

Where's the Evidence?

Confronting Public Panic About COVID-19

by

Laura Pickell

Department of Biology

Cégep Heritage College, Gatineau, QC, Canada



This COVID-19 outbreak is the largest pandemic since the Spanish flu of 1918. We watch closely as the World Health Organization declares the global number of COVID-19 cases to have reached almost 2 million. Today, April 14, 2020, there are over 1.8 million cases in over 200 countries including more than 100,000 deaths. Malik turned off the news. He couldn't believe it. He'd never seen anything like it and hoped he never would again. The whole world had shut down, everything was closed, even the borders were closed and would be for months. They weren't even supposed to go out in public and the government was asking everyone to stay home as much as possible.

Being a public health nurse, Malik knew this was serious and that it was important to follow the directives to social distance and self-isolate. He also knew this was even more important for him given that his 72-year-old father (whom he had brought home to stay with him during the pandemic) was asthmatic, making him especially susceptible to this new respiratory virus. Malik turned to his father, "I'm so glad I was reassigned to answering phone calls on this new COVID-19 hotline. This way I can work from home."

"I know you would have liked to help your friends on the frontlines at the hospital," his father replied.

Malik shook his head. "But what if I carried the virus home to you, Dad? Don't worry, it's really not worth the risk. And this way, I can answer people's questions with actual facts and evidence to put a stop to all of those crazy ideas flying around on social media. It's certainly not helping us in containing the outbreak. There are some really wild rumours out there about the virus that I would like to put a stop to."

Malik remembered the first two coronavirus outbreaks, SARS (severe acute respiratory syndrome) in 2003 when he was still completing his nursing degree and MERS (Middle East respiratory syndrome) in 2012. But this pandemic was different. There were so many more cases and it was spreading so fast. "I guess it should be no surprise given that it's happened twice before," he thought to himself.

Malik was to start answering calls in the morning, so he thought he better brush up on his understanding of the virus. The only thing he remembered from his microbiology class was that the name "corona" came from the fact that these viruses looked like they had a crown from all the protein spikes in the viral membrane. He started searching for information in his favorite databases and came across some great images.

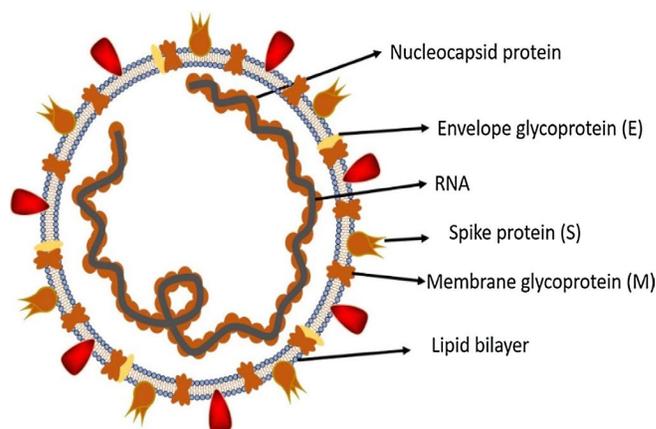


Figure 1. Probable structure of SARS-CoV-2, the virus causing (coronavirus disease) COVID-19. Viruses in the betacoronavirus family are tiny, 65–125 nm, have a single-stranded RNA genome and are enveloped. The spike proteins in the phospholipid envelope allow the virus to bind to and enter the host cells. The viral genome codes for viral proteins, including spike proteins, polyproteins, nucleoproteins, membrane proteins, viral RNA polymerase and proteases. (Image credit: Shereen *et al.*, 2020; CC BY-NC-ND 4.0.)

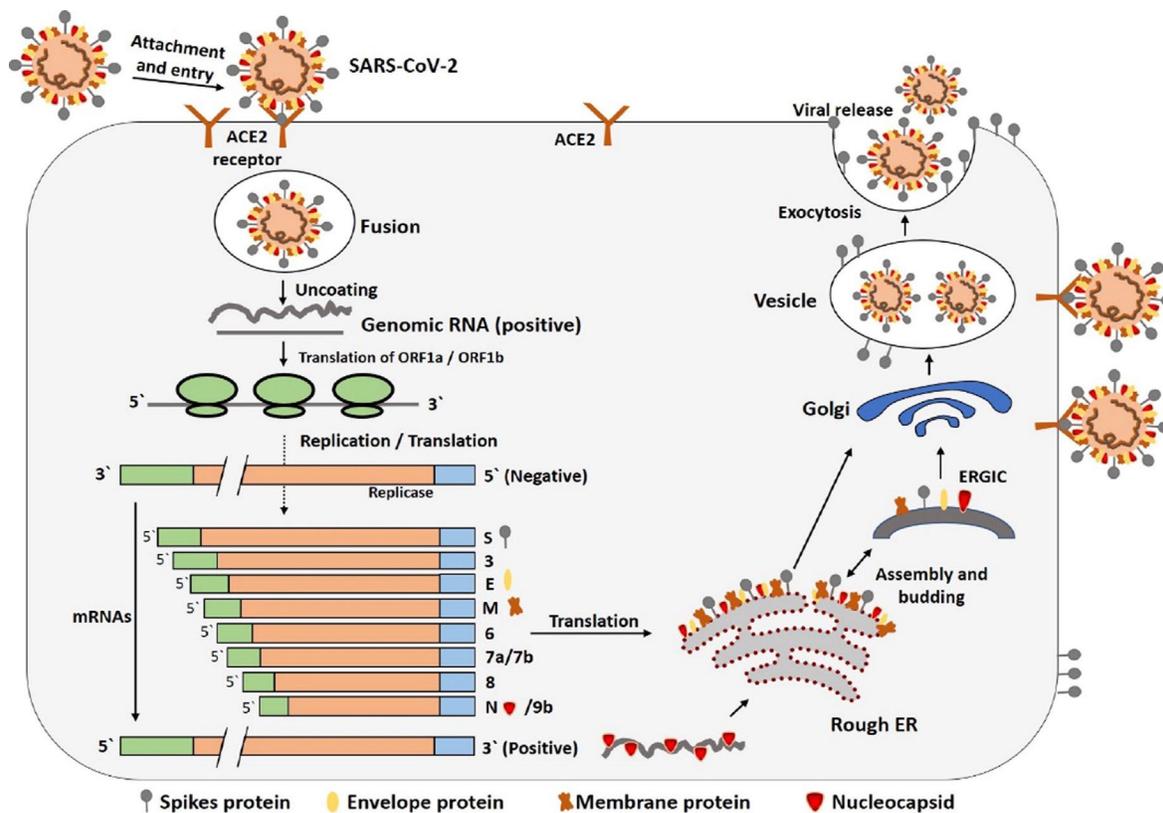


Figure 2. Probable SARS-CoV-2 replication cycle. Viral replication begins with the spike protein binding to the ACE2 receptor on the host cell. The S protein changes shape initiating endocytosis and the fusion of the viral envelope with the cell membrane resulting in entry of the virus into the cell. The viral RNA is replicated by the viral RNA polymerase and translated into viral proteins using the host machinery. New virions are assembled in the ER and Golgi before being transported and released, ready to infect the next cell. ACE2, angiotensin-converting enzyme 2; ER, endoplasmic reticulum; ERGIC, ER–Golgi intermediate compartment (Image credit: Shereen *et al.*, 2020; CC BY-NC-ND 4.0.)

Malik yawned. All of this reading was making him tired, but he wanted to look up the clinical symptoms of COVID-19 before he went to bed. He found that a typical patient presented with fever, headache, malaise and cough. “Wow,” he thought to himself, “that sounds just like the flu or a cold.” He kept reading: “...and pneumonia, which sometimes leads to respiratory distress and death.” “Ok. Maybe not that part.” Malik closed his computer and went up to get ready for bed. “Well, I guess I’ll see what kind of calls I get tomorrow.”



Reference

Shereen, M.A., *et al.* 2020. COVID-19 infection: origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research* 24 91-98. <<https://doi.org/10.1016/j.jare.2020.03.005>>.

Caller 1

Read the conversation between Malik and the first caller. Then answer the following questions using the listed research articles and websites along with any other resources you find on your own.

Conversation

Malik: Good morning. You've reached the COVID-19 hotline. My name is Malik. What can I help you with this morning?

Caller 1: Yes... Hi, umm... I read on Facebook that this new virus was actually genetically engineered by scientists and released as a biological weapon on purpose. Is this true? How do we know where the virus came from?

Questions

1. Summarize the caller's concerns.
2. Identify the caller's questions and rephrase them into scientific questions you can answer.
3. Use the sources given (and other sources you may have found) to summarize the scientific information that will help answer the caller's questions.
4. Indicate the type of sources used to answer the caller's questions and why it is important to use such evidence-based sources rather than popular sources such as those found on social media.
5. How will you respond to the caller's concerns and questions? What will you say to the caller?

Research Articles

Andersen, K.G., *et al.* 2020. The proximal origin of SARS-CoV-2. *Nature Medicine* 26: 450–2. <<https://doi.org/10.1038/s41591-020-0820-9>>.

He, F., Y. Deng, and W. Li. 2020. Coronavirus disease 2019: what we know? *Journal of Medical Virology* (ahead of print). <<https://doi.org/10.1002/jmv.25766>>.

Lai, C.C., *et al.* 2020. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. *International Journal of Antimicrobial Agents* 55(3). <<https://doi.org/10.1016/j.ijantimicag.2020.105924>>.

Li, R., *et al.* 2020. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2). *Science* (ahead of print). <<https://doi.org/10.1126/science.abb3221>>.

Zhou, P., *et al.* 2020. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature* 579(7798): 270–3. <<https://doi.org/10.1038/s41586-020-2012-7>>.

Health Organization Websites

World Health Organization (WHO). <<https://www.who.int/>>

Centers for Disease Control and Prevention (CDC). <<https://www.cdc.gov/coronavirus/2019-ncov/faq.html>>

National Institutes of Health (NIH). <<https://www.nih.gov/>>

Public Health Agency of Canada. <<https://www.canada.ca/en/public-health.html>>

Internet references accessible as of April 16, 2020.

Caller 2

Read the conversation between Malik and the second caller. Then answer the following questions using the listed research articles and websites along with any other resources you find on your own.

Conversation

Malik: Good morning. You've reached the COVID-19 hotline. My name is Malik. What can I help you with this morning?

Caller 2: How's it going? I sure am happy they've set up this hotline. There is so much information going around on the internet that I don't know what to believe. This morning I saw a Tweet from the Surgeon General saying, "Seriously people-STOP BUYING MASKS!" But I see people wearing them all over the place so, should I be wearing one or not? Why would masks help people in the medical field, but they wouldn't help me? It doesn't make sense.

Questions

1. Summarize the caller's concerns.
2. Identify the caller's questions and rephrase them into scientific questions you can answer.
3. Use the sources given (and other sources you may have found) to summarize the scientific information that will help answer the caller's questions.
4. Indicate the type of sources used to answer the caller's questions and why it is important to use such evidence-based sources rather than popular sources such as those found on social media.
5. How will you respond to the caller's concerns and questions? What will you say to the caller?

Research Articles

Feng, S., *et al.* 2020. Rational use of face masks in the COVID-19 pandemic. *The Lancet* (ahead of print). <[https://doi.org/10.1016/S2213-2600\(20\)30134-X](https://doi.org/10.1016/S2213-2600(20)30134-X)>.

He, F., Y. Deng, and W. Li. 2020. Coronavirus disease 2019: what we know? *Journal of Medical Virology* (ahead of print). <<https://doi.org/10.1002/jmv.25766>>.

Lai, C.C., *et al.* 2020. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. *International Journal of Antimicrobial Agents* 55(3). <<https://doi.org/10.1016/j.ijantimicag.2020.105924>>.

Li, R., *et al.* 2020. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2). *Science* (ahead of print). <<https://doi.org/10.1126/science.abb3221>>.

van Doremalen, N., *et al.* 2020. Aerosol and surface stability of SARS-CoV-2 compared to SARS-CoV-1. *The New England Journal of Medicine* (ahead of print). <<https://doi.org/10.1056/NEJMc2004973>>.

Health Organization Websites

World Health Organization (WHO). <<https://www.who.int/>>

Centers for Disease Control and Prevention (CDC). <<https://www.cdc.gov/coronavirus/2019-ncov/faq.html>>

National Institutes of Health (NIH). <<https://www.nih.gov/>>

Public Health Agency of Canada. <<https://www.canada.ca/en/public-health.html>>

Internet references accessible as of April 16, 2020.



Caller 3

Read the conversation between Malik and the third caller. Then answer the following questions using the listed research articles and websites along with any other resources you find on your own.

Conversation

Malik: Good morning. You've reached the COVID-19 hotline. My name is Malik. What can I help you with this morning?

Caller 3: (Coughing in the background.)

Malik: Hello? Hello? Are you ok?

Caller 3: (Cough) Sorry. I have this coronavirus, but the doctors just told me to self-quarantine and wait for it to pass. But the President said on tv that some sort of drug that's already out there, chloro- something or other, is a cure for this thing. I have some old antibiotics in my medicine cabinet. Do you think they would help? I also read that gargling with saltwater will kill the germs and prevent them from leaking more into my lungs. What do you think?

Questions

1. Summarize the caller's concerns.
2. Identify the caller's questions and rephrase them into scientific questions you can answer.
3. Use the sources given (and other sources you may have found) to summarize the scientific information that will help answer the caller's questions.
4. Indicate the type of sources used to answer the caller's questions and why it is important to use such evidence-based sources rather than popular sources such as those found on social media.
5. How will you respond to the caller's concerns and questions? What will you say to the caller?

Research Articles

Cortegiani, A., *et al.* 2020. A systematic review on the efficacy and safety of chloroquine for the treatment of COVID-19. *Journal of Critical Care* (in press). <<https://doi.org/10.1016/j.jcrc.2020.03.005>>.

Cunningham, A.C., H.P. Goh, and D. Koh. 2020. Treatment of COVID-19: old tricks for new challenges. *Critical Care* 24(91). <<https://doi.org/10.1186/s13054-020-2818-6>>.

Lai, C.C., *et al.* 2020. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. *International Journal of Antimicrobial Agents* 55(3). <<https://doi.org/10.1016/j.ijantimicag.2020.105924>>.

Shereen, M.A., *et al.* 2020. COVID-19 infection: origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research* 24: 91–8. <<https://doi.org/10.1016/j.jare.2020.03.005>>.

Wang, M., *et al.* 2020. Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro. *Cell Research* 30: 269–71. <<https://doi.org/10.1038/s41422-020-0282-0>>.

Health Organization Websites

World Health Organization (WHO). <<https://www.who.int/>>

Centers for Disease Control and Prevention (CDC). <<https://www.cdc.gov/coronavirus/2019-ncov/faq.html>>

National Institutes of Health (NIH). <<https://www.nih.gov/>>

Public Health Agency of Canada. <<https://www.canada.ca/en/public-health.html>>

Internet references accessible as of April 16, 2020.



Caller 4

Read the conversation between Malik and the fourth caller. Then answer the following questions using the listed research articles and websites along with any other resources you find on your own.

Conversation

Malik: Good morning. You've reached the COVID-19 hotline. My name is Malik. What can I help you with this morning?

Caller 4: Hey. Listen, so I've heard that only old people are affected by this coronavirus and that most of us younger ones have nothing to worry about. So why is it that we have to stay home and avoid going out or hanging out with our friends? What's the big deal?

Questions

1. Summarize the caller's concerns.
2. Identify the caller's questions and rephrase them into scientific questions you can answer.
3. Use the sources given (and other sources you may have found) to summarize the scientific information that will help answer the caller's questions.
4. Indicate the type of sources used to answer the caller's questions and why it is important to use such evidence-based sources rather than popular sources such as those found on social media.
5. How will you respond to the caller's concerns and questions? What will you say to the caller?

Research Articles

He, F., Y. Deng, and W. Li. 2020. Coronavirus disease 2019: what we know? *Journal of Medical Virology* (ahead of print). <<https://doi.org/10.1002/jmv.25766>>.

Ludvigsson, J.F. 2020. Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults. *Acta Paediatrica* (ahead of print). <<https://doi.org/10.1111/apa.15270>>.

Public Health Agency of Canada. 2020. Coronavirus disease (COVID-19): outbreak update. [Webpage]. <<https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html>>.

Shereen, M.A., *et al.* 2020. COVID-19 infection: origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research* 24: 91–8. <<https://doi.org/10.1016/j.jare.2020.03.005>>.

Sun, P., *et al.* 2020. Understanding of COVID-19 based on current evidence. *Journal of Medical Virology* (advanced online publication). <<https://doi.org/10.1002/jmv.25722>>.

Health Organization Websites

World Health Organization (WHO). <<https://www.who.int/>>

Centers for Disease Control and Prevention (CDC). <<https://www.cdc.gov/coronavirus/2019-ncov/faq.html>>

National Institutes of Health (NIH). <<https://www.nih.gov/>>

Public Health Agency of Canada. <<https://www.canada.ca/en/public-health.html>>

Internet references accessible as of April 16, 2020.