

## **Pandemic Simulation – TIEMS Prague 2008**

### **Introduction**

This simulation will provide conference attendees with a general understanding of the issues that could be faced during the second wave of outbreak during an influenza pandemic. Throughout the simulation attendees will encounter learning checkpoints that will enable them to apply current crisis management practices against a realistic pandemic scenario. Learning checkpoints are provided periodically during the course of the multi-day simulation. To aid attendees in preparing for the simulation, a brief overview of what could transpire during the initial wave of infection is provided as background material.

### **Scope/Objectives:**

The focus of this presentation is designed to address the nature of planning that will have to be undertaken once a pandemic starts. The structure of the problem faced by planners will be complex. Planners will have to develop “Active Analysis” methods in order to maintain accurate and timely information on the situation.

### **Pre-Exercise Reading**

We live in a world replete with uncertainty and risk. Living with uncertainty and being at risk, we attempt to minimize the possibilities of uncertainty materializing and risk being realized. In many instances we have been successful in addressing known uncertainties and known risks. Applying planning concepts that have worked in the past; when preparing for the unknown, unknown, will be like jumping off the Sears Tower in Chicago and building your parachute on the way down. But many will be content with just such a strategy. Others will be content to leave their fate in the hands of their government; abdicating responsibility for preparedness because the government is responsible for making things right, even if we fail to prepare.

At the time of this writing H5N1, known as Avian Flu or popularly as Bird Flu, has spread to approximately 61 countries (see map below). It has one of the highest mortality rates of any flu virus of the previous century. Even the Influenza (Spanish Flu) of 1918 did not have as high a morbidity and mortality rate as H5N1 (Avian Flu). We are seeing almost daily some revelation from the World Health Organization (WHO) or Centers for Disease Control (CDC) or the popular media.

Pandemics have occurred throughout history. From the Bubonic Plague (which occurred three times and took over 300,000,000 lives) to Smallpox (which in the 20<sup>th</sup> century alone took nearly 300,000,000 lives) the threat of a pandemic is ever present.

Bubonic Plague: Black Death	Asia, Europe, Africa	1300s-1720s;
Bubonic Plague: Plague of Justinian	Asia, Europe, Africa	540-590
Bubonic Plague: Third Pandemic	Worldwide	1850s-1950s

Will history repeat itself with the current threat posed by the H5N1 (Avian Influenza) virus? The probability of a major pandemic occurring in the near future is very real according to the World Health Organization (WHO). But, like seeing a black swan, the rarity and randomness of a pandemic makes planning for it difficult. This is partly due to the fact that we do not know the rules – pandemics are not random, they just appear to be. We see them as random because we have drawn invalid conclusions about their occurrence.

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Scientists predict that diseases transmitted from animals to humans will likely cause next pandemic. Scores of infectious diseases have emerged to threaten humans in the past decades as viruses leap the species barrier from wild animals and bacteria mutate into antibiotic-resistant strains. The emergence of new diseases have roughly quadrupled over the past 50 years, 60% of them are so-called zoonoses (a disease of animals, such as rabies or psittacosis that can be transmitted to humans). Most zoonoses come from wild animals, especially mammals, which are the most closely related species to humans. Novel pathogens that adapt to humans can be extremely lethal, as humans have no resistance to them.

The possibility of a global flu pandemic triggered by the emergence of a strain of bird flu that could easily be transmitted from human to human would spread rapidly worldwide. Such a pandemic outbreak could cause massive fatalities and immense economic dislocation. A pandemic is a “known unknown.” The consequences of a pandemic are an “unknown, unknown” what Nassim Nicholas Taleb calls a “black swan.” A “black swan” is an event of enormous impact that is rare and virtually impossible to predict, not least because it comes from beyond the realm of conventional expectations. Current arguments consist of how large a risk the threat of a pandemic constitutes and what should be done and at how much cost to prepare for a pandemic. The risk is there, “underestimated” but it manifestly exists. “Black Swans” are notable for their bolt-from-the-blue quality. If so, then logically, it may seem a sound precaution to focus on bird flu, however if a pandemic comes it will not be the one that we expect.

The difficulty with the black swan concept is that it can acquire nihilistic characteristics. It can be taken to mean that pandemic preparedness should not be addressed because something else will arrive in its place. The realization that a “canned solution” is not available should not frustrate; rather it should lead to flexible planning, aggressive thinking and increased response capability.

### **Shock and Awe – Reaction (60 – 100 days) to the First Wave of the Pandemic**

You’ve survived the first wave of an influenza pandemic; now what? How do you know that the first wave has ended and how will you know when the second wave begins? Are you prepared for the second wave? What will the socio-economic situation look like? Will your business still be in business? Can your government still govern? Are you prepared to understand the ramifications of primary markets for goods and services in a state of constant disruption?

Here is a brief recap of what has occurred during the first wave of the pandemic. The WHO declared Phase 6 and the world set out to minimize the impact of the pandemic (tactical response). Mobilization of assets by WHO, the international community, governments and industry began. This proved too late for effective response as the pandemic already was spreading and defensive actions provided very limited options. During the first 60 days of the pandemic reactive fear based responses overrode almost all planning that had been undertaken.

When WHO declared Phase 6 some countries reacted by closing their borders. This action while purely a defensive reaction started a chain reaction that had many immediate implications from an economic perspective. With the border closures international trade was disrupted. Countries that closed their borders found that this was no defense as influenza outbreaks continued unabated throughout the world.

Faced with suddenly idled workers worldwide and the need to provide medical aid to populations that were succumbing to the global pandemic, governments were thrown into chaos. Government assistance was limited as many government workers either refused to come to work or were stricken with the virus. Traditional services of government, such as, military, police, fire, emergency medical services, administrative and tax functions were soon strained to the point of breaking. Governments worldwide attempted to organize military forces to keep order internally and to supplement police, fire and emergency medical services.

### **Sector Analysis – (60 – 100 days)**

The financial sector was faced with solvency issues as savings and checking accounts are drawn down. Banks experience a demand for money (physical currency) that exceeds their ability to supply currency. Institutions such as the World Bank, International Monetary Fund and Asian Development Bank saw donor nations suspend their commitments of funds. Many recipient nations petition for restructuring of their loans. Consumer credit evaporated as merchants demand cash as payment for goods and services. This created further problems as central banks in some countries could not keep up with the demand for currency. Interest rates, exchange rates, stock, bond and commodity markets experienced wide swings as the worldwide economy was disrupted.

The manufacturing sector felt the impact of the pandemic, as factories were forced to close due to workforce issues, in some areas quarantine, lack of raw materials availability and curtailment of imports and exports due to border closures. Firms dependent on outsourcing and parts made externally were forced to alter their operations (either reducing operations or suspending operations) creating spot shortages and displacing workers.

The service sector, comprised of volume driven firms, saw demand for services dwindle. A significant portion of the workforce is laid off as a result. Severe strains on the financial health of the service sector begin to appear as credit and debit card firms see defaults on payments due. Fraud becomes an increasingly significant issue for this sector.

The telecommunications sector continues to be under intense pressure as worldwide, people attempt to telecommute. In many countries the government exercised its authority and commandeered the bulk of telecommunication services in attempts to maintain order and keep government operations functioning. Telephone exchanges in many parts of the world have degraded to sporadic service as demand far exceeds capacity.

The utility sector also continues to be under intense pressure. Brownouts in most areas of the world are normal, in part due aging infrastructure, lack of and/or disruption of fuel supplies, distribution issues and demand shifts continue to create reliability issues. Blackouts of extended duration are beginning to affect many countries. In many areas fuel supplies are being rationed due to curtailment of deliveries. System maintenance becomes more difficult due to a lack of experienced workers and illegal tapping of supply lines (electrical, gas, water, etc.) have become rampant. In many instances government has had to intercede to assist the utilities maintain operation, through guarantees of payment as displaced workers are unable to pay utility bills. A spike in residential demand as more and more workers are forced to stay at home due to quarantine, facility closures, lack of work and fear of exposure to illness continues.

The insurance sector has seen an upsurge in claims for medical benefits during the initial 60 days of the pandemic, causing a slowdown in payments due to volume impact. As the system is overwhelmed, the volume of claims drops dramatically as healthcare providers are unable to process claims and health insurance companies experience depletion of their workforce due to illness and other factors.

The healthcare sector continues to be overwhelmed by patient volume. Healthcare operations in some areas cease to function due to surge, lack of supplies, panic and inability to staff facilities. This continues to be a factor as people who think they have exhibited the symptoms of the influenza seek medical aid. Limited availability of critical supplies due to trade disruption and border closures continues. Hospitals are unable to contain other illnesses, such as, adenovirus, MRSA (Methicillin resistant Staphylococcus aureus) due to lack of staff and supplies.

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The energy sector which saw a decline in demand, but a spike in prices for raw materials continues to see chaotic swings in prices. International and national travel is less than 30% of pre-pandemic levels. The shift from occupied offices in cities to stay at home workers has reduced the demand for transportation fuel. However, due to the disruption in international trade there continues to be erratic spikes in commodity prices.

The agriculture sector continues to experience “commodity shock” as demand for agricultural products cannot be met as transportation sector disruption continues. As a major importer of foodstuffs the U.S. continues to suffer regional spot outages as grocery stores are forced to close due to lack of inventory. Government food warehouses are unable to alleviate the shortages due to the impact of fuel distribution problems affecting the transportation sector, shortages of personnel and transportation system closures due to quarantine and border closures. Spoilage becomes a factor in planning for this sector. Political tensions continue to build as food prices increase faster than the World Food Program (WFP) and other Non-Governmental Organizations’ (NGO) budgets. Food-constrained nations continue to have difficulty getting agricultural products due to transportation, border and port closures. The U.S., the world’s biggest agricultural supplier, is hampered in its ability to ship agricultural products due to a lack of agricultural inspectors as a result of illness and other factors.

The education sector continues to remain closed as students and teachers furloughed when schools close due to health concerns, quarantine and transportation system impacts are not returning. Additionally, many schools converted to provide healthcare services during the surge are still occupied and in general decontamination is required for all facilities.

The high-technology sector continues to see surges in demand for access and support related to the Internet. Hampered by workforce degradation, many call center operations are being reconfigured resulting in significant disruption of services.

Worldwide governments are rationing critical resources and limiting distribution of goods. Many countries experience food riots and have resorted to repressive actions in order to control their populations. While this picture of the first phase of the pandemic is pretty bleak it is not without precedent in recent history. We have experienced violence and looting after hurricanes, earthquakes and other natural disasters.

The media reports on the worldwide death toll. WHO releases data indicating that the mortality rate of the influenza virus was just 3%. Many countries are reporting higher mortality rates. The hardest hit areas are Africa, Asia, Central America and Central Europe. The U.S., South America, Western Europe and Middle East are reporting mortality rates just under 3%. The following figures are estimated death tolls for all the recognized countries in the world.

Over one billion people (20% of the world's population) worldwide are infected with pandemic influenza, and it is estimated that another 1 billion (20% of the world's population) are at risk of acquiring infection. It is estimated that 60% of these infections were accompanied by viral pneumonia and most of the remainder will be affected by long term health issues. The major vectors for transmission of the influenza are primarily airborne and surface contamination. WHO estimates if more waves of outbreak occur, as in previous pandemics; that in the more rural areas of Africa up to 30% of the population could perish without receiving any medical attention.

<b>Estimated Number of ill (Attack Rate 25%):</b>	1,631,292,566 worldwide
<b>Estimated Number of Dead (Mortality 3%):</b>	48,938,777 worldwide

**End of Initial Situation Update**

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