Thirteen science questions about COVID-19 from teens

How to stay safe and where it all began.

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March 4, 2020

Most people have no reason to worry, but we can all take precautions.*Unsplash*

Follow all of [PopSci*'s COVID-19 coverage here*](#), including [travel advice](#), [pregnancy concerns](#), and [the latest findings on the virus itself](#).

Popular Science has spent the last few weeks working hard to keep our readers informed about COVID-19, the novel strain of coronavirus that's infected close to 100,000 people worldwide since December. Here, we answer a few questions from students at Vineland High School in New Jersey. Still have questions of your own? Let us know in the comments and we'll do our best to find answers.

What are the best methods to prevent getting the virus?

The best way to keep yourself from getting COVID-19 is to [wash your hands frequently (and adequately) and try not to touch your face](#). This is because respiratory viruses like COVID-19, the common cold, and the flu are primarily transmitted from droplets of spit or mucus, which are easy to transfer from person to person via handshakes and food preparation if people aren't washing their hands frequently. When you touch your face, you expose your eyes, nose, and mouth to these bits of virus. So, by limiting how much you touch surfaces in public areas (like subway poles) and washing your hands well and often, you can drastically reduce your risk of getting the virus. Hand sanitizer is a good substitute in a pinch, but not a replacement for washing your hands.

You should also keep your distance from people who are actively coughing and sneezing.

Should we be scared?

It's understandable to feel frightened by news of a novel virus, but the risk to individuals in the United States is still very low. Most people who get COVID-19 have only mild cold or flu-like symptoms. The important thing is to do what you can to

practice good hygiene, which will minimize your risk of getting COVID-19, and keep you from spreading it to others if you do contract it. You should keep yourself informed using trusted news sources (like PopSci!) and stay home if you're sick. For now, that's all you should be doing!

Which is better for cleaning hands? Soap and warm water or alcohol?

Most people don't wash their hands properly. [Here are instructions on how to do it right](#). A summary: Use soap and warm water (the temperature doesn't matter, just use what's comfortable) and lather the soap for 20-30 seconds before rinsing.

Hand sanitizer is not as good as a thorough hand-washing session, but it's better than nothing if you can't get to a sink and soap. Make sure you're using a hand sanitizer that's at least 60 percent alcohol. Check the label of the product you're using to see how much you should dispense, then squirt that amount onto the palm of one hand and rub your hands together. It's important to rub the sanitizer all over your hands and fingers, and to continue doing so until your hands are dry—don't just wipe the sanitizer off on a towel or your clothes.

Without media do you believe the whole COVID-19 issue would be present?

While the fatality rate of COVID-19 is around 2 percent—much lower than some pandemics, like SARS or Ebola—it has infected and killed enough people in China that it would definitely have caused public health officials to be concerned, even before the age of digital media. But the spread of disinformation that exists online is certainly dangerous during international incidents like the COVID-19 outbreak. Research shows false information often spreads quicker than actual facts do, and we've already seen people try to take advantage of the situation by selling "cures" for COVID-19 to their online followings. There is no cure or treatment for COVID-19, and you should only get news from trustworthy publications like *The New York Times*, *STAT News*, *The Washington Post*, *Popular Science*, and *Reuters*. These aren't the only trustworthy sources out there, but they have health reporters I know and trust.

With so many pandemics in the world, should COVID-19 be taken serious in everyday life even though you are nowhere near the areas that are in effect?

Pandemics aren't actually all that common—and thank goodness for that! Pandemic isn't a term with a strict definition, but an epidemic is when we see a surge of case numbers above what is considered normal for any given disease, and a pandemic is generally what we call an epidemic that has spread significantly across multiple continents. Epidemics don't happen every day, and pandemics are even less common. Public health officials consider AIDS to be an ongoing pandemic, but most disease outbreaks do not reach that scale.

To answer the second part of your question, the best way to keep COVID-19 from affecting your area is to practice good hygiene before it becomes a problem. In the Pacific Northwest, health officials are seeing cases that make them suspect the disease has been circulating in local communities for weeks. This is not surprising, given how mild COVID-19 symptoms are for most people, how bad most of us are at washing our hands and not touching our faces, and how difficult it is to take time off work and isolate ourselves for what seems to be a minor cold. COVID-19 was able to spread in that area because people went about their everyday business while coughing and sneezing. That's not their fault, but we can learn from what happened there and try to do better. (Seriously, I'm writing this from my couch because I have a cough).

If I was to boost my immune system would it help fight the virus?

The idea of being able to do certain activities or eat something specific to boost your immune system such that you can become an illness-fighting ninja sounds incredibly enticing. [But unfortunately, it's not exactly how the immune system works](). Your body builds up immunity by encountering a pathogen and learning to recognize it and fight against it, so there's nothing you can do before it encounters the virus to get it ready.

On the other hand, you can do some things to make sure your body is in its best fighting shape when it has that first encounter with a new virus.

The best thing you can do to [help your body fight off disease]() is to get plenty of sleep. [You should really aim for eight hours or more]()! Eating a healthy, balanced diet is also a great way to stay healthy. Doing these things won't protect you from every

potential health threat, but eating a poor diet and depriving yourself of sleep will definitely leave you more vulnerable.

You should also get your flu shot, if you haven't already done so. It won't protect you from COVID-19, but it will lower your chances of getting influenza—which can be just as dangerous!

How long do you think the virus will be a problem?

It's too soon to tell how long COVID-19 will remain significantly active. Some public health experts think it will stick around as a new virus that picks up every season, the same way the flu does. Influenza and the common cold are both types of coronaviruses, so COVID-19 may follow some of the same patterns. However, if COVID-19 does stick around as a persistent threat, it's likely that we'll have a vaccine developed by this time next year, and we'll know to keep an eye out for it and try to minimize this spread. It's worrisome to imagine such a mysterious virus persisting for months or years, but the upside is that COVID-19 is mostly a problem because of how little we know about it. The longer it stays around, the better our tools for tracking and fighting it will get. That being said, we've been dealing with influenza for all of modern history, and it still kills tens of thousands of people in the United States every year. Adding another potentially dangerous respiratory virus to our annual list of concerns will definitely strain the healthcare system, even if it won't produce dramatic outbreaks like this one annually.

Are they going to shut down the schools?

While individual communities with high case rates have shut down some schools and public gatherings, there is no reason to do this before COVID-19 is obviously circulating in any given area. However, schools and businesses should be as flexible as they can be about people taking sick days and working remotely to prevent the spread of disease.

If a vaccine is developed, could the virus somehow adapt to the treatment?

Many viruses originate in non-human animal hosts. We call these zoonotic diseases. The fact that they jump from animal to human hosts means they're more likely to catch us by surprise. But they're not all as scary as COVID-19: The Centers for Disease Control [estimates that 60 percent of the infectious diseases that affect humans originated in another animal](). Microbes mutate all the time, because of how quickly they reproduce—the reason we need new flu vaccines every year is that

influenza mutates into new strains so rapidly—but there is no reason to think COVID-19 will be particularly resistant to vaccination or treatment.

What makes COVID-19 different from other pandemics? (Flu, etc?)

As of this week, the World Health Organization has officially given COVID-19 pandemic status and the disease continues to pose unique challenges compared to other viruses. It appears to be more contagious than the average seasonal flu, though not nearly as contagious as some other viruses like measles. It also presents in incredibly mild symptoms for most people who are infected, which means many people with COVID-19 have been going about their usual routines and exposing others to the disease. But like the flu, COVID-19 can cause serious or even fatal pneumonia in some cases—which becomes much more likely in people who are elderly or sick with underlying health problems. Another difference between COVID-19 and your typical seasonal flu is that a higher rate of infected patients seem to experience these dangerous symptoms: While the fatality rate of influenza is less than 1 percent, estimates for COVID-19 have gone as high as around 3 percent. However, it's difficult to know how reliable those estimates are. Because so many cases of COVID-19 are easy to ignore, it's possible that infection rates are much higher than we've been able to calculate, in which case the percentage of patients who have died would be much lower.

[The flu kills hundreds of thousands of people each year](#), so adding another virus with similar fatality rates—let alone much higher ones—to our seasonal illness rotation could put serious strain on our healthcare system. However, because COVID-19 is new, we've had no chance to develop immunity to it (or to engineer our immunity by crafting a vaccine). If it sticks around for months or years, it will become less deadly as we get better at diagnosing and treating it, and as our immune systems start to recognize it.

Where are scientists currently with the vaccine or medicine?

Several [pharmaceutical companies and research institutions around the globe](#) are working to find [potential treatments or vaccines for COVID-19](#). A U.S. biotech firm says its vaccine is ready for preliminary testing, but the process of approving it could [take as long as a year](#). It could easily take months to get a formula that works well enough to test on humans, let alone something that can be broadly deployed.

Many claims of cures or preventative treatments are circulating online, but the World Health Organization [confirms that there's no known supplement, food, or medication that can protect people from COVID-19](). However, it is advisable to [get a flu shot]() if you have yet to do so: The similar symptoms between the two viruses could lead those with influenza to take up valuable space and time in hospitals, and a compromised immune system could leave you more susceptible to catching COVID-19.

Was the coronavirus ever seen in humans prior to recent cases?

Coronaviruses have existed in humans for a long time, but this particular coronavirus is new.

[Coronaviruses are a family of viruses that often cause mild respiratory symptoms]() (the common cold is one of them), but some can cause serious illness. Severe acute respiratory syndrome coronavirus (SARS-CoV), which jumped from bats to humans in China's Guangdong Province in 2002, infected more than 8,000 people worldwide and killed at least 774.

COVID-19 wasn't detected in humans until December 2019, when it started showing up in patients in Hubei Province, China. [The outbreak may have originated due to close contact between humans and wild animals at a market in Wuhan, but the exact time and location of the initial jump from animal to human isn't yet known]().

With the process of a universal vaccine in the making, could we possibly ever stop a pandemic or another virus from happening?

No one is at all close to developing a vaccine that kills all viruses. Vaccines work by introducing certain molecules from a virus or strain of bacteria into your body; this gives your immune system the chance to learn to fight the disease before you actually encounter it. Obviously it's a tricky business to create a cocktail that looks enough like a dangerous virus to help your body out without actually hurting you in the way the virus would, which is why it takes months to study and approve a new vaccine even under the absolute fastest and well-funded timeline.

Because a vaccine works by mimicking the virus or bacterium it protects against, there's no way to create a "universal" vaccine (at least not with the understanding of biology and technology that we have today). Even the hunt for a universal flu vaccine is going to require several more years of effort, if we can manage it at all. Right now, scientists have to attack a few select strains of the flu with each year's vaccine, based on research about which strains will be most dangerous. If we could create a universal flu vaccine, we might be able to get one flu shot and be done with it. That would be a huge deal in terms of lowering humans' overall risk of flu transmission, but it wouldn't have any effect on the risk of other pandemics.