

All the City Was Dying

The Spanish flu pandemic of 1918-1919 was a major social and economic shock

BY JESSIE ROMERO

In mid-October 1918, Washington, D.C., ran out of coffins. The city was in the throes of the “Spanish influenza” pandemic, and between 70 and 100 people were dying each day. Gravediggers also were in short supply; William Fowler, the city’s health officer, said that anyone who volunteered for the job would be well paid, but fear of contracting the virus kept potential workers home. With bodies piling up in morgues and cemetery vaults, Fowler commandeered a trainload of caskets bound for Pittsburgh (which was facing its own shortage) and ordered inmates from Occoquan Prison to start digging graves.

No mourners were present at the burials: Public funerals had been banned in an attempt to stop the spread of the virus. Similar scenes were playing out across the country, as doctors and local officials struggled to halt the pandemic’s advance across the United States. In less than a year, the flu would kill an estimated 675,000 Americans, a share of the population equivalent to nearly 2 million people today. Worldwide, the death toll may have been as high as 100 million — an economic and social shock from which scientists and economists are still trying to learn.

The Virus Emerges

The first reported cases of the Spanish flu in the United States occurred at Camp Funston, an Army training camp in Kansas. On March 4, 1918, soldiers preparing for deployment to World War I began arriving at the infirmary

complaining of fevers and backaches. Most of the 1,100 men who eventually would be hospitalized had what appeared to be a typical flu virus. But in some cases, the soldiers began having nosebleeds and coughing up blood; as it became more difficult for them to breathe, they slowly turned blue. The virus had attacked the men’s lungs, filling them with a thin, bloody fluid that led to suffocation. Within a few weeks, between 40 and 50 soldiers had died.

Outbreaks occurred at other camps that spring but did not attract much attention; it wasn’t uncommon for a contagious disease to sweep through a military installation, and many of the deaths were attributed to pneumonia rather than the flu. The so-called “first wave” of the virus also went relatively unnoticed in the civilian world, in large part because the country’s attention was focused on the news from Europe. In addition, flu, unlike tuberculosis or cholera, was not an illness that had to be reported to state or federal health departments, so no one connected an outbreak of unusual flu cases in Detroit with similar cases in South Carolina.

Some scientists and historians believe the virus originated on farms in Haskell County, Kan., and was brought to Camp Funston when county residents reported for duty. From there, traveling soldiers might have carried the flu to other army camps and eventually across the ocean to Europe. Other researchers trace the virus to a British training camp in Étaples, France, or to Chinese laborers conscripted by French and British forces. (The virus was dubbed the “Spanish flu” because Spain was the source of the first major news about the pandemic; the country was neutral during World War I, and its press was not obliged to censor news that might damage morale.)

However the flu got to Europe, World War I was a perfect breeding ground. Soldiers, sailors, and laborers from all over the world mingled in hospitals and in trenches and on ships; as they sneezed and coughed, the virus quickly mutated and spread. When hundreds of thousands of U.S. military personnel arrived in Europe during the summer of 1918, they met with a flu strain that had become significantly more dangerous than the one encountered at training camps in the spring.

By most accounts, the second wave of the Spanish flu in the United States started in Boston, where a few sailors who had recently



During the Spanish flu pandemic, makeshift hospital beds were set up on a porch at Walter Reed Hospital in Washington, D.C.

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returned home became sick in late August. Within days, dozens of sailors at Commonwealth Pier were diagnosed with the flu; within weeks, the number of military patients had climbed into the thousands and civilian cases were being reported as well. By the end of September, recalled one nurse, it seemed as if “all the city was dying.”

Before officials in Boston fully realized the seriousness of the flu outbreak, servicemen were already returning to other coastal cities and traveling across the United States, coming into contact with other soldiers, sailors, and civilians at ports and on trains and in their hometowns. Soon, the entire country had been visited by the “Spanish Lady.”

The Virus Kills

The Spanish flu was not the first flu pandemic the world had encountered — researchers have identified 12 that occurred since the 1700s — but it was the most lethal. (An epidemic reaches pandemic status when it spreads to multiple countries or continents.) During the “Russian pandemic” of 1889 and 1890, for example, about 1 million people died worldwide; the case mortality rate, or the share of people infected who die, was roughly 0.15 percent, a rate comparable to more recent pandemics. The Spanish flu killed more than 2.5 percent of people who contracted the virus, on average; in some parts of the world, the case mortality rate was two or even three times higher.

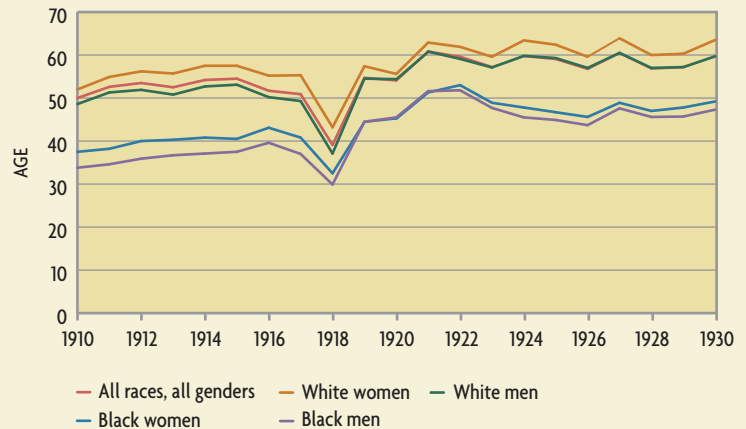
In 1927, the American bacteriologist Edwin Oakes Jordan calculated that the Spanish flu had killed roughly 21.5 million people worldwide. His estimate was based on the best available data at the time, but today, that number is considered much too low. The most recent reputable estimate is nearly 50 million dead, from a 2002 paper by Niall Johnson of the Australian Commission on Safety and Quality in Health Care and Juergen Mueller, a historian and geographer based in Hannover, Germany. But given large inconsistencies in how flu deaths were recorded and reported, Johnson and Mueller concluded the toll could actually have been as high as 100 million.

It’s also uncertain exactly how many people died in the United States. At the time, only about 80 percent of the population lived in the “registration area,” or the cities or states for which the Census Bureau had accurate and complete mortality statistics. And even within the registration area, many flu deaths probably went unreported or were attributed to another illness. Thus, the estimate of 675,000 American deaths is likely to be conservative. Roughly 550,000 of those deaths were “excess deaths” beyond what would likely have occurred during a typical flu season. Overall, U.S. life expectancy fell almost 12 years from 1917 to 1918. (See chart.)

Of the nearly 117,000 American military personnel who died in World War I, about 43,000 were killed by the Spanish flu, compared with 53,402 combat deaths. (The remainder died of other causes.) More Americans, civilian

The Spanish Flu Chasm

U.S. life expectancy dropped dramatically as a result of the Spanish flu pandemic



SOURCE: National Center for Health Statistics, Centers for Disease Control

and military, died during the pandemic than died in combat in World War I, World War II, Korea, and Vietnam combined.

In absolute terms, the Spanish flu pandemic ranks among the deadliest pandemics in world history. As many as 100 million people died during the Plague of Justinian, which began around 540 A.D.; the Black Death killed an estimated 25 million Europeans — one-quarter of the continent’s population — in the mid-14th century.

The flu that struck the world in 1918 differed in several ways from other flu strains. First, the Spanish flu virus afflicted the lungs and respiratory systems, leading many of its victims to develop bacterial pneumonia, which is what eventually killed them (and why many cases were initially misdiagnosed). In other cases, victims died within just a few days of showing symptoms, as their lungs filled rapidly with fluid. And most notably, the Spanish flu was unusually deadly for otherwise-healthy younger adults. Typically, flu deaths follow a U-shaped curve, with deaths peaking for the very young and the very old. But the Spanish flu followed a W-shape, with a sharp peak among adults between 20 and 40 years old. The flu death rate for younger adults was more than 20 times the rate in previous years, and almost half of all flu deaths in the United States were in that age group.

Scientists still aren’t certain exactly why the Spanish flu killed so many younger people. One reason might be that unlike older generations of the time, they hadn’t been exposed to the Russian flu a few decades earlier and thus lacked immunity. Another explanation, based on research with a virus reconstructed from the DNA of a victim found in the Alaskan permafrost, is that the virus turned the body’s immune system against itself. Younger adults tend to have more robust immune systems — and in 1918, that was a liability rather than an asset.

The States (Try to) Respond

Flu mortality varied widely across the United States: Among the 25 states in the death registration area as

of 1915, the excess mortality rate ranged from 360 per 100,000 people in Wisconsin to 757 per 100,000 people in Pennsylvania, according to historian Alfred Crosby's comprehensive 1976 account of the flu, *Epidemic and Peace, 1918*. The disparities do not seem to be entirely explained by either geography or demography. In Colorado, for example, the excess death rate was 681 per 100,000 people; in neighboring Kansas, the rate was a relatively low 423. In New York, an extra 479 people per 100,000 died, versus 649 in New Jersey. (The states with the highest excess mortality rates were Pennsylvania, Montana, Maryland, and Colorado.)

Population density played some role; within states, excess mortality was higher in cities than in rural areas. But there was also significant variation across cities. In Missouri, for example, the rate in St. Louis was 386, versus 624 in Kansas City. Cities also differed in the timing of the pandemic. Some experienced just the second wave of the flu during the fall of 1918, while others were hit by a third wave later that winter or in early 1919.

One factor that might have contributed to different outcomes among cities was the promptness and duration of the public health response. In some cities, officials implemented preventive measures, such as banning public gatherings, requiring people to wear masks, and closing movie theaters and schools, within days of the first flu cases being reported. In other cities, such measures were not put in place until weeks after the flu appeared. Cities also varied in how long they kept the rules in place and in how strictly they were enforced. In a 2007 article in the *Proceedings of the National Academy of Sciences*, researchers concluded that cities that implemented multiple measures early in the outbreak had lower peak mortality rates. There was not much effect on cumulative mortality, however, since few cities kept the measures in place longer than a few weeks. And cities that did enforce preventive measures for longer faced an unfortunate side effect: They were more likely to experience an additional wave of the pandemic later that winter since fewer people had gained immunity during the fall, further limiting the effect on overall mortality.

The gaps in prevention were many and wide. Churches and dance halls might have been closed, but people still went shopping and crowded onto streetcars, despite warnings to the contrary. The gauze masks distributed by volunteers were actually highly porous and did little to prevent the spread of germs. And exceptions were made for patriotism: On Sept. 28, the Treasury Department kicked off its fourth "Liberty Loan" drive to sell \$6 billion in Liberty Bonds. The event was marked with huge parades all across the country, and in many places, rallies and door-to-door solicitations continued throughout October, even when other public gatherings were banned. While it's possible the Spanish flu would have reached similar proportions in the absence of the bond drive, it certainly didn't help. Two days after more than 200,000

Philadelphians gathered to demonstrate their support for the war effort, 635 new cases of flu were reported.

The Virus Reverberates

The United States' medical system was overwhelmed. The country already had a shortage of doctors and nurses since many were serving overseas, and many of those who remained home became sick with the flu themselves. The U.S. Public Health Service (PHS) issued urgent calls for physicians to volunteer to treat flu patients; the Red Cross recruited women without any medical training to work as nurses. Medical school exams were expedited and dentists were authorized to practice as doctors. Thousands of people volunteered, but still there were not enough personnel to treat all the sick. And there was nowhere to put them; university campuses and state armories were turned into makeshift hospitals, and existing hospitals filled their hallways and porches with patients. Many people endured the flu at home, aided by volunteers — nearly all women — who brought cool washcloths and clean linens and helped feed the children of stricken parents.

Some essential services were limited or suspended. Telephone calls could be made only in emergencies because there weren't enough operators; garbage collectors and police officers were too sick to report to work. Retailers reported huge declines in business and revenue, found Thomas Garrett, then with the St. Louis Fed, in a 2007 report. The flu also may have contributed to substantial business failures, according to a 2002 paper by Elizabeth Brainerd of Brandeis University and Mark Siegler of Sacramento State University.

While it's difficult to separate the macroeconomic effects of the pandemic from the effects of World War I, some economists have tried. Brainerd and Siegler concluded that the pandemic may have been a factor in the recession that began in August 1918 and ended in March 1919, as well as in a more severe recession in 1920 and 1921. Research by Robert Barro of Harvard University and Jose Ursua of Dodge and Cox Funds also attributes the 1920-1921 recession at least in part to the flu. Barro and Ursua linked the flu pandemic to declines in GDP and consumer spending in 24 other countries as well, including some that were not involved in the war.

Perhaps counterintuitively, Brainerd and Siegler also found that states with higher flu mortality during the pandemic experienced faster per capita income growth than states with lower mortality during the decade following the pandemic. In part, this could reflect the fact that productivity increases when there are fewer people performing the same amount of work. (Some research suggests that workers' wages in Europe increased significantly following the Black Death.) But it could also be that states with higher flu mortality were further below trend than other states, and their subsequent growth simply represents catching up.

Not all the effects were felt during or immediately

after the pandemic. Pregnant women were more likely to become infected than nonpregnant women, and modern research has linked in utero flu exposure to a host of long-term physical effects, including a greater risk of heart attacks, schizophrenia, and other mental and physical ailments. There were also economic effects from fetal exposure: In a 2006 article in the *Journal of Political Economy*, Douglas Almond of Columbia University found that children who were in utero during the pandemic were less likely to graduate from high school and more likely to be poor, on welfare, or disabled as adults.

Destroyer and Teacher

In a December 1918 article, physician George Price reflected that the Spanish flu had arrived as both “destroyer and teacher.” For example, the pandemic exposed major weaknesses in the United States’ public health system. At the beginning of the outbreak, the lack of coordination and communication between federal and local health officials meant that the scale of the problem went unrecognized until it was too late. Once the U.S. surgeon general, Rupert Blue, did realize that something more serious than the typical seasonal flu was underway, he had to scramble to create an infrastructure that would enable local authorities to share information with the PHS. Blue believed the pandemic had demonstrated the “imperative need of a permanent organization, within the Public Health Service, available with each emergency.” He developed a plan for such a system, but the proposal went nowhere. It wasn’t until the 1940s, when the precursor to the Centers for Disease Control and Prevention was established, that anything like Blue’s dream became reality.

On a local level, the Spanish flu did prompt some changes. Prior to the pandemic, most states had a state public health board. But efforts to expand to the county level had met with resistance, particularly in the South, where citizens were concerned about the intrusion of a centralized authority. As a result, when the flu struck, local efforts were conducted largely by volunteers who were not prepared for the pandemic. The flu changed people’s attitudes and helped spur the development of county health boards, according to historian David Cockrell. After the past few years, one North Carolina doctor wrote in 1920, “the people would no better know how to get along without their health officer than they would know how to dispense with their Sheriff.”

In a 1996 article in the *North Carolina Historical Review*, Cockrell also detailed how the pandemic led to the “hospital age” in North Carolina. The state was severely lacking in hospital capacity, and what hospitals there were didn’t have modern equipment. After the pandemic, “the press of patients, the physical demands, almost beyond endurance, on physicians [and] nurses ... plus the strain on accommodation” motivated many towns to upgrade their medical facilities. James B. Duke, the tobacco magnate turned philanthropist, established a multimillion-dollar endowment to construct rural hospitals. By the end of the 1920s, the number of hospital beds in the state had doubled.

The pandemic also helped solidify in the public’s mind the validity of “germ theory,” which had been gaining currency since the turn of the century. Thirty years earlier, people had believed that the Russian flu was caused by a microorganism that floated through the air but died once it entered its host, rendering the illness itself noncontagious. As a result, people took few preventive measures. During the Spanish flu, in addition to trying to limit contact between people, health authorities also emphasized hygiene. They enforced bans on public spitting and ran extensive ad campaigns urging citizens to cover their coughs and sneezes with handkerchiefs. (The Detroit health commissioner suggested that people use a disposable paper napkin, presaging the invention of paper tissues in the 1920s.) The makers of toothpaste, cough drops, and other products used the focus on hygiene to great effect during the 1920s, warning potential buyers that “a cold may be something far more dangerous.” The mouthwash Listerine advertised itself as protection against “street car colds,” with pictures of men sneezing on public transportation.

Descendants of the Spanish flu still circulate today, as the H1N1 and H3N2 viruses in humans, in addition to several strains in pigs. They are much less virulent than the 1918 strain — but the original, deadly virus does exist in closely guarded laboratories. Studying the reconstructed virus has helped scientists understand how flu viruses mutate and spread and has helped guide more recent public health efforts. During the swine flu pandemic in 2009, for example, researchers discovered the virus was closely related to the Spanish flu virus and that elderly persons who had been exposed in 1918 already had some immunity. That enabled them to target vaccines toward younger people, a group that is not typically the focus of flu vaccination efforts. In that case, there was more to be learned than destroyed. **EF**

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