Preventing an Avian Flu Pandemic

Consider a hypothetical new strain of the bird flu (H5N1++)
-- a mutated virus, particularly deadly and contagious, capable of being passed from human to human.

Antiviral drugs (e.g., Tamiflu) suppress the symptoms and thus reduce the probability of the disease being passed by those already infected to those still susceptible.
A vaccination, on the other hand, reduces the susceptibility of those not yet infected.
[Note that only experimental/unreliable vaccines are available as of right now.]
Both the vaccine and antiviral drugs reduce the probability of a death outcome for those infected.

1. Provide recommendations on the amount of antiviral drugs & vaccine that should be stockpiled to prevent an epidemic in USA.
2. As of right now, a total of 2.5 million doses of Tamiflu are currently on hand in the USA. It is estimated that limited amounts of a reliable vaccine will become available only 6 months after the first outbreak. Provide an estimate for I(t), the likely number of people infected as a function of time. Investigate the impact on I(t) of different quarantine policies.
3. The draft report of the federal government's emergency plan, obtained and examined by ABC News, predicts that as many as 200,000 Americans will die within a few months as a result of an avian flu outbreak. How conservative is this estimate?
4. Where should the stockpiles be stored within the country? Assume that each Storage Center can efficiently distribute vaccine and drugs to the people within 150 miles from it, and that those not covered by any Center incur an additional delay of 5 days in receiving all medicine. Given the geographic distribution of the US population, what is the minimal number of Centers needed to avoid the epidemic?