

# Common coronaviruses are highly seasonal, with most cases peaking in winter months

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Coronavirus. Credit: European Centers for Disease Control

Of the seven coronaviruses known to infect people, four cause common respiratory infections that are sharply seasonal and appear to transmit similarly to influenza, according to a new study by University of Michigan School of Public Health researchers.

The study authors say it is not possible to determine whether SARS-CoV-2 coronavirus, which causes COVID-19 disease, will behave likewise. But they hope their findings will help investigators better prepare for what's to come during the COVID-19 pandemic. Their study appears in the *Journal of Infectious Diseases*.

"Even though the seasonal coronaviruses found in Michigan are related to SARS-CoV-2, we do not know whether that virus will behave like the seasonal coronaviruses," said Arnold Monto, the Thomas Francis Collegiate Professor of Epidemiology at the U-M School of Public Health. "Only time will tell if SARS-CoV-2 will become a continuing presence in the respiratory infection landscape, continue with limited circulation as with MERS, or like SARS, disappear from humans altogether."

The researchers note that while coronaviruses have long been recognized as human respiratory pathogens, human coronaviruses have historically been detected in mild respiratory illnesses; when animal coronaviruses spill over to humans, however, they can cause severe disease. Severe acute respiratory syndrome (SARS) in 2002 and Middle East respiratory syndrome (MERS) in 2012 both emerged when a coronavirus jumped from an animal to people. The COVID-19 pandemic is believed to have started in the same way.

Monto and colleagues used data from the Household Influenza Vaccine Evaluation study, an ongoing longitudinal investigation of respiratory illnesses in households with children in the Ann Arbor area. For the last 10 years, between 890 to 1,441 individuals from several hundred households participated in the study. The continuing study is now tracking the occurrence of SARS-CoV-2 and its potential presence in Michigan households.

In 2010, the study began tracking the occurrence of four typically mild

human coronaviruses (OC43, 229E, HKU1 and NL63). The researchers looked at frequency, seasonality and household transmission characteristics of the 993 infections caused by those coronaviruses. They found:

- Overall, 9% of adult cases and 20% of cases in children were associated with doctor visits. On average, 30% of influenza cases require a doctor visit.
- When year-round surveillance occurred, most coronavirus cases were detected between December and April/May, and peaked in January/February. Only 2.5% of the cases occurred between June and September.
- The highest infection frequency was in children under age 5.
- Of the 993 infections, 260 were acquired from an infected household contact.
- The serial interval between index and household-acquired cases ranged from 3.2 to 3.6 days; secondary infection risk ranged from 7.2% to 12.6% by type.
- Cases in children under age 5 and adults over age 50 were more likely to be classified as severe.

Monto and colleagues say that the coronaviruses studied are sharply seasonal in Michigan and appear, based on serial interval and secondary [infection](#) risk, to have similar transmission potential to that of the influenza A (H3N2) virus in the study population. They say the results are not indicative of how SARS-CoV-2 will behave.

In a separate ongoing study, the researchers are using samples collected before the COVID-19 pandemic to explore community introduction of SARS-CoV-2. Preliminary results show no evidence that SARS-CoV-2 was present in the community before March.

**More information:** Arnold S Monto et al. Coronavirus occurrence and

transmission over 8 years in the HIVE cohort of households in Michigan, *The Journal of Infectious Diseases* (2020). [DOI: 10.1093/infdis/jiaa161](https://doi.org/10.1093/infdis/jiaa161)

Provided by University of Michigan

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