

*A Forgotten Enemy: PHS's Fight Against the 1918 Influenza Pandemic*  
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In the midst of World War I, many of America's newspapers were reporting that the Germans had spread a highly infectious and contagious disease through Bayer aspirin tablets. B. R. Hart, director of New York City's Food and Drug Inspection Station, called on the US Public Health Service Hygienic Laboratory to examine 200 tablets of aspirin imported from Germany to determine if they contained "organisms...responsible for the spread of Spanish Influenza." (Because Spain was not a belligerent in the war, reports of morbidity and mortality were not censored; the disease acquired this name due to the large number of cases reported from Spain.) The evidence failed to link the Germans to this form of biological warfare, and the rumors quickly dissipated.

Yet the hysteria over influenza was not entirely unwarranted. In late September 1918, with the war raging in Europe, localized outbreaks began to be reported on the East Coast. During the next four months, this common viral infection developed into a deadly global pandemic spreading to all parts of the United States and the world. All told, the 1918 pandemic claimed the lives of more than 550,000 Americans and more than 21 million lives world-wide, greatly superseding the 50,000 US and 4.9 million overall war-related fatalities.

During the war, the US Public Health Service (PHS) played an important role in safeguarding the nation's health. Surgeon General Rupert Blue, a North Carolina native who served in the post from 1912 to 1920, expanded many of PHS's responsibilities and duties as wartime demands required additional medical personnel and funding. PHS's responsibilities included safeguarding the health of personnel at military camps, improving the working conditions for industrial workers, and initiating a vigorous anti-venereal disease campaign at home and abroad. With society's and PHS's attention focused on wartime efforts, a small and seemingly innocuous biological foe managed to gain a foothold on the North American continent. PHS responded to the developing influenza pandemic, at least initially, in a routine and casual manner. Blue issued a series of precautions to safeguard against the "flu" on September 13, declaring that "in most cases, a person taken with 'Spanish influenza' feels sick rather suddenly. He feels weak, has pains in his eyes, head, or back, abdomen, etc., and may be sore all over." Although such warnings were typical for influenza, the 1918 strain proved to be something entirely different from expectations.

In a single week in October, 4500 died in Philadelphia and 3200 died in Chicago. Surgeon General Blue reacted to the growing public health crisis by embarking on a four-part strategy. First, and foremost, state and municipal public health departments were urged to report weekly if not daily on their local conditions. The telegraph and the weekly Public Health Reports became essential tools to help PHS obtain the latest news concerning the pandemic's development.

Second, six million pamphlets warning people of the *Spanish Influenza*, the *Three Day Fever*, and *The Flu* were produced and circulated through local health departments. Posters, distributed widely with the aid of the Post Office Department, the Federal Railroad Administration, and the Red Cross, sought to educate the general public and medical community of the dangers of influenza. Alfred Crosby, in his 1989 history of the event, *America's Forgotten Pandemic*, states that "if influenza could have been smothered by paper, many lives would have been saved in 1918."

Third, an influenza director appointed to each state coordinated local disbursement of funds. In most cases, PHS appointed the state's chief health officer to direct the movement of physicians and nurses to more severely affected areas. Last, Blue called on the Volunteer Medical Service Corps (VMSC)---a backup of volunteers for PHS---to submit lists of doctors available for influenza work. More than 600 physicians volunteered and became Acting Assistant Surgeons with a monthly stipend of \$200, plus \$4 per diem.

This hastily constructed health force needed a large infusion of money, and in late September, Senator John Weeks of Massachusetts called for an appropriation of one million dollars to “combat and suppress Spanish influenza.” The measure passed in both houses of Congress without a single dissenting vote. Blue remarked that the appropriation would hopefully establish “an important precedent” for future funding and show not only the importance of PHS but also the “importance of protecting the health of all Americans at all times.”

With the funds and organizational machinery in place, Blue issued an order on October 5 to state and local health officials to close or suspend all places of public activity. Across America, health departments followed the Surgeon General's order and closed schools, churches, saloons, theaters, and most places of public assembly. Many local health departments required citizens to wear flu masks in public while city councils enforced ancient anti-spitting ordinances. The fight against influenza permeated every aspect of life, even infiltrating children's songs.

*I had a little bird  
And its name was Enza  
I opened the window  
And in-flew-Enza.*

As October wore on and the death toll increased, Blue established a network of emergency hospitals and a national system of emergency soup kitchens. Throughout the pandemic, PHS appointed 64 commissioned officers solely for influenza duty and employed 1085 doctors and 73 nurses. In addition to providing desperately needed physicians and nurses to various locales, PHS also conducted experiments in the hopes of developing a vaccine. Incarcerated soldiers quarantined at Boston and San Francisco volunteered as subjects in a series of trials aimed at studying the effects of influenza. The volunteers were repeatedly exposed to hospital patients exhibiting influenza-like symptoms in an attempt to make them contract the disease - Although the 118 men failed to develop influenza, they all received full pardons in recognition of their participation.

### **Assessing the Toll**

As the number of new cases diminished in November and early December, PHS began assessing and tabulating influenza's terrible toll across America. W.H. Frost, a PHS Surgeon and statistician, and a team of inspectors conducted door-to-door surveys in ten US cities and towns to calculate morbidity and mortality. Their findings, although based on a relatively small sample, were the first to uncover the virus's unique tendency to strike the 20-40 age group. This age category, typically the strongest and healthiest segment of the population, sustained an extremely high number of deaths that modern epidemiologists have not been able to explain.

Subsequent studies conducted by Edgar Sydenstricker and Selwyn Collins, statisticians with PHS, helped establish the US death count of 550,000 and the 21 million count worldwide.

These figures, as Crosby points out, probably underestimate the actual number of deaths due to poor reporting and inaccurate diagnoses.

The pandemic exposed the need for a stronger and expanded federal role in safeguarding the nation's health. "The present epidemic has demonstrated," according to the Surgeon General, "the imperative need of a permanent organization, within the Public Health Service, available with each emergency." Blue proposed a comprehensive health program in which national health functions would be centralized within PHS. The goal was to foster a healthy working relationship between federal and state agencies to nurture a "Cooperative administrations for future interactions."

Despite high mortality rates and the need for increased appropriations, the 1918 pandemic faded to stimulate extensive influenza research or a dramatic increase in permanent funds for PHS. Aside from the emergency funding, Congress made no other special appropriations, and the survivors and victims of influenza had no monuments erected on their behalf. Blue's appeal

for a permanent mechanism to prevent and control diseases such as influenza was quickly forgotten as postwar America sought to heal its war wounds and seek a return to "normalcy."

## **Conclusions**

PHS's involvement in the fight against influenza saved many lives and brought together various state, local, and federal health organizations in a cooperative effort. The severity and extent of the pandemic showed PHS officials, including Surgeon General Blue, the need for a centralized public health agency to coordinate large-scale efforts in preventing and eradicating disease. Although influenza claimed a far greater number of victims, the pandemic and PHS's efforts were over-shadowed by the war.

Today, efforts are underway to isolate and sequence influenza genes taken from soldiers who died in 1918. Pathologist Jeffery Taubenberger and molecular biologist Ann Reid hope to isolate ancient viral RNA removed from lung samples stored at the Armed Forces Institute of Pathology in Washington, DC. Understanding the 1918 strain may not only unlock some of the secrets behind influenza but also help researchers and health officials better prepare for the next great pandemic.

This essay was published in *Public Health Reports*, volume 114, November/December, 1999, p. 559-561.

## **Suggested Reading:**

1. Barry, JM, *The Great Influenza: The Epic Story of the Deadliest Plague in History*, New York: Viking, 2004.
2. Crosby, A, *America's Forgotten Pandemic: The Influenza of 1918*. Cambridge: Cambridge University Press. 1989.
3. Taubenberger, J. Reid AH, Krafft AE, Bijwaard KE, Fanning TG, "Initial genetic characterization of the 1918 -Spanish influenza virus." *Science* 1997,275:1793-6

References