SHOULD THE US DEVELOP AND STOCKPILE VACCINES AGAINST A(H5N1) AVIAN FLU?

When first reading this question, one’s instinct is of course to say yes! This would be a natural response to protect oneself from disease and possible death. But one must also look deeper into the question to realize the major implications and impossibilities that it offers to the population of the US.

The possibility of a pandemic is not new to the US. There have been several pandemics over the past 100 years with some having more deadly results than others. The first pandemic took place in 1918 and was known as the Spanish Flu. It spread quickly throughout the world with deadly results. The second pandemic occurred in 1957 with the onset of the Asian flu. Scientific technology was more advanced and the US was quickly able to identify the virus, manufacture a limited supply of vaccine and administer it to the population. The last pandemic was the 1968 Hong Kong flu, which compared to the other pandemics was considered to be the mildest. Today, the new possible pandemic is the avian flu virus or A(H5N1). What is unique about this virus is its ability to jump directly from poultry to humans. Most flu viruses move from poultry to swine to humans. This is the first known virus to jump directly to humans. With each pandemic, scientists and governments have become more efficient at handling the outbreaks due to increased scientific technology and worldwide communication. Armed with more sophisticated knowledge and equipment, the US should stockpile a vaccine for the avian flu.
One question is who will receive the flu vaccine? Companies that would manufacture the avian flu vaccine are currently busy making the flu vaccine for the upcoming season.

Is it realistic to think that these companies could manufacture enough vaccine for this particular avian flu for every man, woman and child in the US? It seems impossible that this could occur especially when you think about the cost that is involved. The plants would manufacture the vaccine but would anyone be able to afford the vaccination because of the cost? How helpful would that be to the population? So now, who does receive the vaccine? These will be tough questions to answer just on an ethical basis alone. Health care workers would receive the vaccine first because they are our first line of defense so to speak. But after that who? Government officials? The upper class? Children or the elderly? These are some tough questions that need to be addressed before a possible pandemic occurs.

The next thought is what type of vaccine should be stockpiled? The vaccine that is being manufactured presently is for the A(H5N1) virus. In order for this vaccine to be effective, it needs to be administered in large doses. Larger doses per person translate into fewer humans being vaccinated. What if the virus mutates? Would this vaccine still be effective in preventing humans from getting sick and spreading the virus? The virus at the moment is not transmissible from human to human. One can only “catch” the virus through the killing, skinning and butchering process of the poultry, in other words, handling the raw meat (Grady et al. 2006). Once the meat is cooked properly, there is no danger of being infected. A problem arises when a human is infected with the avian flu virus and within their system there is the presence of another flu virus that is easily transmitted to other humans. If the avian flu virus and another strain of flu virus, which
is communicable, operate in the same cell and exchange genetic material, a mutation may take place. This could result in a new strain of avian flu that is now transmissible to other humans. If this should occur, then the chance of a pandemic becomes a real possibility. The need to vaccinate people becomes a viable solution but what if the vaccine stockpiled is ineffective in treating this new strain? Scientists are not sure which strain of avian flu may cause a pandemic and there could be several strains. This would mean that a vaccine must offer cross protection for a variety of strains. In their research, scientists have discovered that using an adjuvant (Mackenzie, 2006) in conjunction with the vaccine will help boost the immune system’s response to the virus and its possible strains. There is one problem when using an adjuvant; it can be very toxic in humans when injected into the bloodstream. Through several trials, scientists have found that using a patch containing the adjuvant on the injection site lowers the toxicity and is more efficient in bolstering the immune system. This offers a two-fold solution to the problem. One could lower the amount of the vaccine needed per person, thereby stretching out the supply to vaccinate more people. Secondly, by using an adjuvant, it increases the possibility of cross protection.

Another avenue that scientists are looking at is DNA. Scientists are looking at the proteins within a virus in the hopes of developing a DNA vaccine that would replicate a protein to fight the virus (Mackenzie, 2006). This vaccine would not be administered like the other vaccines. It would be injected directly into the immune cells where it would activate the immune system. If researchers could develop a DNA vaccine, it would be easier and faster to manufacture than other vaccines. This would allow more people to be vaccinated and more lives to be saved. There is also some evidence that a DNA vaccine
would offer cross protection to other strains of the flu virus. If this were the case, then the chances of any type of flu being transmitted human to human would decrease. Looking at what would happen if we do not stockpile an avian flu vaccine seems more frightening than not. There is a possibility that the avian flu virus will not mutate and therefore not become communicable among humans, but do we want to take the chance of this happening? Not stockpiling a vaccine would leave a few undesirable problems. One problem would be the necessity of imposing traveling restrictions on the citizens of the US, limiting travel outside the US. It would also mandate that citizens from other countries would not be allowed to enter the US unless they proved that they are not a carrier of the virus. This would incur a major financial loss for individual businesses, counties and/or states. Another problem is migratory birds. One cannot realistically stop or limit the number of migratory birds that enter the US and may be carriers. The last problem is maintaining a supply of the two drugs that are used to effectively treat the virus only in the early stages, Tamiflu and Relenza (Grady et al. 2006). Lastly, with no vaccine in place, the major loss of life that would occur would border on criminal. It would appear that the option of stockpiling a vaccine would be in the best interest of the US. Being prepared for what may occur in the future speaks to the responsibility of a government to keep its citizens safe and protected. Therefore it is necessary to continue the research into developing a vaccine that is quick to manufacture, offers cross protection and is available to the people of the US. Time seems to be running out and scientists are working frantically to stay one step ahead of the virus, trying to predict what will happen next and prevent a pandemic from occurring. The key is to keep
working at a viable solution that would allow the population of the US the opportunity to be vaccinated against the avian flu and the possible strains, which may arise.