The 1918 Flu Killed Millions. Does It Hold Clues for Today?

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Flu researchers know the epidemic of 1918 all too well.

It was the worst infectious disease epidemic ever, killing more Americans in just a few months than died in World War I, World War II, the Korean War and the Vietnam Wars combined. Unlike most flu strains, which kill predominantly the very old and the very young, this one — a bird flu, as it turns out — struck young adults in their 20's, 30's and 40's, leaving children orphaned and families without wage earners.

So now, as another bird flu spreads across the globe, killing domestic fowl and some wild birds and, ominously, infecting and killing more than 100 people as well, many scientists are looking back to 1918. Did that flu pandemic get started in the same way as this one? Will today's bird flu turn into tomorrow's human pandemic?

And what, if anything, does that nearly century old virus and the pandemic it caused reveal about what is happening today?

The answer is: a lot and not enough. The 1918 pandemic showed how quickly an influenza virus could devastate American towns and cities and how easily it could spread across the globe, even in an era before air travel.

It showed that a flu virus could produce unfamiliar symptoms and could kill in unprecedented ways. And it showed that a bird flu could turn into something that spreads among people.

But the parallels go only so far, researchers say. For now, they are left with as many questions as answers.
In the fall of 1918 flu struck the United States and parts of Europe hard and traveled to every corner of the world except Australia and a few remote islands. A few months later, it vanished, burning itself out after infecting nearly everyone who could be infected.

The virus arrived at even the most improbable places, like isolated Alaskan villages. In one such village, Wales, 178 of its 396 residents died during one week in November, after a mailman arrived by dog sled, bringing the virus along with the mail.

Public health officials tried in vain to contain its spread. In Philadelphia, people were exhorted not to cough, sneeze or spit in public.

But the virus spread anyway. On Oct. 3, Philadelphia closed all of its schools, churches, theaters and pool halls. Still, within a month, nearly 11,000 Philadelphians died of influenza.

Anyone who doubts that flu deaths can be horrific need only read the memoirs of physicians like Dr. Victor C. Vaughan, who treated influenza victims in 1918.

Dr. Vaughan, a former president of the American Medical Association, was summoned by the surgeon general to Camp Devens, near Boston, where the flu struck in September. He later described the scene in his memoirs.

The men, Dr. Vaughan wrote, "are placed on the cots until every bed is full, yet others crowd in."

"Their faces soon wear a bluish cast; a distressing cough brings up the blood stained sputum," he continued.

"In the morning, the dead bodies are stacked about the morgue like cord wood," Dr. Vaughan said. "This picture was painted on my memory cells at the division hospital, Camp Devens, in the fall of 1918, when the deadly influenza virus demonstrated the inferiority of human inventions in the destruction of human life."

Still, scientists are left with an abiding mystery: Where did the 1918 virus come from?

Investigators know more than they once did. They know exactly what the virus looked like, thanks to Dr. Jeffrey Taubenberger, chief of the division of molecular pathology at the Armed Forces Institute of Pathology, and his colleagues, who obtained snippets of preserved lung tissue from three victims of the 1918 flu and managed to fish out shards of the virus and piece together its genes. Although the 1918 virus was a strain different from the A (H5N1) virus that is now killing birds, it was, Dr. Taubenberger found, a bird flu.
What is not known is how the 1918 virus moved from birds to humans.

One clue could come from knowing what flu viruses existed before the 1918 pandemic. Perhaps the 1918 virus entered the human population before 1918 in a more benign form then mutated to become a killer. Or perhaps it suddenly showed up in humans, jumping directly from birds to people.

To find out, Dr. Taubenberger and Dr. John Oxford of the Royal London Hospital are looking for human flu viruses that existed before 1918. London Hospital has a collection of human tissue obtained from 1908 to 1918. Dr. Taubenberger is searching for flu viruses in lung tissue from people who died of pneumonia in those years, hoping to use the same methods that allowed him to piece together the 1918 virus to resurrect a flu virus that was in humans before 1918.

The 1918 virus also is teaching researchers about experimental vaccines that scientists hope will protect against a variety of influenza strains. The plan had been to make a sort of universal flu vaccine that would protect against various flu viruses. Then people would not need a flu shot each year, and the vaccine might stop pandemic flu strains from ever gaining a toehold.

But, says Dr. Terrence Tumpey, a microbiologist at the Centers for Disease Control and Prevention, although the experimental vaccines protect against ordinary human flu viruses, they do not protect against the 1918 virus. Nor do they protect against today's A(H5N1) bird flu virus.

That leaves scientists with a puzzle. If they are worried about a 1918-like flu, they want a universal vaccine to protect against it, and they wonder what makes these bird flus so impervious? At this point, no one knows, Dr. Tumpey says.

Another abiding mystery is that neither the 1918 influenza pandemic nor any other human influenza pandemic began with a flu pandemic that killed birds. And, scientists add, if the 1918 pandemic had begun that way, it would have been noticed. Even if the deaths of wild birds went undetected, the deaths of domestic fowl would have been recorded.

Wild birds are inured to most flu viruses — clouds of the viruses normally infect them, living in their gastrointestinal tracts but causing little or no disease. Sometimes, those flu viruses infect poultry and, while they usually cause little illness, some flu strains can be lethal to fowl and economically devastating to farmers.
That, Dr. Taubenberger says, "has been recognized for 150 years." In the 1920's, scientists even isolated viruses from what they used to call fowl plague and what is now known to be bird flu. They were not the same viruses that infected humans.

The problem is in deciding what all this means.

The history of the 1918 flu can take scientists only so far, Dr. Taubenberger said.

"We don't know how the 1918 pandemic evolved and how the virus emerged into a form that was the finished product," he said. "What we sequenced was a virus that was ready for prime time, not its precursor."

"Ultimately," Dr. Taubenberger said, "the answer to the big question is, We don't know. There is no historical precedent for what is going on today."