Everything you need to know about the coronavirus

Public health experts around the globe are scrambling to understand, track, and contain a new virus that appeared in Wuhan, China, at the beginning of December 2019. The World Health Organization (WHO) named the disease caused by the virus COVID-19, which references the type of virus and the year it emerged. The WHO declared that the virus is a pandemic.

The Verge *is regularly updating this page with all the latest news and analysis.*

You can see where and how many cases of the illness have been reported in this map. The majority of the illnesses were initially in China, where the virus first emerged, but the rate of new cases there has nearly stopped. There are now many times more cases outside of China than there were inside of it at the height of the outbreak. There are large outbreaks of the disease in multiple places, including Spain, Italy, and the United States, which currently has the worst outbreak of any country in the world.

As this important story continues to unfold, our hope is to answer all of your questions as people work to understand this virus and contain its spread.

Table of contents

Where did the virus come from?

At the end of December, public health officials from China informed the World Health Organization that they had a problem: an unknown, new virus was causing pneumonia-like illness in the city of Wuhan. They quickly determined that it was a coronavirus and that it was rapidly spreading through

and outside of Wuhan.

Photo by Kevin Frayer / Getty Images

Coronaviruses are common in animals of all kinds, and they sometimes can evolve into forms that can infect humans. Since the start of the century, two other coronaviruses have jumped to humans, causing the SARS outbreak in 2002 and the MERS outbreak in 2012.

Scientists think this new virus first became capable of jumping to humans at the beginning of December. It originally seemed like the virus first infected people at a seafood market in Wuhan and spread from there. But one analysis of early cases of the illness, published on January 24th, found that the first patient to get sick did not have any contact with the market. Experts are still trying to trace the outbreak back to its source.

The type of animal the virus originated from is not clear, although one analysis found that the genetic sequence of the new virus is 96 percent identical to one coronavirus found in bats. Both SARS and MERS originated in bats.

Where is it spreading?

The virus is now spreading all over the world.

Although it originated in China, the country took aggressive action at the start of the outbreak, shutting down transportation in some cities and suspending public gatherings. Officials isolated sick people and aggressively tracked their contacts, and had a dedicated network of hospitals to test for the virus.

Now, the epicenter of the pandemic is in the US, which has more cases than any country in the world. New York City has the highest number of cases in the country. Previous US hot

spots included a nursing home in Washington; New Rochelle, New York; and the Boston area, where the disease spread at a conference.

There are over 1 million confirmed cases of COVID-19 in the US.

How dangerous is this new virus?

It takes information about both how severe an illness is and how easily it can spread to determine how "bad" it can be. Epidemiologists often use this tool to assess new strains of the flu, for example:

Image: Centers for Disease Control and Prevention

If an illness isn't very severe (and kills only a small percentage of people), but it's highly transmissible, it can still be devastating. An easily transmitted illness that kills a small percentage of the people it infects can still cause a lot of deaths, precisely because so many people get sick.

The WHO named the illness caused by the coronavirus COVID-19 — "co" and "vi" for coronavirus, "d" for disease, and "19" for the year when the disease emerged.

COVID-19 is a serious illness, and it's much more dangerous than the flu. One Centers for Disease Control and Prevention (CDC) projection suggests that between 160 to 214 million people will be infected in the US, and that between 200,000 and 1.7 million could die. That doesn't take into account actions taken to slow down the outbreak, though.

The symptoms of COVID-19 have ranged from mild, like those in a cold, to severe. Around 80 percent of confirmed cases are mild and don't require hospitalization — at least, 80 percent of the cases that we know about. It's still possible that there are more mild cases of the illness that haven't been

flagged, which would shrink the percentage of cases that are severe. In about 15 percent of people, the illness is severe enough that they need to be hospitalized, and about 5 percent of cases are critical. It appears around half of the people with critical cases of the illness die from it.

So far, experts say that around 1 percent of people who get sick with COVID-19 will die, though it's too early to say for sure how often it is fatal. Those numbers may change as the outbreak progresses, and will be different in different places, depending on the demographics of the population. By comparison, 14 to 15 percent of people who got sick from SARS died.

Different groups of people, though, are more at risk of having a severe case of the illness or of dying from it. Most deaths in this outbreak have been in older people and those who have underlying health issues, like heart disease, hypertension, and diabetes. In that group, people are more at risk of dying. Around 14 percent of people over the age of 80 who get sick will die, for example.

How easily can the virus spread?

The virus moves rapidly. The new coronavirus spreads quickly in contained environments, like on the Diamond Princess cruise ship.

Early evidence suggested that, like other coronaviruses, the virus jumps between people who are in very close contact with each other. It also probably spreads when an infected person sneezes or coughs. Coughs and sneezes produce little droplets of mucus and saliva. If these droplets make it into another person's eyes, mouth, or nose, they can get sick. The viruses in those little droplets can also fall onto surfaces, like tables or doorknobs – if someone touches that surface and touches their eyes, mouth, or nose, they can also get sick.

Early research shows that the virus can linger on surfaces

such as plastic and stainless steel for a few days, which is why it’s important to clean countertops, doorknobs, and other places people touch regularly. The virus doesn’t appear to stay infectious on cardboard for longer than a day, so packages should be fairly safe.

Scientists are still trying to figure out how long tiny droplets containing virus could linger in the air if a sick person coughs or sneezes, or when they breathe or talk. They know that certain procedures done in the hospital can spray the virus into the air, where it can linger for a few hours, which is why it’s so important for doctors and nurses doing those procedures to have masks that can filter it out. But it’s still not clear how much the virus stays in the air normally without those artificial interventions.

We also don’t know when people with COVID-19 become contagious or how long being contagious lasts. One study of nine people in Germany with mild cases of the illness found that they had high levels of the virus in their throats early on in the course of the disease, before they felt very sick. Research out of China showed that people without symptoms still have high levels of the virus in their throats and noses, so they may be passing it along if they cough or sneeze.

The WHO says that people appear to be able to spread the virus for up to three days before they start showing symptoms, and preliminary research suggests that people without symptoms or mild, almost unnoticeable symptoms may be driving the epidemic. At a nursing home in Washington state, 13 of 23 people who tested positive for the virus at one point did not yet have symptoms.

Each sick person will go on to infect, on average, between 1.4 and 2.5 additional people, the WHO says, though that’s an early estimate. Other teams of researchers have published their own estimates, with most saying a sick person will infect an average of around two or three people.

Those numbers are called the virus's R0 (pronounced "R-naught"). The R0 is the mathematical representation of how well an infection might be able to spread. The higher the number, the easier the disease is to spread. For comparison, the R0 for SARS was between two and five. But that doesn't mean each sick person will actually infect that many people; quarantines and other actions taken to control outbreaks of a virus can bring down the number of people a sick person infects.

Can we treat this virus?

There aren't any proven treatments for COVID-19, but there are dozens of studies underway to find some. One leading candidate is remdesivir, an antiviral medication originally developed to treat Ebola. There are clinical trials testing it in patients in China, in the US, and around the world. While there's a lot of hype around the anti-malaria medication chloroquine, there's still no evidence it — or any other drug — actually works.

Research teams and pharmaceutical companies are also working to develop a vaccine that can protect people from infection. However, vaccine development takes a long time. Even if everything goes smoothly, it will be around a year to 18 months before one is available, said Anthony Fauci, the director of the National Institute of Allergy and Infectious Diseases.

What can I do to protect myself and others?

Stay home as much as possible, especially if you're feeling sick. Stay home even if you're not feeling sick — evidence suggests people can be contagious even if they don't have symptoms. Wash your hands, wipe down surfaces with disinfectant, and cover your mouth if you cough.

You can also wear cloth masks or face coverings when you're out in public, especially in places where it's hard to stay

far away from others. Don’t go out and buy medical-grade masks because doctors and nurses need those. But wearing a cloth face covering could help stop you virus-laden particles to other people, even if you don’t know you’re sick.

If you’re a young, healthy person, you might not feel very sick if you catch COVID-19. But if you don’t stay home and away from others, you could pass it on to someone older or with a chronic health condition who is more likely to have a severe case of the disease.

One of the best ways to slow the spread of an outbreak is by staying away from other people, which is also called “social distancing.” That gives a virus less opportunity to jump from person to person. It’s why everyone is being asked to stay home. Those measures help blunt the impact of an outbreak by slowing the virus. If fewer people get sick at once, it’s easier for health care providers to give everyone good care.

Image: Centers for Disease Control and Prevention

If I already had COVID-19, am I immune?

Many researchers think that after someone is infected with the coronavirus, there’s a good chance that person won’t get sick from the virus again for some still-undetermined amount of time. That’s based on what scientists know about how most viruses work. Usually, when you’re sick from a viral infection, your body develops antibodies against that virus. The next time you’re exposed to the virus, those antibodies could stop it from turning into a raging illness – though that isn’t always the case.

There isn’t concrete evidence that people who got sick once with COVID-19 can’t get sick again because no studies have specifically tested that idea. But virologists don’t think that this virus behaves differently than most other viruses –

so people who did get sick are *probably* protected. The question, though, is for how long: for some viruses, the protection fades after a year or a few years. There aren't answers to that question yet.

Some doctors in China and South Korea have reported that some patients who were sick with COVID-19 and recovered tested positive for the virus a second time. That probably doesn't mean they were re-infected, though, and doesn't mean that people can get sick more than once in a short period of time. Instead, it probably means that there were still tiny bits of virus lingering in their nose and throat — not enough to make them sick, and probably not enough to make other people sick, but enough to trigger a positive test. It could also mean that the patients' initial, negative tests after they felt better were false negatives, which happen frequently.

What's happening in the US?

US Secretary of Health and Human Services Alex Azar declared a public health emergency in response to the coronavirus at the end of January, and President Trump declared a federal emergency in March.

The virus is spreading through the country, and dozens of states and counties have made emergency declarations. Hotspots include Louisiana and New York. It may have been spreading in Washington and other states for weeks before it was first detected.

As the case counts shoot up, governors and local officials have closed nonessential businesses and told people to work from home and stay away from others. Hospitals in New York City and other places are buckling under the strain of hundreds of critically ill people; they're running short on protective equipment for nurses and ventilators to help patients breathe. The interventions are helping to slow the spread of the disease in some areas.

The virus spread undetected because CDC guidelines originally did not allow testing unless a sick person had been in a country with an ongoing spread of the virus or who had been in contact with someone with a confirmed case of the disease could be tested. That delayed the diagnosis of patients who did not have those risk factors. They've since updated the guidance to say that doctors can use their best judgment to decide if the patient should be tested.

Public health experts are struggling to slow the spread of disease in part because there are still a limited number of tests available. It took too long for the Food and Drug Administration and the CDC to develop and distribute a functioning test, and longer still for testing capacity to increase. In addition, public health agencies across the country don't have the resources to get in touch with everyone who tests positive and find the people they may have exposed — a critical public health tool called contact tracing.

Experts say that the US needs to dramatically increase the number of tests done each week and scale up the contact tracing workforce in order to control the outbreak.

The US currently has the worst outbreak of any country in the world.

https://www.theverge.com/2020/1/23/21078457/coronavirus-outbreak-china-wuhan-quarantine-who-sars-cdc-symptoms-risk