO calls for speedy vaccine, drug and diagnostic development

World Health Organization officials outlined their top research priorities for controlling the outbreak of the coronavirus-associated disease now known as COVID-19. At the close of a two-day international forum in Geneva, Switzerland, assessing the outbreak, WHO director-general Tedros Adhanom Ghebreyesus spoke about the importance of developing candidate therapeutics and easy-to-apply diagnostics for identifying active, asymptomatic and resolved

infections.

How scientists are fighting the novel coronavirus: A three minute guide

Research should also look to understand the best approach for infection prevention, including assessing whether lockdowns in major Chinese cities have had a positive or negative effect on slowing the spread of virus. Virologist Marie-Paule Kieny, who co-chaired the forum, said that there were four vaccine candidates in development. In around three months, she suggested, one or two of those might be in human trials. Still, it will be more than a year until they might be available for wider use. Officials called for research on how to control and counter misinformation that has spread since the start of the outbreak. Finally, Tedros encouraged research into preventing the transmission of zoonotic diseases — which originate in animals — to stem future outbreaks of this type.

Although researchers are already investigating some of these questions, and many others, WHO officials hope that its research blueprint will help to direct donor funding to the most productive avenues.

11 February 15:25 GMT — Coronavirus disease officially named COVID-19

The World Health Organization has officially named the disease caused by the coronavirus COVID-19. This will replace various monikers and hashtags given to the emerging illness over the past few weeks. Most recently, on 8 February, China's National Health Commission decided to temporarily call the disease novel coronavirus pneumonia, or NCP. But because viruses continue to spread from animals to people, this coronavirus won't be novel for long.

"COVID-19 stands for coronavirus disease in 2019," said Soumya Swaminathan, chief scientist at the World Health Organization in Geneva, Switzerland, at a press briefing. She explained that there are many coronaviruses, and this style of naming will provide a format for referring to new coronavirus diseases in future years. "The virus itself is named by an international group of virologists who will look into the taxonomy," she said. "But it is important to have a

name for this disease that everybody uses."

Two other diseases caused by coronaviruses were given names describing the clinical manifestations: SARS (severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome).

Shortly after the WHO announced the disease's official name, the virus causing it was named SARS-CoV-2 by the International Committee on Taxonomy of Viruses. In a paper posted to the bioRxiv preprint server, the committee's study group on coronaviruses explains that this term highlights the new virus' similarity to the SARS virus identified in 2003.

11 February 11:45 GMT – Coronavirus deaths in China pass 1,000

More than 1,000 people in China have been killed by the coronavirus, the nation's health authorities report. Worldwide, more than 43,000 people have been infected.

Millions of people in China returned to work on Monday after the Lunar New Year holiday was extended by more than a week in an effort to halt the spread of the virus – although many businesses remain closed.

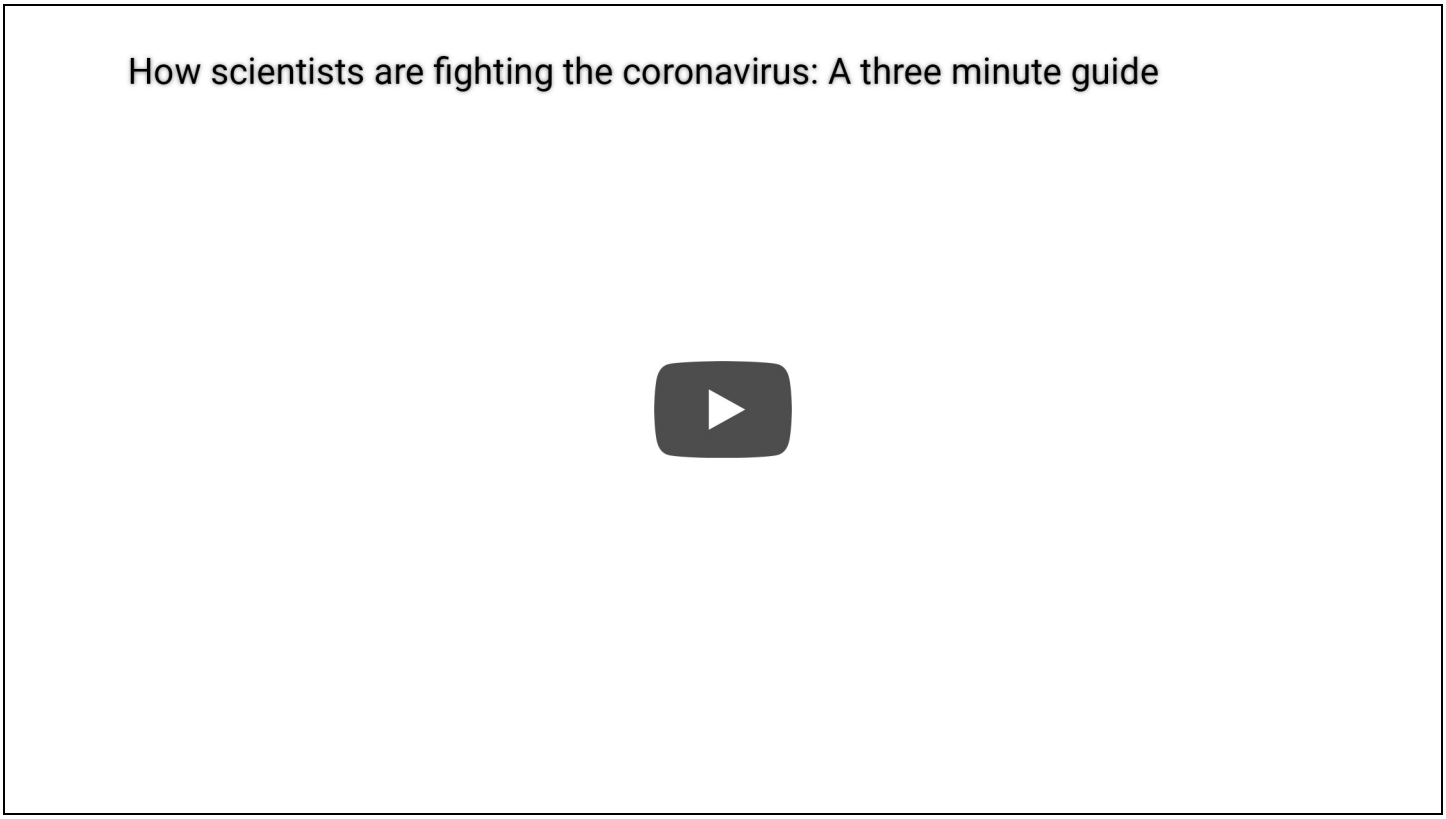
Researchers will be watching closely to see whether the number of cases increases as a result of people going back to work.

in-section electron micrographs of the 2019 novel coronavirus grown in cells at The University Hong Kong.

A microscope image of a cell infected with the novel coronavirus, grown in culture at the University of Hong Kong. Multiple virus particles are being released from the cell surface. Credit: John Nicholls, Leo Poon and Malik Peiris/The University of Hong Kong

10 February 14:00 GMT – Watch: how scientists are fighting the coronavirus outbreak

Nature senior biology reporter Heidi Ledford describes how researchers including epidemiologists, geneticists and virologists are mobilizing in response to the escalating outbreak.



10 February 11:30 GMT – Pangolins claimed as outbreak source

Two researchers at the South China Agricultural University in Guangzhou have suggested that pangolins – long-snouted mammals often used in traditional Chinese medicine – are the probable animal source of the coronavirus outbreak.

Shen Yongyi and Xiao Lihua reported at press conference on 7 February that they had identified the pangolin as the potential source of the virus, named nCoV-2019, based on a genetic comparison of coronaviruses taken from the animals and from humans infected in the outbreak.

The identity of the animal source of nCoV-2019 has been one of the key questions that researchers have been trying to answer. Scientists have already suggested that nCoV-2019 originally came from bats, on the basis of the similarity of its genetic sequence to those of other known coronaviruses, but the virus was probably transmitted to humans by another

animal.

Researchers say that the suggestion that pangolins spread the coronavirus to people seems plausible – but caution that the researchers' work is yet to be published.

ngolin.

Pangolins are scaly mammals often used in traditional Chinese medicine. Credit: Getty

10 February 04:30 GMT – Deaths in China surpass toll from SARS

More than 900 people in China have died from the new virus, a greater number than those who died from severe acute respiratory syndrome (SARS) in the 2002–03 epidemic. That outbreak, which also originated in China, killed 774 people worldwide.

The number of people in the country infected with the new coronavirus has risen to 40,171, according to the latest update from China's National Health Commission.

7 February 10:15 GMT – Global infections pass 30,000

The number of people worldwide infected with the coronavirus has passed 30,000 – with the vast majority of cases occurring in China. Chinese health authorities reported on 7 February that 31,161 people had contracted the infection in China, and more than 630 people had died. Among other countries, those with the most cases include Singapore, Thailand and Japan, which have each reported between 25 and 30 infections so far.

Researchers at Johns Hopkins University in Baltimore, Maryland, are visualizing global infection data in real time.

inese paramilitary policemen wearing face masks for prevention of the new coronavirus

Chinese paramilitary policemen prepare to patrol at Nanning Wuxu International Airport in the city of Nanning in southern China. Credit: Costfoto/Barcroft Media/Getty

4 February 18:30 GMT – Listen: how scientists are responding to the coronavirus outbreak

Nature senior reporter Ewen Callaway and the *Nature Podcast*'s Benjamin Thompson discuss the fast-paced research happening in response to the outbreak – from diagnostics to finding the pathogen's animal host.

Listen: Reporters Ewen Callaway and Benjamin Thompson discuss the escalating coronavirus outbreak.

00:00 05:20

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4 February 11:00 GMT – Cases in China pass 20,000

The number of people in China infected with the coronavirus reached 20,438 on 3 February, after more than 3,000 new cases were reported in a day. China's National Health Commission also reported another 64 deaths, bringing the total to more than 420 in mainland China. And media outlets are reporting the death of a man in Hong Kong, the second fatality to be reported outside the mainland.

3 February 16:30 GMT – Scientists eager to study samples of live virus

Researchers worldwide are keen to get their hands on samples of the coronavirus, to probe the pathogen's biology in detail and to test drugs and develop vaccines. Virologists in China who first isolated the virus found that it can kill cultured human cells and that it enters cells through the same molecular receptor as the coronavirus that causes severe acute respiratory syndrome (SARS).

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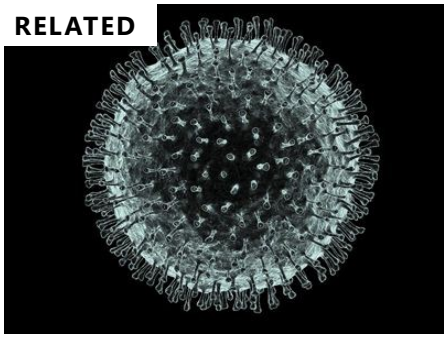

China coronavirus: how many papers have been published?

Scientists say that physical samples have advantages over genetic sequences, dozens of which are now available. They can be used to engineer animal models of the infection and to answer key questions about how the pathogen spreads. Labs in the United States, France, Germany and Hong Kong are isolating and preparing to share virus samples taken from local patients. “It is essential that viruses are shared,” said Maria Van Kerkhove, an infectious-disease epidemiologist at the World Health Organization in Geneva, Switzerland.

ngsu Shuoshi Biotechnology Co. Ltd. production workers working on a coronavirus nucleic ac tection kit, China

Workers assemble detection kits for the coronavirus. Credit: EPA-EFE/Shutterstock

31 January 05:00 GMT – Experts consider what’s next

As cases of the coronavirus continue to climb, experts are considering best- and worst-case scenarios based on the behaviour of previous epidemics and what scientists already know. Cases in China surged to 9,692 on 30 January. One model estimates that the virus could infect about 39,000 of the 30 million people living in the region of Wuhan. “It seems like the virus has got out of hand in China, spread too far, too quickly to really be contained,” says Ian Mackay, a virologist at the University of Queensland in Brisbane, Australia.

One big question is whether the coronavirus will continue to circulate in the community. If efforts to contain the virus fail, there’s a reasonable chance that it will become endemic. As with influenza, this could mean that deaths occur every year as the pathogen circulates. During the current outbreak, there have been several cases of infected people displaying no symptoms. If such cases are common, it will be more difficult to control the disease’s spread, making it more likely that the virus will become endemic.

Qingdao Coronavirus volunteer in a protective suit disinfects a neighborhood in Qingdao, Chir

A worker disinfects a neighbourhood in Qingdao, in east China's Shandong province. Credit: Yu Fangping/Utuku/Ropi/Zuma /eyevine

30 January 19:45 GMT – World Health Organization declares global emergency

The World Health Organization (WHO) has declared the coronavirus outbreak a global health emergency. The organization's director-general, Tedros Adhanom Ghebreyesus, said his main concern was that the outbreak could spread to countries with fragile health systems.

Declaring a "public health emergency of international concern" (PHEIC) is the WHO's highest level of alarm – a step it reserves for events that pose a risk to multiple countries and that require a coordinated international response.

The WHO considered declaring the coronavirus a global emergency last week, but ultimately decided against the move. At that time, only one country outside China – Vietnam – had confirmed person-to-person transmission of the virus within its borders.

Now, four other places outside mainland China – Japan, Taiwan, Germany and the United States – have reported person-to-person transmission, as the size and reach of the outbreak have grown. The WHO says that a total of 7,818 cases have been confirmed in 18 countries. Almost 99% of those – 7,736 cases – are in China.

Tedros praised China for its handling of the outbreak, and recommended against restricting international trade with, and travel to, the country. "This declaration is not a vote of no confidence in China," he said. "This is the time for solidarity, not stigma."

Alexandra Phelan, a global-health lawyer at Georgetown University in Washington DC, praised Tedros's decision and message. "Historically, a PHEIC is seen as an alert to all countries," she says. "But this focus on countries with weak health systems highlights the obligation of wealthier countries with stronger health systems to help them prepare for potential cases."

30 January 17:45 GMT – Human-to-human transmission confirmed in the United States

The first instance of the coronavirus spreading between people in the United States has been confirmed. The US Centers for Disease Control and Prevention says that a woman living in Illinois who had visited Wuhan passed the virus to her spouse.

1 Coronavirus, causing SARS

Coronaviruses take their name from their crown-like shape. Credit: Getty

29 January 04:00 GMT – Australian researchers grow virus in cell culture

Researchers in Melbourne, Australia, are the first outside China to announce that they've grown the new coronavirus in cell culture. The group at the Peter Doherty Institute for Infection and Immunity says it isolated the virus from the first person diagnosed with the infection in Australia, on 25 January.

The team will now share the virus with research labs around the world recommended by the World Health Organization (WHO) to help the development of more accurate diagnostic tests and vaccines, says Mike Catton, a deputy director of the institute. "There are some things that are much easier to do when you have the virus," says Catton.

Although scientists in China say they've been able to grow the virus in the lab, they have not yet shared samples with international researchers — they have shared only the virus's genetic sequence, says Julian Druce, head of the Virus Identification Laboratory at the Doherty Institute. He says he and his team had heard that labs outside China had struggled to grow the virus, but they found it quite easy. He thinks the success was due to the lab's combined expertise in diagnosing infections as well as isolating and growing viruses in culture. "We've got two parts of the puzzle together in one laboratory," he says.

Catton says having samples of the virus will enable scientists to create tests that can detect specific immune cells — antibodies — that indicate whether a person has been infected with the new virus. Such tests are especially useful for people with mild or no symptoms. Making a test for antibodies is difficult without samples of the virus, he says.

A study of a family in Shenzhen, China, identified a child who was infected with the virus but showed no symptoms. The WHO has also reported that three people with the infection outside China have been asymptomatic.

Ian Mackay, a virologist at the University of Queensland in Brisbane, Australia, says the Melbourne group's announcement is fantastic news. He says lab-grown samples are essential

for research into the behaviour of the virus in culture or in animal hosts. Although virus samples can also be used to validate molecular diagnostic tests, most labs have moved away from using whole viruses in favour of synthetically producing parts of the virus from partial genomes, says Mackay.

vorker produces protective suits at a factory in Nantong in China's eastern Jiangsu province

A worker produces protective suits at a factory in Nantong in China's eastern Jiangsu province. Credit: AFP/Getty

28 January 16:00 GMT – First human-to-human transmission outside China

The new coronavirus has spread between humans outside China for the first time.

A German man acquired the infection from a colleague who had returned from Wuhan, according to news reports and a statement from Bavaria's health ministry. In a 27 January update, the World Health Organization confirmed that a person in Vietnam had acquired the virus from an infected family member. And media reports indicated today that a tour-bus driver in Japan who had transported tourists from Wuhan had also tested positive for the coronavirus.

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China coronavirus: Six questions scientists are asking

Bavaria's health ministry said it considered the risk of the virus spreading further to be low. However, more cases of human-to-human spread outside China are likely, said Michael Head, an epidemiologist at the University of Southampton, UK, in a statement distributed by the UK Science Media Centre. "But the indications are at this stage that onwards transmission will be limited."

David Heymann, an epidemiologist at the London School of Hygiene and Tropical Medicine, agrees that more cases of human-to-human transmission beyond China are likely. Health authorities can limit transmission by isolating infected people and closely following individuals they have had

contact with.

But these measures will be effective only if the virus is not able to spread widely through the air. "You can generally keep an outbreak at very low levels unless it's aerosolized," says Heymann. If the virus can spread through the air, contact-tracing and isolation are unlikely to stem transmission.

Evidence so far suggests that the coronavirus spreads only through close contact and through saliva droplets, but Heymann says there is an urgent need to find out whether it can also spread through air. "The frustrating point is that until now we don't have all the evidence that can tell exactly how this disease is transmitted."

28 January 05:00 GMT – Cases increase by more than 60%

The number of confirmed cases in China has jumped to 4,515, up from 2,744 on 26 January, according to the Chinese Center for Disease Control and Prevention. Authorities also report that more than 100 people have died as a result of the infection. Confirmed cases outside China have reached at least 37, but no deaths have been reported outside the country.

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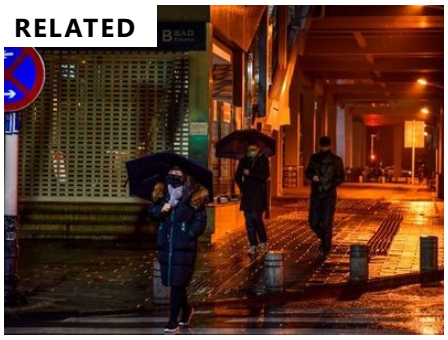

Wuhan scientists: What it's like to be on lockdown

Raina MacIntyre, an epidemiologist at the University of New South Wales in Sydney, Australia, says that although the rise in cases probably reflects an increase in the authorities testing and detecting the virus, the dramatic jump is concerning. "It's very much a dynamic picture, and until we have an indication that cases are declining, it's going to continue to be of concern," she says.

But MacIntyre also notes that researchers are struggling to accurately model the outbreak and predict how it might unfold, because the case-report data that's being released by the Chinese authorities is incomplete. "What we need to identify is when people got sick, not when the cases were reported, and all we've seen so far is when the cases were reported."

27 January 13:30 GMT – Scientists estimate how quickly virus spreads

As the number of confirmed cases of the novel coronavirus climbs into the thousands, scientists around the world are estimating how easily the virus is passed between people – and trying to determine whether those without symptoms can spread it.

One number that epidemiologists want to know is how many people one person with the virus tends to infect – known as R_0, or R-naught. An R_0 higher than 1 means that countermeasures, such as quarantine, will be needed to contain the pathogen's spread.

On Thursday evening, after a meeting of an emergency committee responding to the outbreak, the World Health Organization (WHO) published an estimated R_0 of 1.4 to 2.5. Other teams have since come up with slightly higher values[1,2]. These estimates are similar to the R_0 of SARS during the early stages of the 2002–03 outbreak, and of the novel strain of H1N1 influenza that caused a pandemic in 2009. But they are higher than R_0 figures estimated during outbreaks of the Middle East respiratory syndrome (MERS) virus, a coronavirus similar to SARS.

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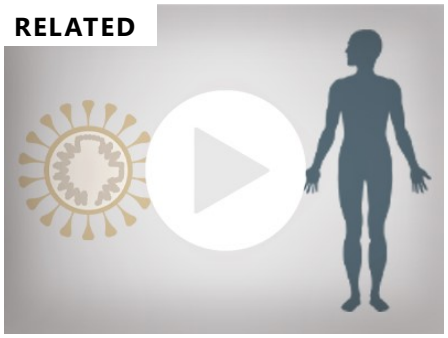


What you need to know about the novel coronavirus

"Now it's in the range of these other important epidemics, and that indicates the potential that it will cause a similar scale of public-health concern if nothing else happens," says Mark Woolhouse, an epidemiologist at the University of Edinburgh, UK.

But researchers caution that R_0 estimates come with large uncertainties, because of gaps in the data, and the assumptions used to calculate the figure. They also point out that R_0 is a moving target that changes over the course of an outbreak – as control measures are implemented – and varies from place to place. In the coming days, health authorities and researchers will be looking for signs that the steps the authorities have taken to stem transmission, such as the travel restrictions in Wuhan and other Chinese cities, have reduced the R_0 there.

Another important unanswered question surrounding the virus's spread is whether – and how extensively – people without symptoms can infect others. A study of a cluster of five infections in a family in Shenzhen identified a child who was infected with the virus but did not show any symptoms[3]. If such asymptomatic cases are common and these individuals can spread the virus, then containing its spread will be much more difficult, researchers say. Few SARS cases were asymptotic, and this was key to controlling the virus.

RELATED

This scientist hopes to test coronavirus drugs on animals in locked-down Wuhan

"Defining the scale of asymptomatic transmission remains key: if this is a rare event then its impact should be minimal in terms of the overall outbreak," Jonathan Ball, a virologist at the University of Nottingham, UK, said in a statement distributed by the UK Science Media Centre. "But, if this transmission mode is contributing significantly then control becomes increasingly difficult."

One way to determine whether symptom-free people can spread the virus would be to study its spread in individual households in China, says Sheila Bird, a biostatistician at the University of Cambridge, UK. By closely monitoring all the members of a household in which one person is infected, it should be possible to determine who else contracts the virus and how. Such studies would also be helpful for identifying ways of stopping spread in households, Bird adds.

inese paramilitary officers wearing masks stand guard at an entrance of the closed Hankou ilway Station in Wuhan.

Travel in and out of the Chinese city of Wuhan has been suspended. Credit: China Daily via Reuters

27 January 12:45 GMT – Scientists speak out from locked-down Wuhan

Nature has spoken to several scientists who are in Wuhan, which has been on lockdown since last week in a bid to halt the spread of the coronavirus. "The street is near empty," says Fei

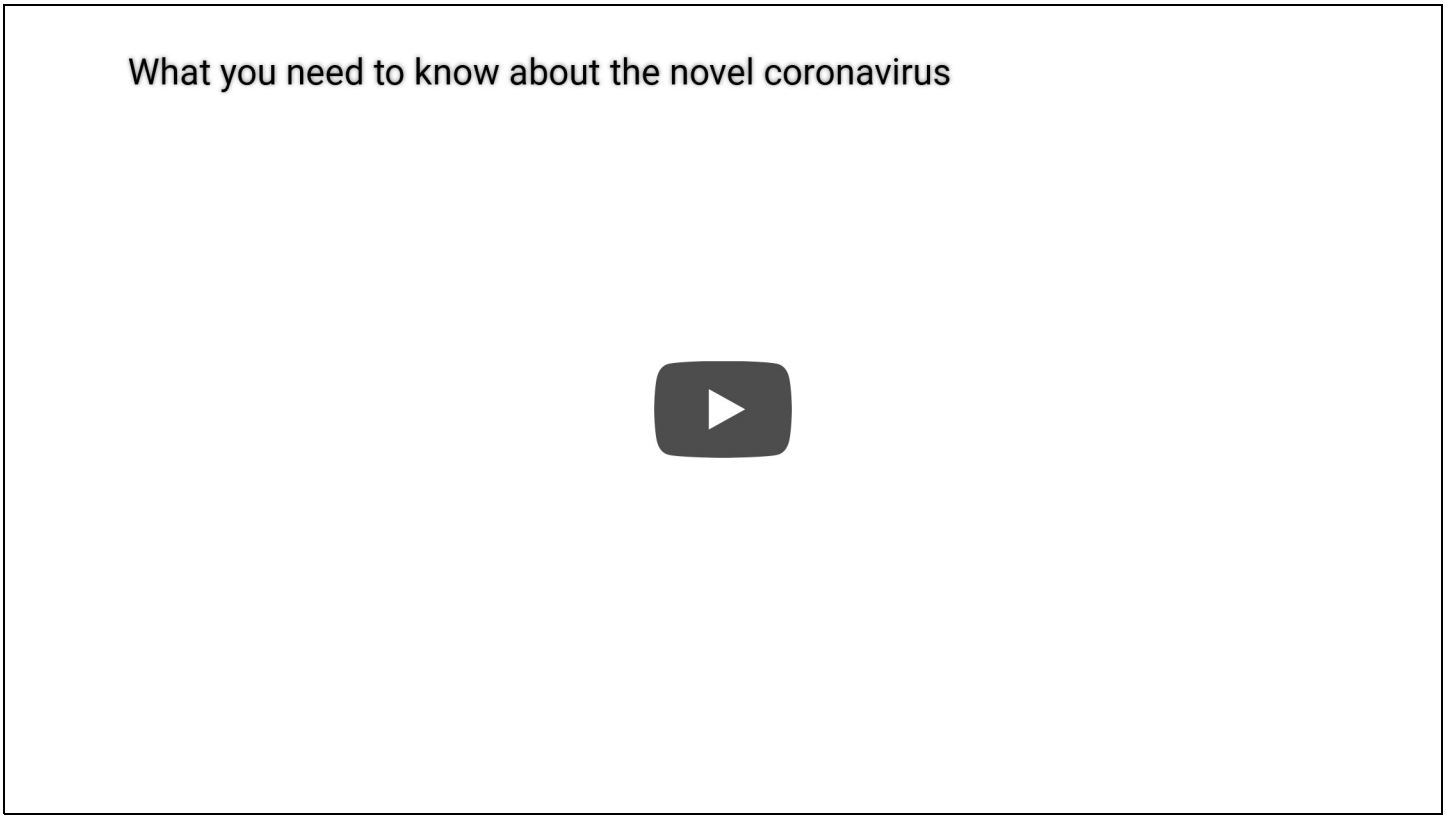
Chen, a materials scientist at the Wuhan University of Technology. Researchers say that they are spending most of their time at home, and some have had to cancel travel to conferences.

A scientist who is trying to get into Wuhan — to work with collaborators to test drug compounds that could work against coronaviruses — also described his experiences and motivation to *Nature*. Rolf Hilgenfeld, who is based at the University of Lübeck in Germany, has been trying to develop coronavirus drugs since the 2002–03 SARS outbreak, and wants to test two compounds on animal models in Wuhan.

27 January 03:00 GMT — Death toll rises

At least 80 deaths have now been associated with the virus, all in China, and confirmed cases of the infection, mostly in mainland China, have passed 2,700. Cases have also been confirmed in Taiwan — and in Thailand, Australia, Malaysia, Singapore, France, Japan, South Korea, the United States, Vietnam, Canada and Nepal.

24 January 20:00 GMT — What you need to know about the virus



24 January 16:30 GMT — Second US infection

The US Centers for Disease Control and Prevention (CDC) confirmed on 24 January that a second person in the United States had been infected with the new coronavirus. A woman in her sixties returned to her home in Chicago, Illinois, on 13 January after visiting Wuhan, the Chinese city where the outbreak began. She experienced symptoms a few days later. Doctors immediately suspected an infection with the coronavirus on the basis of her travel history. They admitted her to an isolation room and sent blood samples to the CDC's laboratory. She remains in hospital but, in a press release, the CDC says that she is doing well.

The agency warns that there will probably be more US cases of the coronavirus in the coming weeks. But it adds: "The immediate risk of this new virus to the American public is believed to be low at this time."

23 January 20:00 GMT – World Health Organization decides against emergency declaration

The WHO has decided not to declare the coronavirus outbreak a global health emergency, it said on 23 January.

"At this time there is no evidence of human-to-human transmission outside China," said WHO director-general Tedros Adhanom Ghebreyesus. "That doesn't mean it won't happen."

The WHO committee that considered whether to declare a global emergency – the agency's highest level of alarm – met for two days before issuing its verdict. The panel decided against the declaration in part because the virus's rate of spread between humans remains unknown. "For now, it appears limited to family groups and health workers caring for infected patients," Tedros said.

ıny banded krait Bungarus multicinctus.

A team of researchers pointed to the many-banded krait snake as one possible source of the coronavirus that originated in Asia. Credit: Alamy

23 January 15:45 GMT – Scientists dismiss claim that snakes spread virus

Scientists are trying to identify the animals in which the epidemic probably began. In a controversial study published last night, a team of researchers in China claimed snakes were the culprit.

But many scientists are sceptical of this claim and say there is no proof that viruses such as those behind the outbreak can infect species other than mammals and birds. "Nothing supports snakes being involved," says David Robertson, a virologist at the University of Glasgow, UK.

23 January 15:00 GMT – Chinese authorities lock down Huanggang

A second city in China – Huanggang – is going into lockdown similar to that in Wuhan. Huanggang has a population of about 7 million people and is around 70 kilometres from Wuhan. Public bus and railway operations will be suspended from midnight, Reuters reports. A third city, nearby Ezhou, has shut its train stations.

23 January 04:00 GMT – Chinese government closes off Wuhan

Chinese authorities have suspended all travel in and out of Wuhan – the city at the centre of the outbreak, home to more than 11 million people – in an effort to control the worsening outbreak. Since 10 a.m. Chinese local time, planes and trains leaving the city have been suspended, and buses and the city's subway have also stopped running.

The announcement is a considerable escalation in China's response to the outbreak, but whether it will be effective is unclear, says Ian Mackay, a virologist at the University of Queensland, Brisbane. Although quarantining the city might help to curb the international spread of the virus, it won't stop it from being transmitted between people in the city. Mackay worries that the authorities might have "just created a large cell-culture dish in which all these people will share the infection and create a lot more cases all stuck in Wuhan".

Indonesian health quarantine official holds a thermal scanner, Soekarno-Hatta International Airport, Indonesia

Authorities are monitoring travellers at several airports to contain the spread of the coronavirus. Credit: Mast Irham/EPA-EFE/Shutterstock

Mackay also questions whether the city will be able to feed its citizens and manage the increasing number of people who have become sick with the virus, as well as with seasonal influenza, without the free flow of supplies and aid from outside the city. He says the lockdown could have a psychological effect on people.

22 January 20:00 GMT – World Health Organization delays decision on emergency declaration

The WHO has postponed a decision on whether to declare the outbreak a "public health emergency of international concern"– a step it reserves for events that pose a risk to multiple countries and that requires a coordinated international response. The move follows a meeting of a committee organized to respond to the outbreak. The same committee will meet again on 23 January.

"This is an evolving and complex situation," WHO director-general Tedros Adhanom Ghebreyesus said in a press conference after the meeting.

22 January 16:45 GMT – Five questions researchers have about China virus

Scientists around the world are racing to find out more about the coronavirus – including how it spreads and information about its genetic sequences. Researchers have already sequenced several strains of the virus taken from infected people. This information can help to reveal how easily the virus can pass between humans and whether the outbreak has the potential to persist. Researchers in China are also hoping to study whether drugs could be developed to fight the virus.

21 January 19:45 GMT – First US case confirmed

The United States has confirmed its first case of the new coronavirus, the US Centers for Disease Control and Prevention (CDC) said on 21 January. A 30-year-old man in Washington state has been diagnosed with the illness after a trip to China, making the United States the fifth country to report the disease – and the first outside Asia.

The man had been admitted to a hospital in Washington last week with pneumonia, but "is right now, very healthy", Nancy Messonnier, director of the CDC's National Center for Immunization and Respiratory Diseases in Atlanta, Georgia, told reporters. He is under observation at the hospital.

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How quickly does the Wuhan virus spread?

The CDC says that the man did not have symptoms on his arrival in Seattle, Washington, but developed a fever on 16 January and sought treatment. A hospital in Washington state collected blood from the man and shipped it to the CDC, which identified the virus in the samples on 20 January. The CDC is now tracking down individuals who had contact with the man.

International airports in New York City, Los Angeles and San Francisco, California, have been screening arriving passengers for signs of coronavirus infection since 17 January. All three receive direct flights from Wuhan. The CDC says it will now expand the screening to airports in Atlanta and Chicago, Illinois. All travellers leaving Wuhan for the United States will be routed to one of the five airports that have screening programmes.

21 January – Researchers must share sequences

In an editorial, *Nature* says that researchers have a crucial role in publishing and sharing genome sequences. It also calls on China's health authorities to continue reporting what they know and what more they are uncovering, and on the WHO to lead and coordinate the global response.

21 January – Chinese health workers infected

Infections have been confirmed in 15 health-care workers in Wuhan; scientists say this suggests that the virus is more adept at human-to-human transmission than was first thought. Previously, Chinese authorities and the WHO had said that there had been some limited cases of human-to-human transmission between family members, but that animals seemed to be the most likely source of the virus.

In response to the worsening outbreak, the World Health Organization has called a meeting on 22 January to decide whether to declare a public-health emergency.

MORE STORIES ON THE CORONAVIRUS

When will the coronavirus outbreak peak?

Officials want to know but predictions vary wildly, from now to after hundreds of millions of people are infected.

More than 80 clinical trials launch to test coronavirus treatments

As HIV drugs, stem cells and traditional Chinese medicines vie for a chance to prove their worth, the World Health Organization attempts to bring order to the search.

Scientists fear coronavirus spread in countries least able to contain it

Concerns are rising about the virus's potential to circulate undetected in Africa and Asia.

Did pangolins spread the China coronavirus to people?

Genetic sequences of viruses isolated from the scaly animals are 99% similar to that of the circulating virus — but the work is yet to be formally published.

China coronavirus: labs worldwide scramble to analyse live samples

Scientists need the pathogen to probe the biology of the emerging infection and to develop tests, drugs and vaccines.

Coronavirus outbreak: what's next?

Experts weigh up the best- and worst-case scenarios as the World Health Organization declares a global health emergency.

China coronavirus: how many papers have been published?

Research papers and preprints are appearing every day as researchers worldwide respond to the outbreak.

What you need to know about the Wuhan coronavirus

Video: How science can help control the outbreak.

Wuhan scientists: What it's like to be on lockdown

Measures to contain a new virus's spread have cut off the city's researchers.

This scientist hopes to test coronavirus drugs on animals in locked-down Wuhan

Structural biologist Rolf Hilgenfeld has been working on coronavirus treatments since the SARS outbreak.

Why snakes probably aren't spreading the new China virus

One genetic analysis suggests reptilian reservoir — but researchers doubt that the coronavirus could have originated in animals other than birds or mammals.

New China virus: Six questions scientists are asking

Researchers are racing to find out more about the epidemiology and genetic sequence of the coronavirus spreading in Asia and beyond.

How quickly does the Wuhan virus spread?

Chinese officials have confirmed that the virus is spreading between people, but it's still unclear how easily this happens.

Editorial: Stop the Wuhan virus

Vigilance, preparedness, speed, transparency and global coordination are now crucial to stopping a new infectious disease from becoming a global emergency.

New virus surging in Asia rattles scientists

Chinese officials reported more than 100 new infections and South Korea confirmed its first case.

New virus identified as likely cause of mystery illness in China

The legacy of SARS has haunted the race to understand a respiratory infection that has affected 60 people.

doi: 10.1038/d41586-020-00154-w

UPDATES & CORRECTIONS

Correction 31 January 2020: An earlier version of this story misstated the number of countries in which human-to-human transmission has been confirmed.

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