The question has been posed “Should the United States develop and stockpile vaccines against the avian flu?” There is no simple yes or no answer to this question. Unlike the ordinary seasonal flu, the avian flu is much more deadly. According to the CDC, the epidemic threshold for seasonal flu and pneumonia is that it comprises a mere 8 percent of all reported deaths (1). Many of those who die are elderly, very young, or those with compromised immune systems. The avian flu, however, is very deadly. It has killed over half of those who have contracted the virus, and most of those infected were healthy individuals (2). Yet even this statistic is in question. Only approximately 200 people have contracted the disease. Contrast this with the millions of seasonal flu cases per year. Very few autopsies have been conducted to determine the exact cause of death, so precisely how the avian flu kills is not conclusive. Pneumonia is the chief cause of death. There is also a possibility that some individuals have become only slightly sick with bird flu and not been counted as part of the statistics, making the actual percentage of lethality lower than the 50% stated above. Looking at the deadliness of this virus, even though the actual numbers so far have been small, it would be easy to say “yes” a vaccine should be developed and stockpiled. However, several very meaningful factors stand in the way. Disagreement over the possibility/probability of a bird flu pandemic, availability of the vaccine and its efficacy all must be considered before the stockpiling question is answerable.

Some researchers doubt that a bird flu pandemic will happen. The virus has been detected for at least ten years, and it has yet to shift to a form that will allow human-to-
human transmission. Yet the virus is changing. It now affects more species of birds, especially migrating species. This has allowed the virus to cross countries and increase the possibility of contact with humans. If a transgenic shift were to occur between the A(H5N1) virus and a virus that does allow human-to-human transmission, the pandemic would be unleashed across the world, not just in one area or country. Many other researchers say the question is not if a pandemic will happen, but when. So we spend millions, or perhaps billions of dollars stockpiling vaccines, and the pandemic does not materialize. The government and taxpayers will have wasted millions of dollars. This very thing happened during the feared swine flu epidemic in 1976. Millions of dollars were spent developing and distributing a vaccine against the deadly swine flu. The epidemic never happened, and several people died from the vaccine itself. However, if the reverse scenario occurs and the government does very little stockpiling and a pandemic strikes, sickness occurs, national productivity decreases and death spreads throughout the U.S. Until researchers perfect the use of a crystal ball, there is no definitive answer as to whether or not a bird flu pandemic will occur.

The availability of a vaccine against the A(H5N1) virus must also be called into question. Most factories that could be used to produce a bird flu vaccine are busy manufacturing vaccines currently used to guard against seasonal flu. Already there are many shortages of the seasonal flu vaccine. Since the drug companies are using all of their production time to manufacture the needed, profitable, regular flu vaccine, they do not have the time or financial incentive to make any vaccine that might help prevent the spread of bird flu. Current U.S. stockpiles of avian flu vaccine are available for government and health workers. After that supply is depleted, who would be next in line
to receive the vaccine? The young? Old? Male or female? And would the limited vaccine be as effective on one group as on another? Studies on different age groups and the correlating immunity have not been done. With our national debt rising daily, where does the money come from to stockpile a possibly unnecessary vaccine? There are also differing views as to the amount of vaccine needed per person. Since humans have never been exposed to this particular virus, high concentrations have been needed to begin an immunity response. Using an adjuvant has helped increase the efficacy of a smaller amount of vaccine, but the U.S. still does not have nearly enough vaccine stockpiled to protect all, or even most, of its citizens. Drug companies do not have the production capabilities, and our budget surely does not have the needed funds. Yet can we afford not to find a way to manufacture more and make what we do have go farther, so that if a pandemic occurs, each of us will remain healthy?

Finally, the efficacy of any vaccine used to prevent a pandemic of avian flu must be considered before any future stockpiling begins. Since viruses mutate, any vaccine currently in production will not directly match the virus that causes a disease pandemic. The exact hemaglutinin or neuraminidase antigens in the virus causing the pandemic will most likely not match those that any current vaccine fully recognizes. Therefore, most research states that use of the current vaccine will only show limited results. There is no way to fully know the effectiveness of any current vaccine until the possible pandemic strikes. Waiting until then, however, may be too late. If the current vaccine was distributed along with antiviral drugs, the efficacy of the vaccine would increase. However, this would mean stockpiling these antiviral agents along with the vaccine. The amount of vaccine needed to fully protect each individual is also relatively unknown. The
amount of vaccine seen as needed to protect individuals against the avian flu is based on studies of vaccine titers needed to protect against ordinary seasonal flu. No one is certain whether these amounts will be the same. In addition, the titer deemed effective against seasonal flu has varying effects on the population. Some that have the correct titer still get sick. Some of those that have a lower titer do not. Alternatives such as a DNA vaccine are being explored. Although an immune response seems to be limited, it does have some promise. Even with the limited efficacy of the current vaccine, most researchers feel that it will provide at least some help in reducing the deadliness of any avian flu pandemic.

There is no doubt avian flu is a very serious, deadly disease. An exceedingly high mortality rate that seems to affect healthy individuals is a cause for grave concern. The A(H5N1) virus has yet to mutate into a human-to-human communicable virus. It may never. Current stockpiles of a vaccine in the U.S. are small. The availability of manufacturing plants to create more is limited. Finally, the ability of any current vaccine to minimize the spread of an avian flu pandemic is uncertain. So, should the United States develop and stockpile vaccines against the avian flu? In a perfect world, of course. To do nothing in the face of such a disease threat is irresponsible. Considering all of the other factors discussed above, the possibility that future stockpiling will occur is uncertain and calls into question whether or not that is the best course of action. Just as the “duck and cover” drills used in schools across the country during the 1950’s and 60’s provided the public with some sense of well being should a nuclear attack occur, providing the public with certain health guidelines should a bird flu pandemic occur may provide a sense of well being. The atomic bomb drills would have had limited efficacy
had an attack occurred, just as current stockpiles of vaccine against the avian flu may. Research into defensive maneuvers continued while these drills were practiced, just as research into new vaccines and preventative measures against the spread of a pandemic continue. Hopefully, just as the duck and cover drills became obsolete, so will the need to consider whether or not to stockpile a possibly inefficient vaccine against the avian flu. Future research is critical so that we may reach that milestone.

(1) [http://www.cdc.gov/flu/weekly/weeklyarchives2005-2006/weekly01.htm](http://www.cdc.gov/flu/weekly/weeklyarchives2005-2006/weekly01.htm)