

# Bulls, Bears and Birds:

## Preparing the Financial Community for a Pandemic

Deutsche Bank, the Center for BioSecurity from the University of Pittsburg, and the Contingency Planning Exchange jointly sponsored a half day conference at the fortress-like facility of Deutsche Bank, at 60 Wall Street. After exiting the Wall Street subway station, one walks past concrete and metal obstacles in what is now a pedestrian mall, guarded by officers in flak jackets and machine guns, past the militarily uniformed security at the Deutsche Bank building, and down two floors to their amphitheater conference room. The stage is set.

### 1-Background

This conference was focused on the newly emerging strain of flu virus referred to as “avian flu” (or in French, “la Grippe Aviane”). In a general sense, all flu is avian since the flu virus lives in birds in total harmony. There are 16 basic types of flu virus referred to by their position on the DNA of the virus as H1 through H16. Through a process of genetic evolution, in which the virus recombines with other viruses in other settings, a strain of virus may acquire the characteristic of being “casually transmissible from person to person”.

Casually transmissible flu virus is what causes the annual flu epidemic that we experience every winter in this country. These outbreaks of flu are essentially minor genetic variations on major strains to which the human race has been previously exposed, in some other minor variation. The body’s protection mechanism – antibodies created through vaccination or prior exposure – mitigates the impact of the flu, although there are, on average, about 1 million deaths per year in the United States from the flu during the annual outbreak.

A new strain of flu virus was identified in 1997 and is referred to by its major class as H5. The H5 virus is the one referred to as “avian flu”. This virus is extraordinarily lethal, with fatality rates between 50 and 100 percent of those exposed to the virus in such animal categories as chickens, ducks, and ferrets (often used for flu research as a model of mammalian behavior). This virus has accounted for about 100 recorded human deaths, primarily in southeast Asia, and primarily from either direct contact with infected birds (chickens, ducks, geese) or from eating the meat of these infected animals.

The human race has no exposure to the H5 version of the flu virus and therefore has no built-in defense mechanisms. Given the observed fatality rates, if the H5 version of the flu virus were to acquire the characteristic of being “casually transmissible from person to person”, the expectation is that this version of the flu would sweep the world and cause a catastrophic number of human deaths, exceeding those of the great flu pandemic of 1918 by some multiple.

The probability that the H5 virus will acquire the “casually transmissible” characteristic is 100 percent. This version of the virus is widespread in the bird population and widespread geographically. This means that there are millions of opportunities for the virus to recombine in accidental ways. Only one of those recombinations has to “work” for the spread of this flu in the

human population to be launched. The questions that remain, therefore, are when and where will it happen, will we observe it in time, and will our medical resources be sufficient to mitigate enormous fatalities.

The director of the emergency health management program for New York City, who spoke at the conference put it succinctly: “Our planning assumptions are that this will happen and that we cannot prevent it from coming to New York. Our question is what do we do about it.”

Because any outbreak would be global (almost by definition), the challenges that emerge to the organization of human communities appear to be political – domestically as well as internationally – more so than economic. This point was made by several speakers in the conference suggesting that the global political upheaval could be more problematical (under certain assumptions about the lethality of the virus) than the medical/health impact.

## **2-Conference Agenda**

The conference opened with statements from the current national administration, including Dr. Rajeev Venkayya, Senior Director for BioDefense at Homeland Security, and James L. Pavitt, Principal of the Scowcroft Group and former Director of Operations for the CIA.

The second session focused on a “status and implications” discussion, featuring Dr. Richard Webster, followed by Dr. Robert Shapiro, an economist, former Under Secretary of Commerce in the Clinton Administration, and director of a number of international economic societies.

The third session focused on plans and featured the head of NY City’s health emergency unit, Deputy Commissioner Isaac Weisfuse; Dr. Klaus Stohr, Project leader of the Global Influenza Programme for the WHO (who had arrived overnight from Geneva); and Dr. David Fedson, former director of Aventis Pasteur MSD.

There were two other sessions, one on learning from past health emergencies and the second on conclusions and closing statements. I did not attend the final two sessions.

This conference was well attended, including business continuity managers from several large financial institutions as well as emergency program managers from several states. Other financial types, including analysts and investment bankers were present. There was good representation from the medical and policy communities. Total attendance was over 200. I thought that scheduling and holding represented real leadership on this issue by Deutsche Bank.

## **3-Administration Statements**

I missed the opening statement by Dr. Venkayya, however the scorn with which his remarks were referenced by subsequent speakers led me to believe that I did not miss very much.

One presenter, later in the conference program, commented: “You have heard your government spokesperson say that ‘the government is fully engaged with this problem’. Do you really believe that after what you have heard here today?”

The remarks by Mr. Pavitt were so spectacularly platitudinous that I took the opportunity to organize my papers. Later, a representative from the Council on Foreign Relations told me: “if that’s what the administration is thinking, we are in deep doo-doo.”

At the conclusion of Mr. Pavitt’s remarks, an attendee who introduced herself as being from the Flu Study Group at the Council on Foreign Relations said: “I only want to ask what plans you have in place for using the armed forces, when they are so deployed around the world and when 30 percent or more of them will be infected with the flu? I want to know how you expect Cities to maintain order and provide basic services when 30 percent of the police and fire department personnel will be sick? I want to know how you will keep supplies moving when every union I have talked to has said they will forbid their members to fly. What will happen to your just-in-time delivery then?” Pavitt made light of the question by laughing that of course he would have covered all these points if he had had more time.

On a recent trip, I passed through the Charles de Gaulle airport and saw posters, in French and English, warning travelers about symptoms of “la Grippe Aviane”. If a traveler was experiencing these symptoms, he was instructed to “Dial \*15 *Anywhere in France!*” That struck me as an extraordinary move and representative of a government that is more engaged than the US national response.

#### **4-Status and Implications**

**Robert Webster, PhD, Rose Marie Thomas Chair of the Virology Division,  
St Jude Children’s Hospital**

Dr. Webster spoke clearly and eloquently about the issues to human beings presented by the H5 flu virus. He started his remarks by saying that “science and scientists have done their job. Within 3 months of identifying a killer strain of flu, by reverse engineering the flu virus DNA, we can have a fully competent vaccine against that strain. We have the tools to do this. But we are not doing it. We are piddling around. We are asleep on top of a time bomb.” This capability he attributes to advances in basic science and structural biology.

For example, the development of Oseltamivir over the last 5 years is an example of this process. This formulation, known as Tamiflu and produced by one laboratory in the United States belonging to Hoffman La Roche, is not a vaccine but a post infection treatment. It is a retro-viral formulation that inhibits the spread of the virus in the human body once infected. It may also have some preventive characteristics if taken before exposure.

Dr. Webster emphasized the existing transmissibility of the H5 strain, saying that it had been demonstrated to be casually transmissible in cats, as well as among various bird populations. He also emphasized the neurological aspects of the impact of the virus, saying that death in Ferrets was caused by paralysis. The appearance of the disease in humans, he said, also manifested neurological symptoms (intense headaches at first) and diarrhea (an uncommon characteristic of the flu). He highlighted the lethality of the H5 strain, and cited percentages ranging from 50 percent to 100 percent in both laboratory experiments and field observations. These lethality ratios are, of course, relevant to certain specific animal populations (eg, ducks, geese, ferrets, etc.)

In the Q&A period at the end of this session, Dr. Webster was asked to comment on the lethality rates used in the economic analysis. Pressed, he said that they were much too low, at least by a factor of 10.

**Robert J. Shapiro, PhD, former Under Secretary of Commerce for Economic Affairs**

Dr. Shapiro's message was clear:

- **Large, advanced economies** will shrug off exogenous shocks that occur as single events. The effects on those economies will be “distributional” as economic activity is shifted in and among sectors. If the exogenous shock, however, is **protracted and pervasive**, then the effects will be more serious.
- **Smaller, less advanced economies** will be much more severely impacted by single event exogenous shocks. Presumably, and by extension, they could be devastated by protracted and pervasive exogenous events.
- **Domestic and International Political Issues** will dominate any impact analysis and need to be addressed

Dr. Shapiro compared the impact of a single event pandemic to other single event shocks such as 9-11 and noted how the economy recovered sharply from that event. He also noted how economic activity shifted in the quarters following the event, somewhat in response to Federal Reserve action and somewhat through market mechanisms. Other examples of single exogenous shocks were the 1989 heat wave in which 5,000 people died in the U.S. and the earthquake in Turkey in which 17,000 people died.

The comparables for pervasive and protracted exogenous shocks include terrorism in Columbia, Northern Ireland, Israel, and the Basque region of Spain. He noted that investment in the Basque declined by 10 percent over expected levels due to sustained terrorist activity. He also noted that sustained terrorist activity in Israel had shifted the path of GNP development there.

These examples also illustrate the problem of smaller and less advanced economies. There is simply no safe place to go in the event of a major external shock. While the onset of avian flu might destroy the chicken population of Vietnam, which would be devastating for that country, the worlds largest producers of chicken (the US, Brazil, and one other country) would hardly be impacted. In the event of a loss of chicken for human consumption, food patterns in advanced economies would shift to fish and meat products – which is an example of the distributional impact of a single exogenous shock.

The case of a “pervasive and protracted” exogenous shock is based on the 1918 flu pandemic which occurred in three waves and lasted 2 years. The first wave was mild; the second wave was referred to as “the killer wave” and occurred about 6 months after the first; and the third was serious but not as bad as the second. In that event (termed “catastrophic”), there would be measurable and meaningful impact, even on the largest economies.

Dr. Shapiro commented that the greatest threat in the US was likely political. He recounted a “war game” exercise that posited the outbreak of smallpox in a number of locations throughout the US and the world. The exercise showed that typical responses included closing borders, shutting down air travel, and other steps that resulted in more pronounced economic impacts than may have been warranted by the objective conditions. He urged planners to study ways to keep open transportation and shipping links in any pandemic condition as a way of mitigating the economic and political consequences of an outbreak.

He concluded by noting that the kind of opportunity we have for advanced planning in the case of a flu pandemic is unique. It is not available for instances of bio-terrorism, for example. He pointed out that there are no plans for managing quarantines, for the distribution of medicines, and so on. Commenting on a prior administration spokesperson’s comments that such plans would be available in “a few weeks”, he said that the Katrina experience suggested that he would have no confidence in either the timeliness or efficacy of such plans. He said that he found the absence of advance planning in this instance “inexcusable.”

### **Question and Answer**

In the following Q&A session, there was some discussion of the pathogenicity of the H5 virus. Dr. Webster’s science reported lethality rates 25 times higher than those used in Dr. Shapiro’s economic models.

Dr. Webster suggested that in acquiring “casual transmissibility” the virus might lose some of the extraordinary lethality it currently possesses. From an evolutionary perspective, it would be more “successful” (in the way that “success” is determined in evolutionary changes) for the virus to become somewhat less lethal. However, he felt that the assumptions in the economic models were significantly too low.

The question of low death rate assumptions arose again in the presentation of the NYC director of emergency health preparedness.

## **4-Plans and Preparedness**

### **Isaac Weisfuse, MD, Deputy Commission for the Division of Disease Control, NYC Department of Health**

Dr. Weisfuse outlined a program of emergency preparedness that should set the standard for national and regional planning and preparedness throughout the US. Not only is the plan detailed in its design, it is also comprehensive; many elements have been in place for several years; and most major systems have been exercised repeatedly in real world (annual flu epidemic outbreaks) and “gaming” situations.

The planning assumptions for this health emergency preparedness model are:

- There is no way to keep the avian flu out of NYC once it starts to spread
- There is no way to keep it from spreading within NYC once it gets here

- Maintenance of public services (eg, fire, police, transportation) is essential to the provision of emergency health services

The elements of the preparedness program are ...

- Surveillance** – identify where in the City pockets of disease activity may be located and the intensity of disease spread
- Laboratory Capacity** – ensure capacity to analyze samples promptly; the City has recently added 20 thousand square feet of bio-hazard level 3 lab capacity
- PODs** – “POD’s” are Points of Distribution, points at which medicines and supplies can be disbursed to the population. The City’s POD network was tested in the distribution of medicines during last year’s flu outbreak in which supplies were rationed
- Provider Outreach** – the Department maintains a contact program with doctors around the City, on the point of view that traditional surveillance (eg, doctors’ reports) are critical to the system
- Backup Plans** – the preparedness program specifically includes provisions for backup facilities and equipment in the event some locations are lost and/or need exceeds first line supply.
- Hospital Preparedness** – the City has implemented an HERDS software program (Hospital Emergency Resource ... ) that displays minute-by-minute availability of beds, staff, and other critical facilities

In working to build this program, Dr. Weisfuse has drawn on his experience at the Centers for Disease Control, where he was part of the Epidemic Intelligence Service. He has been with the City Department of Health and Human Services since the mid-90’s and has worked on such issues in the City as AIDS, STDs, and Tuberculosis. He was the Department’s “incident commander” for the World Trade Center disaster.

With respect to surveillance, Dr. Weisfuse commented that 80 percent of all the emergency rooms in the City now provide daily downloads of recaps of patient visits including symptomatic information as well as diagnosis and treatment. The surveillance network also includes reports from the several large drug chains on prescriptions dispensed and remedies purchased, also on a daily basis. Absentee reports from major participating employers are also part of the program. The program employs advanced statistical techniques that run on a regular (daily) basis to identify any patterns in low level health services (absenteeism, drug store purchases, doctor visits, emergency room visits) that might signal unusual patterns in very specific local areas. These are then analyzed for their implications for disease outbreak and spread.

Dr. Weisfuse also noted that the overall program of the Department includes a commitment to communication through a Health Alert Network, outreach to ethnic media outlets, and a contact email mailing list that now numbers 145 thousand names. He said that it was “inexcusable” for

any major corporation not to be part of the Health Alert Network and urged everyone present to make sure that their HR departments were apprised of this responsibility.

He commented on Hospital Surge Capacity planning – which involves mandatory postponement of elective surgeries and early dismissal of as many patients as possible. And he noted that part of the program involves Mass Fatality Planning, which he did not describe in detail.

Dr. Weisfuse commented on the implications for businesses in this environment. He made the following points:

- Just-in-time deliveries do not work in this environment
- Emphasis on telecommuting possibilities is important; he noted that some companies have a work team approach in which there is an office team and a home team covering the same work functions
- Participating in the Health Alert Network is key
- Other avenues for business involvement may include the medical response corps, the NYC Office of Emergency Management, and the Ready NY program

Dr. Weisfuse's remarks were warmly applauded by the audience who respected the level of effort and detail that this kind of program represents.

**Dr. Klaus Stohr, DVM, Project Leader, Global Influenza Program,  
World Health Organization, Geneva**

Dr. Stohr, who had arrived from Geneva overnight for this meeting, made a number of observations reflecting the organization of the WHO effort. These were essentially high level bureaucratic programs aimed at coordinating the resources of voluntarily contributing organizations around the world and voluntarily cooperating countries. For example, Dr. Stohr complimented the Chinese on significant improvements in their cooperation with WHO since the SAARs outbreak. He commented that developments in Indonesia were difficult to monitor and track because the cooperation of the Indonesian government has only recently begun to improve.

Dr. Stohr said that the pandemic will occur, that we are watching it develop in slow motion. We can reduce/mitigate its impact, he said, but not eliminate it. He stressed that it will cross all borders – national borders, institutional borders, geographical boundaries.

In outlining the mission of the WHO in this matter, he noted that their goals are:

- Detect and contain (although he acknowledges that efforts to contain the spread are unlikely to be successful; the purpose of containment programs is to gain time to advance preparedness efforts)
- Minimize human death

- Contribute to global preparedness, which in his view does not equal the availability of vaccines, since there are many issues in preparedness that have to be addressed

Other speakers applauded the work of the WHO in this area. One speaker noted that the total staff of WHO, FEMA and the CDC was less than the total number of people who work in the Deutsche Bank building at 60 Wall Street. In raising that point, in light of the issues that had been identified, the speaker questioned whether sufficient resources were being applied to this problem.

Another speaker pointed out that Dr. Stohr's entire group has a staff of 12 – and this staff is charged with Global Preparedness! For reasons that were not cleared, several speakers noted that the Doctor is not permitted to make that point in public, which is why they were making it for him.

There has been some criticism of the standards that WHO has imposed for the definition of a case of H5N1 virus in humans – requiring two positive blood tests for antibodies several days apart. In several cases, the persons have died before the second blood test, which means the case was not positively identified for WHO purposes. Given that this group is working through an entirely voluntary network of organizations and countries, one wonders how they can promulgate any reasonable standard and enforce it.

**Dr. David Fedson, former Director of Medical Affairs, Aventis Pasteur MSD**

Dr. Fedson made it clear that there are three possible strategies for drug development to counteract the spread and lethality of avian flu:

- **Anti-neuraminidase** – which as I understand it are the retro-virals like Tamiflu and Amantadine, which have been discussed earlier
- **Inactivated virus** – which as I understand it is the traditional flu virus technology
- **Other means** – especially evidence about anti-inflammatory statins

Dr. Fedson focused on the inactivated virus strategy. He pointed out that in the case of Swine Flu in the late 60's, a fully functional vaccine was available 4 to 5 months after the first identified case. This included full trials of 4 different vaccines at 3 different dose levels. At the end of this period, the medical community knew what the virus was about and had an effective response. (Dr. Webster, earlier in the conference, had talked about DNA engineering techniques that could even shorten this process today.)

“Do the math!” he said. To protect the population of the US, which is 300 million people, with the minimum two dose requirement to provide vaccine protection (which is thought to be the requirement for avian flu protection), a total of 600 million doses are required. Domestic production of 60 million full strength doses translates into 180 million reduced strength doses every six months. This would be sufficient – with all out production from existing capacity – to vaccinate 90 million out of 300 million people in six months.

The issue, as he pointed out, is that we do not yet know specifically which version of the H5 virus we need protection against. What the Europeans have done is to use the “antigen sparing approach” (which is a low dose of inactivated virus together with an “alum adjuvant” which increases the effectiveness of the low dose in stimulating anti-body production) and they have defined an approach to producing a vaccine that will not require phase 3 efficacy trials. Thus, according to Dr. Fedson, they can have a licensed vaccine within 3 days (referring to the time required to license).

In the US, the FDA has required so-called “inter-pandemic trials” – which would be trials of any vaccine in the interim period before a pandemic emerges. There is no need for a drug in this period, however, and therefore, no financial incentive for any company to engage in any trials of anything until a need emerges. Dr. Fedson thought this was idiocy. He also commented that the low dose, alum adjuvant approach (“antigen sparing”) is not well understood in this country.

Dr. Fedson presented a chart showing the growth of flu vaccine consumption divided into producing countries and non-producing countries. There are 7 or 8 producing countries, including the US, England, France, and others. Within a short period, consumption of flu vaccines will be greater in non-producing countries than in producing countries. However, in the event of a pandemic outbreak, it is likely that producing countries will nationalize their sources of production and require treatment of their populations first. This he said will lead *to a global diplomatic and security crisis*. For example, will the United States supply Mexico with vaccine? And what will happen if we do not?

In focusing on other possible drug availabilities, Dr. Fedson noted that statins (prescribed as cholesterol lowering agents such as Lipitor, Prevacol, and Zochor) act as an anti-inflammatory and that much of the lethality of the H5 virus is from an auto-immune inflammatory reaction. At his request, several studies of large populations (using historical data) showed that among patients who suffered from pneumonia, there was a 64 percent reduction in mortality for those taking statins. There are abundant supplies of statins. They are produced globally, in particular in India. The use of statins in treating a flu pandemic might be an important medical and diplomatic resource.

In closing, he reminded the audience of Winston Churchill’s comment: “it is not enough to do your best. You must succeed at what is necessary.”

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The conference continued with a panel on what has been learned from prior experience, especially the SARS outbreak in Canada and Singapore. Concluding remarks were made by the head of Global Business Continuity at Deutsche Bank and the Director of BioSecurity at the University of Pittsburg.

## Attachment – Links for Reference

**Recombinomics** is a site “committed to the study of recombination as the driver of rapid molecular evolution and the emergence of novel infectious agents.” On the page linked below, the host provides near-daily updates on the developments related to Avian Flu around the world, along with his personal commentary.

[http://www.recombinomics.com/whats\\_new.html](http://www.recombinomics.com/whats_new.html)

**Maps** are important to visualizing the spread of the H5 virus in the bird population as well as any human outbreaks that appear. There are several maps available. Recombinomics maintains one at their site which is updated every month ..

[http://www.recombinomics.com/H5N1\\_Map\\_2005\\_QinghaiL.html](http://www.recombinomics.com/H5N1_Map_2005_QinghaiL.html)

The “**Flu Wiki**” is an internet based effort to “*help local communities prepare for and perhaps cope with a possible influenza pandemic.* This is a task previously ceded to local, state and national governmental public health agencies. Our goal is to be:

- a reliable source of information, as neutral as possible, about important facts useful for a public health approach to pandemic influenza
- a venue for anticipating the vast range of problems that may arise if a pandemic does occur
- a venue for thinking about implementable solutions to foreseeable problems”

<http://www.fluwiki.com/>

**News and Resources** are available at both Flu Wiki and Recombinomics. Another site that provides a summary of news reports, perhaps with an emphasis on Canada and Western Europe, is the H5N1 site at ...

<http://crofsblogs.typepad.com/h5n1/>

This site also includes reports on developments from the business press, especially the Financial Times, which seems to be devoting an above average level of resources to this topic.

**Center for BioSecurity, University of Pittsburg** was a co-sponsor with Deutsche Bank of the conference reported in these notes. The conference agenda is available at their web site ...

<http://www.upmc-biosecurity.org/avianflu/index.html>

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This is a limited and personal list of sites that I reference that may be of interest to others. There are a rapidly growing number of sites in this topic area. These seem both credible and reliable, which is not to say that the others are not, just that I have not investigated them.