

STAT

People 'shed' high levels of coronavirus, study finds, but most are likely not infectious after recovery begins

By [Helen Branswell](#) @HelenBranswell

March 9, 2020

[Reprints](#)

As symptoms go away you become MUCH LESS infectious !!



An electron microscope image shows the coronavirus that causes Covid-19. *Courtesy NIAID-RML*

People who contract the novel [coronavirus](#) emit high amounts of virus very early on in their infection, according to a new study from Germany that helps to explain the rapid and efficient way in which the virus has spread around the world.

At the same time, the [study](#) suggests that while people with mild infections can still test positive by throat swabs for days and even weeks after their



~~KE~~ illness, those who are only mildly sick are likely not still infectious by about 10 days after they start to experience symptoms. }

The study, by scientists in Berlin and Munich, is one of the first outside China to look at clinical data from patients who have been diagnosed with Covid-19, the disease caused by the coronavirus, and one of the first to try to map when people infected with the virus can infect others.

It was published Monday on a preprint server, meaning it has not yet been peer-reviewed, but it could still provide key information that the public health response has been lacking.

Support STAT: If you value our coronavirus coverage, please consider making a one-time contribution to support our journalism.

“This is a very important contribution to understanding both the natural history of Covid-19 clinical disease as well as the public health implications of viral shedding,” said Michael Osterholm, director of the University of Minnesota’s Center for Infectious Diseases Research and Policy.

The researchers monitored the viral shedding of nine people infected with the virus. In addition to tests looking for fragments of the virus’s RNA, they also tried to grow viruses from sputum, blood, urine, and stool samples taken from the patients. The latter type of testing — trying to grow viruses — is critical in the quest to determine how people infect one another and how long an infected person poses a risk to others.

Importantly, the scientists could not grow viruses from throat swabs or sputum specimens after day 8 of illness from people who had mild infections.

“Based on the present findings, early discharge with ensuing home isolation could be chosen for patients who are beyond day 10 of symptoms with less than 100,000 viral RNA copies per ml of sputum,” the authors said, suggesting that at that point “there is little residual risk of infectivity, based on cell

culture.”

Public health officials and hospitals have been trying to make sense of patients who seem to have recovered from Covid-19 but who still test positive for the virus based in throat swabs and sputum samples. In some cases, people test positive [for weeks](#) after recovery, the World Health Organization has noted.

Those tests are conducted using PCR — polymerase chain reaction — which looks for tiny sections of the RNA of the virus. That type of test can indicate whether a patient is still shedding viral debris, but cannot indicate whether the person is still infectious.

The researchers found very high levels of virus emitted from the throat of patients from the earliest point in their illness —when people are generally still going about their daily routines. Viral shedding dropped after day 5 in all but two of the patients, who had more serious illness. The two, who developed early signs of pneumonia, continued to shed high levels of virus from the throat until about day 10 or 11.

This pattern of virus shedding is a marked departure from what was seen with the SARS coronavirus, which ignited an outbreak in 2002-2003. With that disease, peak shedding of virus occurred later, when the virus had moved into the deep lungs.

Shedding from the upper airways early in infection makes for a virus that is much harder to contain. The scientists said at peak shedding, people with Covid-19 are emitting more than 1,000 times more virus than was emitted during peak shedding of SARS infection, a fact that likely explains the rapid spread of the virus. The SARS outbreak was contained after about 8,000 cases; the global count of confirmed Covid-19 cases has already topped 110,000.

Osterholm said the data in the paper confirm what the spread of the disease has been signaling — “early and potentially highly efficient transmission of the virus occurs before clinical symptoms or in conjunction with the very first

mild symptoms.”

The study also looked at whether people who have been infected shed infectious virus in their stool. [The report](#) of last month’s international mission to China — co-led by the WHO and China — said that in several case studies in China, “viable virus” had been recovered from stool but that isn’t likely driving transmission of the virus.

The German researchers found high levels of viral fragments in 13 stool samples from four patients in their study, but they were unable to grow virus from any of them. The paper noted, though, that all the patients had mild illness, and the fact that they could not find virus in their stool doesn’t rule out that it could happen in other cases.

“Further studies should therefore address whether SARS-CoV-2 shed in stool is rendered non-infectious though contact with the gut environment,” they wrote, adding that their findings suggest measures to try to stop spread of the virus should focus on respiratory tract transmission — protecting others from the coughs and sneezes of people infected with the virus.

Virus could not be grown from blood or urine samples taken from the patients, the authors reported.

The study also noted that people who are infected begin to develop antibodies to the virus quickly, typically within six to 12 days. The rapid rise of antibodies may explain why about 80% of people infected with the virus do not develop severe disease.

About the Author [Reprints](#)



[Helen Branswell](#)

Senior Writer, Infectious Disease

Helen covers issues broadly related to infectious diseases, including outbreaks, preparedness, research, and vaccine development.

[@HelenBranswell](#)

© 2020 STAT