The Truth About COVID-19

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Mar 1 · 5 min read ★

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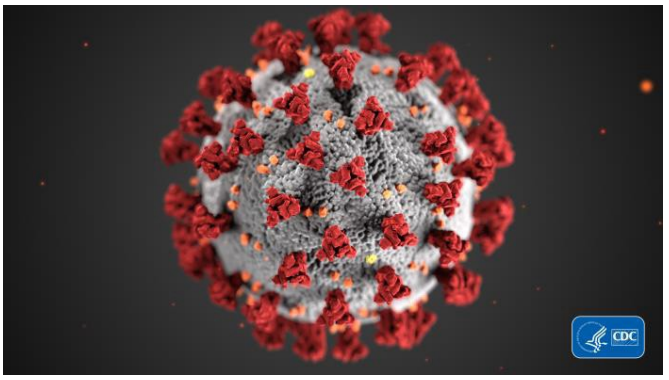

CDC illustration of ultrastructural morphology exhibited by coronaviruses

It's been more than two months since the first documented case of novel coronavirus in Wuhan, China. Despite border closures, quarantines, and travel restrictions, the virus continues to slither its way around the world. In the US, Washington state officials are investigating a possible COVID-19 outbreak at a long-term nursing facility where two people tested positive for the virus and dozens more are showing symptoms of the disease. Experts now believe the coronavirus may have been spreading in Washington, silently, for nearly six weeks. Infected patients with no known exposure to the virus are popping up in countries thousands of miles away from the epicenter, dotting the globe and threatening a pandemic.

As fear pushes the stock market down and purchases of masks go up, scientists are in a race for answers.

> *COVID-19 has now been detected on every continent except Antarctica.*

COVID-19 is not the same as "the common cold", even though both are in the coronavirus family. Comparing the two is like comparing apples to oranges, or more

specifically, like comparing the common cold to HIV or herpes or Ebola or SARS or MERS or COVID-19 or influenza. All are viruses. However, they all act on our body in very different ways. We can learn from each one by comparing the infectious rate, how the virus replicates, transmission, and mortality rate. It's important to look at and understand how viruses may be similar, but equally important are where the similarities end.

Coronavirus is a broad term for a subfamily of RNA viruses with distinctive crown-shaped spikes. Like COVID-19, SARS (severe acute respiratory syndrome) is also a coronavirus. SARS mortality rate? Nearly 10% (9.6% to be exact). MERS (Middle East respiratory syndrome) is also a coronavirus. It kills around a third of patients infected with the disease.

COVID-19 appears to be closer to 2% mortality in diagnosed cases, far less than SARS, and MERS, but it is also disproportionately killing the elderly. Data from the Chinese Center From Disease Control and Prevention showed a major leap in mortality rate based on age. There have been NO deaths in children under 10. While that's wonderful news for parents, it's also bizarre. Many common infectious diseases, like flu, are especially dangerous for the elderly, those with compromised immune systems, AND children. The exclusion of children from the mortality rate also concentrates the deaths within the population to those over age 10. The data from China showed 15% of those infected with COVID-19 over the age of 80 died from the disease, and 8% of those over age 70. Like many other viruses, it's also very dangerous for those with compromised immune systems.

Compare those mortality rates to influenza, which varies by year, but is usually closer to .1% in the United States, according to the New York Times. CDC data suggests a mortality rate this year closer to .05%.

How does it spread?

source: geralt, via pixabay (CC0)

Scientists are also struggling to understand why this novel coronavirus is so contagious.

The World Health Organization says it's far more infectious than SARS, and early research from Nankai University showed COVID-19's ability to bind to cells was 1,000 times greater than SARS. That may be because of an "HIV-like mutation". COVID-19 attacks a protein called furin, like HIV and Ebola. Both Ebola and HIV are viruses, but NOT coronaviruses. That mutation is unique, and disturbing. If the process of replication is similar to HIV and Ebola, an effective vaccine may be elusive. Merck first patented a potential Ebola vaccine in 2003. European regulators approved it sixteen years later, in November of 2019. The FDA followed suit one month later, in December of last year. Researchers are still searching for an effective vaccine for HIV.

What we are learning, may help stop the spread of the disease, by stopping the replication of the disease in our body.

There are antivirals that are being tested right now, and some are showing promising signs. The broad-spectrum antiviral remdesivir inhibits an enzyme called RNA-dependent RNA polymerase which many RNA viruses, like coronaviruses, need to replicate. Stop the cycle of replication, stop the infection, and stop the spread. There are dozens of drugs in trials now, and there are many drugs that are in development that are either broad-spectrum, or aim to trick the virus into replicating using the drug, and not human cells.

However, even if an effective treatment is found, there are no guarantees it will be available at a price the general public can afford, or if there will be enough supply worldwide to prevent future illness.

Health and Human Services Secretary Alex Azar faced criticism last week when he went before Congress to request taxpayer dollars to fight COVID-19, but would not guarantee a potential vaccine would be affordable for all US citizens. “We would want to ensure that we work to make it affordable, but we can’t control that price because we need the private sector to invest,” Azar said. “Price controls won’t get us there.”

The Trump administration has requested $2.5 billion dollars in funding to fight COVID-19, which includes vaccine research. Democrats have signaled they want to increase that dollar amount even higher. But the idea of taxpayer dollars funding research for a potential vaccine that may not be affordable to the people actually footing the bill is a difficult pill to swallow.

There is also the question of how quickly treatment is initiated. Wait too long to start treatment and the body’s own immune system could be beyond repair. Late stage lung damage and death is often because of the body’s own immune response and not viral replication.

We also don’t know the long-term effect on the body. Will those infected with COVID-19 have life-long immunity? Will those infected be susceptible to other infections in the future? Will COVID-19 rear its ugly head in times of stress like herpes (zoster or herpes simplex)? Will exposure now allow us to treat COVID-19 like the common cold or influenza in the future? Or will the virus mutate again and become even more deadly? As researchers feverishly search for answers, the rest of us wait, hoping the disease can be contained until there’s an effective, and affordable treatment.