STANDARD DEVIATIONS: Is Your Dog a Canary?

Greetings,

Watchdogs of genetic adaptation are barking about the rise of canine influenza.

We normally think of birds, or swine, as prime "mixing vessels" for influenza, but the truth is, any host that can support dual infection has the potential to produce a "hybrid" flu virus.

Influenza A are the flus we share with other species. Influenza B are the bug that we see only in humans.

Canine influenza is a relatively new Flu A disease. The first appearance is believed to be in 2003, as a result of direct transfer of a single **equine** influenza virus to dogs in a large greyhound training facility and was then carried to several states by an infected dog. Similar transfers have occurred among foxhounds in the UK, and in dogs kept near infected horses during a 2007 outbreak in Australia.

Equine influenza viruses from the early 2000s can easily infect the respiratory tracts of dogs, while those from the 1960s are only barely able to bind to the same cells.

A canine H3N2 appears to have jumped directly from an **avian** source in Korea (2007) as a different canine influenza virus emerged. In 2011, the plot thickened yet again, when it was announced that this canine H3N2 had jumped to cats. In 2015, H3N2 infected dogs in a Chicago outbreak and the same strain spread to dogs in Florida in 2017.

We know that genetic reassortment creates new viral hybrids. These hybrids routinely fail, **until they don't**. Given enough material and time, a hybrid emerges that crosses species and adopts a new host. When that virus mutates such that those antigens bind to human cells, pandemic pandemonium ensues.

Historically, these mutants have risen from avian and porcine influenzas. These are still believed to be the most likely to jump over to us. After all, we don't keep dogs or cats in large herds or flocks. Proximity promotes promiscuity; pigs and birds are sharing virus much more frequently than canines and felines. The result can be pretty dramatic and fast, if humans are susceptible. 203,000 deaths are thought to have been caused by the swine-flu pandemic of 2009.

The emergence of African Swine Fever in the last year, decimating swine populations in Asia, may alter the dynamics of influenza evolution in this species.

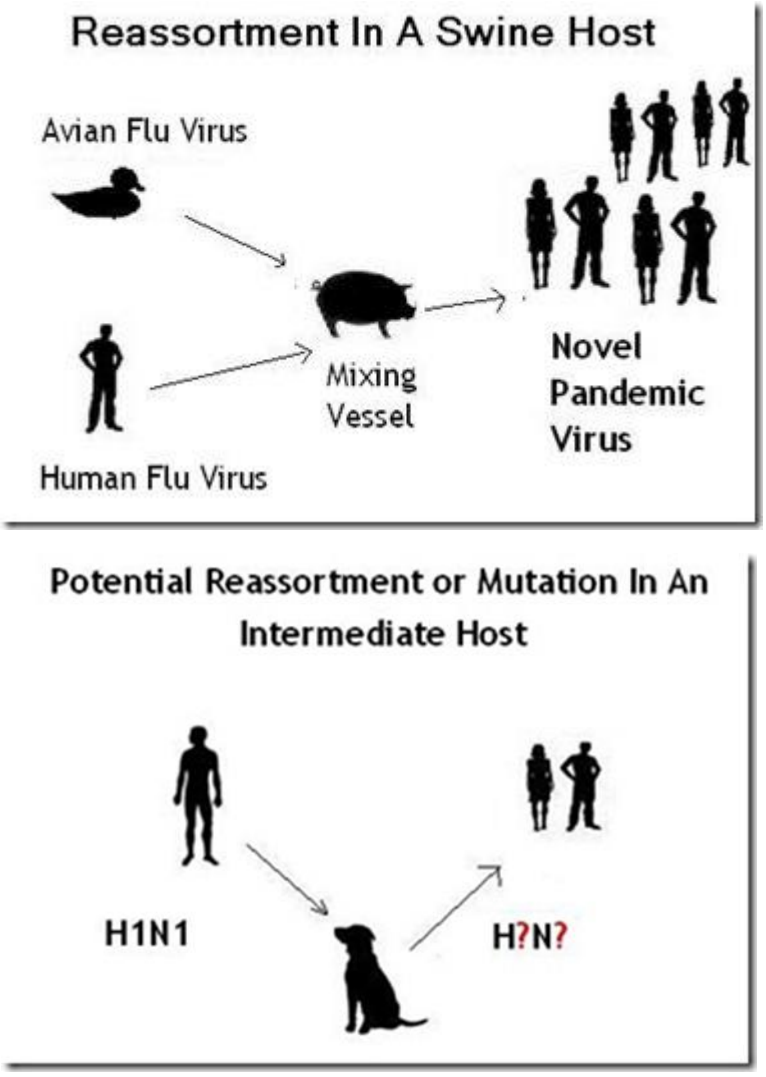
So, if you're a numbers guy, the smart money is on birds and pigs for the next pandemic Influenza A. But folks have seen "human" flu virus in skunk, ferrets, seals, camels, whales, and now dogs and cats. Let's say it takes billions, no, let's say it takes trillions of reassortment events to produce a protein with a strong affinity for human tissues. Once it happens the "where" doesn't matter.

Humans are the mortar and pestle for Influenza B virus. Those same reassortments occur in this variety and a new, deadlier, variant is out there, somewhere, waiting to emerge.

All of this just shows how remarkable influenza viruses are at adapting to new hosts, and re-inventing themselves.

Have a great week and be safe,

Bryan



{Source: Avian Flu Diary, afludiary.blogspot.com}