

Pathology

A discussion of the virology (various strains, mutation tendencies, and symptoms) of the flu and the human body's immune response to the virus is beyond the scope of this article. The vast majority of those infected by the 1918 H1N1 virus eventually recovered; however, when the virus did kill, it killed via three modes. First, the viral flu alone was capable of rapidly devouring enough lung cells to block the flow of oxygen, possibly resulting in death within hours. Second, the H1N1 strain could cause Acute Respiratory Distress Syndrome (ARDS) (also known as viral pneumonia), possibly resulting in the brutal death of the host over a span of two to four days. Third, as is often still the case, the flu may have been accompanied by bacterial pneumonia; most of these victims were probably killed via secondary complications within two to three weeks.

The most germane mode of death for military populations involves the development of ARDS. When the flu virus arrives in the lungs, white blood cells attack en masse, emitting proteins called *cytokines*, which raise the body's temperature and stimulate the marrow to produce more white blood cells (hence, the fever and aching bones associated with the common flu). If the immune system is unable to defeat the virus before it gains a firm foothold in the epithelial cells of the lungs, white blood cells continue to swarm, creating a "cytokine storm," which has a toxic effect on the alveoli and capillaries. This, in turn, compromises the lung's ability to exchange oxygen. Eventually, the virtual burning of lung tissue causes ARDS, which leads to rapid, irreversible organ decay and death. With the H1N1 strain, the more robust the immune system, the greater the cytokine storm and the more likely the disease will result in a fatality. This explains why otherwise healthy individuals ranging from 15 to 45 years of age are targeted by the H1N1 virus and why IET units face exceptional risks during H1N1 epidemics (see Figure 2).

The Cure

No cure for the flu has ever been found. Dr. George Soper, the chief 1918 influenza investigator at the time (and later director of the American Cancer Society), concluded that the only effective measure against the flu in Army camps was the isolation of individual victims or entire commands. He explained that these efforts "failed when and where they were carelessly applied," and that they "did some good when rigidly carried out." According to Soper, nothing else changed the destructive course of the disease—except its own natural attenuation over time. Therefore, it was leadership

that made the difference in how an organization handled the flu epidemic. Leaders could heed medical warnings and take appropriate action, or they could treat disease prevention and response as though they were someone else's mission.

U.S. Army Training and Doctrine (TRADOC) Regulation 350-6 prudently indicates that the primary responsibility for preventing communicable diseases in the IET community rests with the individual. Good personal hygiene habits and deliberate sanitization absolutely reduce the survivability of viruses that are typically passed via water droplets and can remain on hard surfaces for several days. However, IET leaders must provide Soldiers with appropriate instruction and enforce the thorough cleansing of linens and living environments. Ultimately, IET leaders must thoughtfully consider all potential illness transmission hazards within their span of influence and accept ownership of preventive medicine as an essential aspect of their mission. 

Endnotes:

¹John M. Barry, *The Great Influenza: The Epic Story of the Deadliest Plague in History*, Penguin Group, New York, 2005.

²This statement was made based on data that was available in 2005.

Reference:

TRADOC Regulation 350-6, *Enlisted Initial-Entry Training Policies and Administration*, 1 July 2009.

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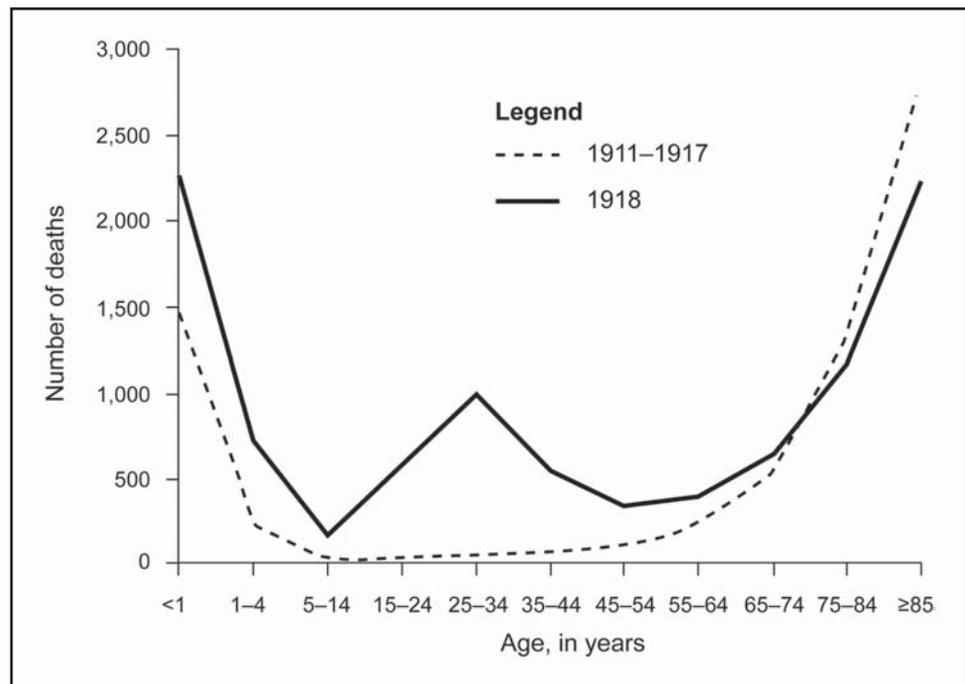


Figure 2. Flu-related death rates according to age