

James L. Holly, M.D.

Influenza Pandemics Part II: Assumptions in the HHS Plan for Dealing with a Pandemic By James L. Holly, MD Your Life Your Health *The Examiner* April 13, 2006

There have been three influenza pandemics, i.e., world-wide spread, in the last 100 years: 1918 in which 40-50 million people died, 1957 and 1968. The Health and Human Services planning is based on the following ten assumptions about a pandemic. After the identification of each assumption, a comment is offered to further explain the importance of the assumption.

1. Susceptibility to the pandemic influenza subtype will be universal.

Comment: Because the “novel” – new – influenza virus will have different hemagglutinin (H) and neuraminidase (N) proteins on the virus surface (for an explanation of this see *The Examiner*, April 6, 2006), the human immune system will not “recognize” these viruses and they will be allowed to grow. In that very few human beings will be immune, all will be susceptible. If the current bird flu virus develops the ability to spread from human to human, which it presently does not have the ability to do in significant numbers, then a pandemic will occur. There is no guarantee, however, that human-to-human transmission will develop.

2. The Clinical disease attack rate will be 30% in the overall population; illness rates will be highest among school-aged children (about 40%) and declined with age. Among working adults, an average of 20% will become ill during a community outbreak.

Comment: This is speculation. Different influenza pandemics have affected different populations, but it is suspected that these populations will be the most significantly affected.

3. Of those who become ill with influenza, 50% will seek outpatient medical care.

Comment: Because of the potential of secondary infections, the sooner the presence of the flu is recognized and the sooner primary treatment is initiated, the less likely it is for a person to develop complications. The primary treatment is isolation from others, hydration, rest, control of fever and observation for secondary infections which will require treatment. The antiviral medications currently available may or may not be of significant benefit.

4. The number of hospitalizations and deaths will depend on the virulence of the pandemic virus. Estimates differ about 10-fold between more and less severe scenarios. Because of the virulence of the influenza virus that cause the next pandemic cannot be predicted.

Comment: Virulence is the ability of a microorganism to cause disease. Virulence and pathogenicity are often used interchangeably, but virulence may also be used to indicate the degree of pathogenicity. Infectious diseases are caused by bacteria, fungi, protozoa, viruses, and larger parasites. Scientific understanding of the underlying mechanisms of virulence has increased rapidly due to the application of the techniques of biochemistry, genetics, molecular biology, and immunology. Bacterial virulence is better understood than that of other infectious agents.

5. Acute and fatal infections cannot be predicted with certainty. During annual fall and winter influenza season, infants and the elderly, persons with chronic illnesses and pregnant women are usually at higher risk of complications from influenza infections. In contrast, in the 1918 pandemic, most deaths occurred among young, previously healthy adults.
6. The typical incubation period (the time between acquiring the infection until becoming ill), for influenza averages 2 days.
7. Persons who become ill may shed virus and can transmit infection for one-half to one day before the onset of illness. Viral shedding and the risk of transmission will be greatest during the first 2 days of illness. Children will shed the greatest amount of viruses and therefore are likely to pose the greatest risk for transmission.

Comment: From a public health and a personal concern viewpoint, this fact causes the most problems. The sequence of events is: you are exposed to the virus; the virus grows in your body; you develop the illness; you can spread the illness; you become aware that you have the illness. The pandemic is caused by delay in the time between the onset of the illness and the recognition of the illnesses. If you are going to be protected from the illness, you must isolate yourself from anyone who potentially has the illness, be immunized with an effective vaccine, and/or start on effective antiviral medication before coming into contact with a person with the illness.

Logistically, all of these present problems. We do not presently have effective vaccines. We do not know if the medications we have are effective. It is impossible to isolate large populations for long periods of time. It is possible for individuals to limit their exposure to those who are or who may be infected.

8. On average about 2 secondary infections will occur as a result of transmission from someone who is ill. Some estimates from past pandemics have been higher, with up to about 3 secondary infections per primary case.

Comment: The occurrence of secondary infections and particularly life-threatening ones are predictable by the general health and condition of an individual. Included in this assessment will be their patient's hydration, nutrition, cardiovascular condition, presence of other illnesses and habits such as tobacco use. It is possible to increase one's "immune strength" by diet including increasing fresh vegetables and fruit intake, hydration, exercise, weight management, avoiding tobacco smoke, decreasing or eliminating alcohol use.

9. In an affected community, a pandemic outbreak will last about 6-8 weeks. At least two pandemic disease waves are likely. Following the pandemic, the new viral subtype is likely to continue circulating and to contribute to seasonal influenza.

Comments: If a pandemic outbreak occurs, public health initiatives will be executed including guaranteeing those who have the illness, vaccinating those who are at highest risk, including healthcare workers, and limiting public exposure by changing school and work habits.

10. The seasonality of a pandemic cannot be predicted with certainty. The largest waves in the U.S. during 20th Century [pandemics occurred in the fall and winter. Experience from the 1957 pandemic may be instructive in that the first U.S. Cases occurred in June but no community outbreaks occurred until August and the first wave of illness peaked in October.

Next week, we will discuss in more detail what you can do to protect your family and yourself in case of a pandemic. Remember, it is your life and it is your health, which means that ultimately it is your responsibility.