

GREAT DECISIONS

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HIGH SCHOOL

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TEACHERS:
CHECK OUT
THE BACK PAGE

THE COVID-19 PANDEMIC

**VACCINES
IN RECORD TIME**

**STOP THE
SPREAD**

AN UNCERTAIN FUTURE

**TEEN TRAIL
BLAZERS**

For more than a year, the COVID-19 pandemic has upended normal ways of life. Is there finally an end in sight?

BY ISOBEL WHITCOMB

A RACE AGAINST TIME



At mass distribution sites like this one in Seattle, thousands of people can receive vaccinations each day.

Credit: LINDSEY WASSON/REUTERS/Newscom

In 2020, life ground to a halt. School and work, graduations and weddings were canceled or moved online. The culprit? A mysterious new sickness called COVID-19.

The disease blazed across national borders. By March, only four months after the earliest cases were reported, COVID-19 had spread to more than 170 countries. That same month, the World Health Organization, an international agency responsible for public health, declared the outbreak a **pandemic**—a disease occurring across many different countries and infecting large numbers of people.

Scientists believe that COVID-19 originated in China, but they aren't sure exactly how it formed. They do know that the **pathogen** causing it is a coronavirus—a family of viruses that cause illnesses such as the common cold. Scientists suspect that this new coro-

navirus is **zoonotic**. That means that it comes from animals. **Mutations** in its genetic material allowed it to jump over to humans.

Experts say that a particular suite of characteristics helped this coronavirus spread so quickly. First, coronaviruses are airborne, meaning they can spread on particles of saliva and mucus tiny enough to float in the air. We spread these particles when we cough or sneeze, laugh or sing. Also important is the fact that people can spread the virus before they develop any symptoms. In other words, those who are infected can feel fine and still get others sick.

COVID-19 has overwhelmed hospitals around the world. Many of them simply didn't have enough beds, equipment, or staff to care for the number of patients coming in with the disease. As of April 22, more than half a million people have died of COVID-19 in the U.S.—and

As of April 2021, there had been more than 144 million known COVID-19 cases worldwide.

more than 3 million have died worldwide. The disease has hit some populations much harder than others. Older adults, people with health conditions, and pregnant women are all at higher risk of severe disease. COVID-19 has also disproportionately impacted people of color—particularly those who are Black, Hispanic, or Native American.

Thankfully, there may finally be an end in sight. Each week, fewer people are testing positive for COVID-19. That's largely thanks to **vaccines**—and the monumental effort of governments, scientists and health care workers to deliver them to the public.



credit: David L. Ryan/The Boston Globe/Getty Images

A scientist at Moderna’s laboratory in Cambridge, Mass., works on a potential vaccine in February 2020.

GEARING UP THE IMMUNE SYSTEM

Vaccines train our bodies to fight infection by introducing harmless parts of a disease pathogen, such as proteins from a dead virus. The immune system responds by building up an army of **antibodies**. Antibodies are proteins designed to destroy that specific pathogen, or at least block it from attacking our cells.

“It’s a little bit like showing a picture of a known bank robber to security guards at the bank,” says Ryan Demmer, an **epidemiologist** at the University of Minnesota.

“It helps the security guards recognize when a threat is coming, and allows them to quickly call in more reinforcements and target their response.”

If enough people receive them, vaccines can put a total end to an outbreak—even if some people remain unvaccinated. With more people immune, the disease runs out of people to infect, essentially

reaching dead ends. Ideally, it then dies out in the community. This phenomenon is called **herd immunity**.

“We don’t just need vaccines to protect ourselves, we need to get them to protect everybody,” says Josh Snodgrass, an expert in global health at the University of Oregon.

A HISTORIC EFFORT

Normally, vaccines take 10 to 15 years to develop. During this period of time, scientists run clinical trials. They test the vaccine on larger and larger groups of people to determine whether it works, identify side effects, and study how long immunity lasts. The final stage, called phase 3, compares the effectiveness of the vaccine to a **placebo**, a harmless substance that looks like a vaccine but has no effect on the body. This stage includes tens of thousands of people and takes years.

But ending the pandemic couldn’t wait a whole decade. So on May 15, 2020, the White House announced its plan to develop a vaccine by January 2021. The mission was named **Operation Warp Speed**. The U.S. government poured billions of dollars into the effort. Scientists had access to nearly unlimited resources. They worked fast, but they didn’t cut any corners.

THE DEBATE

SHOULD REGULAR COVID-19 TESTING BE REQUIRED FOR STUDENTS TO ATTEND SCHOOL?

YES

- ✓ Weekly testing in schools could reduce infections by 50%, some models suggest.
- ✓ Kids and teens with COVID-19 often develop mild or no symptoms and may accidentally come to school sick.
- ✓ When outbreaks shut down schools, learning suffers.

NO

- ✗ COVID-19 tests can cost more than \$100 each.
- ✗ Regular testing requires a high level of effort and organization on the part of schools.
- ✗ It can take days to weeks to receive results from the most accurate tests. Rapid tests produce results in minutes, but are less accurate.

“People need to get vaccinated as quickly and as expeditiously as possible.”

**—Dr. Anthony Fauci,
Chief Medical Advisor
to the President**

They already had a solid understanding of similar coronaviruses and decades of experience perfecting the vaccine technology they planned to use. This earlier scientific research allowed scientists to shorten the vaccine development process.

Finally, scientists were able to streamline clinical trials by overlapping the different stages, so that different trials happened at the same time. “But the safety component was always front

and center,” says Jason Varin, a professor at the University of Minnesota College of Pharmacy. Scientists still conducted rigorous evaluations of safety data at each stage of the process.

By November 2020, multiple vaccines were in development, and tens of thousands of people had received them in clinical trials. But were the vaccines ready to be delivered to the public?

THE FIRST VACCINES ARRIVE

When the results of phase 3 clinical trials started rolling in, they exceeded scientists’ expectations. Scientists were hoping for a vaccine that was 70% effective. The first vaccine to arrive, produced by pharmaceutical company Pfizer and biotechnology company BioNTech, was 95% effective after two

doses. Soon after, pharmaceutical company Moderna announced that its vaccine was 94% effective after two doses.

During the clinical trials, neither vaccine showed severe side effects. Some participants reported mild symptoms, including chills, headaches and tiredness. These symptoms are uncomfortable, but they aren’t harmful. In fact, they mean that a vaccine is working. As your body gears up to fight the foreign substance, it produces many of the same symptoms as the flu—even though you’re not fighting a real infection.

Normally, a vaccine requires approval from the U.S. Food and Drug Administration before it can be distributed to the public. But a drug can’t be approved until phase 3 trials are complete. We already know that the vaccines are effective, but scientists have to continue to monitor trial participants for long-term side effects and to see how long immunity lasts—a process that could take years. So Pfizer and Moderna applied for emergency use authorization, special permission to distribute a drug before long-term trials are complete.

In December 2020, a board of scientists determined that the benefits of curbing the pandemic outweighed the potential risks of the vaccines. Shortly after, Sandra Lindsay, an ICU nurse in New York, became the first person in the U.S. to receive a COVID-19 vaccine. “It feels surreal,” she told *The New York Times* that same day. “It is a huge sense of relief for me, and hope.”



Credit: Shannon Stapleton-Pool/Getty Images

Nurse Sandra Lindsay receives her second dose of vaccine on January 4, 2021, greatly reducing her risk of contracting or spreading the virus while working.



Credit: DANIEL ROLAND/AFP/Getty Images

The transport of vaccines at ultra-low temperatures requires special equipment and an enormous amount of careful planning.

GETTING THE COUNTRY VACCINATED

Distributing vaccines to 328 million people is no small feat. First, there's vaccine production itself. For instance, it takes around 110 days to manufacture the Pfizer vaccine. (In February, Pfizer announced its plan to cut production time in half.) Then, there are the logistics of shipping the vaccines to hospitals. The Pfizer-BioNTech vaccine has to be kept at ultra-cold temperatures, no warmer than -76° Fahrenheit until it is almost ready to be used.

Confusion ensued when the vaccines were first shipped out. Hospitals and other distribution sites received little direction on how to organize this stage of the process. At one site, 42 people were mistakenly injected with the wrong treatment. At others, vaccines went to waste as they sat unrefrigerated for too long. As a result, the vaccination process got off to a

slow start. Federal officials pledged to vaccinate 20 million people by the end of 2020. They fell short of that goal by more than 17 million. Despite these challenges, the U.S. currently has outpaced most countries in its distribution of vaccines. As of April, more than 40% of the population was at least partially vaccinated.

WHO GETS VACCINATED FIRST?

Who needs the vaccine more? A frontline worker who is young and healthy, but at high risk of being exposed to COVID-19? Or a 70-year-old with heart disease who is careful not to leave the house? Because vaccine supply is limited, these were the kinds of decisions public health officials were forced to make when vaccines first became available.

Ultimately, most states opted to prioritize health care workers first. Then came people living in long-term care facilities such as nursing homes. These populations were at particular risk of contracting COVID-19. More than one-third of all COVID-19 cases occurred in long-term care facilities, and in 2020, more than 2,900 health care workers died of the disease. Next on the list in many states were teachers, older adults, grocery-store workers and people with health conditions that put them at higher risk of severe illness.

THE DEBATE

IS IT ETHICAL TO PRIORITIZE VACCINATING ESSENTIAL WORKERS?

YES

- ✓ Essential workers, such as those working in health care and transportation, are vital for our economy and to COVID-19 relief efforts.
- ✓ These groups are dying at higher rates than the general population.
- ✓ Many essential workers risked their lives to save people and keep the economy running.

NO

- ✗ Some essential workers are young, healthy, and at low risk of severe COVID-19.
- ✗ Not all essential workers are highly exposed to coronavirus.
- ✗ Prioritizing a whole group of workers tends to overlook "hot zones"—locations where COVID-19 is spreading most rapidly.



Credit: Vít Šimanek/ZUMA PRESS/Newscom



A second-grade teacher in Maryland conducts class remotely using video-chat software in May 2020. With vaccines being administered, educators and students alike are hoping schools will soon return to normal.

But what about kids and teens? The Pfizer vaccine is only authorized for people 16 years of age and older and the Moderna vaccine for people 18 years of age and older. That's because kids and younger teens weren't involved in clinical trials until recently. Luckily, the trials for children over 12 have so far been successful, and trials for children under 12 have recently begun.

THE ROAD AHEAD

COVID-19 isn't going to disappear anytime soon. At our current vaccination rate, it'll be June before 70% of the U.S. population is vaccinated—the point at which experts estimate we'll reach herd immunity. Even then, the virus could persist in communities with lower rates of vaccination.

Variants, or mutated versions of the virus, also pose a risk to vaccination efforts. Variants

started appearing in multiple countries in late 2020. While the current vaccines appear to work against most of them, it's possible they won't be as effective against future variants. Every time the virus replicates, there's a risk it'll develop another mutation that helps it evade our immune systems.

Still, there are a lot of reasons

to feel hopeful. Case counts have declined significantly since the beginning of January, and experts expect that they will continue to do so as the vaccine is rolled out. As more people get vaccinated, we'll also see fewer variants. "The less viral spread there is, the less the virus replicates, the fewer new variants we see," Demmer says.

We may be headed towards a very different summer than that of 2020—one where it's safe for us to once again gather with friends and family, attend sports games and concerts, and dine at restaurants. "I'm feeling very encouraged," Demmer said.

WHAT YOU CAN DO

All of us have a role to play in ending the pandemic. Here are some things teens can do to save lives—and help life get back to normal.

- Continue wearing a mask. Masks prevent coronavirus-containing droplets of saliva and mucus from reaching others. Even after vaccination, it's important to keep your mask on.

THE DEBATE

SHOULD GOVERNMENTS BE ABLE TO REQUIRE MASKS IN PUBLIC?

YES

- ✓ Mask wearing reduces an individual's risk of infection by 40%, according to some estimates.
- ✓ Masks are safe for everyone 2 years of age and older.
- ✓ Universal mask-wearing prevents people without symptoms from unknowingly spreading coronavirus.

NO

- ✗ Mask mandates in workplaces have generated conflict, sometimes even leading to violence.
- ✗ It's difficult to enforce mask requirements.
- ✗ Masks can make breathing feel more difficult, and many people find them uncomfortable.

TEEN TRAIL BLAZERS

Though the vaccine prevents us from getting sick, it's possible that a vaccinated person could unknowingly transmit the virus.

- Pay attention to guidance from your state health authorities and from the [Centers for Disease Control and Prevention](#). As COVID-19 cases drop in number, health authorities may announce that it's safe to gather indoors and relax social distancing. Wait for that green light—then you can go back to hugging friends.
- Be a vaccine ambassador. With false information floating around, many people are hesitant about getting the new vaccine. Teens can play an important role in spreading scientifically sound information on vaccine development and safety. The faster everyone is vaccinated, the faster the pandemic ends.
- Socialize safely with others until you all are vaccinated—or until case counts are way down. Because we don't know whether vaccinated people can transmit coronavirus, it's safest to continue gathering outdoors, six feet apart. While you wait for your vaccines (or for COVID-19 to stop spreading in your area), try picnics, hiking and trips to the beach.
- [Let your elected officials](#) know how important this issue is.
- [And as soon as you're old enough, VOTE!](#) With few exceptions, you can't vote until you're 18, but in many states you can register at 16 or 17, and you'll be all set when 18 rolls around.



Avi Schiffman

Credit: Annie Poole/The MHS Islander

Avi Schiffman

Avi Schiffman, an 18-year-old living in Washington State, was 7 years old when he started teaching himself about computers. During the COVID-19 pandemic, he put his skills to use: He designed a website that tracks COVID-19 case counts around the world.

Schiffman developed a computer code that scrapes data from the websites of various countries' health authorities. His website displays all these stats in one place, updating on a minute-by-minute basis. You can check out his work at nCoV2019.live.

Sarah Shapiro and Skye Loventhal

When the pandemic forced students to attend school from home, it placed a heavy burden on many parents, who had to juggle childcare and homeschooling on top of work. Sarah Shapiro and Skye Loventhal, 17-year-old best friends living in Los Angeles, stepped in to help. They recruited more than 100 other

teens to offer free online tutoring to kids around the world. Their organization, called the [COVID nineTEEN Project](#) has helped more than 800 students in subjects ranging from history to yoga, taught in 15 different languages.

We Stand With Her

At the beginning of the pandemic, millions of migrant workers in India lost their jobs as factories were forced to temporarily close. On the long trek back to their home villages, access to food and water was scarce—and many women were left without menstrual period products, like pads.

Six teens in Gurugram, a city in northern India, wanted to draw attention to the menstrual hygiene crisis. They started an Instagram campaign under the account name [@We_StandWithHer](#). Since then, they've raised enough money to provide hundreds of women with reusable, biodegradable sanitary pads.



Credit: Sarah "Lemon" Daks

Sarah Shapiro and Skye Loventhal



Credit: Sarah Morrisett/ CartoonStock

“She won’t even notice when it’s safe to go out again.”

GETTING BACK TO NORMAL

1. How has daily life changed for most people during the pandemic? Which changes have been for the better, and which ones have been for the worse?
2. After more than a year of living under pandemic conditions, what will be the hardest adjustments people need to make as the world goes back to normal?
3. Which ways do you think life will remain permanently changed even after the pandemic is over? What lasting effects could these changes have in your community?

NOW IT’S YOUR TURN TO MAKE GREAT DECISIONS

1. How has the pandemic affected people of color and people in certain countries more than others? Why have these people faced greater struggles?
2. What, if anything, could have helped prevent the pandemic from getting so bad? Who is to blame, and why?
3. **YOUR STORY:** Did you or anyone you know get sick from COVID-19? What was the experience like?

KEY WORDS & TERMS

antibodies
epidemiologist
herd immunity
mutations

Operation Warp Speed
pandemic
pathogen
placebo

vaccines
variants
zoonotic



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Executive Editor: Eliza Edel McClelland

Managing Editor: Josh Gregory

Writer: Isobel Whitcomb

Design: Kathleen Petelinsek, The Design Lab

Photo Editor: Cynthia Carris Alonso

Fact Checker: Tonya Ryals

Copy Editor: Melissa McDaniel

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