Reconstructed 1918 influenza virus has yielded key insights, scientists say

September 11 2012

The genetic sequencing and reconstruction of the 1918 influenza virus that killed 50 million people worldwide have advanced scientists' understanding of influenza biology and yielded important information on how to prevent and control future pandemics, according to a new commentary by scientists at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, and several other institutions.

By sequencing the 1918 virus, researchers were able to confirm that the viruses that caused influenza pandemics in 1957, 1968, and 2009 were all descended in part from the 1918 virus. Studies showed that the 2009 pandemic virus had structural similarities with the 1918 virus and explained why younger people, who had never been exposed to the 1918 virus or its early descendants, were most vulnerable to infection by the 2009 influenza virus. As a result, public health officials were able to target limited vaccine supplies to predominantly younger people, who needed vaccine protection most, rather than the elderly, who were at lower risk of infection in 2009, but are traditionally the most important target group for vaccination. Further, determining the physical structure of parts of the 1918 virus, particularly the portions that are consistent across influenza viruses, has informed the ongoing development of candidate "universal" influenza vaccines that may be given infrequently yet protect broadly against multiple influenza viruses. In addition, by comparing the 1918 virus to related influenza viruses found in animals, scientists have learned some of the changes necessary for influenza viruses to adapt from an animal to a human host. This has led to more

targeted surveillance of certain influenza viruses in animals that may be more likely to move to humans.

More generally, the authors say that reconstruction of the 1918 influenza virus has furthered scientific understanding of how novel influenza viruses emerge and evolve. Additionally, study of the 1918 influenza virus has helped clarify the critical effects of the human immune system's response to viral infection and the importance of bacterial co-infections that often follow the influenza infection. In sum, the authors write, learning more about the 1918 pandemic influenza virus has led to important insights that could help prevent or mitigate seasonal and pandemic influenza.

More information: JK Taubenberger et al. Reconstruction of the 1918 influenza virus: Unexpected rewards from the past. *mBio* DOI: 10.1128/mBio.00201-12 (2012).

Provided by NIH/National Institute of Allergy and Infectious Diseases