



Written by [Dennis Behreandt](#) on April 20, 2020

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## SARS-CoV-2: What Does Science Tell Us?

**SARS-CoV-2, the virus causing the disease COVID-19, is a serious threat. If there is good news, though, it is that it may not be as deadly as previously thought.**



It's a bioweapon: That was the first reaction from many when word of the SARS-CoV-2 coronavirus started reaching people from China. Even a U.S. senator wondered about the origin of the virus, given that the outbreak reportedly started in a "wet market" that was not far from what *Nature* described in 2017 as "China's pathogen lab," the "maximum-security biosafety facility" in Wuhan.

"We ... know that just a few miles away from that food market is China's only ... laboratory that researches human infectious diseases," Senator Tom Cotton (R-Ark.) said, according to *Fox Business*. "Now we don't have evidence that this disease originated there, but because of China's duplicity and dishonesty from the beginning we need to at least ask the question."

Indeed, as *Nature* reported just a few years earlier, "Some scientists outside China worry about pathogens escaping" from Wuhan's biosafety level-4 (BSL-4) lab.

"Worries surround the Chinese lab," *Nature* said. "The SARS virus has escaped from high-level containment facilities in Beijing multiple times, notes Richard Ebright, a molecular biologist at Rutgers University in Piscataway, New Jersey." The dark implication: It, or something else, might escape the Wuhan lab. Moreover, as *Nature* noted already in 2017, "Future plans include studying the pathogen that causes SARS."

Of course, there is legitimate worry that BSL-4 labs may be "dual-use," having a role to play in bioweapons research. Ebright, according to *Nature*, "is not convinced for the need for more than one BSL-4 lab in mainland China. He suspects that the expansion there is a reaction to the networks [of similar labs] in the United States and Europe, which he says are also unwarranted. He adds that governments will assume that such excess capacity is for the potential development of bioweapons."

An additional reason to worry is the history of experimental gain-of-function research that included a pair of researchers from the Wuhan Institute of Virology working with U.S.-based and international researchers on a study that created a dangerous, chimeric SARS virus. Reporting in 2015 in *Nature Medicine*, the research team noted that they "generated and characterized a chimeric virus expressing the spike of bat coronavirus SHC014 in a mouse-adapted SARS-CoV backbone" — work that, to the casual observer, seems to have a disquieting similarity to the novel coronavirus now afflicting the world. With this type of knowledge in Wuhan and the emergence of SARS-CoV-2 locally, near the environs of the BSL-4 lab, it is reasonable to worry that the new pestilence escaped the lab.

Whether natural or not, it is conceivable, however unlikely, that the virus escaped from the lab. But if it



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is an engineered virus, it would be possible to discover the evidence of it within the SARS-CoV-2 genome. Though there is much yet to learn about the virus, evidence indicates that rather than the new virus being an engineered pathogen, it is most likely the result of zoonotic transmission, a pathogen that mutated in another animal species and jumped to humans.

## The Health Crisis

Even though evidence points to SARS-CoV-2 originating from a natural zoonotic event, that doesn't mean it is not a serious problem. In fact, the potential for RNA viruses to mutate themselves into human pathogens is an ever-present danger. The new coronavirus neither is the first to make this jump, nor will it be the last — a frightening problem.

Just how bad is COVID-19, the disease caused by SARS-CoV-2? The answer is, not very — in most cases.

"COVID-19 appears to constitute a major threat to human health," writes microbiologist Jason Tetro in a special issue of the journal *Microbes and Infection* about the coronavirus. "Yet, examining the situation outside of Hubei Province provides a very different perspective. Most infected individuals have a mild disease and do not progress into severe stages of infection. Moreover, patients appear to be able to recover with little to no medical intervention. Based on this evidence, the virus would not be considered a major threat to public health. Instead, it appears to be no more concerning than the influenza virus."

The chief problem with SARS-CoV-2 is its propensity to spread. The virus spreads readily, and a complicating factor is that those infected with the virus can spread it before experiencing symptoms. Thus, many people in a region can be infected before anyone knows there is an infection.

A key factor in understanding the threat a viral disease such as COVID-19 poses is the time between when illness starts in an original case and then starts in a new case. In results reported in the *International Journal of Infectious Diseases*, a research team from Hokkaido's Graduate School of Medicine "estimated the median serial interval at 4.1 days" for SARS-CoV-2. According to the researchers, this means that the virus may cause the number of disease cases to increase quickly enough "to exceed what available healthcare and public health workers are able to handle." They also noted that this interval is shorter than the incubation period for the virus, meaning asymptomatic transmission is probable.

This explains, but doesn't condone, the panic now afflicting most Western nations, including the United States, where it is feared that cases of COVID-19 will rise so quickly that medical institutions will not be able to handle the influx of patients.

But this also doesn't take into account the high degree of probability that death rates from the virus are probably much lower than originally estimated and that in most cases of the disease, symptoms are mild.

John P.A. Ioannidis, professor of medicine, epidemiology, and population health at Stanford University, examined the cases of COVID-19 that occurred aboard the *Diamond Princess* cruise ship and concluded that death rates are much lower than previously thought. He estimated a mid-range death rate from the cruise ship data to be 0.3 percent of the general population and noted, as a result, that "this would translate into about 10,000 deaths" if one percent of the U.S. population contracted the disease. "This sounds like a huge number," he wrote, "but it is buried within the noise of the estimate of deaths from 'influenza-like illnesses' that occur every year."



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“If we had not known about a new virus out there, and had not checked individuals with PCR tests, the number of total deaths due to ‘influenza-like illness’ would not seem unusual this year,” Ioannidis concluded. “At most, we might have casually noted that flu this season seems to be a bit worse than average. The media coverage would have been less than for an NBA game between the two most indifferent teams.”

Even Anthony Fauci, a key member of President Trump’s coronavirus task force and head of the National Institute of Allergy and Infectious Diseases (NIAID), recently concluded, along with his co-authors, much the same. In an editorial for the *New England Journal of Medicine* published online on February 28 and in the March 26 print issue, Fauci and co-authors Dr. H. Clifford Lane and Dr. Robert R. Redfield wrote, “If one assumes that the number of asymptomatic or minimally symptomatic cases is several times as high as the number of reported cases, the case fatality rate may be considerably less than 1%. This suggests that the overall clinical consequences of Covid-19 may ultimately be more akin to those of a severe seasonal influenza.”

## Many Frightening Diseases

The deaths from COVID-19 are indeed tragic. The prospect of catching the virus is frightening, and the potential impact of a rapid spread of the disease on medical facilities is alarming. That said, to prevent panic, the disease should be put into perspective.

There have been many deadly pandemics throughout history. The most famous, and perhaps most dreadful and damaging, was the black death of the 14th century. This plague killed people in from two to seven days after infection and it depopulated Europe, killing perhaps as many as 200 million people. The population of Europe may have been reduced by as much as 50 percent.

Similarly, the Spanish Flu of 1918 infected an estimated 500 million worldwide and caused 50 million deaths, with 675,000 of those deaths in the United States.

Thankfully, COVID-19 appears far less deadly, at least so far, by comparison.

Other extant diseases, too, present a greater threat than COVID-19, most notably malaria. According to the CDC, “In 2018, an estimated 405,000 people died of malaria,” mostly in sub-Saharan Africa, with about 2,000 cases in the U.S. each year. Another disease that continues to extract a heavy toll is cholera, caused by the bacterium *Vibrio cholerae*. According to the CDC there are up to 2.9 million cases of cholera annually around the world and 95,000 people die from the disease. Frighteningly, *V. cholerae* “has emerged as a notorious multi drug resistant (MDR) enteric pathogen,” notes recent research published in the journal *Vaccine*.

## How Does the Pandemic End?

The good news is, even if tens of millions of people become infected with SARS-CoV-2, upwards of 98-99 percent or more will survive the disease. At least in its current form, COVID-19 is not going to be the disease that removes the human species from the planet.

The bad news is that halting the spread of the disease will continue to be very expensive and disruptive, especially if the current approach of blanket lockdowns used by many states and nations continues. Under such measures, disease and death from SARS-CoV-2 will be compounded by deaths brought on from damaging behaviors such as drug and alcohol abuse and even suicides induced by isolation



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policies. Already, indicators of a significant uptick in suicides have been noted.

“FirstLink, a local company that answers the 211 helplines and National Suicide Prevention Hotline, says call volume to some call centers are up 300% nationally,” reported *Valley News Live* in Fargo, North Dakota, on March 24. This aligns with research published in the journal *Crisis* in 2010 that looked at suicide rates in Hong Kong during the original SARS outbreak in 2003. In that case, researchers noted, “Social disengagement, mental stress, and anxiety at the time of the SARS epidemic among a certain group of older adults resulted in an exceptionally high rate of suicide deaths.”

Is there any hope, then, of a happy ending? Unfortunately, it remains difficult to know. The virus may mutate during the course of the pandemic and the mutated form may become less dangerous. Or, it may, in fact, be the case that warm weather coming with spring in the northern hemisphere will shut the virus down, as it seems that SARS-CoV-2 is most virulent at a temperature of 46.5 degrees Fahrenheit.

This was the conclusion reached by a team of researchers in a study they made available on medRxiv, the preprint server for health sciences. The Chinese researchers reported that their study “suggests significant impact of daily mean temperature on the daily confirmed new case counts 14 days later.” They also noted that “there is an optimal temperature for SARS-CoV2 at 8.07 °C [46.5 °F] and most cities with high epidemic transmission of COVID-19 locate in the humidity range of 60%~90%.”

If this is true, with any luck a long, hot summer will exterminate the virus and life can go on.

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