HOW ARE YOU DOING TODAY?

Science

SCIENTISTS LEARN NEW THINGS EVERY DAY ABOUT

THE CORONAVIRUS

BY APOORVA MANDAVILLI · ILLUSTRATION BY PETER PHOBIA

AT THE BEGINNING of the pandemic, the coronavirus was mysterious. It wasn't clear how it was spreading or making people sick. Since then, scientists all over the world have been working at breakneck speed to study it, and they have figured out a lot. (For example, we know now that the virus was spreading in America in January, a lot earlier than we first thought.) Science is all about gathering new evidence to make conclusions. Here are four big lessons we've learned over time.

1. PEOPLE WHO DON'T SEEM SICK CAN STILL SPREAD THE VIRUS.
"That was the biggest surprise," says Carl Bergstrom, an infectious-disease expert at the University of Washington in Seattle. Related coronaviruses mostly spread from people who are visibly sick, so scientists were expecting the new virus to behave the same way. But in January, doctors in China noticed that people could pass the virus to others without ever feeling sick themselves. It took until March to realize that this was a defining trait of Covid-19. This aspect has been a big problem, because if people don't feel ill, they may not stay home and away from others. Most kids, especially, never even get the sniffles, but may still spread the virus to other people. That's why it's so important to wear masks when you're around people you don't live with — even if you or they seem healthy.

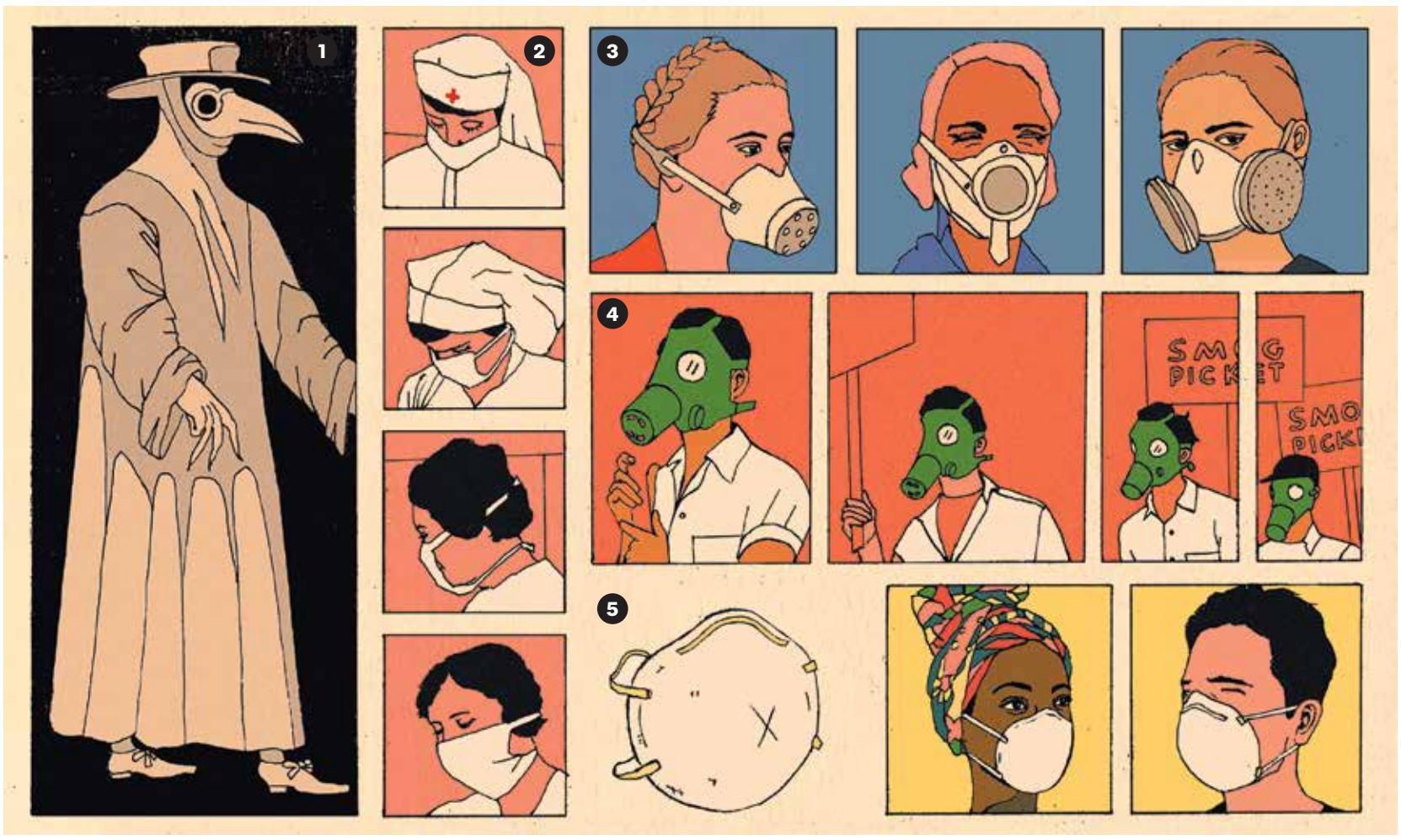
2. SOME PEOPLE GET MUCH SICKER THAN OTHERS.
Scientists have found that people who are older or overweight or have a disease like diabetes are more likely to become severely ill with Covid-19. Black, Hispanic and Indigenous people are also much more likely to end up in the hospital — not because of the color of their skin but because they are more likely to have jobs that force them to leave home, increasing their risk of exposure, and because they may not have the time, money and access to get medical care. Although these groups are most at risk, young and healthy people of all ages and races also sometimes unexpectedly get very sick — and we don't yet fully understand why that is.

3. IT'S SAFEST TO BE OUTDOORS.
Early in the pandemic, scientists were most worried about people becoming sick by touching something with the virus on it (that was why everyone was talking about hand-washing: still important! But not the whole story). Experts now think that most people get sick from breathing in air from someone nearby. Infected people release the virus in tiny droplets when they breathe, talk, shout or sing — not just when they sneeze or cough. Indoors — especially in small, stuffy rooms with no open windows — these droplets can linger. Outdoors, they disappear quickly, so it seems safe, Bergstrom says. If you are inside a room not in your home, it's best to wear a mask and stay far from other people.

4. IT'S WORSE THAN THE FLU.
People at first didn't know how seriously to take this new virus, and many wondered if the regular flu that comes around every year was more dangerous. We now know the coronavirus is more deadly than the flu, and unlike the flu, it may damage the body for a long time. "It's not just a disease of the lungs; it affects the whole body — the kidney, heart, brain," says Syra Madad, who studies highly infectious diseases at New York City Health & Hospitals. Some people have mild symptoms at first or seem to recover, but then get much sicker and stay ill for a long time. Doctors don't know why that happens. As Madad says, "There are still a lot of unknowns." ◆

MASKS THROUGH HISTORY

BY CHELSEA LEU · ILLUSTRATION BY TOMA VAGNER



FACE MASKS ARE a must-have accessory: They're currently among the best ways to stop the coronavirus from spreading, especially if everyone wears one. Seeing so many masked people might seem strange, but this is far from the first time that face coverings have become widespread. Here are five masks that were common sights during historical health emergencies, ending with the present-day N95 respirator.

1. BUBONIC PLAGUE MASK (1600s)
In 1619, the French physician Charles de Lorme is believed to have created this terrifying-looking mask for doctors. At the time, there was an outbreak in Paris of the deadly bubonic plague, a disease that had, well, plagued Europe for centuries. The beaked mask was part of a full-body suit that doctors could wear when treating sick patients to avoid catching the sickness themselves. The beak was stuffed with fragrant herbs like mint, because experts at the time thought that disease was transmitted by bad-smelling air. (It's not!)

2. GAUZE MASK (1918-1919)
The current Covid-19 crisis is often compared to the 1918 flu pandemic, which over the course of a year and a half killed at least 50 million people worldwide. To control the spread of that virus, health and government officials in the United States urged barbers, secretaries, street sweepers and anyone else who interacted with others (kids too!) to wear masks. These masks were most often sewn from cotton gauze folded into layers, and in certain cities, including San Francisco and Seattle, you could be arrested if you went out in public without one.

3. DUST RESPIRATOR (1930-1940)
Huge dust storms swept through the plains of Colorado, Texas, Oklahoma, New Mexico and Kansas during the 1930s, caused by a yearslong drought and a lack of plants to hold down the soil. These "black blizzards," as many newspapers called them, were so dense that streetlights were often left on during the day and citizens resorted to wearing goggles and respirators (which fit tightly over the nose and mouth). The masks were often made of rubber and used cotton as a filter to keep out dust. Breathing in too much grit could cause what doctors then called "dust pneumonia": severe irritation in the lungs that made it difficult to breathe and could kill people, particularly young children.

4. SMOG MASK (1940s-1970s)
Starting in the 1940s, Los Angeles was often blanketed with particularly thick smog, a brownish haze that smelled like bleach and made pedestrians' eyes water. (Smog forms when pollutants including gases emitted from cars react with sunlight to create ozone, which, if inhaled, can make breathing painful and triggers asthma attacks.) On some sunny days the air became so bad that residents wore gas masks left over from World War II, which had canisters that contained activated charcoal to filter out the harmful gases. Only after pollution laws in the 1970s required antismog devices on cars did the heavy smog finally lift.

5. N95 RESPIRATOR (1972-PRESENT)
The star of the coronavirus pandemic has been the N95 respirator, which hospital workers have been wearing to keep from catching the virus from the patients they care for. It takes its name from its ability to filter out 95 percent of the particles in the air. The flat filter inside is made of a tangle of microscopic fibers that trap those particles: dust, germy droplets containing the coronavirus and more. The N95's shape and stretchy straps make it fit snugly, so air doesn't leak in from the sides. ◆

HOW I BECAME A

FOSSIL PREPARATOR

BY MYRIA PEREZ

FOR AS LONG as I can remember, I was interested in dinosaurs — my mom claims it goes as far back as when I was 2. She would bring me to the Houston Museum of Natural Science, and I had to see the paleontology exhibit at the beginning *and* the end of the visit. When I was 12, the museum had a competition to see who could draw the best dinosaur. I brought a binder full of drawings, and I won. I got to have breakfast with a paleontologist and meet with a curator. They told me that I could become a volunteer, which I did throughout middle and high school. I learned how to prepare fossils by carefully cleaning them; gave presentations to tour groups; and even got to go on excavations, where I was taught how to get fossils out of rock without damaging them and to create jackets around them — basically a plaster case surrounding the fossil.

For college, I looked for a school that would let me double major in geology (the study of the earth) and anthropology (the study of humans). I found the paleontologist Louis Jacobs at Southern Methodist University, and he said I could start working in the fossil lab as a freshman. When I got there, I spent hours preparing fossils, mostly marine reptiles like mosasaurs, plesiosaurs and ichthyosaurs. I also worked on an exhibit for the Smithsonian National Museum of Natural History. With my team, I created ways to display fossils, figured out what scenes would appear in the exhibit and helped decide how we would present information to visitors.

After college, when the Perot Museum of Nature and Science in Dallas posted a preparator job, I applied immediately. Now I prepare fossils every day, using tools like dental picks, porcupine quills and scribes — a tool that uses air pressure to knock away rock. The primary dinosaur I work on is Pachyrhinosaurus perotorum, which is from the Cretaceous period — around 70 million years old. Sometimes, I also go on digs in the area. Last year, we were called to help excavate a fossil turtle.

At the museum, my lab is made of glass, and I get to see all these young girls visiting in blinged-out dinosaur clothes that didn't exist when I was a kid. I love it. I see myself staying in the museum world forever. *Interview by Elise Craig*

TINY STORY

70

The age a white shark can live to. Their range is vast: In the Pacific Ocean, a single shark can travel from Mexico to Alaska. In the Atlantic, they'll travel from Newfoundland to the Gulf of Mexico.

Perez: Illustration by Adriana Bellet; source photograph: IF/THEN. Mask source photos: 1: British Museum; 2, 3, 4: Getty Images.