

CORONAVIRUS

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## COVID-19 can be spread by building ventilation, argue Canadian researchers working on an HVAC fix

*A group of Alberta researchers are working on ways that buildings could change their HVAC set-ups to curb the risk of infection*



An African restaurant is closed off along with other businesses in Guangzhou's Sanyuanli area, where a neighborhood is in lockdown after several people tested positive for the novel coronavirus disease (COVID-19), in Guangdong province, China April 13, 2020. *REUTERS/David Kirton*



TOM BLACKWELL

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4:30 PM EDT

Last Updated  
April 27, 2020  
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The outbreak of COVID-19 at a restaurant in the southern Chinese city of Guangzhou was a puzzle.

The suspected index patient was a visitor from the coronavirus's epicentre in Wuhan. But the eight other customers who later tested positive were not sitting close enough for droplet transmission, and most of the patrons and staff avoided infection altogether.

A team of local scientists eventually came to an eye-opening conclusion about the episode: tiny particles of virus had hitched a ride on currents created by the eatery's air-conditioning.

That runs counter to the prevailing view that the novel coronavirus is transmitted only by heavier "droplets." But for a group of civil engineers at the University of Alberta, the finding was no surprise. In their world, they say, it's well known that building ventilation systems are efficient disseminators of viruses and other pathogens, and they believe the COVID-19 bug is no exception.

Aided by a \$440,000 [federal-government grant](#), they're now working on ways that buildings could change their HVAC set-ups to curb the risk of infection, what the researchers call a "non-pharmaceutical" intervention against the disease.

## THERAPEUTIC SPOTLIGHT

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Browse a magazine or website dedicated to health and you'll often hear the familiar commandment take your supplements. And with good reason: minerals and vitamins play an important role in ...

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Canada has one of the highest prevalence rates of multiple sclerosis (MS) in the world. Each person experiences disease onset and progression in a different way.

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### Advocacy brings hope and change



Multiple sclerosis (MS) is an unpredictable disease that can have a profound impact on a person's ability to earn a living.

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STORY CONTINUES BELOW

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*We want to save lives, let's cut right to the chase*



“We want to save lives, let’s cut right to the chase,” said Prof. Brian Fleck, part of the project. “There are so many, many, many buildings ... This affects absolutely everybody. Billions of people. If we are able to cut down the transmission rate by a per cent, that’s a lot of people.”

The engineers’ belief in the importance of building ventilation as a transmitter of the COVID-19 virus is not universally held.

The World Health Organization and [other public-health bodies](#), citing the science to date, say the pathogen is spread almost entirely by droplets, heavier particles emitted mostly when infected people cough or sneeze, and which fall down within a short distance. Hence the two-metre rule for social distancing, and the emphasis on washing hands after touching surfaces where virus may have alighted.

“The HVAC systems in most non-medical buildings play only a small role in infectious disease transmission, including COVID-19,” argued the [American Society](#) of Heating, Refrigerating, and Air-Conditioning Engineers last month.

It’s just smaller and lighter aerosol particles that can spread through a ventilation system and “the truth is that we still don’t really know if the (COVID-19) virus can be spread by aerosols,” said [Matthew Miller](#), a virus expert at McMaster University in Hamilton.

But Chinese and Australian air-quality experts, citing in part the experience with SARS, another coronavirus, [argued in a paper](#) earlier this month that as droplets from an infected person start to evaporate, the resulting smaller

particles can indeed become airborne.

They point to evidence that passengers confined to their cabins on cruise ships like the Diamond Princess may have been infected through the vessels' air ducts.

"It is highly likely that the SARS-CoV-2 virus also spreads by air," they conclude, urging "all possible" action in response, including modifications to ventilation systems. "We predict that ... failure to immediately recognize and acknowledge the importance of airborne transmission and to take adequate actions against it will result in additional cases."

Then there was the Guangzhou restaurant case, detailed in a U.S. Centers for Disease Control online journal recently. [Researchers concluded](#) flow from an air conditioner moved over three tables, carrying virus from the infected patron at the middle one to the far table, then back to the diners closest to the air conditioner.

Even if it turned out SARS-CoV-2 does not spread that way, influenza viruses can, and the University of Alberta research would be valuable for that reason alone, said Miller.

Heating, ventilation and air conditioning (HVAC) engineers have long known that tiny particles of pathogen travel in the air that is circulated, heated and cooled in modern buildings, said Fleck. He pointed to Legionnaires disease, a bacterial pneumonia first traced to a hotel's air-conditioning system.

*The particle can stay airborne long enough to go all the way through the system and then pop out in somebody else's office*



"This has been on people's radar for quite a while," he said. "Somebody on a different floor sneezes ... The particle can stay airborne long enough to go all the way through the system and then pop out in somebody else's office."

There are various ways that the risk can be lessened, including use of filters that catch a greater number of those particles, and drawing more fresh air into a system. It also is likely that higher levels of humidity – a factor that only some Canadian buildings can adjust – will help kill off the virus, said Fleck.

But each of those changes carries a cost. Adding more fresh air can require additional heat or air conditioning. Heavier filters means more energy is needed to push the air through them. And more humidity can lead to mould,

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he noted.

“This will make for difficult decision making.”

Funded by the Canadian Institutes for Health Research, the University of Alberta project is led by engineering professor Lexuan Zhong and also involves pediatrics professor Lisa Hartling. It consists of three phases: systematically reviewing literature on air circulation and viruses, determining what strategies would be effective and then carrying out a detailed audit of all the buildings on the Edmonton campus to create a real-world model of what should be done.

The team hopes to have solid results by the summer of 2021, said Fleck.

*(Modified 12:40 April 26 to add comments by Matthew Miller.)*

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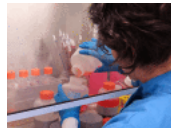
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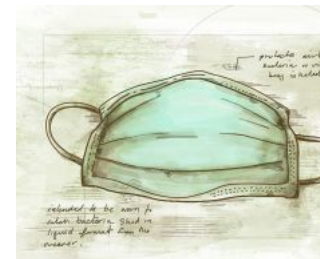
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THIS WEEK'S FLYERS

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RB

**Randy B** 25 MIN AGO

Non ozone generating UVC lights installed in the duct work. I've had one in my home for years. It lights up the highly reflective duct work for some ways in all directions (but don't be looking at the light or let it shine on your skin).

Don't be surprised there will be 'new' information that the 6 foot rule alone is of limited effectiveness. The virus can travel no problem much further than that. It makes sense for all to wear a mask AND keep apart at least 6 feet.

REPLY 1 REPLY 1 0

RB

**Rick B** 4 MIN AGO

Reply to **Randy B**

Yes, good idea. I have had one for a couple years. Seems to work w/allergies, maybe colds. Install yourself for \$150, Can Tire.

REPLY 1 0



Add your reply

DM

**Douglas Mortimer** 35 MIN AGO

Great, so now the virus is airborne? Hold your breath, folks!

And report your neighbours who open their windows!

REPLY 2 REPLIES 1 0

TG

**Tangwystyl Goch** 21 MIN AGO

Reply to **Douglas Mortimer**

I really hope that your comment was sarcasm.

REPLY 1 REPLY 1 1

RB

**Rick B** 6 MIN AGO

Reply to **Tangwystyl Goch**

And if not?

REPLY 0 0



Add your reply



**Robert Manders** 49 MIN AGO

Even now, after all the global misery, China won't allow American medical investigators into the country to investigate the spread of COVID there. Pompeo had asked Xi repeatedly for access to Wuhan's bio-labs, and wet markets, and the Communists have refused to cooperate. Britain now rejects all data from China because their death and infection statistic are demonstrably fake. However, Trudeau still believes China is an honest broker and we must follow their lead.

EDITED

REPLY 2 0

RE

**robert elder** 58 MIN AGO

Take a look at the pic at the top of the article.

What normal person would even THINK about going into one of those "stores" ??

REPLY 3 REPLIES 3 1

1

SHOW OLDER REPLIES

DM

**Douglas Mortimer** 41 MIN AGO

Reply to **robert elder**

I'm sure the McDonald's restaurant is all right. Yes, I'll have a Double McBat meal with a side of civet, please. No pickle.

REPLY 1 REPLY 3 0



**Robert Manders** 20 MIN AGO

Reply to **Douglas Mortimer**

The pickle, bathed in salty brine, would be the only thing not contagious.

REPLY 1 0



Add your reply



ZD

Zarko Darko 1 HR AGO

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ACTIVE CONVERSATIONS

Your premise is that the Chinese, in their great and wonderful and newfound benevolence, are offering more information regarding this virus?

Loading

The same group, that we are now learning, hid this from the world late last year?

Oh, OK, now they are being honest.

Hev last time I checked I had a "ventilation" system in my house too!



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