

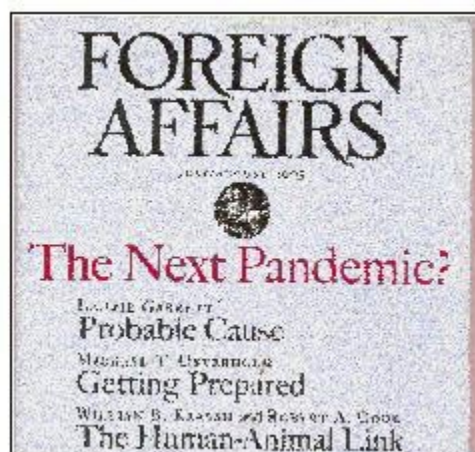
July 2006 Meeting: Dr. Al Zelicoff on "One Flu out of some Cuckoo's Head: Why Pandemic Influenza isn't a problem (unless you are a chicken)."



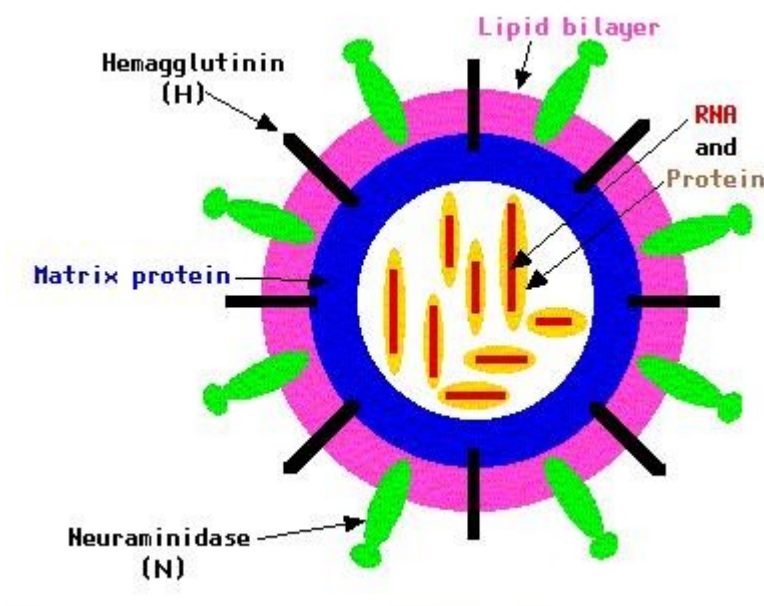
Al Zelicoff, a physicist/physician formerly at Sandia, spoke on "One Flu out of some Cuckoo's Head: Why Pandemic Influenza isn't a problem (unless you are a chicken)."

Al began by asking "What are the major international disease problems?" He identified Biological Weapons (a special problem), Pandemic influenza (not this time), and novel diseases (Hantavirus, Pertussis, Anthrax, etc.). He wondered "Why do we always get it wrong? And what can we do about it?" We gave "gotten it wrong" on numerous occasions - SARS, Monkeypox, Anthrax, Influenza shifts, and Tularemia, to name a few. And that's the ones we know about - what else is there? Why do we get it wrong? It's a combination of no data, bad science, poor statistical understanding, and failure to learn from history, Al said. He decried the lack of awareness of statistics among many medical doctors, who often generalize a few observations of a particular syndrome over their careers into "In case after case after case..."

The recent Bird Flu Pandemic Scare was officially kicked off by a cover story in Foreign Affairs magazine. With the words "The Next Pandemic" in huge red letters, the accompanying articles by Laurie Garrett got major media all excited about the imminent "pandemic." Al noted that a "pandemic" means global distribution of a disease, and not necessarily the disease's severity. Al proceeded to explain why the present threat is nothing like the 1918 Spanish Flu, which killed millions.



Zelickoff first described influenza nomenclature. Take the cryptic name A/ Hong Kong/ 68 (H3N2) - what do all the tags mean? For Flu, the Type is referred to by letter (A in the example), the location where identified is next (Hong Kong), followed by the year identified (68) and the "subtype" (H3N2). This last is key to understanding why the pandemic isn't what it's been cracked up to be. The "H" in the subtype refers to Hemagglutinin, a protein that binds the virus to the surface of a respiratory cell, attaching to sialic acid residues. These help the virus invade cells. The "N" stands for Neuraminidase, which cuts the bonds with H, and allows the virus to escape the cell, ready to infect another.



The common wisdom is that only immune system responses (antibodies) to the "H" proteins provide protection, and thus new antibodies are needed for each "H" variant. Thus, immunity to the Spanish Flu virus of 1918 (H1N1) would be useless in the presence of the new "Bird Flu" (H5N1). That common wisdom turns out to be wrong, fortunately for us! If someone has immunity to H1N1, and is exposed to H5N1, that virus will be blocked by the immune system as it tries to escape infected cells. People with antibodies for H1N1 will be protected from H5N1.

Zelickoff described Flu Pandemics over the last century. The big one, the 1918 Spanish Flu, was an extreme case, exacerbated immensely by the extremely crowded conditions in war hospitals, trenches, and so on.

In uncrowded conditions, a virus that aggressively attacks and kills its host will be left alone to die before it can find a new host. Thus, uncrowded conditions favor non-aggressive strains of virus. But if conditions are very crowded, aggressive strains can find an advantage: as the victim coughs his dying breaths, he can infect those next to him, and so on. Crowded conditions like the abysmal mass hospitals of World War I actually selected for more virulent and deadly strains.

Since 1918, several flu strains have impacted the world: H0N1 in 1933 (no pandemic), HxN1 in 1947 (no pandemic), H2N2 in 1957 ("Asian Flu", moderate pandemic), H3N2 in 1968 ("Hong Kong" flu, mild pandemic), and again in 1976 (Fort Dix, no pandemic). H1N1 returned in 1977 (the "Russian Flu," and was pandemic, but mainly for those under age 25 - i.e, those who had never been exposed to

H1 or N1 in their lifetimes. In 1996, H5N1 ("The Bird Flu") appeared, and has not been pandemic. In 1998, H7N7 and H9N9 appeared (but no pandemic).

The threat to humans from H5N1 is small. Many have immunity by virtue of previous exposure to N1; millions have developed new immunities to H5N1 itself. The real threat of H5N1 is to chicken populations, which are held in crowded pens rivalling any of the horrors of WWI.

Because of the way chickens are often housed, for them, the Bird Flu is a serious threat indeed. But the hype about a human pandemic is extremely overblown, and detracts from truly important problems.

One reason for the "Sky is Falling" panic is that some felt we're "overdue" for a new pandemic. But looking at the actual data shows that no predictable pattern of pandemic periodicity exists. Other beliefs behind the "Bird Flu" hysteria include fears of an antigenic shift in the "H" gene, perception that there's a lack of antibodies for "H5", and insistence that antibodies to H5 are required for protection. Since some humans have gotten ill with H5N1, and since travel is widespread, we're two-thirds of the way to the pandemic, or so the story goes. Instead, immunity to H5N1 is already spreading through human populations. [On August 1st, 2006, Al sent word that "A CDC study released on Monday (8-1) 'suggests it might be more difficult for the deadly avian flu virus to spark a pandemic than originally feared.'"]

We *should* be scared of outbreaks of certain old (and new) diseases, Al said. We've done a miserable job on diseases which turned out to have very little impact, like SARS, but only with lots of luck (and some key observations by Dr. Bruce Tempest) was a serious outbreak of Hantavirus avoided right here in New Mexico. Then there was the case of detection of Tularemia in Washington, D.C. on Sept. 24-25, 2005. This was followed by reports of pneumonia in people who had been on the Mall in protests on those days. But, there was no surveillance, no phone calls to hospitals (nearby or out-of-state), and sloppy diagnoses. We don't have a clue what happened.

What we need, Al said, are some political and international agreements, some technological solutions, and some simple public health solutions. Monitoring is key. Al's company has developed a system, SYRIS, that is being used in Texas to create real-time communication between public health officials, private and public physicians, and (very importantly!) veterinarians. SYRIS simplifies the reporting process - it's only used on a very few patients exhibiting unusual symptoms, but when it's needed, it only takes 15 to 30 seconds for a report to be filed. SYRIS allows these data to be tracked in real time, and provides alerts to doctors if required.

Al summarized his points by stating that novel diseases are a certainty, are unpredictable, and usually associated with animals; we need better models for spreading of diseases, even common ones; international cooperation is needed; and real-time, geographic-based data collection is very much needed.

NMSR thanks Al Zelicoff for a stirring presentation.