



COVID-19 mythbusting series

Will the good weather decrease infection rates?

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A topic that's been debated a lot is whether SARS-CoV-2, the virus that causes COVID-19 disease, is sensitive to weather and climate. There's a lot of reasons why you might expect it to be – every winter, for example, we see peaks in influenza and colds caused by other respiratory viruses. Some people have even claimed that good weather will get rid of the virus. How realistic is this?

What we do know from experiments using the SARS coronavirus that caused the 2002 outbreak is that changes in heat and moisture can affect how long coronaviruses remain stable outside of a person. We also know that UV light can deactivate SARS-CoV-2 in laboratory settings. What still isn't clear though, is whether this sensitivity will make a meaningful difference outside of the lab, as the kind of UV light we get in sunlight is quite different, and many transmission events will happen indoors, where we control the temperature and humidity, away from any weather.

Some work we've done at the University of Liverpool has looked at different parts of the world in context of when their COVID-19 epidemic was worst, as well what kind of population they have, and their level of disease control, and if we adjust for all those factors, we might get an estimate of how sensitive to climate SARS-CoV-2 really is. That word estimate is a really important word, because to do this kind of investigation, we need to assume certain things, like all cases have been accurately reported, and we can't ever say that weather has directly caused any particular case.

But what we see is certain areas that are warmer and get more light have experienced less transmission, and as I say that's adjusted for the fact that warmer brighter parts of the world tend to be different human settlements to colder darker parts of the world. This suggests that the SARS-CoV-2 virus will have some sensitivity to changes in climate and we might feasibly expect seasonal transition to winter to bring more cases.

However, transmission is much more sensitive to the size and population structure of an area as well as how strict its disease control has been. And just because COVID-19 might have a seasonal pattern to its spread does not mean that you cannot catch the virus if the weather is hot or sunny, far from it. We've seen substantial transmission happen virtually all across the world, in all kinds of climates, so it's still possible for the virus to transmit in any weather, just that we would expect spread to be slightly slower in warmer places with more sunlight based on the patterns we see.

Additionally, aside from physical reasons why viruses may or may not survive in certain weather conditions, another reason that our respiratory illnesses spike in winter in the northern hemisphere in the first place is how we behave in those seasons. When the weather gets colder and worse, we're more likely to spend more time indoors, putting us in closer contact to other people in all kinds of community settings – reminding us of the importance of social distancing no matter the weather.

A lot of attention has gone towards trying to estimate how weather affects COVID-19, and no study, including ours, is going to be predictive. In fact, some previous research has been criticised for having overstated results. No one individual study is going to have the power to forecast exactly what will happen to the pandemic in the next few months – but what they can do is build up evidence so we get a picture of what different possibilities might reasonably look like, and why.

Perhaps the most prominent of these has been a mathematical simulation of COVID-19 by epidemiologists at Princeton University, based on what we know about how other respiratory viruses change as the seasons change. Like our study, although using a very different kind of method, this also suggested that the size and spread of COVID-19 outbreaks may be affected by weather to a small extent, but they're affected much more by number of people in an area and the contact rate between them. These findings demonstrate that it's important to maintain careful social distancing within veterinary practices as summer continues – just as for anywhere else.

So while warmer seasons may slightly slow down spread of COVID-19, what happens in the coming months will be much more about getting the disease control right. And an individual's risk of catching the virus is likely to depend much more on where they go and who they have contact with, rather than what the weather report says.

For more free COVID-19 resources for veterinary professionals, visit rcvsknowledge.org/covid-19



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