

ones in 1957 and 1968, originated in East Asia, where millions of people live on small farms with poultry and pigs. Western Kansas is a long way from China, but it was and remains a farming area.

The Haskell County outbreak faded by March, but it left a deep impression on Miner. More important, the virus very likely traveled with some of the soldiers and others who journeyed that winter between Haskell County and the Army's Camp Funston, Kan., 300 miles to the east. On March 4, a cook at the camp fell ill with flu. Within three weeks, more than 1,100 soldiers lay in

the camp hospital with the disease, and thousands more had milder cases. Thirty-eight men had died by the time the outbreak ended. While it raged, the camp was feeding "a constant stream of men to other American bases and to Europe," Barry wrote.

Various other launching pads for the pandemic have been suggested. But two comprehensive studies, one by the American Medical Association and the other by a British group, concluded in the 1920s that it originated in the United States. Barry writes that there is no other known outbreak that could have presaged the Haskell

## Avian Flu: Potential for Another 1918?

In May 1997, a 3-year-old boy in Hong Kong died of viral pneumonia. Doctors found he had an influenza virus, but they couldn't identify the strain, so they sent it to laboratories in the United States and Holland. Those labs determined it was a subtype called H5N1—an avian (bird) flu virus that had never before infected humans. Flu experts felt a chill of fear: No one would be immune to this virus. If it was highly contagious, the whole world could be at risk.

A team of top flu specialists flew to Hong Kong to investigate. They learned that 5,000 chickens there had died a few months earlier and that the boy's preschool had obtained some baby chicks shortly before he got sick. But there were no more human cases. The experts returned home, satisfied that the virus hadn't spread. But in late November, new human cases surfaced in Hong Kong. Ultimately 18 people were hospitalized, and six died. When the virus started killing chickens again, authorities decided to act fast. In an attempt to stamp it out, they quickly slaughtered all 1.2 million chickens in Hong Kong. The human cases and poultry outbreaks stopped.

But in 2003 the virus reap-

peared—first in a Hong Kong family, later in poultry in Korea and Vietnam. The first of an ongoing trickle of human cases surfaced in Vietnam in January 2004. Since then, the virus has spread through poultry flocks in wide areas of Asia and infected wild birds and some poultry in a number of European and African countries. At this writing, it has infected at least 224 people in Asia and Africa and killed 127 of them. Now it is well-established in Asian and African poultry and constitutes a threat that could last for years.

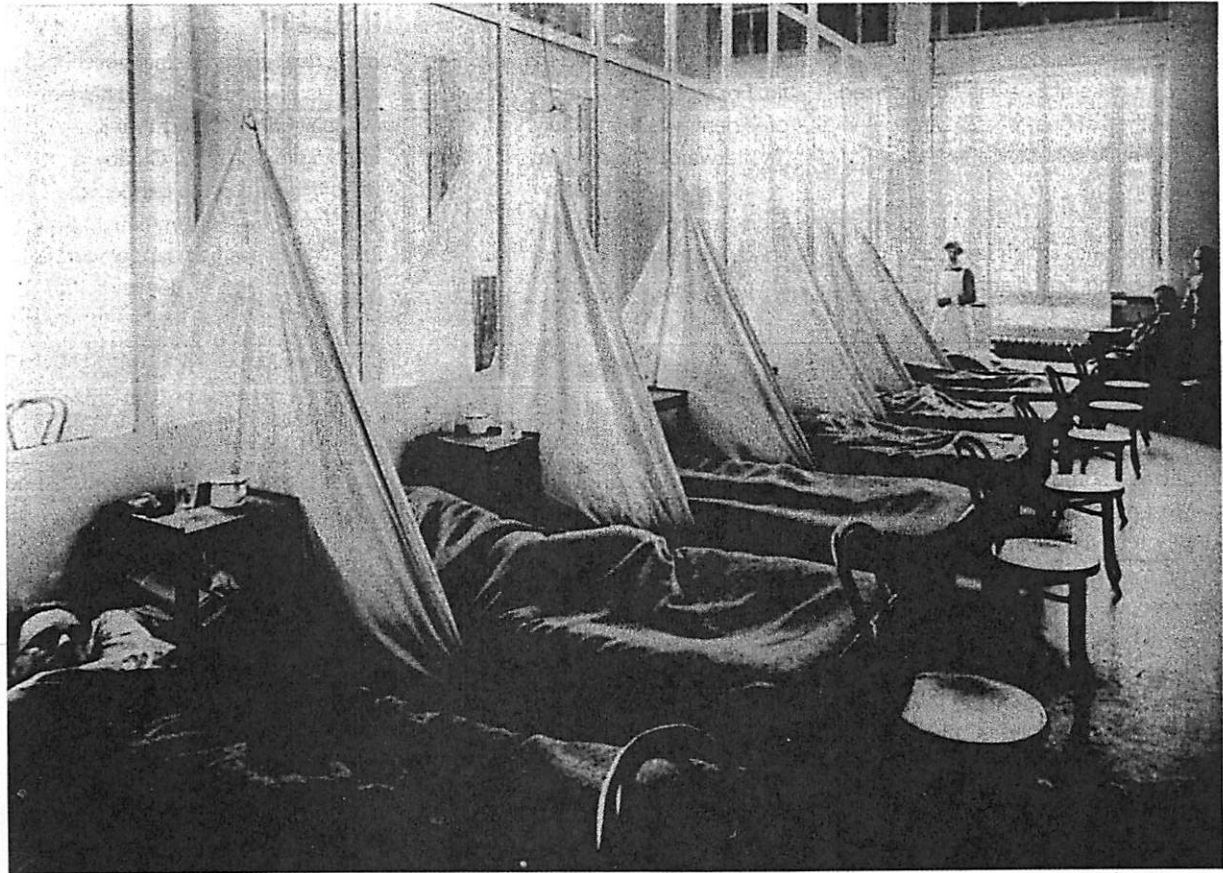
The stage seems set for a human flu pandemic that could possibly rival the disaster of 1918. A lethal virus has jumped the "species barrier" between birds and humans. The only missing condition is that the virus has not shown the extreme contagiousness that typifies flu viruses. Most of the human cases so far have been linked with exposure to infected poultry; very few people seem to have caught the virus from someone else. But as the virus evolves, that could change.

The world today is not that much better equipped to deal with a

lethal pandemic than the world of 1918 was. Vaccines based on H5N1 are being developed, but no one knows how well they would work because the pandemic virus, by definition, will have mutated. Tailoring a vaccine to the pandemic virus, and making it in quantity, would take months. Certain antiviral drugs could help, but they are in short supply and must be used early in the illness.

"For the vast majority of people who become infected, we won't have much different health care than we had in 1918 because we'll run out of equipment, drugs, and health care workers to take care of people," says Michael T. Osterholm, a leading advocate of pandemic preparedness and director of the University of Minnesota Center for Infectious Disease Research and Policy.

While periodic flu pandemics are a given, no one knows if the H5N1 virus will trigger a 1918-like disaster. "I'm not saying that it's going to happen," Osterholm says. "But in all my public health experiences, there's nothing that I've seen coming together to add up to a perfect storm more than this."—RR



Influenza Ward No.1 at the U.S. Army Camp Hospital No. 45 in Aix-Les-Bains, France. The 1918-19 influenza epidemic killed millions around the world.

County cases, and that the disease is easily traced from Camp Funston to other parts of the world.

In this first wave of cases the flu was not as lethal as it would later become but it was already showing one distinct peculiarity: Typically, flu is hardest on those who have immature or weakened immune systems—the very young and the very old. In 1918 the very young and very old did die in increased numbers, but the virus took its greatest toll among adults between the ages of 20 and 40—precisely the group that would be expected to best resist the disease. In the United States, areas that had the best record keeping, the 25- to 29-year-old age group was hit hardest, followed by 30- to 34-year-olds and 20- to 24-year-olds.

### The second deadly wave

By the late summer of 1918, the Spanish flu virus had passed through millions of people. Perhaps these “passages” had honed the virus’s ability to invade humans, or perhaps for other reasons unknown, the virus mutated into a much more dangerous form. The first explosions came in August in three seaports thousands of

miles apart: Boston, in the United States; Brest, France; and Freetown, Sierra Leone. Those who had had the flu back in the spring were lucky because they were much less likely to be struck again.

Thirty-five miles west of Boston lay Camp Devens. By mid-September the fire was raging, with as many as 1,543 men reporting ill on the same day. By Sept. 22, the day before Welch and his colleagues arrived, almost 20 percent of the 45,000 men at the camp were sick, and 75 percent of those were hospitalized. By the end of the month, 757 had died.

The disease that Welch saw at Devens bore only a passing resemblance to the flu that had spread through the Army in the spring. It struck suddenly and ferociously. One moment victims were well, the next they were seized by a pounding headache, muscle aches, chills, exhaustion, coughing, and perhaps nausea. One military doctor wrote, “The patient can often tell the exact moment of his attack.” There were stories of people who collapsed and died on the sidewalk and on streetcars. Some patients had agonizing joint pain, some suffered fever of 105 or 106 degrees with extreme