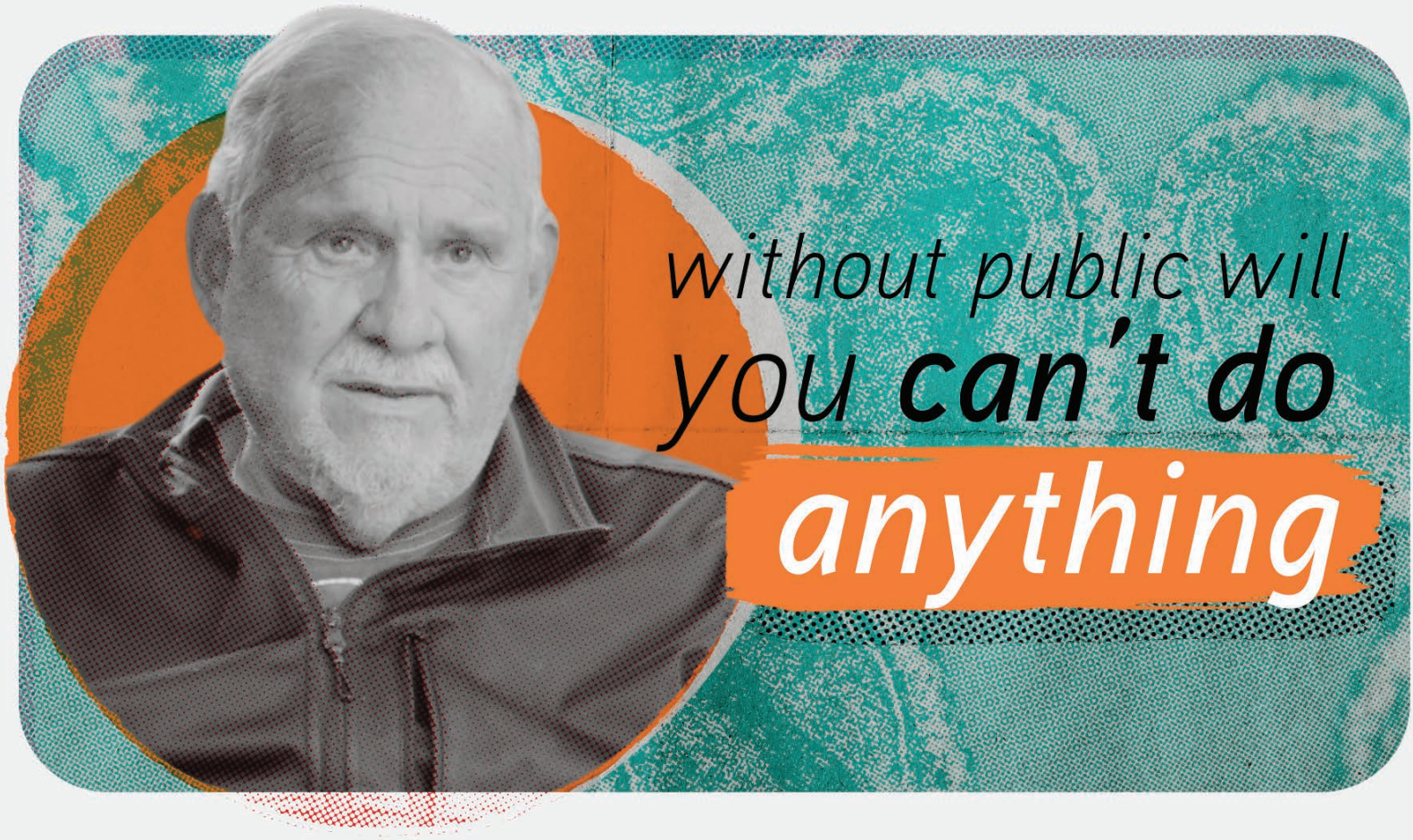


# Eradicating Smallpox

As we battle this pandemic and seek to prevent the next, we might look to history for lessons. The worst disease that has ever afflicted humanity is also the only one we've ever eradicated. Dr. Larry Brilliant lived this history as part of the global campaign to end smallpox. In this video, he reflects on the long history of humanity's battle against smallpox and how the world finally found the public will to defeat its old foe at the end of the twentieth century.

**0:12**

*World map; background music; smallpox graphics*

An invisible enemy stalked our species for thousands of years. It killed 3 out of 10 people it touched. Those who survived were left scarred for life. The killer's name? Smallpox.

*Text box: smallpox*

Among the many diseases that have plagued human history, few are so deadly or so enduring as the smallpox virus. It brought mighty empires to their knees, killing king and commoner alike..

*Smallpox death chart*

In the 20th century alone, smallpox killed more people than World War I, more than the Spanish Flu, and more than World War II combined.

*WHO magazine*

All this long, terrible history, and you probably never think about smallpox, do you? Why not? Because it's gone—eradicated

**1:01**

*World map showing COVID-19 hotspots; photo of healthcare workers in protective gear; photos from the COVID-19 pandemic*

Humanity declared victory against its old enemy on May 8th, 1980. Today in the year 2022, we look back on over two years of the COVID-19 pandemic. Many questions about our future remain unanswered: when will the pandemic end? Can we eradicate COVID-19 virus altogether, like we did with smallpox?

*More photos from the pandemic; text box: Niranjan Bose*

As we confront this uncertain future, we might look to history for guidance. History won't help us predict the future, but as the only human infectious disease we've ever eradicated, the long history of smallpox holds important lessons for today and for tomorrow as we seek to prevent the next pandemic.

*Photo of Dr. Larry Brilliant*

To understand this history, I turned to someone who lived it, Dr Larry Brilliant, an epidemiologist.

**1:57**

*Text box: The Big History of Smallpox; transition music*

In the 1970s, Dr Larry joined the WHO in India as part of a global effort to eradicate smallpox.

*Text box: Larry Brilliant; continued background music; black and white photos of smallpox sores*

Smallpox is the worst, the most lethal disease in history. It has that combination of how rapidly it spreads and how many people it kills to make it the worst disease in history. One case of smallpox would lead to four or five or six other cases. It's very transmissible.

**2:52**

*More photos showing the effects of smallpox*

But when it got into your body, it attacked all of the mucous surfaces: the inside of your nose, the inside of your mouth, the inside of your throat, your intestinal system, all throughout your body. And every place on your skin, you would get pustules and boils. And in some of the worst cases that I saw, there wasn't a single piece of skin that was normal, you could put your finger it was covered with boils.

But unlike COVID or flu, instead of killing one person out of a thousand, out of a hundred, one out of every three people who got smallpox died, and they were usually little children. 90- 95 percent of the time, it was spread by respiration like the flu or like COVID.

*Drawings of smallpox*

Human societies in every part of the world have suffered from smallpox outbreaks for centuries. It traveled with us, spreading between societies. But as the disease spread, so too did methods of fighting it: first in China and India, and then spreading through the Islamic world to Europe and West Africa.

**3:43**

*More smallpox drawings; text box: Variolation*

Physicians experimented with Variolation: a method of giving people a tiny bit of smallpox virus from another person's pistols in the hope of provoking a milder infection and lifelong immunity.

*Graphic showing the success rate of Variolation*

It wasn't a safe procedure by today's standards. One out of every 10 who got Variolated would die. But it's far better if you think about the mathematics of survival to risk one out of ten dying than the inevitable three or four out of ten dying.

*Text box: Vaccination; transition music*

To this day, we don't have a treatment for smallpox, which is why in the end we had to prevent it and eradicate it.

**4:31**

*Text box: Edward Jenner; Portraits of Jenner; paintings of how Jenner discovered vaccination*

In 1796, a country doctor in Berkeley, England, named Edward Jenner, sparked a major innovation in the fight against smallpox: the first vaccine. And this country doctor couldn't understand why one community didn't have pox, didn't have scars, and he noticed a milkmaid named Sarah Nelms, who was milking a cow named Blossom—that was the name of the cow— and a Blossom had an infection on her udders that were like pox marks, and when Sarah Nelms was milking Blossom the disease spread from the cow to her fingers. And somehow, Edward Jenner thought, "That must be it, if you have a pox on your finger, you won't get punks on your face."

**5:24**

And it has to be considered a great leap of imagination—a great belief that there could be special transmission of immunity.

*Paintings of Jenner inoculating child*

Using material from a cow pox sore, on milkmaid Sarah Nelson's hand, he inoculated the eight-year-old James Phipps, later exposing him to smallpox as an experiment.

*Illustration of vaccine theory; text bubble: Eradication; transition music*

Thankfully for young James, and for us, the vaccine worked. And that was the moment that the idea that you could prevent a disease—now remember, this is before Germ Theory, nobody knew about viruses, bacterias, we didn't have microscopes then—and with that breakthrough, came the idea that by getting the cowpox, you could prevent the more deadly smallpox. That was the first vaccination.

**6:26**

*Illustrations and photos of the vaccination process*

Armed with the new tool of vaccines, wealthy nations launched programs to vaccinate their citizens against smallpox, often facing anti-vaccination protests. By the end of the Second World War, most of the world's wealthiest nations had eradicated smallpox within their borders. But smallpox was far from defeated.

Let's vaccinate everybody—we call that mass vaccination and some countries were able to push smallpox out of the country by vaccinating everybody.

*Video of vaccination campaign in Burma and China; more photos of the vaccination campaign around the world*

Countries like Burma and China, which had more strict governments, could accomplish that. Countries like the United States, which were wealthy, could accomplish that by having routine vaccination mandatory of all kids before they went to school and all travelers. But for most of the world it didn't work. We had that smallpox vaccine for 200 years and we weren't able to eradicate smallpox.

**7:22**

*Text box: the United Nations; photo of a UN meeting; the WHO logo; clips of WHO's vaccination program*

After the Second World War, humanity had a new tool in its fight against smallpox: the United Nations, more specifically, the World Health Organization, enabled international cooperation of a scale and efficiency never seen before.

*Photos of WHO vaccinating people*

In 1967, the organization launched the Intensified Smallpox Eradication Program led by scientists and doctors like William Feige and D.A. Henderson. The organization set out on an ambitious mission: to rid the world of smallpox.

*Clips of people being vaccinated*

In 1972, Dr Larry Brilliant joined their ranks

**8:06**

*Text box: Bill Feige; photos of Bill Feige; graphic of Feige's vaccination method*

So Bill Feige—who was this wonderful epidemiologist working in Nigeria during the Civil War in Nigeria in the 60s, the Igbo Civil War—Bill was a missionary doctor and he was working in a little village, and he had only a little bit of smallpox vaccine. And there was a big outbreak, and Bill, who was a very moral person, asked himself, "What do I do with this little bit of vaccine? Who do I save? Who do I protect?" And, you know, usually that may have been in a different scenario: the richest person, or only women, or only children or something like that.

Bill said, "I guess the most important person that I need to vaccinate is the one who's going to give the disease to five other people."

**8:57**

And so he located those people who were surrounding, living near somebody who had smallpox,and the people that he vaccinated. And suddenly, the entire epidemic stopped.

*Photos and illustrations of vaccinations*

So Bill came up with the idea of surveillance and containment. People later on called it ring vaccination. That strategy was what broke through the centuries of difficulties that populist countries like India had, who couldn't do mass vaccination.

Now, we go far away from the realm of science, we have to understand that the most important thing to eradicate a disease is public will. With public will you can do anything, without public will you can't do anything.

**9:47**

*Photos of vaccination rallies; text box: Viktor M Zhdanov; photo of Zhdanov*

At the time that the smallpox eradication campaign began in the 70s, there was public will to eradicate smallpox. It was a Russian professor who came to the World Health Organization and said, "We must eradicate smallpox."

*Text box: D.A Henderson; Photos of Henderson; WHO meetings; photos of worldwide vaccination*

The whole world assembly voted to have a campaign. They hired an American, D.A Henderson, to run it. People came from 50 different countries to work together. We had every language spoken. Our meetings—you would see people with every color of skin. You had people who were Islamic, Jewish, Protestant, Catholic, Shintu, Hindu, Buddhist—every religion you could think of speaking dozens of languages. But the horror, the agony of this disease, and the fear that it would spread, made us forget about our differences and look at what we cherished together, and what we cherished was a world free of this damn disease.

**10:48**

*Photos of the international vaccine campaign; text box: Ali Maow Maalin; photo of Maalin; photo of WHO declaring an end to smallpox*

It evoked such a hatred for the disease. We thought of it as the demon, we thought of it as our enemy, and we considered that we were at war with smallpox. Incredibly, despite civil wars and a global Cold War, the campaign succeeded. In October 1977, Ali Maow Maalin, a Somalian hospital cook, was the last person to be naturally infected with smallpox. He survived and later became a vaccination campaigner himself, promoting the polio vaccine.

*Photo of WHO declaring an end to smallpox; text box: Lessons Learned; transition music*

On May 8, 1980, the WHO officially declared smallpox eradicated.

**11:33**

*Map of polio rates around the world*

I hope that polio joins smallpox as the second disease to be eradicated because those of us who worked in the smallpox program—we call ourselves smallpox warriors—we're very lonely. We don't want to be in a world where only one disease has been eradicated. And the next one is going to be polio—in fact, I think this year there have only been about 15 cases of polio in the whole world. There are only three or two, or maybe even one countries, that has not eradicated polio.

*Eradication program cartoon; photos of Malaria patients*

So polio will be eradicated in our lifetimes, and that's magic and wonderful. After that, it gets harder. People talk about a measles eradication program, they talk about a malaria eradication program, we've tried to eradicate three other diseases. Yaws is one of them. I'm hopeful that we can do it. I don't think we have that feeling for COVID.

**12:32**

*Photos of the COVID-19 pandemic*

It's unfortunate, because in its own way, COVID is a horrible disease. And how many more will there be like that? We haven't done very well in trying to stop COVID, a lot of great science and creating vaccines, anti-virals, treatments. But the guts of it, the program, the communications, people working together as friends and not bringing politics in it. We haven't done a very good job. So, we've missed the public will part.

So, we have smallpox, we will soon have polio, they should inspire us, they should make you want to go into public health, they should make you get excited about global health. But it isn't clear that the best science in the world is enough.

**13:20**

And so, a lot of times you hear public health people saying, "I don't want to get politics into it." Yes, we do. We have to bring politics into it, and said another way, we have to bring public health into politics. And that's my hope. That's my hope: for one of the great lessons of smallpox eradication.

*Text box: quote by Larry Brilliant*

The long history of humanity's struggle against smallpox and the story of its eradication is evidence that we have the knowledge, resources, and ability to eradicate diseases and prevent future pandemics before they start. Dr Larry has said before that "Outbreaks are inevitable but pandemics are optional."

Humanity can eradicate diseases. We can prevent future pandemics. We need only to find the willpower to work together across borders and differences and use the tools we already have.