



THE DEADLIEST ENEMY

THE U.S. ARMY AND INFLUENZA, 1918–1919

BY KATHLEEN M. FARGEY

The world has been devastated by one of the worst scourges in history. It took a terrible toll from our army camps. It shattered every organization trained to combat such a condition by attacking the individual cogs in the machine and many of the most important of these succumbed *[sic]*. —Maj. Ellis K. Kerr, Medical Corps, U.S. Army¹

Influenza Ward No. 1, U.S. Army Camp Hospital No. 45, Aix-les-Bains, France



Troops wearing masks march through the streets of Seattle, c. 1918

THE LONGER WAR

In the first several months after the Armistice of 11 November 1918, much of the chaos created by World War I continued to affect America and the world. On the last day of fighting, many military commanders insisted on prosecuting the war up until the last moment, causing approximately 11,000 casualties on all sides before the Armistice officially began at 1100, leaving those bereaved and wounded that day with little inclination to celebrate. It took months of complex negotiations involving twenty-seven nations before the Treaty of Versailles was signed on 28 June 1919, officially ending the war. In the meantime, fighting continued for many. A Polish uprising in the German province of Posen in late 1918 lasted into February 1919, when an armistice was agreed, but Polish and Soviet troops clashed into 1921. The Easter Rising in 1916 led to fighting between British forces and Irish rebels into 1921 and then a civil war among Irish factions (over the terms of Ireland's independence) lasting until 24 May 1923. In the former Russian Empire, civil war continued into October 1922 between the Red Army of the Bolsheviks and the White Army attempting to stem

the Communist revolution. Discontent over the terms of the Treaty of Versailles and other postwar arrangements in the reshaping of nations and empires would affect significant portions of Asia, Eastern Europe, and Africa, and the punitive treatment of Germany created fierce resentment. Such discontent would fuel further violence in the following decades.²

The deadliest enemy to strike during the war ignored the Armistice to wage its third and final campaign during the first half of 1919. With its common ally, pneumonia, influenza came back to make one final cull. In early April, it had perhaps its biggest impact on history: President Woodrow Wilson became severely ill and was never quite the same in mind or body afterward, suffering a follow-on stroke in September. After working so hard for an equitable "peace without victory," Wilson seemed to lose much of his will after his apparent bout of influenza and gave in to French demands that Germany be made to accept occupation and pay heavy reparations.³

Though we tend to think of World War I dangers in terms of artillery, gunfire, poisonous gas, and barbed wire, the influenza pandemic had a much greater impact than occasional references would suggest—it

played a central role in the lives and deaths of American servicemembers. According to the Center of Military History's fact sheet on the U.S. Army in World War I, more than 50,500 U.S. servicemembers were killed in battle or died of combat wounds during World War I. A severe new form of influenza killed about 55,322 U.S. servicemen in Army camps, on Navy installations and ships, and in the American Expeditionary Forces (AEF) overseas. This influenza also affected civilian communities, taking the lives of about 675,000 Americans and millions of people worldwide (estimates range between 20 and 50 million, with some estimates as high as 100 million), making the 1918–1919 flu the deadliest disease in history.⁴ Symptoms included body temperatures up to 105 degrees, delirium, and as author Lynette Iezzoni puts it, coughing up of "pints of greenish sputum." Flu weakened the body's defenses, often allowing secondary pneumonia, which caused most of the deaths, to invade, filling lungs with blood and other fluids and turning oxygen-deprived skin blue. Influenza occasionally led to other respiratory conditions or severe complications such as meningitis, internal bleeding, and organ damage. At Camp Meade, Maryland, 1st Lt. James M. McTiernan, a



National Museum of Health and Medicine,
Armed Forces Institute of Pathology

Emergency hospital during influenza epidemic, Camp Funston, Kansas

doctor with the Army's Medical Reserve Corps, recalled forty-eight influenza patients who developed otitis media (a potentially dangerous infection causing middle ear swelling) which physicians treated by making incisions into the ear drum. Doctors also observed thirty-seven cases of ear complications among influenza patients at the Army's Walter Reed General Hospital in Washington, D.C.⁵

The theory accepted by the U.S. Department of Health and Human Services and many historians is that "Spanish influenza" (so-called because unlike French newspapers, Spanish ones ran uncensored reports on the disease) originated in Haskell County, Kansas, early in 1918, and spread in three waves. By the first week of March 1918, a severe strain of flu had infected soldiers at Camp Funston, which was part of Fort Riley, Kansas. As the military sent large numbers of soldiers and sailors to military establishments all over the United States, influenza traveled with them. By May 1918, American servicemen had brought the flu to Europe. Theory holds that this influenza virus then mutated into a deadlier form which struck during the fall of 1918. In Europe, the flu spread to Allied forces, to the German military, and into civilian populations, and then to Asia, Africa, South America, and back to North America. The third and final, but less lethal, wave of Spanish flu occurred in early 1919. The 1918–1919 flu affected between 20

percent and 40 percent of American military personnel.⁶ It is therefore at the center, not the periphery, of the American military's World War I experience.

Most military camps and U.S. civilian communities experienced their greatest crises during the second wave of the pandemic from August to October 1918, but with the third wave occurring in 1919,

U.S. soldiers' battle against influenza became the later, as well as the deadlier, of their two wars. By looking at five Army locations—Camp McClellan, Alabama; Camp Merritt, New Jersey; Camp Meade, Maryland; Camp Greenleaf, Georgia; and Gièvres, France—we can examine how the 1918–1919 influenza pandemic affected the U.S. Army.

CAMP MCCLELLAN, ALABAMA

Camp McClellan (renamed Fort McClellan in 1929), is one of several major Army camps established in 1917. About six miles from both Anniston and Jacksonville, Alabama, Camp McClellan was a National Guard camp which received troops from New Jersey, Virginia, Maryland, Delaware, and the District of Columbia. In May 1918, it became a field artillery brigade firing center. At its peak strength in October 1918, the camp housed nearly 28,000 soldiers, mostly in tents. The 29th Division trained at McClellan before deploying overseas in June 1918. The camp hosted the Headquarters of the 6th Division and parts of the 7th, 9th, 12th, and 98th Divisions.⁷

Influenza arrived at Camp McClellan on 20 September 1918, and the height of the epidemic there was between 10 and 20 October. Officials quarantined the camp from 2 to 14 October. When regular medical facilities filled up, camp officials used recreational buildings, tents, and



National Institutes of Health

Interior view of ward, U.S. Army Base Hospital, Camp McClellan, Alabama



A memorial monument at Camp Merritt dedicated to those who died there from the flu.

canvas-covered boardwalks as additional wards for flu patients. According to a senior surgeon, “Medical officers inspected the entire command daily, and isolated suspicious cases in the end of company streets. All cases with a temperature above 99 were sent to the base hospital.” Military authorities also attempted to prevent the spread of infection by keeping buildings clean, airing out tents and bedding daily, exposing troops to fresh air, and keeping recovering patients isolated for an additional ten days. Units which seemed prone to illness were sprayed with chemical agents in an attempt at decontamination.⁸

The senior surgeon cited an influx of new troops, causing “temporary overcrowding and unavoidable exposure,” in the two weeks preceding the onset of influenza as a factor in the camp’s epidemic. Quarters and clothing for newly arriving troops (some of whom arrived drenched by a cold rain) were initially inadequate. Soldiers were quartered in tents, and doctors imposed a strict limit of five men per tent in an attempt to limit the spread of flu. Soldiers recovering from flu, once they had normal body temperatures for forty-eight hours, were moved from hospital beds to a tent convalescent camp nearby. At the epidemic’s peak, Camp McClellan had over 4,900 cases of influenza and pneu-

monia, and about 228 reported deaths from these causes occurred there in the month of October 1918. Only a few soldiers died in subsequent months.⁹

CAMP MERRITT, NEW JERSEY

Camp Merritt, New Jersey, was established in August 1917 as an embarkation camp to move troops through the port at Hoboken. Its base hospital opened 9 January 1918. Camp facilities included thirty-nine warehouses, a large bread bakery, and a delousing plant capable of processing 260 men per hour. From December 1917 to November 1918, over half a million soldiers representing dozens of Army divisions deployed overseas from the camp. From November 1918 to October 1919, roughly the same number returned to Camp Merritt from overseas, leaving Camp Merritt with a population of 44,500 at the end of June 1919. From February 1918 through April 1919, the camp’s permanent garrison was generally between 4,000 and 6,000, being as low as about 2,000 before and after this period.¹⁰

Pandemic influenza arrived at Camp Merritt on 16 September 1918, and it took a few days for doctors there to realize that the new flu cases were “of far greater severity” than earlier cases of flu. About a week later, many flu patients developed pneumonia. In three weeks, the base hospital expanded from one influenza ward to fifty-one influenza and pneumonia wards and brought in

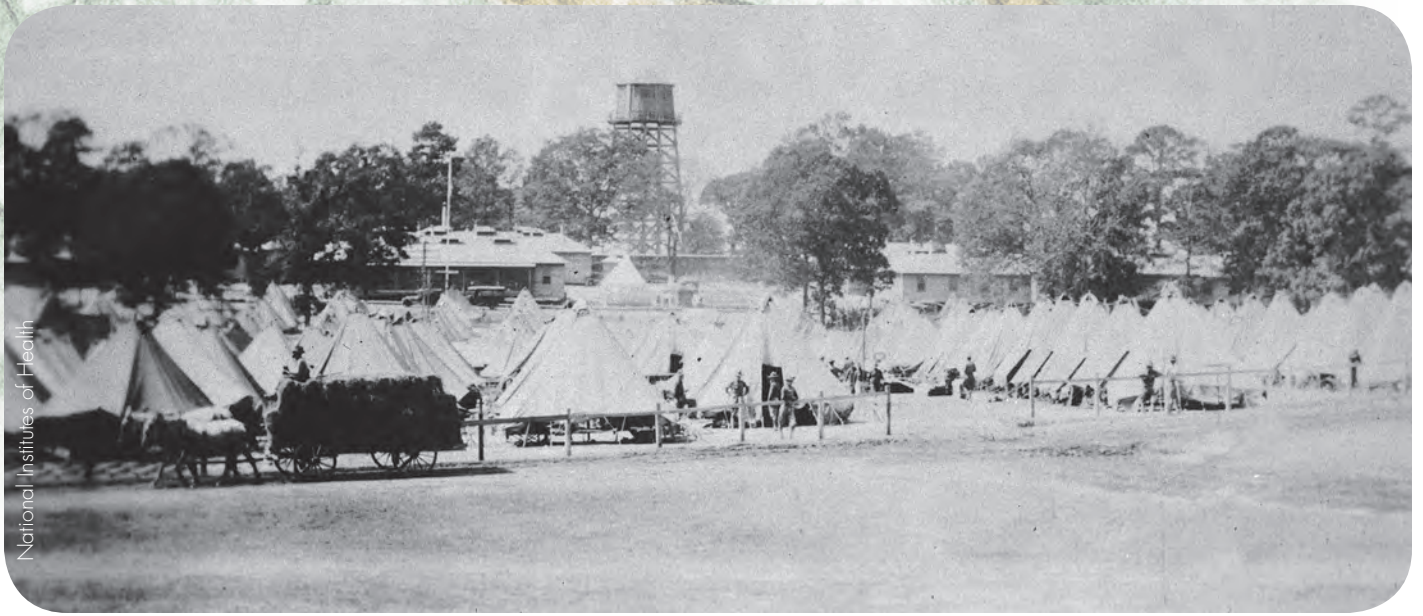
new medical personnel—many of whom became sick themselves, especially nurses. Another complication was that several sick servicemembers were transferred to Camp Merritt’s hospital from other locations, including docked ships. Dozens of enlisted soldiers detailed to assist in the wards had no medical experience. Medical officers transferred influenza patients who developed pneumonia to separate wards to isolate them from other patients. Several autopsies conducted on soldiers who died of pneumonia at Camp Merritt indicated hemorrhages in the lungs and signs of emphysema. By 1 November 1918, 265 of Camp Merritt’s 999 pneumonia patients had died, a mortality rate of just over 26 percent.¹¹

CAMP MEADE, MARYLAND

Camp (now Fort) Meade, Maryland, was another of the large cantonments established in 1917 to handle draftees. It was 18 miles from Baltimore with tracks connecting to the Pennsylvania and B&O Railroads. Meade hosted more than 400,000 soldiers during the war: the 11th and 79th Divisions, parts of the African-American 92d Division, training battalions, a depot brigade, an Ordnance Supply School, and a remount station handling over 22,000 horses and mules. After the Armistice, 96,000 returning soldiers were mustered out at Meade. Meade also hosted medical training for Army and civilian personnel.¹² In November 1917, at



Convalescent house, U.S. Army Base Hospital, Camp Meade, Maryland



Tents for influenza patients, U.S. Army Base Hospital, Camp Beauregard, Louisiana

the north end of the camp, a base hospital opened with 105 buildings including a pharmacy, a kitchen and various messes, baths, officers' quarters, a chapel, a farm to supply vegetables and decorative flowers, and an exchange with a lunch counter, barber shop, and tailor. Wooden corridors joined thirty-two hospital wards, and there were three isolation wards for dangerous diseases and stand-alone convalescent wards. During the epidemic, all except the isolation wards housed flu patients. There were additional regimental and brigade infirmaries.¹³

On 17 September 1918, a handful of soldiers reported to Meade's base hospital and doctors discovered they had influenza. Camp Meade's doctors were aware of influenza outbreaks at other Army camps and had cleared beds—they had moved patients, convalescents, and staff to tents—in anticipation of the flu's arrival. Company commanders were ordered to ensure ventilation and cleaning of barracks. Nonetheless, the hospital admitted 800 soldiers on 24 September, and officials placed the camp under a quarantine that lasted until 20 October. By the time the epidemic waned in late October 1918, at least 11,000 soldiers (25 percent of the camp population) had gotten sick, and over 750 died, with a mortality rate of 27 percent for those who got pneumonia after catching the flu. Like many other Army camps, Camp Meade had to scramble to set up additional medical facilities and bring in outside help—Army nurse trainees, Johns Hopkins University medical students from

Baltimore, and Catholic nuns trained as nurses. Camp Meade was the entry point for influenza into the state of Maryland, including the city of Baltimore, which experienced at least 24,000 cases of flu and 4,125 influenza-pneumonia deaths. However, death rates in Baltimore were lower than in hard-hit Washington, D.C., Philadelphia, and Boston.¹⁴

In keeping with wartime censorship and the drumbeat of positive patriotism, newspapers often deemphasized the seriousness of the influenza-pneumonia epidemic at Army camps. Even the *Camp Meade Herald* assured readers that Army doctors had everything under control and that the flu outbreaks would end shortly. The *Harrisburg Patriot* underreported the number of flu patients at Camp Meade (its figures are at odds with those of Camp Meade's Division Surgeon's report). On 25 September 1918, the *Philadelphia Inquirer* was hopeful that no quarantine of Camp Meade would be necessary, but a camp quarantine had already been imposed on 24 September. On 27 September, the *Baltimore American* quoted a local health commissioner's declaration that Spanish flu was no different from regular seasonal flu, which had caused only 103 deaths the previous year—ignoring the fact that in September 1918, flu killed 12,000 Americans. In the gap between these rosy reports and the rapid spread and unusually high mortality rates of flu and pneumonia, rumors arose—generally along the lines that German infiltrators among the U.S. Army medical staff had been caught deliberately

spreading flu germs among American soldiers. The *Camp Meade Herald* and other camp newspapers denounced a particular rumor making the rounds in Washington, D.C.: "Within walking distance of Army Medical Department headquarters here, an infantry regiment is encamped. Almost to a man, that group believed that three officers and six nurses had been shot at Camp Meade" for spreading flu.¹⁵

Although influenza and pneumonia spread rapidly at Camp Meade, affecting soldiers of infantry and service units, nurses, doctors, other medical personnel, chaplains, and volunteers of recreational organizations, some segments of the camp population appear to have benefitted from isolation. Six companies of the 71st Infantry, the unit in which flu first appeared, were moved from their barracks to tents four miles away in an isolated area of the camp, and men in these companies remained free of influenza. African American soldiers living in segregated quarters were not afflicted with influenza at the same rate as whites, although their rate of sickness rose in October just as the rate of sickness among other soldiers decreased. On 26 October 1918, a contingent of about 372 black soldiers was marched out to Baltimore's Mount Auburn Cemetery, which belonged to the African American Sharp Street Methodist Episcopal Church. There they buried the bodies of African American flu victims which had gone unburied for several days as Baltimore's undertakers and gravediggers had been overwhelmed by the

number of flu deaths and incapacitated by illness themselves.¹⁶

CAMP GREENLEAF, GEORGIA

Camp Greenleaf was established in May 1917 as part of Fort Oglethorpe to provide Army training for medical professionals. In March 1918, Camp Greenleaf's commandant officially took charge of Fort Oglethorpe's post hospital. Greenleaf consisted of medical schools (including dental and veterinary schools), a motor school, and training organizations for sanitary units of field hospitals and ambulance companies, noncommissioned officers of base hospital and convalescent camp units, replacement units for overseas service, and staff for evacuation hospitals and trains. From June 1917 through November 1918, according to War Department records, "6,640 officers and 31,138 enlisted men arrived at, and 4,318 officers and 22,138 men departed from, the camp. During this period 63 base hospitals, 37 evacuation hospitals, 5 field hospitals, 13 hospital trains, 5 ambulance companies, 21 evacuation ambulance companies, 9 convalescent camps, 10 replacement units and numerous detachments were organized."¹⁷ Camp Greenleaf trained and dispatched doctors and other medical professionals who would care for Army influenza patients around the United States and abroad, yet even this medical camp could not escape pandemic influenza.

Thanks to prominent physician Victor C. Vaughan's article in the June 1918 issue of the *Journal of Laboratory and Clinical Medicine*, there is an unusually detailed description of the initial spring 1918 wave of Spanish flu which hit soldiers at Fort Oglethorpe beginning about 18 March 1918. It began with men of the 51st Infantry, and continued to spread over the next two weeks, though only part of Camp Greenleaf was affected. Because many of the flu cases "were not severe," the camp did not compile complete statistics, but Vaughan estimated 2,900 illnesses at Oglethorpe. Doctors did not initially identify the epidemic as influenza. Vaughan described the symptoms of this spring illness as "headache, pain in the bones and muscles, especially the muscles of the back, marked prostration, fever . . . [s]ometimes there was conjunctivitis, coryza [inflammation of mucous membranes in the nose], a rash and possibly nausea." Patients generally recovered within a few days.¹⁸

On 23 September 1918, the second and deadlier wave of the epidemic arrived at Camp Greenleaf, when an enlisted man who returned from leave in Massachusetts was "sick on arrival." On 25 September, there were twenty-six reported cases of flu at Greenleaf. Officials attempted to isolate patients in specific areas, but partly due to a shortage of tents, they were not successful in preventing the rapid spread of the disease.

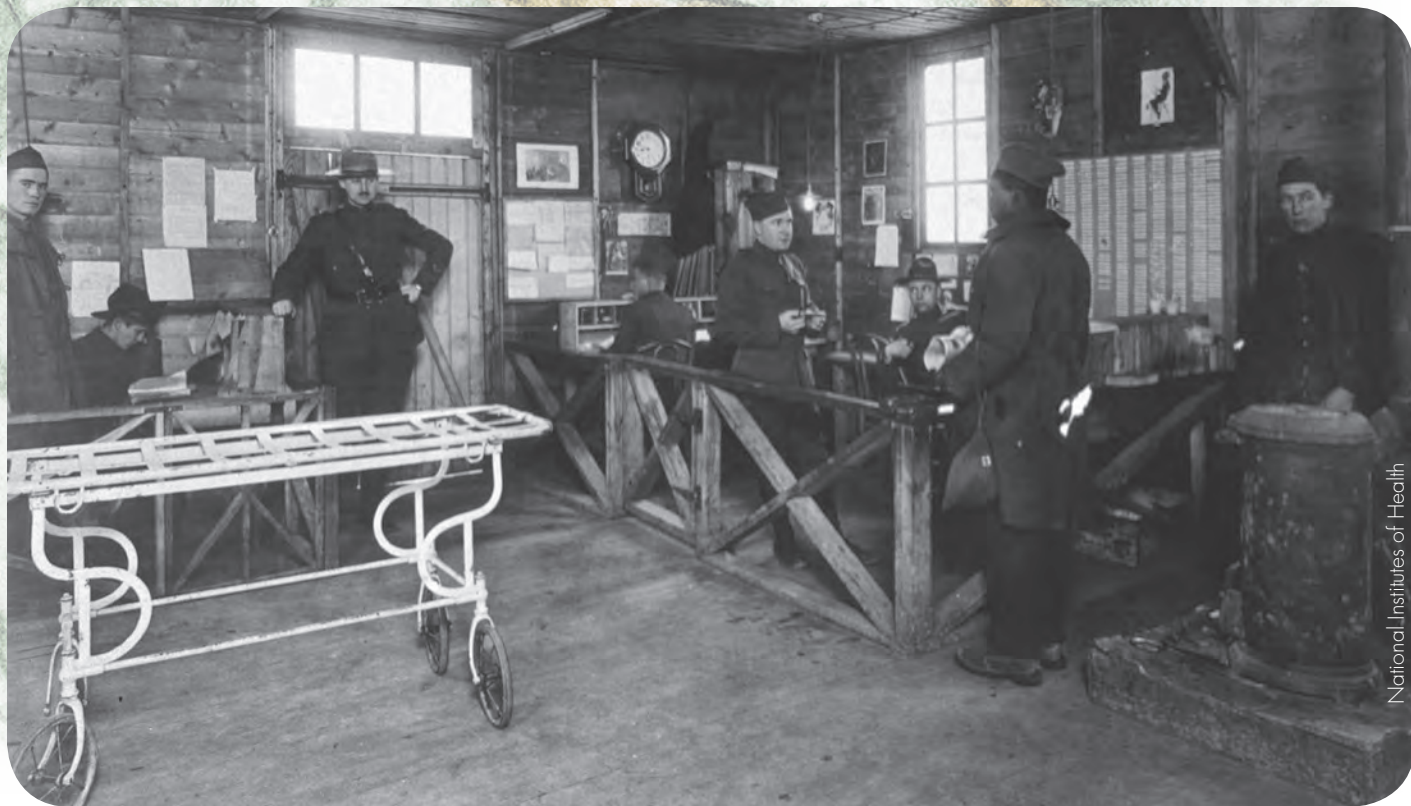
However, men in the detention area isolated in tents or stalls did not get sick, unlike those housed in regular barracks. Before the epidemic "disappeared completely" by 26 October, there were about 5,160 flu cases at Greenleaf and 999 cases of pneumonia accounting for 325 deaths. Surgeon general's records report a 6.3 percent death rate for influenza at Camp Greenleaf with a 32.6 percent death rate for those who also got pneumonia. Forty-four German and Austro-Hungarian prisoners of war also died at Fort Oglethorpe in the Fall epidemic, which "greatly interfered" with training at the camp and prevented its personnel from being rapidly transferred to overseas locations—at a time when the Army urgently needed medical professionals. However, Camp Greenleaf did not join many other Army camps in "closing all places of public assembly" during the epidemic.¹⁹

GIÈVRES, FRANCE

Gièvres, in central France, was connected by rail to St. Nazaire on the Atlantic coast, where freight for American forces arrived. The U.S. Army's 15th Engineers worked for months constructing additional railroad tracks, warehouses, and other facilities for an immense storage depot at Gièvres from which clothing, fuel, food, medicine, and other supplies were moved to troops around the European theater. The depot included



Medical ward, U.S. Army Hospital No. 43, Gièvres, France



National Institutes of Health

Interior of receiving ward, U.S. Army Camp Hospital No. 43, Gièvres, France

4,500,000 square feet of covered storage space and 10,000,000 square feet of open storage space. There was refrigeration space for 5,200 tons of meat and an ice-making facility capable of producing 75 tons of ice daily. In addition to approximately 32,000 Army personnel, the facilities at Gièvres housed Chinese and Spanish laborers and German prisoners of war.²⁰

In November 1917, the Army established an infirmary at Gièvres for the 15th Engineers. It consisted of two wooden barracks. It was converted into a post hospital in February 1918 and designated Camp Hospital No. 43 in April 1918. The hospital then expanded to include twenty-four buildings with a 400-bed total capacity by September 1918. In August 1918, Camp Hospital No. 43 began to treat fractures and perform surgeries of the type previously transferred to other hospitals. In February 1919, Camp Hospital No. 43 annexed a former base hospital at Pruniers. Apart from the regular hospital barracks, the Army set up twenty hospital tents to accommodate “the large number of mumps cases brought in with arriving troops.”²¹

Many historians believe that U.S. troops carried the flu to France following outbreaks at fourteen large Army camps in the United States in the spring of 1918. By the end of

summer 1918, all European armies had been exposed to the flu. Despite the risks of contagion, the U.S. Government decided against halting troop shipments because they did not wish to encourage the enemy. The government considered the sacrifices which influenza would require as a consequence of troop movements as necessary to the war effort. There is incomplete data on the epidemic in France, but between 125,000 and 250,000 civilians and about 30,000 military personnel died there as a result of the flu. The government banned French newspapers from reporting on the outbreak during the war.²²

Flu first broke out at Gièvres in early June 1918 among Chinese laborers. Characterized by “sudden onset of gastrointestinal and bronchial disturbances,” it spread to the rest of the camp despite a quarantine of the Chinese section. This flu typically lasted four days and did not result in any deaths. During August and September 1918, U.S. troops arrived at Gièvres almost daily, prompting the expansion of the hospital.²³

The second wave of influenza arrived at Gièvres in late October 1918, beginning in the supply depot. This time, many flu patients developed pneumonia and cyanosis (blue-tinted skin due to oxygen deprivation), and there were many deaths, especially

among African American soldiers. For those who survived, the illness lasted about fourteen days and recuperation was long and slow. A U.S. Navy medical officer stationed at Gièvres identified factors he believed contributed to servicemen developing severe cases of flu: “physical fatigue, long hours of uninterrupted labor with no relaxation from routine duties, no entertainment or change of scenery, and exposure to cold, inclement weather.”²⁴

U.S. Army medical officials at Gièvres kept separate wards for patients with specific diseases, including influenza and bronchio-pneumonia—housing patients in tents if space ran out. Sometimes Army officials imposed quarantines on individual units or organizations, keeping them away from the YMCA (Young Men’s Christian Association) facilities and other recreational activities. The Army required all soldiers in units having disease outbreaks to gargle twice a day, and sprayed their noses and throats with an unspecified liquid. Medical staff sterilized mess kits, clothing, and bedding, and sprayed bunks and floors with disinfectants. Guidelines required all those attending the sick to wear masks and gowns. The camp hospital was kept ventilated, and “sputum, urine, and excreta disinfected before being removed from the wards.”²⁵



The nurses of U.S. Army Camp Hospital No. 43, Gièvres, France

Although the Armistice of 11 November 1918 ended the fighting, it took months to bring thousands of American servicemen home from overseas. Army Camp Hospital No. 43 at Gièvres would continue to deal with flu cases well into 1919. It did not close until August of that year.²⁶

Soldiers weren't the only ones to die at Gièvres due to the epidemic. The YMCA sent a number of volunteers to organize recreation for American soldiers in Europe. Alice J. Knight of Natick, Massachusetts, a "missionary deaconess" for the YMCA, died of pneumonia on 21

February 1919 at Camp Hospital No. 43, and YMCA secretary Lorraine Ransom of New Rochelle, New York, died of pneumonia at the same hospital three days later. Both these women are buried in an AEF cemetery in northern France (now the Oise-Aisne American Cemetery).²⁷



The officers of U.S. Army Camp Hospital No. 43, Gièvres, France



National Institutes of Health

Interior view, Receiving Ward, U.S. Army Base Hospital, Camp Devens, Massachusetts

ARMY FATALITY RATES

Many large Army camps have comparable statistics on the number of illnesses and deaths from influenza and pneumonia in 1918–1919, though comparisons must be made cautiously and with the caveat that statistical sources vary. Different statistics cover different time periods: some encompass only the height of the epidemic at a particular location; others cover a longer period. Statistics also reflect different circumstances: some include a camp's total population; others measure only those who became ill or those admitted to a particular hospital.

For Maryland's Camp Meade, flu statistics range from 11,400 to 14,280 illnesses, 607 to 763 deaths, and fatality rates of 4.4 percent to 6.7 percent (variances reflect use of different records and date ranges, and inclusion or exclusion of additional camp infirmaries). The surgeon general's report of 1919 indicates 13,698 flu hospitalizations at Meade from September to December 1918 and 607 deaths (including 56 African Americans), for a fatality rate of about 4.4 percent. Carol Byerly, referring specifically to the base hospital, reports

that 27 percent (about 11,421) of Meade's 42,300 troops were hospitalized. Dr. Edgar Sydenstricker's data on the 1918–1919 flu in 118 U.S. civilian communities finds mortality rates of 2.7 percent to 4.6 percent, making Camp Meade's rate comparatively high.²⁸ However, Meade's statistics roughly match those of several other large Army camps. Camp Dodge, Iowa, had 13,700 flu cases among 33,000 men and 702 deaths. At Camp Devens, Massachusetts, (the first Army camp in the United States to be significantly affected by the second wave of the flu epidemic in fall 1918), 45,000–50,000 men had over 14,000 flu cases and over 500 deaths during the epidemic's peak. Camp Lee, the entry point for flu into Virginia, had over 12,000 flu cases and at least 634 deaths at the flu's peak. Camp Grant, Illinois, with very crowded barracks, had a high death rate: 1,060 deaths among over 10,700 flu cases in a population of 40,000. Camp McClellan, with a smaller population of about 28,000, had fewer influenza cases than many larger camps did, with over 4,900 flu patients during the apex of the epidemic. However, its influenza mortality rate of about 4.7 percent is comparable to those of larger camps. Pneumonia mortality rates for

Army camps are largely consistent at about 25 percent to 27 percent, as is the case for Camp Merritt, where 265 of 999 pneumonia patients died for a mortality rate of about 26 percent. Yet at Camp Greenleaf, where 325 of 999 pneumonia patients died, the pneumonia mortality rate was 32.6 percent, and the overall influenza mortality rate was also high at 6.3 percent.²⁹

Although about 15,849 members of the AEF died of influenza and pneumonia in Europe, it seems that the Army surgeon general did not collect or publish disease statistics for individual camps or locations there as it did for Army camps in the U.S. Keeping in mind discharges of recovering patients, a general guess as to the prevalence of the flu epidemic at Gièvres, France, during the Fall epidemic can be made based on Camp Hospital No. 43's usual capacity of 400, plus its report that influenza taxed that capacity "to such an extent that an average of 350 patients have had to be quartered in tents."³⁰

Certain differences in the progress and handling of the epidemic in different Army camps emerge from the information provided above. At Camp Meade, African Americans may have experienced lower rates of illness due to segregation, but at

Camp McClellan, where black soldiers received inadequate quarters and clothing, and in Gièvres, African Americans experienced higher death rates than white soldiers. Especially isolated populations, like those in the detention center at Camp Greenleaf and certain companies of the 71st Infantry at Camp Meade, managed to escape influenza altogether. Quarantine and isolation measures, however imperfect, were part of the normal Army response to outbreaks of flu and pneumonia, but unlike at other camps hit by the epidemic, Camp Greenleaf kept open its places of public assembly. Camp McClellan, which quartered its soldiers in tents rather than in barracks, limited inhabitants to five per tent. To what extent such measures helped stem the tide of influenza and pneumonia is not clear, but Camp McClellan does appear to have had a lower mortality rate than Camp Greenleaf (4.7 percent versus 6.3 percent). As a transit camp, Camp Merritt handled not only its own local cases of influenza but also flu patients transferred into the camp from ships and other locations. Medical officials at Camp Merritt attempted to isolate pneumonia patients in separate wards, as did officials at Camp Hospital No. 43 in Gièvres. Army medical officials enacted aggressive disinfection efforts, including the use of chemical agents, at many Army camps and hospitals, including Camp McClellan and Camp Hospital No. 43, which even undertook treatment of human waste before disposal.

The common denominator for the various Army posts, however, is the measure of chaos brought by the epidemic. During the influenza crisis, Army camps struggled to secure sufficient beds, medical personnel, and resources for their patients. Despite quarantines, sanitation efforts, and the isolation of patients, influenza and pneumonia affected hundreds of thousands of soldiers. Some Army installations and hospitals experienced outbreaks of severe influenza in spring of 1918, but the most deadly form of influenza arrived that fall, and was soon accompanied by pneumonia, and generally peaked in October. The United States Army took the 1918–1919 flu virus from Kansas to other states and to Europe, from which it encircled the globe.

1919 REPRISÉ

While the final wave of the influenza pandemic was limited at some Army camps (Camp Meade experienced only seven



An Army doctor at Camp Devens checks on a patient

influenza-related deaths in the first half of 1919), there are strong hints that the third wave of influenza was more costly at Gièvres, France, and surrounding areas. Private Alva Gressmire of Indiana went overseas with the 64th Engineers in March 1918 and survived earlier waves of influenza only to die of pneumonia on 13 February 1919 in Camp Hospital No. 43. Five hundred thirty-seven American servicemen and civilians who died after the Armistice at Gièvres and in other parts of France are interred or memorialized at the Oise-Aisne American Cemetery in northern France. Several of these individuals, such as 2d Lt. Richard Bishop Alvord of the 119th Infantry, 30th Division (died 27 February 1919); Pvt. Vandee Cotton (a black soldier) of the 335th Quartermaster Labor Battalion (died 13 March 1919); Sgt. Lucien J. Fenouillet of the 73d Aero Squadron (died 24 March 1919); and 2d Lt. Paul Nowers of the Transportation Corps (died 2 February 1919), died of influenza and pneumonia. Many are simply listed as having “died of disease” and among them are likely influenza-pneumonia victims.³¹

In many ways, the full impact of the Spanish flu only began to become clear in the months after the guns fell silent in Europe. Of those who survived, not everyone recovered fully. As a Catholic priest who served at Camp Meade wrote, “They [some of Meade’s flu survivors] wake to find the dream a sad reality. [. . .] the mental ward crowded with poor soldiers who will never recover from the

[flu-induced] delirium.” Some flu survivors developed lasting respiratory conditions. Many family members and friends were left to mourn.³² Some Army families found out in 1919 that the influenza which had visited them in 1918 was not finished with them. Ettie May Perkins, a nurse at Camp Meade, died of influenza and pneumonia on 4 October 1918. Flu visited tragedy on the Perkins family again in April 1919, when the war veteran husband of Ettie’s sister Lizzie died of flu-related spinal meningitis a week after returning from overseas.³³

Well into 1919, the Army surgeon general and others compiled statistics and reports. On 27 January 1919, the American Red Cross announced more than 200 of its nurses had died “of influenza contracted while administering to influenza-stricken soldiers.” On 30 April 1919, the *Baltimore Sun* newspaper cited a newly issued report by the War Department estimating that 51 percent of Army deaths during the war had been caused by disease—and that a further 12,000 deaths from disease had happened since Armistice Day.³⁴ On 5 April 1919, thirty-six soldiers returning from overseas were sent to the base hospital at Camp Devens to recover from influenza. Camp Devens reported 208 new flu cases and 102 new pneumonia cases among returning troops for the week ending 18 April 1919. The *Washington Post* reported 5,679 new cases of influenza and pneumonia for the week of 26 April among soldiers in the United States according to an Army Medical Department report issued 6 May 1919, which nonetheless represented “a marked decrease” over previous weeks. Also as of late April, 44,172 servicemen lay sick in hospitals abroad (added to 9,428 recovering from war injuries), as the Army Medical Service hoped to bring them home by July 1919.³⁵

Of course, they would not all make it home. At the end of March 1919, Haskell Mayo of Bakersfield, Vermont, received a telegram informing him of the death of his son, Pvt. Haskell Mayo Jr., of the 26th Division. He died in France on 12 March due to influenza, just before he was to sail for home. The *Burlington Free Press* noted, “He had participated in the hard fighting in which his division had been engaged without a wound or injury of any kind.” On 10 April 1919, the Vermont newspaper, *St. Albans Weekly Messenger*, published Private Haskell’s last letter to his father, dated 2 March 1919, in which he reported that his division was due to sail home in April and lamented that he couldn’t get home in



National Institutes of Health

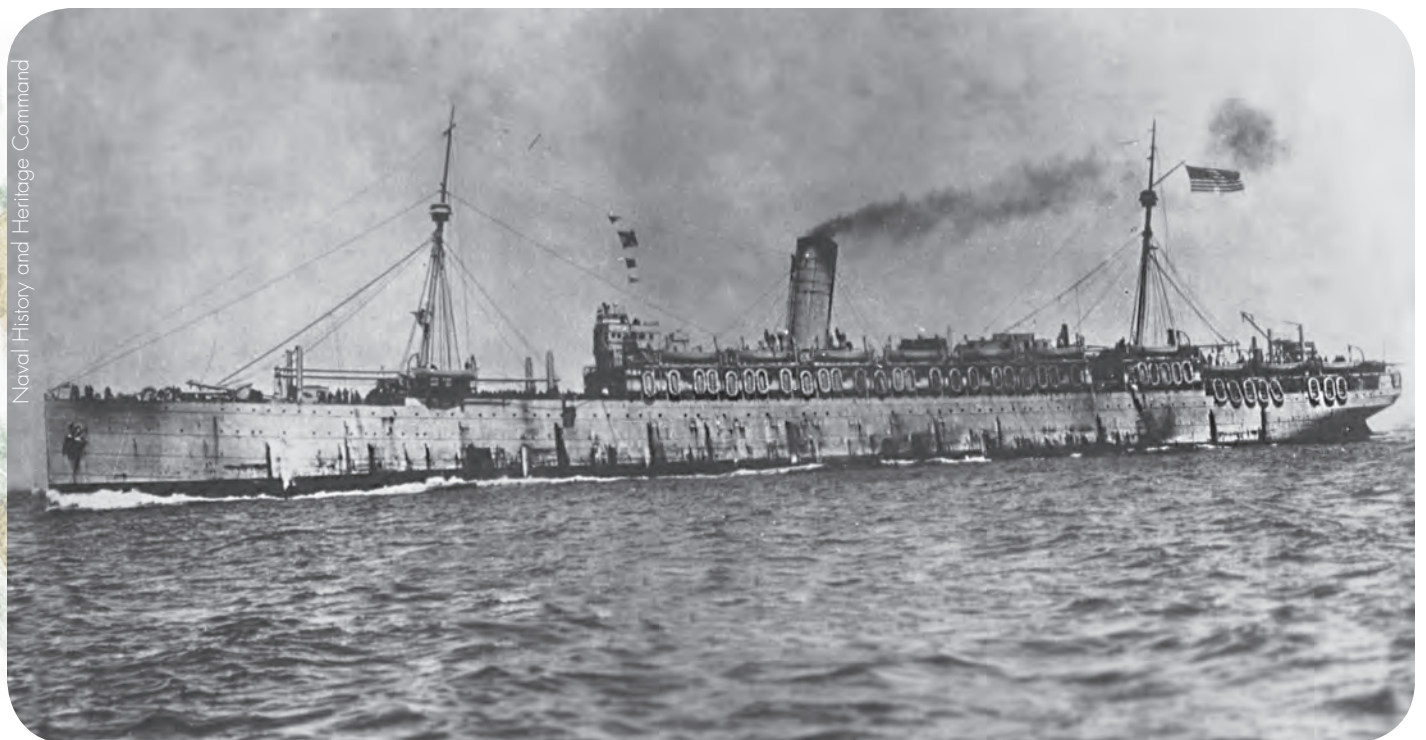
Interior view, Ward, U.S. Army Walter Reed General Hospital, Washington, D.C.

time for Vermont's maple sugar-processing season. In his closing lines, he wrote, "Hope you are all well. I am, only I have a little cold. Hope to be with you soon." On 30 April 1919, Mrs. Alice Mulliner received word that her son, Cpl. George Mulliner of

the 44th Coast Artillery, who had been ill with influenza, pneumonia, and diphtheria, had died aboard the USS *Rijndam* on his way home from France.³⁶

At a time when the pathogen causing influenza had not been identified, the

American Medical Association called on the U.S. Congress to provide \$1.5 million for research into the disease and attempts to prevent the next influenza epidemic.³⁷ The war against our deadliest enemy, influenza, would continue.



Naval History and Heritage Command

USS *Rijndam*



National Institutes of Health

Morgue, U.S. Army Camp Hospital No. 43, Gièvres, France

THE THREAT REMAINS

Researchers at the National Institute of Allergy and Infectious Diseases have discovered that all Type A influenza viruses circulating today are genetic descendants of the 1918–1919 virus. Influenza pandemics (generally accompanied by pneumonia) have continued to haunt us. The year 1957 saw a pandemic of “Asian flu,” and 1968–1969 saw the “Hong Kong flu” pandemic, which killed more than one million people worldwide. In late 1977, the “Russian” or “red flu” virus threatened people under twenty-five years of age. Researchers Jon Hodge and Dennis Shanks have provided examples of influenza’s impact on the U.S. military since 1918–1919, including the following: 1) the U.S. Air Force temporarily suspended bombing missions over Vietnam when the 1968 flu pandemic hit air crews based in Thailand; 2) severe respiratory diseases “often caused by influenza” were the main cause of nonbattle injury and disease for the U.S. Army during the Vietnam War; and 3) in 1996, a U.S. Navy cruiser experienced a 42 percent attack rate of influenza and had to return to port as a result. In early

1976, two potentially dangerous flu viruses circulated in crowded barracks at Fort Dix, New Jersey, but did not erupt into a major epidemic. A new and virulent H1N1 flu caused the World Health Organization to declare a pandemic on 11 June 2009. That year, medical researchers observing U.S. soldiers participating in military exercises in Egypt became concerned by the flu’s ability to affect young, otherwise healthy soldiers, to result in respiratory illnesses and other complications, and to affect military operations. Annual estimates regularly include seasonal influenza and pneumonia (counted together in one category) in the top ten medical causes of death in the United States. In January 2017, many French hospitals were reported to be “at breaking point” due to an influx of patients affected by a severe type of flu; hospitals postponed nonurgent operations and implemented emergency plans to provide more beds to flu patients. By September 2017, Australia had also experienced a severe flu epidemic with historically high numbers of flu cases in some of its states.³⁸

The 2017–2018 flu season, dominated by the H3N2 virus, has been the worst flu season

in the United States in many years. The Centers for Disease Control and Prevention (CDC) estimates that there have been 12,000 to 56,000 flu-related deaths per flu season (approximately five–six months long) in the U.S. from 2010–2011 to 2016–2017 (West Africa’s 2014–2016 Ebola epidemic took 11,325 lives). However, for the 2017–2018 flu season, the CDC believes that about 80,000 Americans died of flu, surpassing the flu mortality rates of the past several years.³⁹ Additionally, influenza viruses in animals, which could affect humans and develop the ability to spread rapidly from person to person, represent potential pandemic threats. We have medical options—flu and pneumonia vaccines and antiviral (for flu) or antibacterial (for pneumonia) medicines—which didn’t exist in 1918. The CDC estimates that for the 2015–2016 season, flu vaccinations prevented 5.1 million illnesses, 71,000 hospitalizations, and 3,000 pneumonia and influenza deaths in the United States. However, timely production, distribution, and usage of a large supply of vaccines and medications remains a challenge. The U.S. Department of Defense Implementation Plan for Pandemic Influenza (DoD

Pandemic Plan) assumes that an effective vaccine will not be widely available until several months after a pandemic begins. In the meantime, seasonal flu vaccines may provide limited protection against a pandemic virus.⁴⁰

Appropriate medical care is vital. During the Ebola epidemic, life-saving treatments were not readily available in West Africa. The epidemic's mortality rate, 80 percent overall, dropped to 45 percent for those who received hospital care and to 18 percent for those airlifted to developed countries. Among Americans, 95 percent of "influenza deaths" are due to pneumonia which is not treated quickly enough.⁴¹

Since the DoD Pandemic Plan was developed in 2006, the U.S. military has pandemic exercises in locations such as Germany, Hawaii, Indiana, and South Carolina, involving rapid vaccination of local communities, enactment of quarantines, and communication and coordination with multiple agencies and officials.⁴² However, advanced planning isn't always enough. In 1918, officials at Camp Meade anticipated the flu's arrival and cleared hospital beds—and the Army established medical labs at many of its posts—but still the Army was unprepared for the high rates of infection and deaths that flu and pneumonia brought. Even a medical training camp, Camp Greenleaf, experienced high influenza and pneumonia mortality rates. A virulent virus might still overwhelm medical systems. Where plans fail, the ability to adapt rapidly will be vital. Overconfidence must be kept in check. As DoD's plan predicts, "Any effective response [to a severe pandemic] will require the full participation of all levels of government and the private sector."⁴³

At 100-years-old, the Spanish flu is already a distant memory. Hardly anyone alive today has personal memories of it. And yet, the 1918–1919 influenza-pneumonia pandemic holds clues to a situation we may again have to face—and reminds us that the flu must be taken seriously. Soldiers may once again be on the front lines fighting against influenza and its allies like pneumonia.

ABOUT THE AUTHOR

Kathleen M. Fargey has a master's degree in public history from Wright State University. She previously worked for the U.S. Holocaust Memorial Museum and the Office of the Federal Register and has been with the Force Structure and Unit History Division of the U.S. Army Center of Military History for

over twelve years, specializing in the lineages and history of quartermaster, support, and ordnance/maintenance units. She has also researched and written about Civil War medicine and African American units of World War II.

NOTES

1. "Epidemic Influenza at Camp Greenleaf, Georgia," *Essays on Military Hygiene, 1917–1919*, Records of the Office of the Surgeon General (Army), U.S. Army Continental Commands, 1817–147, Record Group 393, National Archives and Records Administration, Washington, D.C., p. 17.

2. Joseph E. Persico, "World War I: Wasted Lives on Armistice Day," *MHQ: The Quarterly Journal of Military History*, 17, no. 2, Winter 2005, HistoryNet, 12 Jun 2006 accessed 11 Dec 2018, <http://www.historynet.com/world-war-i-wasted-lives-on-armistice-day.htm>; Alan Sharp, "The Paris Peace Conference and Its Consequences," 1914–1918 Online: International Encyclopedia of the First World War, 8 Oct 2014, accessed 10 Dec 2018, https://encyclopedia.1914-1918-online.net/article/the_paris_peace_conference_and_its_consequences; Richard Frucht, *Eastern Europe: Introduction to the People, Lands, and Culture*, Volume 1 (Santa Barbara, Calif.: ABC Clío, 2005), pp. 24–25; Conor Mulvagh, "Irish Home Rule," 1914–1918 Online: International Encyclopedia of the First World War, 12 May 2016, accessed 10 Dec 2018, https://encyclopedia.1914-1918-online.net/article/irish_home_rule#GlossaryTerm_Irish_Home_Rule; "The Civil War 1922–1923," Óglaigh na hÉireann/Defence Forces Ireland, accessed 10 Dec 2018; <http://www.military.ie/info-centre/defence-forces-history/the-civil-war-1922-1923/>; and Alexandre Sumpf, "Russian Civil War," 1914–1918 Online: International Encyclopedia of the First World War, 8 Oct 2014, accessed 10 Dec 2018, https://encyclopedia.1914-1918-online.net/article/russian_civil_war.

3. Lynette Iezzoni, *Influenza 1918: The Worst Epidemic in American History* (New York: TV Books, 1999), pp. 190–91; and John M. Barry, "How the Horrific 1918 Flu Spread Across America," *Smithsonian Magazine*, Nov 2017, Smithsonian.com, accessed 10 Dec 2018, <https://www.smithsonianmag.com/history/journal-plague-year-180965222/>.

4. "The U.S. Army in World War I Fact Sheet," U.S. Army Center of Military History (CMH), accessed 11 Dec 2018, http://www.history.army.mil/html/bookshelves/resmat/wwi/_documents/WWI_Fact_Sheet.pdf; Carol

R. Byerly, "The U.S. Military and the Influenza Pandemic of 1918–1919," *Public Health Reports* 125, Suppl 3, (2010): 82–91; Maj Jonathan H. Jaffin, "Medical Support for the American Expeditionary Forces in France During the First World War" (Master's thesis, U.S. Army Command and General Staff College [CGSC], 1990), pp. 59–60; Maj. Milton W. Hall, "Inflammatory Diseases of the Respiratory Tract (Bronchitis, Influenza, Bronchopneumonia, Lobar Pneumonia)" in *Communicable and Other Diseases*, Vol IX, The Medical Department of the United States Army in the World War (Washington, D.C.: Government Printing Office [GPO], 1928), p. 90; *Annual Reports of the Navy Department for the Fiscal Year 1919* (Washington, D.C.: GPO, 1920), p. 2447; Molly Billings, "The 1918 Influenza Pandemic," University of Stanford, Feb 2005, accessed 11 Dec 2018, <https://virus.stanford.edu/uda/>; "The Deadly Virus: The Influenza Epidemic of 1918," National Archives and Records Administration, accessed 11 Dec 2018, <https://www.archives.gov/exhibits/influenza-epidemic/>; Jeffrey K. Taubenberger and David M. Morens, "1918 Influenza: The Mother of All Pandemics," *Emerging Infectious Diseases* 12, No. 1 (January 2006): 15–22; and Lauren Maloy, "Deciphering Death," *Heritage Gazette* (Congressional Cemetery newsletter) (Spring 2016): 10–11.

5. Iezzoni, *Influenza 1918*, p. 16; John M. Barry, "1918 Revisited: Lessons and Suggestions for Further Inquiry," in *The Threat of Pandemic Influenza: Are We Ready? Workshop Summary*, ed. S. L. Knobler, A. Mack, A. Mahmoud, and S. M. Lemon (Washington, D.C.: National Academies Press, 2005), National Center for Biotechnology Information, accessed 10 Dec 2018, <https://www.ncbi.nlm.nih.gov/books/NBK22148/>; Robin May, "Spanish Flu: Revisiting the World's Most Lethal Pandemic," University of Birmingham, 22 Nov 2018, accessed 10 Dec 2018, <https://www.birmingham.ac.uk/news/thebirminghambrief/items/2018/11/spanish-flu-revisiting-the-world%27s-most-lethal-pandemic.aspx>; Joseph H. Bryan and C. Norman Howard, "The Relation of the Ear and Accessory Sinus to the Recent Epidemic of Influenza as Observed at the Walter Reed General Hospital, Takoma Park, D.C.," *Transactions of the Section on Laryngology, Otology, and Rhinology of the American Medical Association* (Chicago: American Medical Association Press, 1919), pp. 105, 119; and Edward B. Dench, "Three Unusual Cases of Mastoiditis," *Transactions of the American Otological Society, Fifty Second Annual Meeting* Vol XV, Part I (New Bedford, Mass: Mercury Publishing Company, 1919), p. 136.

6. "Influenza Strikes," The Great Pandemic: The United States in 1918–1919, United States Department of Health and Human Services, accessed 29 Aug 2016, http://www.flu.gov/pandemic/history/1918/the_pandemic/influenza/index.html; Iezzoni, *Influenza 1918*, pp. 23, 25–26; Taubenberger and Morens, "1918 Influenza," pp. 15–22; and John M. Barry, "The Site of Origin of the 1918 Influenza Pandemic and Its Public Health Implications," *Journal of Translational Medicine* 2, No. 3 (2004): 1–2.
7. *Zone of the Interior: Territorial Departments; Tactical Divisions Organized in 1918; Posts, Camps, and Stations*, Order of Battle of the United States Land Forces in the World War, Vol 3, Part 2 (Washington, D.C.: CMH, 1988), pp. 834–37; *Report of the Surgeon General, U.S. Army, to the Secretary of War*, Vol I, (Washington, D.C.: GPO, 1919), p. 440.
8. *Report of the Surgeon General, U.S. Army, to the Secretary of War*, Vol II, (Washington, D.C.: GPO, 1919), pp. 755–56.
9. *Ibid.*; and *Report of the Surgeon General*, Vol I, pp. 450.
10. *Zone of the Interior: Territorial Departments; Tactical Divisions*, pp. 748–49.
11. *Report of the Surgeon General*, Vol II, pp. 774–76.
12. "Fort Meade History," The Official Homepage of Fort George G. Meade, Maryland, accessed 28 Aug 2016, www.ftmeade.army.mil/museum/history/history.html; Lt. Col. Frank W. Weed, *Military Hospitals in the United States*, The Medical Department of the United States Army in the World War, Vol V (Washington D.C.: GPO, 1923), p. 728; History document, Fort George G. Meade Press Center, accessed 28 Aug 2016, www.ftmeadepresscenter.com/external/content/document/6858/2480518/1/Fort%20Meade%20History%20-%20Extended%20Version.doc; Sharon Lynn Wigle, "Meade Former World War I Training Site," *Soundoff!*, 6 Nov 2008; and Maddie Ecker, "Celebrating History," *Soundoff!* 14 (13 April 2017): 10–11.
13. Weed, *Military Hospitals*, pp. 728–31; "The Influenza Epidemic at Camp Meade, October 1918," *The Woodstock Letters*, Vol. XLVIII, no. 1 (Woodstock, Md: Woodstock College Press, 1919), pp. 4–10, 15, 17; and John G. Knauer, *Complete History of the United States Army Base Hospital, Camp Meade, Md., October 1917 to June 1919*, pp. 1–2 and 4–13, copy in Historians files, CMH.
14. *Report of the Surgeon General*, Vol II, pp. 760–62; Maj. Albert S. Bowen, *Activities Concerning Mobilization Camps and Ports of Embarkation*, The Medical Department of the United States Army in the World War, Vol IV: (Washington, D.C.: U.S. GPO, 1928), p. 120; "Camp Takes Precautions to Forestall Influenza," *Camp Meade Herald*, 54 (27 Sep 1918): 1; *Report of the Surgeon General*, Vol I, pp. 458 (Table 219) and 462 (Table 221); Carol R. Byerly, *Fever of War: The Influenza Epidemic in the U.S. Army During World War I* (New York: New York University Press, 2005), p. 76 and 79–80.; Joseph F. Siler, *Communicable and Other Diseases*, The Medical Department of the United States Army in the World War, Vol IX (Washington, D.C.: U.S. GPO, 1928), p. 138; Knauer, *Complete History*, pp. 19 and 25; *Annals of the Congregation of the Mission: Letters from the Missionaries and Daughters of Charity* 235, no. 98 (Jan 1918), 546–47; "Flu' Outlook Less Serious at Meade," *Baltimore American*, 5 Oct 1918; "1,177 New Cases of 'Flu' Reported," *Baltimore Sun*, 5 Oct 1918; "Camp Meade Base Hospital Report," War Department Annual Reports, 1919: Report of the Surgeon General, Vol I, Part 2 (Washington, D.C.: GPO, 1919), pp. 761–62; "From St. Joseph's Hospital," *Baltimore Sun*, 4 Oct 1918; "UM SJMC History and Heritage," University of Maryland St. Joseph Medical Center, accessed 29 Nov 2017, <https://www.umms.org/sjmc/about-us/history-heritage>; "The Influenza Epidemic at Camp Meade," pp. 12–13; J. Whitridge Williams, "Report of the Dean of the Medical Faculty," *The Johns Hopkins University Circular*, 38, no. 10 (December 1919): 98; Frank J. Goodnow, "Annual Report to the President," *The Johns Hopkins University Circular*, 38, no. 10 (December 1919): 10; and "Baltimore, Maryland," *Influenza Encyclopedia*, accessed 29 Nov 2017, <https://www.influenzaarchive.org/cities/city-baltimore.html#>.
15. "Influenza Hits Boys at Camp Meade," *Harrisburg Patriot*, 24 Sep 1918; "Spanish Influenza at Camp Meade," *Harrisburg Patriot*, 25 Sep 1918; "500 Influenza Victims at Meade," *Philadelphia Inquirer*, 25 Sep 1918; "Camp Takes Precautions to Forestall Influenza," *Camp Meade Herald*, 27 Sep 1918; "Five Soldiers Die; All Had Influenza," *Baltimore American*, 27 Sep 1918; "Liars Active to Aid Bosche Propaganda," *Camp Meade Herald*, 1 Nov 1918; and "Poison Tongues: Out-Pouring of Lies is Old Stunt in New Guise," *The Caduceus*, 2 Nov 1918, p. 5.
16. "Camp Meade Division Surgeon's Report" in War Department Annual Reports, 1919, pp. 2152–53; *Report of the Surgeon General*, Vol I, pp. 458–59; "Meade Fills Ranks Depleted by Grip," *Washington Times*, 1 Oct 1918; and "Soldiers Dig Graves: Negro Contingent From Meade Buries 150 Bodies at Westport," *Baltimore Sun*, 27 Oct 1918.
17. Col. William N. Bispham, *Training*, The Medical Department of the United States Army in the World War, Vol VII (Washington, D.C.: GPO, 1927), pp. 17, 21, and 26; *Zone of the Interior: Territorial Departments; Tactical Divisions*, p. 825; and *Zone of the Interior: Organization and Activities of the War Department*, Order of Battle of the United States Land Forces in the World War, Vol 3, Part 1 (Washington, D.C.: CMH, 1988), pp. 269–70.
18. Victor C. Vaughan, "An Explosive Epidemic of Influential Disease at Fort Oglethorpe," *The Journal of Laboratory and Clinical Medicine* 3, no. 9 (June 1918): 560–61.
19. "Epidemic Influenza at Camp Greenleaf, Georgia," pp. 3–5, and 8; and Bispham, *Training*, pp. 17, 21, and 26.
20. William Barclay Parsons, *The American Engineers in France* (New York: D. Appleton, 1920), p. 94; *Reports of the Commander-in-Chief, Staff Sections and Services*, United States Army in the World War, 1917–1919, Vol 15 (Washington, D.C.: CMH, 1991), pp. 16, 40, 77, and 94; and Col. Joseph H. Ford, *Administration, American Expeditionary Forces*, The Medical Department of the United States Army in the World War, Vol II (Washington, D.C.: GPO, 1927), p. 768.
21. Ford, *Administration, American Expeditionary Forces*, p. 768.
22. J. Guènel, "Spanish Influenza in France from 1918–1919," *Histoire Des Sciences Médicales*, 38, no. 2 (April–June 2004): 165–75; Byerly, "The U.S. Military and the Influenza Pandemic" pp. 82–91; and Byerly, *Fever of War*, pp. 70–73.
23. Ford, *Administration, American Expeditionary Forces*, p. 768.
24. *Ibid.*; *Annual Report of the Surgeon-General, U.S. Army*, Part 3 (Washington, D.C.: GPO, 1920), pp. 3829–3830; *Annual Report of the Surgeon-General, U.S. Navy* (Washington, D.C.; GPO, 1918), p. 443.
25. *Annual Report of the Surgeon-General, U.S. Army*, Part 3, pp. 3831–32.
26. Ford, *Administration, American Expeditionary Forces*, p. 768; and *Annual Report of the Surgeon-General, U.S. Army*, Part 3, pp. 3829–30.
27. *Summary of World War York of the American Y.M.C.A.*, International Committee of the Young Men's Christian Association, privately distributed, 1920, pp. 231–32; and "Search ABMC Burials and Memorials," American Battle Monuments Commission, database, accessed 10 Dec 2018, <https://www.abmc.gov/database-search>.
28. Bowen, *Activities Concerning Mobilization*, p. 120; "Camp Meade Base Hospital Report," p. 761; *Report of the Surgeon General*, Vol I, pp. 458 (Table 219) and 462 (Table 221);

Byerly, *Fever of War*, pp. 76 and 79–80; and Siler, *Communicable and Other Diseases*, p. 138.

29. Byerly, “The U.S. Military and the Influenza Pandemic,” pp. 82–91; *Report of the Surgeon General*, Vol I, pp. 387, 397, 758, 767, 773, 774–76; “The 1918 Flu Epidemic Kills Thousands in New England,” *New England Historical Society*, accessed 13 Sep 2017, <http://www.newenglandhistoricalsociety.com/the-1918-flu-epidemic-kills-thousands-in-new-england/>; Bispham, *Training*, pp. 17, 21, and 26; *Report of the Surgeon General*, Vol II, pp. 755–56 and 774–76; *Report of the Surgeon General*, Vol I, pp. 450; and “Epidemic Influenza at Camp Greenleaf, Georgia,” pp. 3–5, and 8.

30. Maj. Albert G. Love, *Statistics, Medical and Casualty Statistics*, The Medical Department of the United States Army in the World War, Vol XV, Part 2 (Washington, D.C.: GPO, 1925), pp. 86–87, 96–97, 134–35, and 142–43. See also Jaffin, *Medical Support for the American Expeditionary Forces in France During the First World War*, pp. 59–60; and *Annual Report of the Surgeon-General, U.S. Army*, Part 3, p. 3831.

31. *Report of the Surgeon General*, Vol I, Table 221, p. 462; *Gold Star Honor Roll: A Record of Indiana Men and Women Who Died in the Service of the United States and the Allied Nations in the World War, 1914-1918* (Indianapolis: Indiana Historical Commission, 1921), p. 178; “Search ABMC Burials and Memorials,” accessed 10 Dec 2018, <https://www.abmc.gov/database-search/>; “Richard Bishop Alvord,” obituary, *Rochester Democrat and Chronicle*, 23 Mar 1919; “The Honored Dead,” *Pine Bluff Daily Graphic*, 13 Apr 1919; “Brigadier General J. Leslie Kincaid,” *Roll of Honor: Citizens of the State of New York Who Died While in the Service of the United States During the World War* (Albany, N.Y.: J. B. Lyon Company, 1922), p. 235; and “Paul Nowers is Dead,” *Topeka State Journal*, 4 Feb 1919.

32. “The Influenza Epidemic at Camp Meade,” p. 16.

33. “North Carolina Nurses Who Served in the Military,” *North Carolina Nursing History: Appalachian State University*, accessed 11 Dec 2018, <http://nursinghistory.appstate.edu/nc-military-nurses/>; “In the Nursing World: The Supreme Sacrifice,” *The Trained Nurse and Hospital Review*, LXI, no. 6 (December 1918): 376; and “Death in Marion of Mr. W. M. M’Nairy,” *Morgantown News-Herald*, 17 Apr 1919.

34. “200 Nurses Die in Army Influenza Wards,” *Minneapolis Star Tribune*, 28 Jan 1919; and “War Deaths Now 111,179,” *Baltimore Sun*, 30 Apr 1919.

35. “Only 36 Arrivals at Devens Sent to Hospital,” *Boston Globe*, 6 Apr 1919; “War Deaths Now 111,179;” “Letters from and About Soldiers,” *Hood River Glacier*, 24 Apr 1919; “New Sick in Army 5,679,” *Washington Post*, 7 May 1919; and “Bells and Whistles Greet Homecomers,” *Philadelphia Inquirer*, 21 May 1919.

36. “Private Haskell Mayo,” *Burlington Free Press*, 8 Apr 1919; “Bakersfield,” *St. Albans Weekly Messenger*, 10 Apr 1919; and “Mother Notified of Son’s Death on Transport *Rijdam* [sic],” *Harrisburg Telegraph*, 30 Apr 1919.

37. “First Woman Chosen,” *Cincinnati Enquirer*, 2 Aug 1919; and “The Time to Act,” *Green Bay Press-Gazette*, 30 Jun 1919.

38. “Dynasty: Influenza Virus in 1918 and Today,” news release, National Institutes of Health, 29 June 2009; Edwin D. Kilbourne, “Influenza Pandemics of the 20th Century” in *Emerging Infectious Diseases*, 12, no. 1 (January 2006): 9–14; Lt. Col. John Hodge and Dr. G. Dennis Shanks, “The Ability of Seasonal and Pandemic Influenza to Disrupt Military Operations,” *Journal of Military and Veterans’ Health*, 19, no. 4, (11 Oct 2018): 13–18; “The 2009 H1N1 Pandemic: Summary Highlights, April 2009–April 2010,” Centers for Disease Control and Prevention, 16 Jun 2010, accessed 11 Dec 2018, <https://www.cdc.gov/h1n1flu/cdcresponse.htm>; Peter J. Sebeny, et al, “Hotel Clinic-Based Diarrheal and Respiratory Disease Surveillance in U.S. Service Members Participating in Operation Bright Star in Egypt, 2009” *The American Journal of Tropical Medicine and Hygiene* 87, no. 2 (1 Aug 2012): 312–18; “Leading Causes of Death,” National Center for Health Statistics, Centers for Disease Control and Prevention, 17 Mar 2017, accessed 11 Dec 2018, <http://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>; Ben McPartland, “What You Need to Know About the Deadly Flu Epidemic in France,” *The Local fr*, 11 Jan 2017, accessed 11 Dec 2018, <https://www.thelocal.fr/20170111/what-you-need-to-know-about-the-deadly-flu-epidemic-in-france>; and Adam Baidawi, “Why Australia Wasn’t Prepared for a Dangerous Flu Season,” *New York Times*, 19 Sep 2017.

39. “Estimating Seasonal Influenza-Associated Deaths in the United States,” Centers for Disease Control and Prevention, 29 Jan 2018, accessed 10 Dec 2018, https://www.cdc.gov/flu/about/disease/us_flu-related_deaths.htm; and “National Press Conference Kicks Off 2018-2019 Flu Vaccination Campaign,” Centers for Disease Control and Prevention, 27 Sep 2018, accessed 11 Dec 2018, <https://www.cdc.gov/flu/spotlights/press-conference-2018-19.htm>.

40. “Avian Influenza A (H7N9) Virus,” World Health Organization, accessed 11 Dec 2018, <http://www.who.int/influenza/>

<http://www.who.int/influenza/> human_animal_interface/influenza_h7n9/en/; Donald G. McNeil Jr., “Bird Flu Is Spreading in Asia, Experts (Quietly) Warn,” *New York Times*, 17 Nov 2017; Dr. David M. Morens, “Epidemics Past and Present: Causes, Responses and Human Impact,” public presentation for the Smithsonian Institution, Washington D.C., 17 May 2017; Melissa A. Rolfes, et al., “Estimated Influenza Illnesses, Medical Visits, Hospitalizations, and Deaths Averted by Vaccination in the United States,” Centers for Disease Control and Prevention, 19 Apr 2017, accessed 11 Dec 2018, <https://www.cdc.gov/flu/about/disease/2015-16.htm>; and “Department of Defense (DoD) Implementation Plan for Pandemic Influenza,” Office of the Assistant Secretary of Defense, Homeland Defense, Aug 2006, pp. 8, 26, accessed 11 Dec 2018, <https://www.hsdl.org/?view&did=473250>.

41. Morens, “Epidemics Past and Present.”

42. DoD Implementation Plan, p. 77; Kevin Downey, “Pacific Medical Team Prepares Northern Marianas for Bird Flu,” U.S. Army, 11 Jun 2008, accessed 10 Jan 2019; Sfc. Jason Shepherd, “Avian Influenza Epidemic Played Out During Exercise ‘Lightning Rescue 08,’” U.S. Army, 25 July 2008, accessed 11 Dec 2018, https://www.army.mil/article/11252/avian_influenza_epidemic_played_out_during_exercise_lightning_rescue_08; Sfc. Jason Shepherd, “USARPAC’s Joint Task Force Homeland Defense Joins Interagency Partners for Lightning Rescue 09,” U.S. Army, 30 Jul 2009, accessed 11 Dec 2018, https://www.army.mil/article/25258/usarpacs_joint_task_force_homeland_defense_joins_interagency_partners_for_lightning_rescue_09; S.Sgt. Crista Yazzie, “Flu Shots,” U.S. Army, 24 Oct 2008, accessed 10 Jan 2019, https://www.army.mil/article/13622/flu_shots; Pacific Regional Medical Command, “Mass Flu Exercise Brings Services Together,” U.S. Army, 27 Sep 2012, accessed 10 Jan 2019; Thomas Peske, “Crane Army Participates in Pandemic Flu Exercise,” U.S. Army, 29 Sep 2008, accessed 11 Dec 2018, https://www.army.mil/article/12801/crane_army_participates_in_pandemic_flu_exercise; Susanne Kappler, “Battling the Bug: No Cases of H1N1 Yet, But Post Is Ready,” U.S. Army, 7 May 2009, accessed 11 Dec 2018, https://www.army.mil/article/20703/battling_the_bug_no_cases_of_h1n1_yet_but_post_is_ready; and Michael K. Beaton, “BMEDDAC Hohenfels Health Clinic Hosts Pandemic Exercise,” 24 Oct 2016, accessed 11 Dec 2018, https://www.army.mil/article/177197/bmeddac_hohenfels_health_clinic_hosts_pandemic_exercise.

43. DoD Implementation Plan, pp. 5, 8, 16, 24, 29, and 73.

