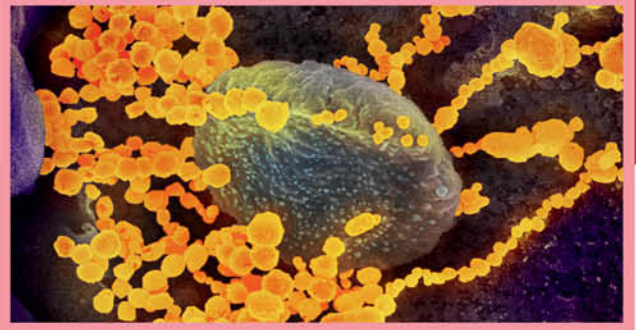


Wars Waged Under the Microscope



# The War Against **COVID-19**



Cynthia O'Brien

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# The Enemy

In late 2019, a deadly disease emerged in China. By March 2020, the world was in the grips of a **pandemic**. The disease is called **COVID-19** and it is caused by a **virus** that scientists had never seen before. The virus that causes COVID-19 is a **novel**, or new, type of coronavirus.

## What Is a Coronavirus?

Coronaviruses are a large family of viruses that can affect birds and **mammals**, including humans. Many coronaviruses cause mild illnesses, such as some common colds. Coronaviruses generally target the upper **respiratory system**, including the nose and throat. However, the new coronavirus, SARS-CoV-2, which causes COVID-19, can also attack the lungs. It can then go on to affect other **organs**.



*The coronavirus that causes COVID-19 may have transferred to humans from pangolins. Pangolins are anteater-like mammals that are sold illegally for food and medicine in markets in China.*





Coronaviruses  
spread quickly  
in large crowds  
where people are  
close together.

## A Deadly Spread

**Virologist** Shi Zhengli and her team were the first to identify SARS-CoV-2. They tested fluid **samples** taken from patients in Wuhan, China, who had a mysterious case of **pneumonia**. They discovered that a new coronavirus caused the illness. It was very similar to one Shi had earlier found in bats. Shi believed that the virus had passed from a bat to another animal then to a human. No one is sure what animal the bat infected before the virus passed to people.

The new coronavirus spread quickly, infecting thousands of people in China, then around the world within months. Governments and scientists urgently looked for ways to prevent it, and they began developing treatments and **vaccines**. On March 11, 2020, the **World Health Organization (WHO)** declared a pandemic. By that time, there were 118,000 cases in 114 countries. By December 2020, there were more than 73 million cases and more than 1.6 million deaths worldwide.

*"We have a choice. Can we come together to face a common and dangerous enemy?"*

**Tedros Adhanom Ghebreyesus, Director-General, WHO**

# The Battle Begins

The first cases of COVID-19 emerged in Wuhan, China. By December 1, several people had become very sick with pneumonia, but doctors did not know what triggered the infection in the first place. Then they discovered they were dealing with something new. This was the beginning of the war against COVID-19.



## Looking at History

There are hundreds of different coronaviruses that scientists know about. However, only seven of these, including SARS-CoV-2, infect humans. Scientists looked back at other coronavirus **outbreaks** for clues about the new virus. They knew that coronaviruses usually started in animals, and that the coronaviruses that infect people usually infect animals first.

*Different types of bats carry about 60 viruses that can infect humans. Bats live close together, making it easy for the virus to spread.*





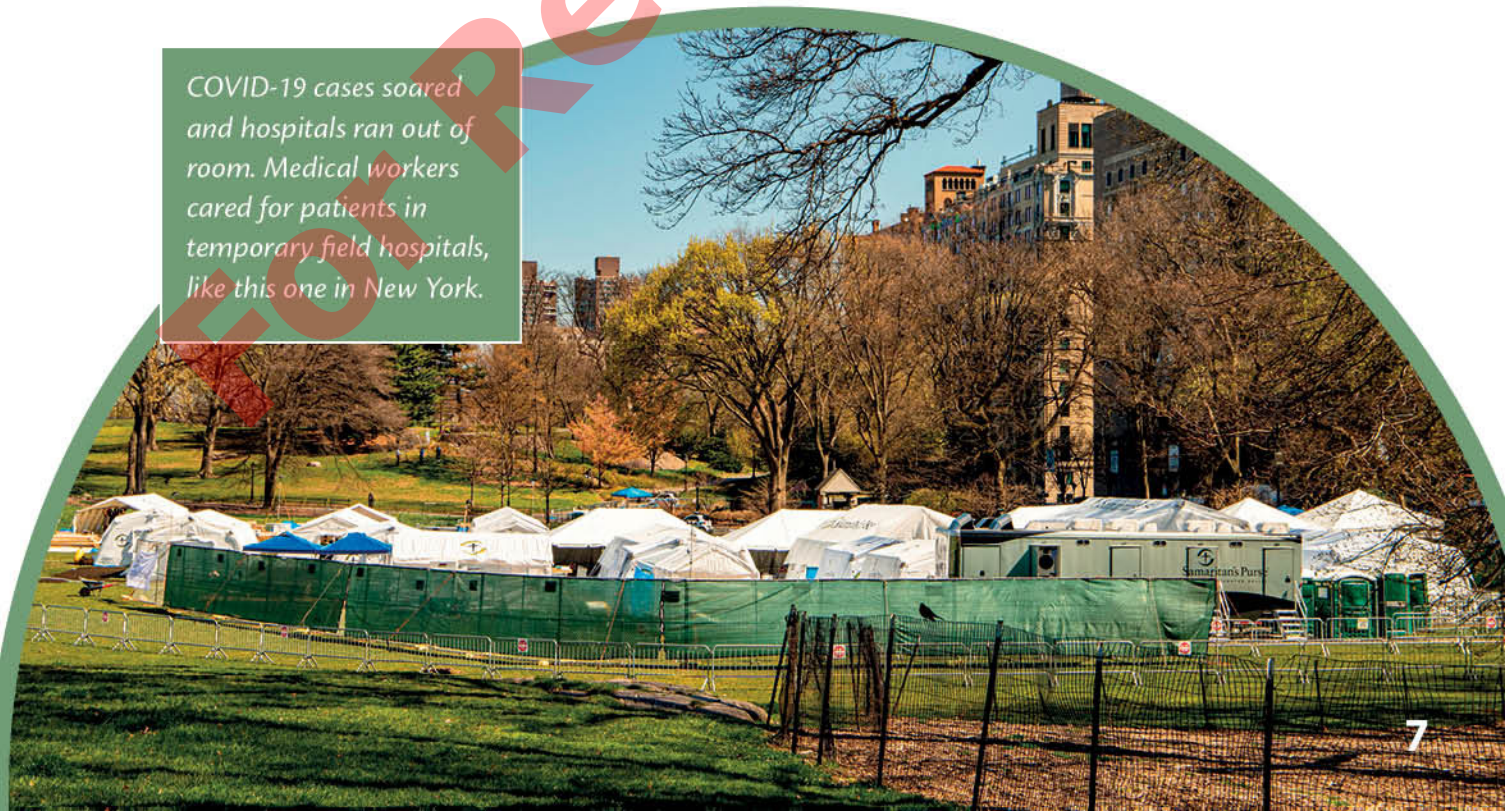
## Other Coronaviruses

In 2003, a coronavirus caused the Severe Acute Respiratory Syndrome (SARS). It spread from China to other countries. People became sick with a high **fever** and other symptoms, or signs of illness. The virus likely started in bats and transferred to another animal before infecting humans. In 2012, another coronavirus caused the Middle East Respiratory Syndrome (MERS). The first cases of MERS were in Saudi Arabia, but the virus spread to more than 25 other countries. People caught the virus from camels and the camels likely got it from bats. MERS causes fever and coughing, and often turns into pneumonia.

## Early Battles

Scientists first thought that, like other coronaviruses, SARS-CoV-2 mainly attacked the respiratory system. They saw that the virus was very contagious, or spread easily from person to person. It was able to infect the throat or lungs quickly. If the virus latched onto lung **cells**, it could do a lot of damage. Some people's **immune systems** could stop this, but in other cases, patients do not recover.

COVID-19 cases soared and hospitals ran out of room. Medical workers cared for patients in temporary field hospitals, like this one in New York.



# An Invisible Threat

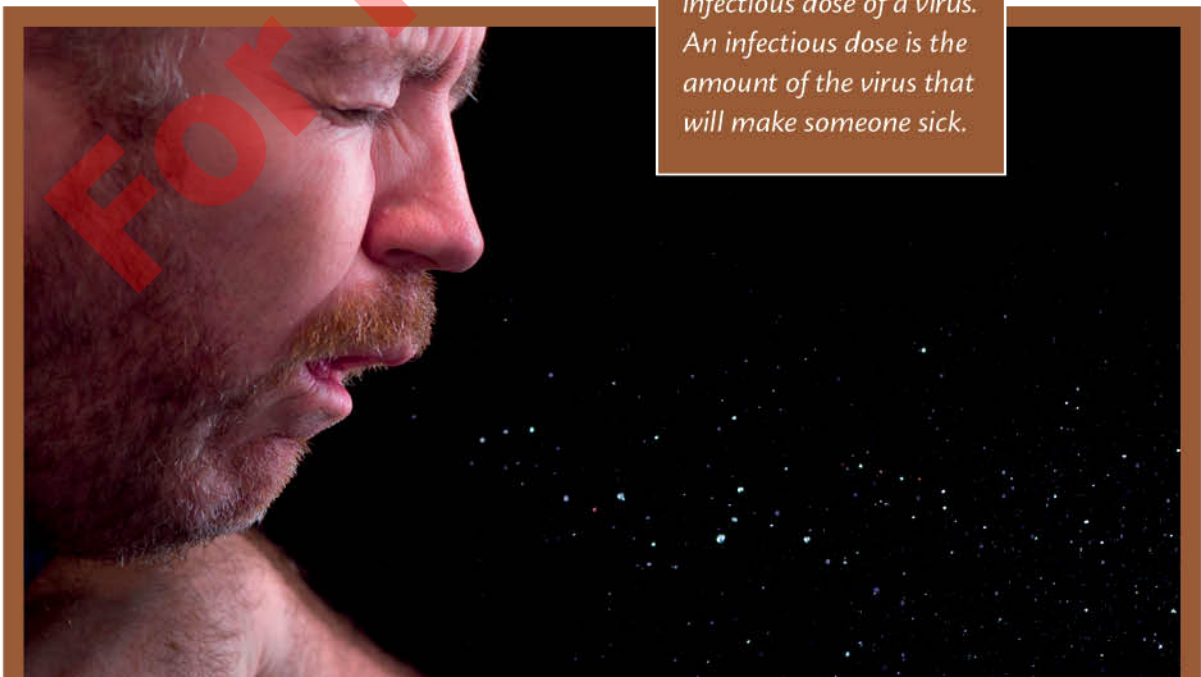
Coronavirus is a **microorganism**, also called a **microbe**. Microbes exist in plants, water, soil, and the human body. They cannot be seen without a microscope, yet they are all around. A **microscope** is a device that magnifies things, or makes them bigger.

## Pathogens on the Attack

Types of **bacteria**, viruses, **fungi**, and **protozoa** are all pathogens. Pathogens are microbes that can cause many different diseases. For example, **bacteria** can cause throat infections. Fungi can trigger skin infections, while a protozoan, carried by some mosquitoes, is responsible for malaria.

Viruses are the tiniest microbes. There are many kinds of viruses, most of them causing diseases, from chickenpox and colds to influenza and COVID-19. Viruses cannot exist or spread on their own. They need to invade cells in living things to thrive. Then they use the cells to replicate, or make copies of, themselves. These copies spread to other cells. As the virus attacks, it kills, damages, or changes the cells, causing people to become sick.

*A sneeze can release an infectious dose of a virus. An infectious dose is the amount of the virus that will make someone sick.*





*Soap and water make most viruses fall apart and become inactive. This is why it is important for people to wash their hands often.*

## How People Catch Viruses

Viruses enter the human body in a variety of ways. They can spread from person to person through tiny droplets in the air or through contaminated, or impure, water or food. Some viruses live on surfaces for a period of time. The coronavirus that causes COVID-19 usually transfers through droplets in the air. Droplets may come from an infected person coughing, talking, or sneezing, and others may breathe in the droplets. The virus may land on surfaces and stay active for a time. People may pick up the virus and transfer it to their noses or mouths when they touch their faces.

## UNDER THE MICROSCOPE

Viruses are so tiny that scientists could not identify them until they had powerful microscopes. In the 1890s, scientists identified the tobacco mosaic virus that infected the tobacco plant. Later research began detecting viruses that infected humans. Today, virologists know about more than 200 of these viruses, but they discover new viruses all the time.