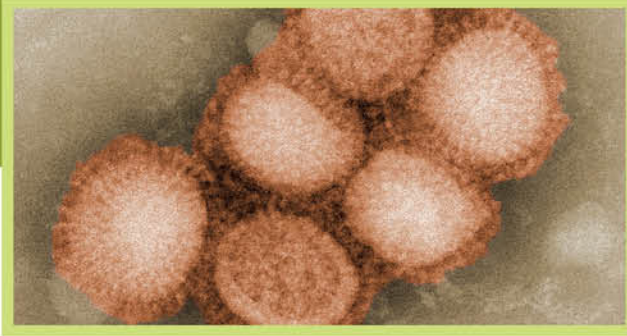
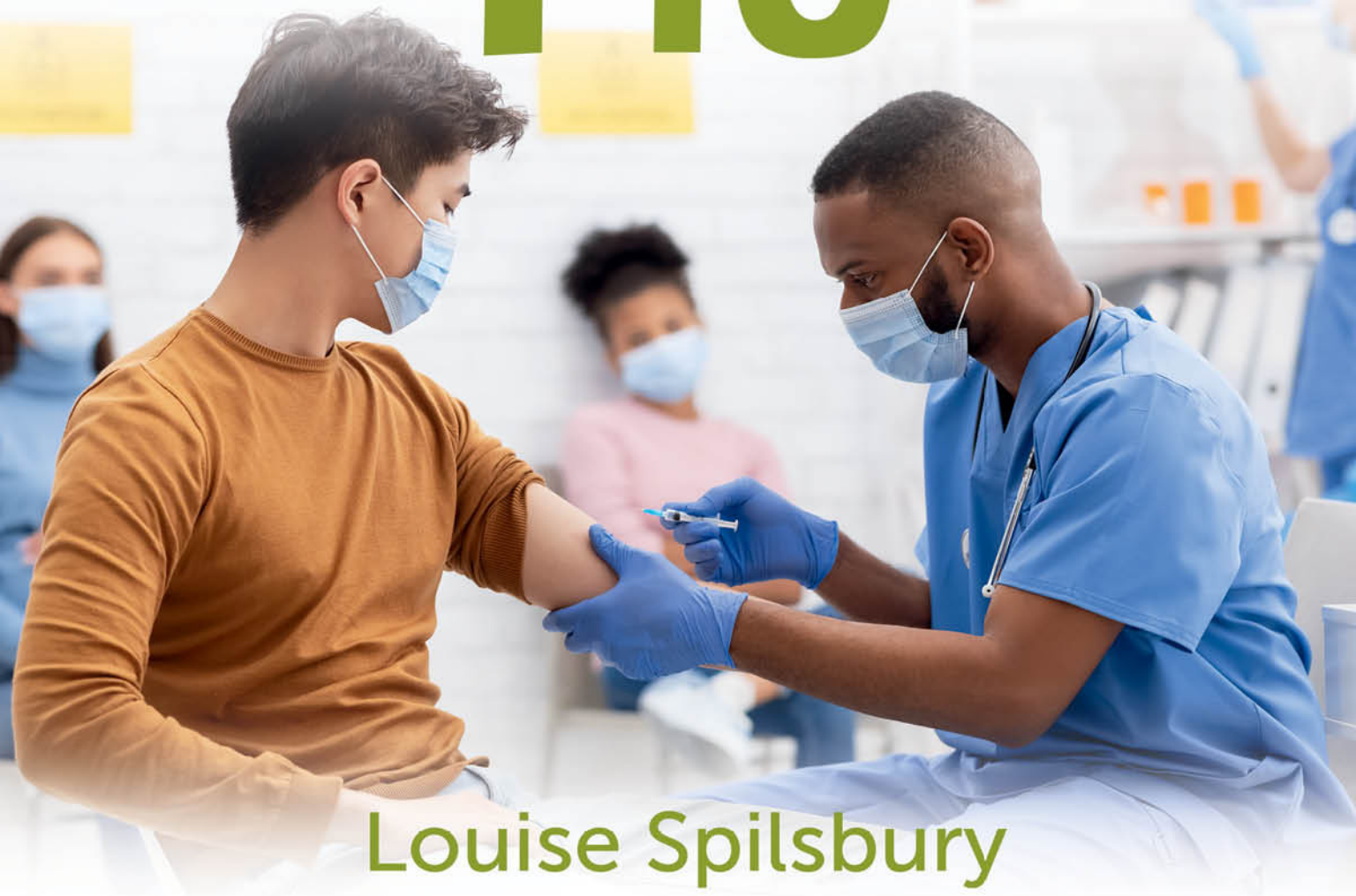


Wars Waged Under the Microscope



The War Against the **Flu**



Louise Spilsbury

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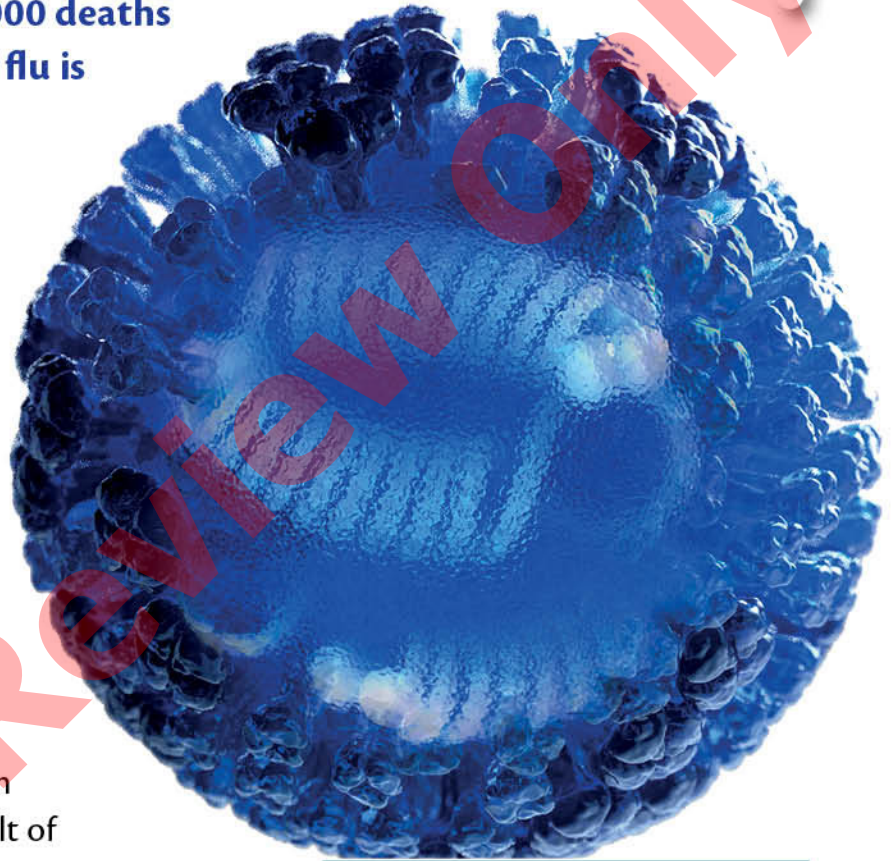
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The Enemy

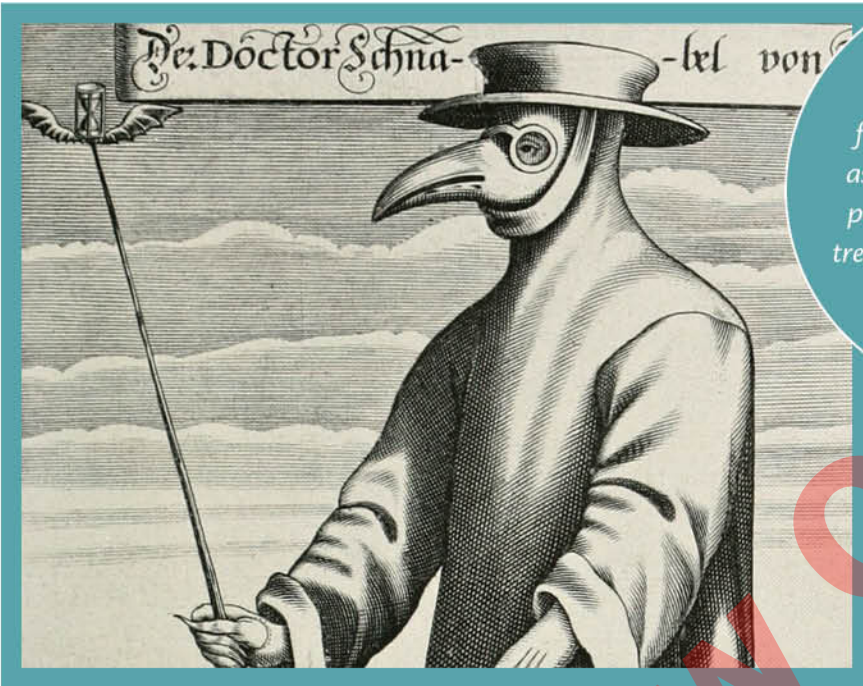
According to the **World Health Organization (WHO)**, each year, influenza, or the flu, makes as many as 5 million people severely sick and causes up to 650,000 deaths around the world. The flu is caused by **viruses** that attack a person's nose, throat, and lungs. People who have the flu may cough and sneeze a lot, and have muscle aches and pains.

Flu as the Enemy

The flu is often only a mild disease. However, it is very contagious, which means it spreads easily from person to person. As a result of this, it can cause epidemics. An epidemic is when thousands of people in a community or country catch a disease at the same time. Pandemics are epidemics that spread through many different countries. For example, the 1918 pandemic (sometimes called the Spanish flu) infected about 500 million people. It killed at least 50 million people worldwide.



*This is what a single influenza virus may look like under a **microscope**. Tiny though it is, the virus can turn the body into a factory that spreads the disease once it gets inside.*



In the 1400s, doctors were so fearful of diseases such as the flu that they wore protective clothing while treating patients, including a beak-like mask, shown left.

The Story of the Flu

In the past, doctors came up with many different explanations for how the flu came about. In the 1300s, people in Florence, Italy, explained an **outbreak** of the flu as *influenza di freddo*, which translates to “influenced by the cold.” Then in 1414, when an epidemic in France affected 100,000 people in the capital city, Paris, doctors there believed a smelly and cold wind caused people’s flu **symptoms**. By the 1700s, the word “influenza” was commonly used to describe the disease. However, at the time, people believed cold air caused the illness.

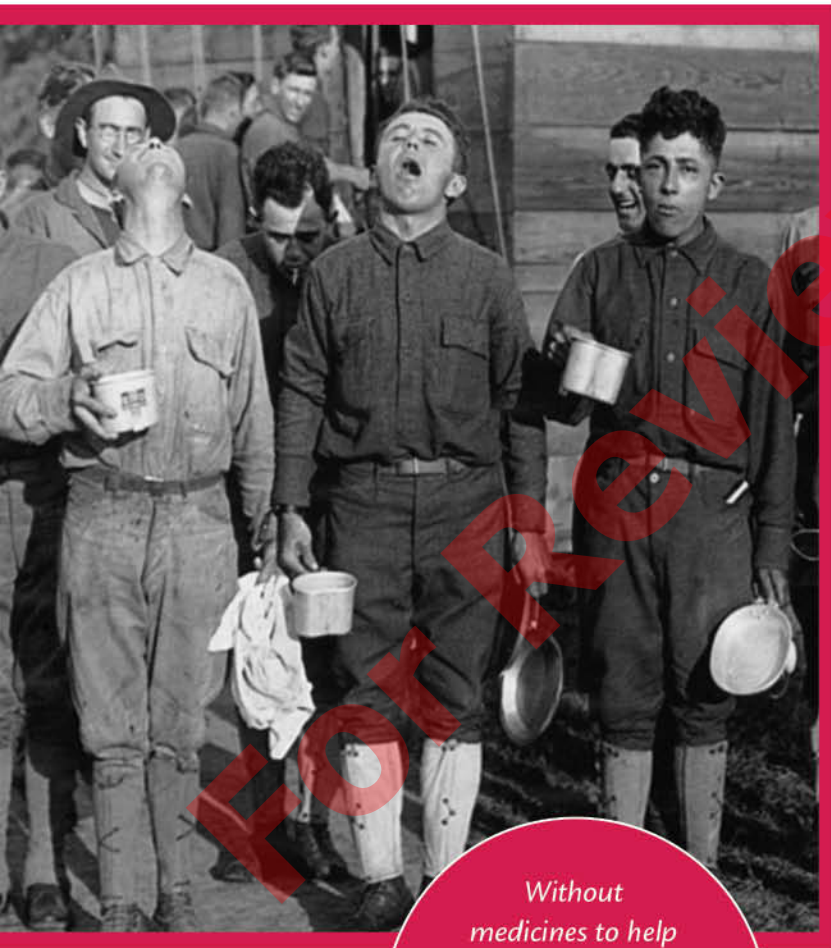
There was a little girl, and she had a little bird,
And she called it by the pretty name of Enza;
But one day it flew away but it didn’t go to stay,
For when she raised the window, in-flu-Enza.

Childhood chant from 1918



The Battle Begins

People did not begin to fully understand what caused influenza until the early 1900s, when a deadly strain spread across the world. The 1918 pandemic caused so many people to die that medical science began a dedicated effort to learn more about this enemy.



Without medicines to help them, U.S. soldiers tried gargling with salt and water to prevent influenza during the 1918 pandemic.

Searching for the Virus

In 1918, most scientists believed that influenza was caused by bacteria. Bacteria are single-celled **organisms** that can cause disease. However, the scientists and doctors had not been able to find identical bacteria in **samples** taken from a range of flu patients. So, they started to search instead for something they called a virus.

In the early 1930s, Richard Shope, a doctor from Iowa, isolated, or separated, the flu virus from swine, or pigs, infected with a highly contagious flu-like disease.

The disease symptoms were so similar to human influenza that it was named swine influenza.

What Caused Swine Flu?

To figure out what was causing swine flu, Richard Shope took bacteria from the spit of a sick pig and injected them into a healthy pig. When the second pig did not become sick, he knew the flu was not an infection caused by bacteria. He then took the bacteria out of the pig spit and injected the remaining substance into the healthy pig. The pig became sick, proving that something other than bacteria caused the disease.

Identifying the Enemy

Shope's finding was quickly followed by the isolation of the influenza virus from humans by a team of **virologists** at the National Institute for Medical Research in the United Kingdom (UK). In 1933, Wilson Smith, Christopher Andrewes, and Patrick Laidlaw transferred human **antigens**, which were not bacteria, to ferrets. The ferrets became infected with the flu. This helped the team identify the antigen as a virus. A virus was described as an antigen that was too small to be seen. It could be filtered, and still produced disease, even though it could not reproduce on its own.

Today, thermal cameras can be used to detect pigs that have a high body temperature and therefore are likely to have swine flu.



An Invisible Threat

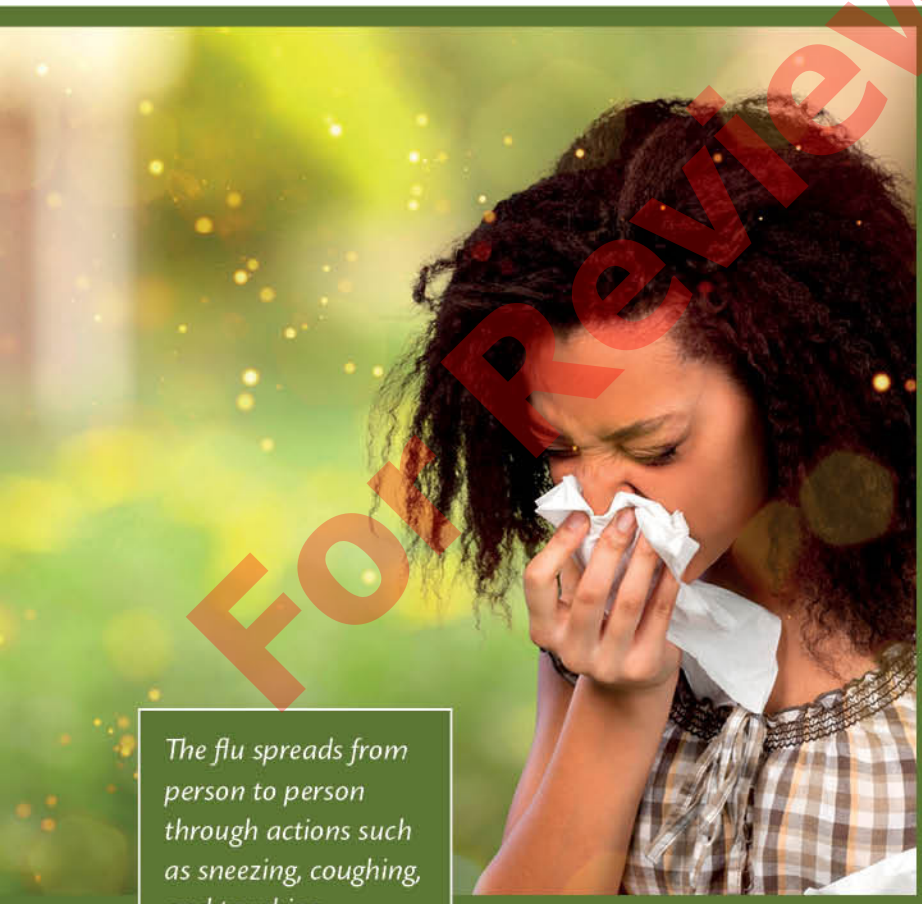
Once scientists had identified the flu virus, the next step was to discover how it got inside cells and caused disease. They were then able to understand how the virus spread.

Virus Invasion

When a virus invades a body, it seeks out cells and moves inside them. Once inside a cell, a virus uses the cell to replicate, or make copies of itself, so it can spread rapidly to other cells throughout the body. Once the virus has done this, it can spread to other people.

Virus All Around

When someone coughs or sneezes, viruses from their mouth and nose can travel through the air around them, where other people breathe them in. Traces of the flu virus can also be left on surfaces, such as a phone or doorknob, when someone who is sick touches them. When another person touches those objects and then their eyes, nose, or mouth, the virus enters their body and makes them sick.



The flu spreads from person to person through actions such as sneezing, coughing, and touching.

Being Contagious

A person who has the flu can pass on the virus before they even feel sick. Once they feel sick, they remain contagious for several days. Most people begin to show symptoms of the flu within two days of coming into contact with the virus. They then become contagious within three to four days of becoming sick. However, some people may be contagious just one day after catching the flu, before they even begin to show symptoms of the illness.

Washing hands in warm, soapy water for 20 seconds is one of the most effective ways to stop the flu virus from spreading. It is especially important to wash hands before eating food or touching the eyes, nose, or mouth because these are routes that viruses can take into a person's body.



Regular handwashing is important not only to keep from getting the flu but also to prevent passing it to other people.

*"When you wash your hands, you can prevent...1 in 5 **respiratory** infections such as a cold or flu."*

Centers for Disease Control and Prevention (CDC)