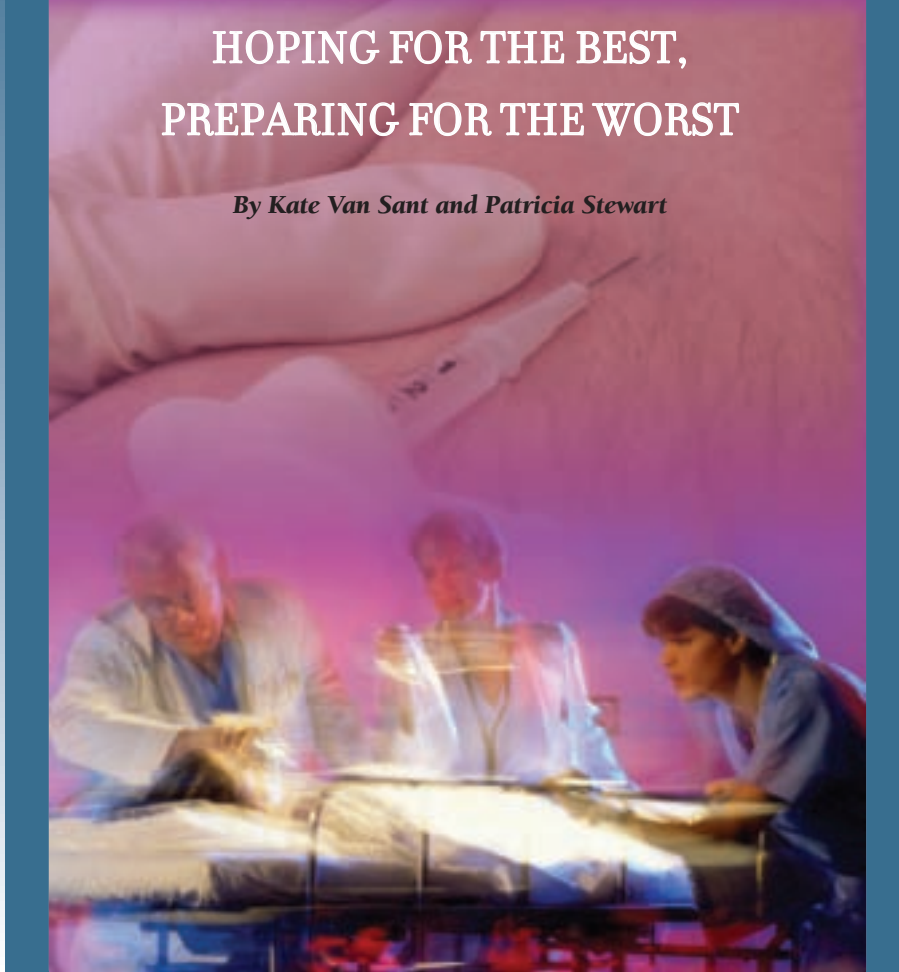


PANDEMIC PREPARATION:

HOPING FOR THE BEST, PREPARING FOR THE WORST

By Kate Van Sant and Patricia Stewart



Universities and colleges are more aware than ever that sitting back and hoping for the best should a pandemic hit this country is neither wise nor acceptable. Yes, we should hope for the best case scenario to happen—that being nothing at all; however, that hope should not preclude smart preparation for the worst possible scenario. Experts everywhere agree that even if a flu pandemic does not occur, there are still other disasters that could happen. The recent events at Virginia Tech attest to the necessity of being as prepared as possible; even for something that does not yet exist.

Although regular flu shots may provide some protection from a new strain of influenza, there is always a delay between the appearance and identification of a new type of influenza and production of an effective vaccine for that

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particular strain. In the event of an influenza pandemic, the Department of Defense Implementation Plan for Pandemic Influenza indicates that a vaccine specifically targeted to the pandemic virus would not be available until at least six to nine months after confirmation that the virus was indeed being transmitted human to human. Modern travel could spread influenza human-to-human around the world in days.

Following are some useful definitions:

***Virus**—(from the Latin meaning toxin or poison)

A microscopic particle that has the ability to infect other organisms and cause disease; viruses cannot reproduce themselves; instead they invade the cells of the host and use the genetic material of the host to “make more of them”.

This ability to corrupt the cells of the host makes treating a viral infection very difficult. These infections do not respond to traditional therapies such as antibiotics, and few antiviral drugs exist. The best protection against viral infection is vaccines that aid the body in mounting an immune response.

Examples of viral infections include AIDS; all strains of Influenza (flu); Chickenpox and the common cold. (American Heritage® Dictionary of the English Language)

***Epidemic**—from Old Latin; epi (among, upon) + demos (people, district)

An infection or disease that spreads quickly and is localized in terms of its impact on a given population or area; basically, many people are infected at one time in one place. (Dictionary.com Unabridged)

***Pandemic**—pan (all) + demos (people)

An epidemic that is spread over a very wide area such as an entire region, country or continent; the infection impacts all people everywhere. (Online Etymology Dictionary)

***Morbidity**—the incidence and rate of infection; measures how quickly an infection is able to spread; how many people got sick? (American Heritage® Stedman's Medical Dictionary)

***Mortality**—measures the rate of death caused by an infection or disease; how many people died; how long did it take? (Merriam-Webster's Medical Dictionary)

***Mutation**—the ability of a virus to adapt to changes in its host's environment. Mutations can occur deliberately, by error or by chance. (The American Heritage® Science Dictionary)

There have probably been several influenza pandemics per century throughout history. The flu pandemic in 1918 is the worst we know about, estimated to have killed 40 to 50 million. That pandemic killed more people in one year than the Black Death (bubonic plague) killed in a century, and killed more people in 24 weeks than AIDS has killed in 24 years (Barry, 5). Subsequent influenza pandemics occurred in 1957 (the "Asian flu") and 1968 (the "Hong Kong flu"), but they were nowhere near as severe in morbidity or mortality as the 1918 pandemic. We study the 1918 influenza because it is the first flu pandemic for which we have any real data, and by far the worst.

Although this pandemic was often called the "Spanish" flu, this was a misnomer. Since the infection appeared near the end of World War I, when most nations were censoring their news, reporting of the progress of the pandemic was first covered by the uncensored press of neutral Spain, so the pandemic was incorrectly associated with that country. For along time it was assumed that the first grouping of infection actually appeared in Kansas, where soldiers on their way to the war were crowded together into army camps, huddled together to stay warm during a very cold winter. Recently, a British virologist, John Oxford, has revived evidence that the disease might first have appeared in 1916 at Etaple, a British army transit

camp, where birds, pigs, and a constantly changing population of 100,000 soldiers created an ideal incubator for an influenza mutation.

Influenza usually kills the very young and the very old, those with weakened or as yet undeveloped immune systems. But the 1918 flu showed a strange pattern; along with infants and the aged, those in the prime of life also had a very high mortality rate. One theory explaining this phenomenon maintains that the healthiest people died because they had the strongest immune systems; the flu hit the body so hard that the healthiest immune systems launched all-out, no-holds-barred attacks on the virus, filling the lungs with fluid and spurring the rest of the unpleasantness that happens internally when the human body fights infection. This allowed pneumonia to take hold, which was the real killer. Another theory is that a related form of the 1918 flu had appeared in the mid 19th century, giving a limited immunity to the older generation.

The argument can be made that we now have antibiotics to treat bacterial pneumonia, but even with antibiotics, pneumonia following influenza has about a 7 percent mortality rate.

Straains resistant to antibiotics are fatal much more often. A secondary infection of *Staphylococcus Aureus*, now an antibiotic-resistant problem in hospitals, kills about 42 percent of the influenza victims it strikes (Barry,

252). And those infected with Avian flu may then contract viral pneumonia, on which antibiotics have no effect.

Risk assessment weighs *probability* and *consequence*.

The following three "ifs" might not be *probable*, but:

- If the Avian flu mutates so that it can be transmitted easily from person to person;
- If it sickens half the world, as the 1918 influenza pandemic is suspected of doing;
- If it kills 50 of those who catch it, as it has so far;

Then... the *consequence* would be the death of over 1? billion people. The World Health Organization is using an estimate of 2 to 7.4 million deaths for planning purposes, but this estimate is based on the "comparatively mild 1957 pandemic" (World Health Organization).

To understand why our technology and scientific sophistication might not protect us from a pandemic, it is necessary to know a little about the influenza virus. There are really many different varieties of flu virus. Influenza viruses live in birds, especially the gastrointestinal system of ducks. They can spread the virus to other birds such as chickens, sometimes pigs, and from pigs to people. So areas where people live in close proximity to pigs and birds are suspected to

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breed new flu strains more frequently. Remember the Swine flu years ago? It was called that because it was thought to have mutated so that birds could infect pigs, and then mutated again so that it spread from pigs to people, then again so it could spread person to person.

We don't know what form, or forms, of the influenza virus are going to hit us at any time. Flu shots are often effective because the form of the virus that has circulated in humans the year before will probably produce a related version the next year. That same flu shot may be somewhat effective for the Avian flu, if they have enough similarities. Bottom line: get the shot.

There have so far been several hundred cases of the Avian flu virus passing from bird to human, usually in circumstances of some intimacy—people perhaps slaughtering diseased birds or using the sick bird's waste to fertilize where they grow their food. The big question is will this virus mutate into a form that can be passed easily from one person to another? All these different versions of the virus are changing all the time. So, if the Avian flu does not become a pandemic, another form of the flu may become so at any time in the future. This is not a one-time exercise.

The incubation period is the time from exposure to when symptoms appear. For influenza this period is usually around two days. You can catch the flu, be contagious, and not know

it for a day. You go to class or the office, go to a movie, meet friends, ride the bus home, and you may have infected dozens before you wake up feeling awful the next morning.

A pandemic would be a different kind of emergency than most of the disasters we plan for. Since influenza mutates so rapidly, a pandemic would probably occur in three or four waves. Even with low mortality, a large percentage of the workforce would probably be sick or caring for their sick families. We cannot plan for business continuity in the same way. "Social disruption may be greatest when rates of absenteeism impair essential services, such as power, transportation, and communications" (World Health Organization).

A pandemic would not be a five-hour event where we can begin recovery/continuity efforts the next day. You might compare it to the scenarios we have seen for a nuclear war, where cities throughout the world are hit, radiation follows, and the subsequent shortage of resources. A pandemic of this kind would not be a battle, but a war, with all the attendant complications of supply, morale, and exhaustion.

Since Hurricane Katrina, perhaps we are in less danger of complacently assuming that our governments or other normally dependable organizations are going to "save us." We now know that the National Guard, the Red Cross, the doctors, nurses, and pulmonary technicians, will all be short-handed, worried about their families, and running out of supplies if we experience a pandemic.

One important thing that all facilities should do is begin to identify and inventory available assets and resources that could prove beneficial, and even essential, in the face of an event such as pandemic flu. Ask these questions: Who are essential personnel? What supplies are needed? What do we have on hand available for use now? How long will these supplies last? Are we maintaining a minimum three month supply of needed items?

Supplies to have on hand now include, but are not limited to, the following items. Hand sanitizers (gel based is best)—available in all your department's restrooms and break areas; stock the smaller, portable versions in all work vehicles. A quality pop-up wipe is also a good idea to have on hand in your stockrooms. Maintain a good supply of soap as well, not necessarily antibacterial, just good quality soap; liquid or foam is best—see to it that all your restrooms and break areas have a hot water supply. Bandages, masks, gloves, heavy duty garbage bags and spray disinfectants are good to have as

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well; also, these are items that will keep long-term. Liquid bleach should be considered; this item in 1-gallon containers or smaller has a shelf-life of 1 year if stored properly. There are quality surgical-type masks being manufactured with a layer of bio-filter built in, along with N-95's, these are the masks that should be considered for use. If left unopened and stored properly they should have an indefinite shelf life. The health and safety officer should have information on reliable scientific companies from which these type masks can be purchased. Be aware that the Centers for Disease Control (CDC) recently issued a statement on the use of masks during a bird flu pandemic—the bottom line being that masks may not provide 100 percent protection, but some protection is better than none at all.

Consider also what expertise already exists in your department. Who are your resident experts in areas of responsibility that may overlap with your preparedness needs? It is critical to the success of a well-prepared campus to know who these people are: the environmental health and safety officer; the environmental engineer; the safety and training officer. These are people whose jobs require that they be up to date on the latest research, compliance regulations and any breaking news relevant to the health and safety of the campus. Give them the responsibility of gathering and disseminating relevant information to the director of facilities as news happens. It is also wise to develop a good relationship with the director of student health and to maintain an ongoing dialog with this individual—here is another expert and valuable resource. Yet another valuable resource is the director of telecommunications for your campus; he or she will be critical during the planning stages of your campus pandemic policy and instrumental in maintaining an accurate, timely flow of information to the students and staff. These are also the people to rely on for help in establishing a good working relationship with outside agencies at the local and state levels. The people who come to the table for disaster preparedness will be the same people who come together for pandemic preparation.

As we consider resources, what can be done right now to ensure that our staff is healthy? One of the best practices established at the University of Mississippi was to take cold and flu season seriously. The University partnered with employee health services and strongly encouraged staff to get a flu shot; the safety officer reminded everyone to regularly wash their hands and sent out emails that addressed the proper technique for hand washing; the safety officer also stayed current on health articles and tips that could be used by the staff to help prevent colds and flu. Gently encourage anyone who knows or thinks that they might be sick to see a doctor and stay home until they are better. This helps greatly reduce employee down time due to illness. Take the well being of your staff seriously; they are your most valuable asset.

A pandemic would be a different kind of emergency than most of the disasters we plan for.

One of our primary concerns should be identifying essential personnel. West Virginia University has specified four main areas of responsibility:

- Operations
- Planning
- Administration/Finance
- Logistics

Each of these four areas, and several layers below them, include a command structure five people deep, in case of illness, family concerns, or unforeseen circumstances. For pandemic planning purposes the Department of Defense assumes a 40 percent absentee rate. We have no way of knowing who will get sick, and who will have to function in multiple roles. The outline of specific responsibilities for planning and managing a possible pandemic must be more flexible than hierarchical.

The logistics area, which was assigned to facilities, includes identification of the following locations and the supplies needed:

- Health evaluation, infirmary area
- Quarantine area
- Sick bay
 - ✓ Medicine storage
 - ✓ Medical supply storage, masks, gloves
 - ✓ Detergent, bleach
 - ✓ Available washers and dryers
- For both sick bay and staff housing
 - ✓ Air mattresses
 - ✓ Linens, towels
 - ✓ Paper goods
 - ✓ Plastic sheeting, framing to separate beds
 - ✓ Food and water
- Transportation
 - ✓ Transportation of sick people, soiled linen, bio-waste
 - ✓ Gasoline
 - ✓ Diesel
- Critical Equipment
- Generators
 - ✓ How much fuel is required?
 - ✓ Can they support Police Dispatch?
 - ✓ Can they provide hot water,
 - ✓ Basic cooking needs?
 - ✓ Can they heat/cool
 - Populated areas
 - Research
 - Animal Quarters
 - Temperature-sensitive chemicals
 - Food storage

- Radios
- Protective equipment
- Signage

Remember that any staff members who are on the job during a pandemic may well be staying on campus, may be quarantined on campus, and/or may not want to go home and risk infecting their families, especially if they get sick. Make an extra effort to plan for their care. Whoever stays with the ship will be overworked, anxious about their families, their friends, and their own health. We have to make sure we have safe, comfortable quarters for them, as much communication with the rest of the world as we can rig up, and a lot of calories and coffee.

As the pandemic progresses, we will have to provide more intense care for our students as they too become sick, anxious, and bored. Simultaneously, we will have fewer staff available as they get sick, exhausted, or go home. All of us must begin to identify and arrange for the specifics that will be required before we need them. If and when Avian flu became infectious person-to-person, it will be on CNN, and everyone everywhere will hear about it at the same time. We will all be calling the same vendors wanting rush orders of the same equipment and materials. We can't wait until it actually becomes infectious person-to-person. The following decisions should be made now:

Is your campus participating in disaster drills and exercises? Exercises and drills will provide an ideal situation for testing your pandemic procedures; this is where we spot the flaws and work out the kinks, particularly in communications.

- Agree on assumptions, examples:
- For both sick bay and staff housing
 - ✓ How much of what quality of supplies to purchase
 - ✓ Exactly what will medical personnel have, what must you provide
 - ✓ What kind of protective equipment to provide
 - ✓ Which buildings could be closed
 - ✓ How much transportation to provide, to whom, of what type
- Assign responsibility for each task, each item to specific person
- Assignee obtains high and low estimates of total cost to provide to central administration

The goal of campus facilities should be to do everything that is reasonable, practical and beneficial to safeguard the health of faculty, staff and students. Another area to consider is that of communication and cooperation between physical plant facilities, student health and your administration (move up your chain of command). Maintain a strong but fluid loop of information and keep it flowing.

Facilities and physical plants should also participate in table-top exercises with their state and local agencies. Get to know these people and establish a good working relationship with them. We have found that many of the protocols used in disaster planning transition easily to pandemic planning...don't reinvent the wheel, just tweak it where needed. As previously stated, these agencies and their respective employees are assets that may prove invaluable as we prepare for the worst. Is your campus participating in disaster drills and exercises? Exercises and drills will provide



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an ideal situation for testing your pandemic procedures; this is where we spot the flaws and work out the kinks, particularly in communications. For all of us, the desired result is to be as flexible and prepared as possible.

Does your institution include a medical school, or is there a large health facility nearby? Establish contact with them; you will have more medical supplies and personnel on campus in the event of a pandemic if you have prearranged the use of your field houses and auditoriums to hold extra sick bays and clinics, indicated that your residence hall laundry facilities will assist in stockpiling bleach and keeping bedclothes clean, and offered food and coffee for the duration. When working on your communications plan, start with the local Public Health Department; they are the center of information for events of this kind.

The CDC provides free downloadable software, based on Microsoft Excel that estimates the potential number of days lost from work due to an influenza pandemic. Input values can be changed by the user so that all sorts of scenarios can be explored. This software can be found at <http://www.cdc.gov/flu/tools/fluworkloss>, and there are links to additional influenza planning software at the bottom of the web site. The U.S. Department of Health and Human Services maintains PandemicFlu.gov, a one-stop site that brings together all sorts of information on pandemic planning; including an excellent checklist for institutions of higher learning ("Colleges and Universities Pandemic Influenza Planning Checklist"). The Harvard School of Public Health offers Exercises and Drills, including a Tabletop Drill for avian and pandemic flu, at <http://www.hsph.harvard.edu/hcphp/products/exercises/index.html>. Although the drill is geared to public health agencies, the scenarios are useful in planning drills for any organization, including colleges and universities.

We live in a constantly changing world. It is a world where physical plants and facilities are tasked with the responsibility of bridging the gap between meeting the needs of our employees and customers and meeting head-on the challenges that naturally occur with change. In both instances,

preparation will be the key to any hope of success, no matter how small that success might be. We make every effort to train and equip our employees so that they possess the knowledge, skill, and right attitude to carry out their organization's mission. Can we do any less in preparing our organizations for events such as pandemic flu, natural disasters, or other equally devastating threats?

Surely we can all agree that the issue is not if something will happen; only when, where, and who among us will be impacted first remains as yet unanswered. The vital importance of being as prepared as reasonably possible cannot be overstated. It is better to be ready—even for a

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circumstance that doesn't exist yet—than to have that circumstance become reality and find your organization totally overwhelmed by it. To quote the director of physical plant at Ole Miss, “we are not the University of Mississippi's main mission...our role is to support the school's mission by thinking ahead to three, four, or five years down the road and asking ourselves whether or not we have sustainability.” The very nature of our work demands that we be flexible, viable and sustainable in thinking, doing and planning for the future. Bottom line, start looking toward the future of your organization and be prepared. †

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World Health Organization site on Avian Influenza. June 2007
http://www.who.int/csr/disease/avian_influenza/en/

Resources

Work loss calculation software (free)
<http://www.cdc.gov/flu/tools/fluworkloss>

CDC site on Stopping Spread of Germs at Work,
<http://www.cdc.gov/germstopper/work.htm>
Campus Safety, Health, and Environmental
Management Association site with
Pandemic Influenza Resources
for Colleges and Universities,
<http://www.cshema.org/resource/pandemic0306.htm>

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<http://www.hsph.harvard.edu/hcphp/products/exercises/index.html>

Official U.S. Government site, <http://www.pandemicflu.gov/>

The White House National Strategy for Pandemic Influenza:
Implementation Plan, <http://www.whitehouse.gov/homeland/pandemic-influenza-implementation.html>

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