

## HOW CONTAGIOUS IS THE NEW CORONAVIRUS, AND HOW DOES IT CO...

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### HEALTH

## HOW CONTAGIOUS IS THE NEW CORONAVIRUS, AND HOW DOES IT COMPARE TO FLU AND SARS?

BY **KASHMIRA GANDER** ON 3/20/20 AT 9:27 AM EDT



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**C** OVID-19 has spread to more than 160 countries and territories since the outbreak started in central China late last year. But how contagious is the new coronavirus?

The virus' ability to infect people won't change unless it mutates in a significant way, Ranu S. Dhillon, of the Division of Global Health Equity at Brigham and Women's Hospital at Harvard Medical School, told *Newsweek*. Totting up its potential victims is a little complicated.

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One way that experts approach the question of contagion is by calculating what is known as reproduction number or  $R_0$ , (pronounced R naught). This number denotes how many new cases one infected person will go on to cause. Severe acute respiratory syndrome (SARS) has an  $R_0$  between less than one to 2.75, while seasonable flu's ranges from 2 to 3.

flu  $R_0$  2-3, SARS 2.75

"How contagious a virus is depends on a lot of things," Angela Rasmussen, a virologist and associate research scientist at Columbia University, told to *Newsweek*. "Early in the epidemic, this number [ $R_0$ ] was in the two to five range.

"It depends on the virus, the mode of transmission, environment, and the population in which it is spreading," she said. Variables in a population which can affect how easily a virus spreads include how many people are at great risk of infection, say if they have a weaker immune system, as well as how they behave, and how much they move around and potentially pass on the bug. The climate is another factor that can make a difference, Rasmussen said.

One team at the U.K.'s Imperial College London in the U.K. initially put the  $R_0$  of the COVID-19 virus at between 1.5 to 3.5, while the Chinese Academy of Sciences Institute of Automation said 4.08 was more likely.

COVID-19 1.5 to 4.08

"With different measures, such as isolating people who are infected, washing hands, disinfecting surfaces, and social distancing," explained Dhillon, "the number of people each infected person transmits to can be brought down."

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Could the Coronavirus death rate be much lower than what has been reported previously?

"Based on most estimates, each infected person is infecting between two and three additional people," he said. "The ultimate goal — even if mostly by isolation — is to get that rate below 1 at which point the epidemic is no longer growing and starts contracting.

"With interventions like travel restrictions and or quarantines and an accurate understanding of prevalence in the population (as with widespread testing like they have done in South Korea), they have been able to bring the R0 down over time," Rasmussen said.

But with experts still learning about the new coronavirus, partly by analyzing data from China's outbreak and those which have popped up elsewhere, the R0 could keep changing.

Dhillon said, "That estimate of transmissibility is similar to what we thought from the outset, but we have some concerning recent evidence on exactly when and how the virus spreads."

He pointed to one pre-print study from Germany indicating infected people "can emit large amounts of virus before having any symptoms."

"A study in *Science* suggests that most transmission of the virus — up to 80 percent — is mediated by people who have mild or no symptoms," Dhillon added.

"If these findings are confirmed with further studies, the fact that the virus is so contagious before symptoms start and so much of its spread is being driven by those with mild or no symptoms makes stopping its transmission very challenging. If confirmed, it would suggest that we need to do intense social distancing for some time to cut down transmission or potentially start testing and isolating a wider range of asymptomatic or mildly symptomatic — though potentially infectious — people, not just those with serious symptoms."

Donald Burke, professor of health science and policy at the University of Pittsburgh, expressed similar concerns to *Newsweek*. Burke said he had "back of the envelope type concerns" that the R0 may be higher than originally estimated.

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have to be 3 to 4 to sustain this rate," he said.

"But the case count is confounded because case testing and reporting are increasing, and that might be artificially inflating the apparent R0," Burke said, adding, "All I can say for sure is that the rate of rise is faster than would be expected with conventional parameter estimates."

More than 246,000 cases of COVID-19 have so far been confirmed, including over 10,000 deaths and 86,000 plus recoveries. The virus has hit all 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands, as suggested by the [Statista](#) map below.

The map shows the number of cases of COVID-19 across the U.S. as of March 19.

STATISTA

### World Health Organization advice for avoiding spread of coronavirus disease (COVID-19)

#### Hygiene advice

- Clean hands frequently with soap and water, or alcohol-based hand rub.
- Wash hands after coughing or sneezing; when caring for the sick; before, during and after food preparation; before eating; after using the toilet; when hands are visibly dirty; and after handling animals or waste.
- Maintain at least 1 meter (3 feet) distance from anyone who is coughing or sneezing.
- Avoid touching your hands, nose and mouth. Do not spit in public.
- Cover your mouth and nose with a tissue or bent elbow when coughing or sneezing. Discard the tissue immediately and clean your hands.

#### Medical advice

- If you feel unwell (fever, cough, difficulty breathing) seek medical care early and call local health authorities in advance.
- Stay up to date on COVID-19 developments issued by health authorities and follow their guidance.

#### Mask usage

- Healthy individuals only need to wear a mask if taking care of a sick person.
- Wear a mask if you are coughing or sneezing.
- Masks are effective when used in combination with frequent hand cleaning.
- Do not touch the mask while wearing it. Clean hands if you touch the mask.

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- Do not reuse single-use masks.