

PLANNING FOR A UNKNOWN FLU PANDEMIC PANDEMONIUM

**Col. (r) Assoc. Prof. Dr. Nicolae Steiner MD, PhD
NATO international expert in Disaster Medicine
Honorary member of NDMS, USA.**

Abstract:

Planning for the unknown pandemonium of a global flu pandemic is a complete challenge for planning community. The multiplicity of the planning situations the unknown reactions of the authorities in such an event constitutes some of the planning constraints.

Planning, pandemics, challenges and constraints.

Have you ever prepared a "go" bag for emergencies or disasters? You should. A search of Centers for Disease Control and Prevention,(CDC)[1] reveals much information on personal emergency or disaster preparation. You will also find that preparing for emergencies and disasters for you and your family requires thought before action.

Now, extrapolate preparations for emergencies and disasters to medical facilities, some of which have a workforce of mid-sized towns, plus patients and their visitors, and students if it is a university medical center.

They must be prepared for all types of scenarios including but not limited to mass shootings; vehicle pile-ups; cyberattack; natural disasters such as hurricane, tornado, flood, or earthquake; or terrorist bombing or release of a biological weapon.

All of these emergency situations are horrendous and affect many people, but they are largely localized. There is one scenario, however, that can strike fear into the heart of the entire world at once: infectious disease.

Since Ebola virus has reared its ugly head once more, announced on May 8, 2018, with 26 in the Democratic Republic of Congo dead as of May 21, the threat of a pandemic is once again thrust into the limelight.[2] The 2014 Ebola outbreak in West Africa infected more than 28,000 and more than 11,000 died. Of the 2014 Ebola outbreak, Tom Frieden, who was director of CDC at that time, said this epidemic had served as a test. "We, the world, failed that test,"[3] he said.

This time, the Ebola outbreak appeared in a large city instead of only rural areas. That is frightening, because there are so many more opportunities to pass the infection, making it harder to contain. What is worse is that the affected city sits on the Congo River, which connects to other large cities. Immunization with experimental vaccine started on May 22, 2018.[4] Let's hope it is successful.

In the opening of their book *Deadliest Enemy: Our War Against Killer Germs*,[5] by Osterholm and Olshaker, there is a quote by Sir William Osler, MD: "Humanity has but three great enemies: fever, famine and war; of these by far the greatest, by far the most terrible, is fever.[5]

The effects of infection reach far beyond the individuals affected. Osterholm explained that, while there are other serious diseases such as heart disease, cancer, and

Alzheimer's, those diseases "don't really have the potential to alter the day-to-day functioning of society, halt travel, trade, and industry, or foster political instability.[5]

The Washington Post recently ran an interesting article entitled, "This mock pandemic killed 150 million people. Next time it might not be a drill.[6] In this mock situation, a panel of experts, including high-ranking government officials, played out a pandemic exercise on May 15 to demonstrate what policies and strategies the U.S. government should have in place. The scenario mixed details of past disasters with fictional possibilities. Tara O'Toole, a former top Homeland Security Department official who played the homeland security secretary, was quoted as saying, "We are in an age of epidemics, but we aren't treating them like the national security issues that they are.[6]

Bill Gates put an interesting spin on the problem, comparing preparing for a pandemic to getting ready for a war. "If you were to tell the world's governments that weapons that could kill 30 million people were under construction right now, there'd be a sense of urgency about preparing for the threat,[7] Gates said. "In the case of biological threats, that sense of urgency is lacking," he said. "The world needs to prepare for pandemics in the same serious way it prepares for war.[7]

The threat of a pandemic is not a matter of if but when. A pandemic can develop seemingly overnight, but it won't leave as it came. A pandemic may take six months, perhaps a year or two, to reach its peak before it starts to decline. It may come in waves, as it did 100 years ago with the Spanish influenza of 1918, an avian flu similar to H5N1 or H5N2. With each wave, the pathogen likely will grow more virulent. By the third and last wave of Spanish flu, people were dying within hours of showing symptoms. The Spanish flu killed approximately 50 million, some would say closer to 100 million, people over a period of less than two years. Imagine what kind of impact air travel would have on the death toll now. We could lose a significant portion of the world's population in a spectacularly short period of time.

It is commonly acknowledged that the next pandemic may very well be, perhaps is most likely to be, a type of influenza previously unknown to us. Viruses are smart. They are constantly mutating. Recently, Science Daily quoted Landon Westfall, PhD, a senior project manager and infectious disease scientist at Southern Research, as saying, "the evolving nature of influenza viruses presents tough challenges to the research community. Flu . . . can change from week to week, from month to month, and from region to region."Every person who gets infected with the flu basically creates a small change in that virus that's then passed on to multiple people. Flu constantly changes that way.[8]

At the 1995 National Academy of Sciences meeting in Washington, DC, Nobellaureate Dr. Joshua Lederberg asked, "The question is, will we get them before the bugs get us? We're beginning to lose ground," he said, mainly because of air travel. "The microbe that felled one child in a distant continent yesterday can reach yours today and seed a global pandemic tomorrow, [9] said Lederberg. As Melinda Gates was quoted recently, "Think of the number of people who leave New York City every day and go all over the world - we're an interconnected world.[10]

Who needs to be involved?

The first step is determining who should be involved in planning for an emergency or disaster, whether it be a pandemic, biological warfare, a mass shooting, natural disaster, or other emergencies. Scott Cormier, Vice President of Emergency Management, Environment of Care and Safety, Medxcel, explained what is needed. "In emergency management, we use the term 'all-hazards approach.' For each disaster, a core group of people respond and perform core functions. The core group should include executive

leadership, both clinical and administrative, emergency managers, supply chain, facility management and engineering, public relations, and human resources, to form the basics of the incident command team: incident command, operations, planning, logistics, and finance. Other departments may be needed to plan for specific incidents. Local government emergency-management and public-safety teams should also be part of the process."

Christopher J. O'Connor, President and CEO, Acurity, Inc., and Nexera, Inc., pointed out that disaster preparation and response is a team effort. "Several hospital departments should be involved in developing emergency operations plans. Supply-chain staff should be fully integrated into the hospital-incident command system, alongside operations personnel, such as medical directors of the emergency department, operating room, or intensive care unit, and department heads of security, environmental/hazmat, and space and staging. Additional components involve information and communications activities, such as information technology, for data continuity; human resources (staffing); and public affairs, to handle community and press outreach. Finally, there are financial and administrative elements to manage, i.e., disbursement of funds, compensation, and cost tracking."

Alise Howlett, Assoc. AIA, CHFM, CFPE, Healthcare Facilities Standards Advisor, Emergency Management, Physical Environment, and Life Safety Standards Advisor, at Healthcare Facilities Accreditation Program (HFAP), noted that infection-prevention specialists, surgical and sterilization services directors, radiological and diagnostic services management, as well as individual department heads should be included, because, "All departments have some role in planning an emergency response, with the hospital leadership positions responsible for orchestrating all players," noted Howlett.

If the emergency is on a larger or worldwide scale, organizations with a broader scope should also be involved, noted Jeffrey T. Paquet, CEO, Mobile Medical International Corporation (MMIC), including, "CDC, World Health Organization, Federal Emergency Management Association (FEMA; Department of Homeland Security), local emergency-management organizations, and businesses with emergency-response equipment designed to be utilized during an emergency or disaster situation."

Components of preparation

Is it possible to be adequately prepared for every possible type of scenario? Probably not. However, it is possible to learn from others' experiences and from information gleaned from advisory organizations.

Howlett, HFAP, outlined three necessary general components: a Hazard Vulnerability Analysis (HVA), the Emergency Operations Plan (EOP), and means for evacuation. "There are many standards and policies required underneath these main subjects," according to Howlett. "HFAP provides standards and guidance to help healthcare organizations develop and flesh-out their emergency plans. HFAP's standards directly reference the components mandated by Centers for Medicare and Medicaid Services. Our survey process has been modified to devote more time by our surveyors to review and provide guidance on all emergencymanagement standards and documents."

The requirement for an "all-hazards" approach seems to be misunderstood by some, noted Howlett. "The Emergency Operations Plan is really about organizing an approach that will work with any disaster or emergency event. Also, facilities may think there is a standard plan they can use and do not have to plan each component specific to their own hospital. This is never the case. All plans are specific to each institution and site, and no two are ever the same."

Cormier, Medxcel, outlined main components of an emergency/disaster plan. "The Joint Commission identifies six components of an emergency/disaster plan: Communications, internal and external; resources and assets, ie, utilities, medications, supplies, and specialty equipment such as decontamination equipment; safety of patients, visitors, and staff; security of the facility; staff responsibilities, including staff knowing their role in a disaster; managing utilities; and patient clinical and support activities."

O'Connor, Acurity, Inc., emphasized the role of the supply chain in preparedness for emergencies and disasters. "The first step is to conduct a HVA, which enables institutions to prioritize risks by considering their probability and likely impact on operations. Supply-chain leadership should be involved in the HVA, as well as in the emergency-operations-plan review and updating process."

O'Connor briefly outlined components of a preparedness plan. "The main components of an emergency plan include (1) pre-disaster preparation, including examining successful response from past events, staging emergency and personal protective equipment supply caches, training, and drilling key personnel; (2) a written plan of emergency/disaster procedures, with first responders on all shifts and backup for each role; (3) post-disaster recovery, including financial assessment, and emergency-preparedness-plan inventory replenishment; (4) disaster-specific logistics that address loss of utilities (such as power, water, steam, etc.), mass casualties, chemical or nuclear events, and hoteling key personnel, with transportation and child care, if necessary."

Paquet, MMIC, went into more specific detail on some items needed on hand in a wide-scale emergency. "The main components of an emergency/disaster plan are people who are trained to respond appropriately and who have the means to do so. The main tools needed are shelters, with sufficient supplies and equipment to house people; access to potable water; generators and fuel to power lighting and equipment; communications; logistics for the pick-up and delivery of supplies, water, and food; and on-site healthcare, supported with trained personnel to attend to injuries and medical issues."

Paquet offered advice reaped from experience on a couple of important areas that might be overlooked without previous experience. "During the Joplintornado, the need for a temporary morgue was identified, as well as a way to manage the myriad of pets that were orphaned or temporarily displaced in the aftermath."

Voices of experience

"Emergency management events are unique," stated Cormier. "Expertise is developed through response to events. Medxcel supports the largest not-forprofit healthcare system in the country and regularly responds to disasters, whether hurricanes, flooding, hazardousmaterials events, or infectious-disease outbreaks. We utilize a Corporate Virtual Emergency Operations Centerconcept to bring equipment, supplies, and expertise to local facilities, and to coordinate with state and federal agencies before, during, and after the event."

Cormier related a hands-on experience where Medxcel dealt with major disaster. "The 2017 hurricane season was historical. Medxcel had a coordinated response, which started by engaging our private meteorological service, which tracks potential hurricanes and tropical storms. Planning continued as landfall risk areas became known, which included delivering spare generators, personnel, equipment, and supplies to facilities in the threat area and planning evacuations of critical patients. Our hospitals received patients from hospitals in devastated areas, which we coordinated with our state and federal partners. Some of our hospitals received significant damage, but no patients, visitors, or staff were

injured. We restored full operations within 24 hours. Work continued as we coordinated remediation of damage and worked with FEMA to apply for disaster remediation funds."

"Acurity's expertise in supply chain, logistics, contracting, and hospital operations has proven invaluable to providers during past events, ranging from destructive storms to disease outbreaks and terrorist attacks," said O'Connor. "We are deeply committed to ensuring that members are prepared to respond to a wide range of emergencies so that patient care is minimally disrupted. When events do occur, we work with members, other provider groups, and state, federal, and local health and emergency-management agencies to ensure a coordinated, comprehensive response."

O'Connor related their experience with a major infectious-disease outbreak. "In response to the 2014 Ebola outbreak, Acurity staff kept in touch with the supplier community to monitor the availability of the supplies on the CDC list and informed the supply-chain community about which vendors manufactured these items and the specific stock-keeping units (SKUs) for each. Because many supplies were not available from traditional medical/surgical suppliers, Acurity helped members locate alternative suppliers and provided vital instruction on donning and doffing personal protective equipment, as well as managing the clean and infectious areas required."

Acurity offers tools to help hospitals plan for and recover from disaster. Downloads include a key supplies checklist, including items of which facilities should have a 96-hour inventory (i.e., food and water, generators, hoteling items, and medical supplies); a key contacts checklist (i.e., names, phone numbers, and after-hours contact information for key suppliers and emergency personnel); and a supplychain department checklist for imminent emergencies, including an example of a 120-hour preparedness plan for a coastal storm scenario. They also have a blog on supply-chain emergency preparedness at <https://www.acurity.com/articles/category/blog/>.

Cardinal Health also has a blog designed to help those charged with preparing for emergencies and disasters. Check out "Hospital Disaster Preparedness: best practices learned from Hurricane Irma," at <https://www.cardinalhealth.com/en/essential-insights/best-practices-learnedfrom-hurricane-irma.html>. While you're there, sign up for a free hospital disasterpreparedness checklist.

Orlando Health responded to the June 2016 mass shooting at the Pulse nightclub in Orlando, FL. Eric Alberts, Corporate Manager of Emergency Preparedness, talked about a lesson learned on the importance of having a plan for communication in place for visitors from abroad during a mass disaster. "The US welcomes millions of visitors a year, with people travelling on business, to see family, or on vacation. They come for a short time and have extremely limited resources and support networks available to them. When something unexpected happens and they're hospitalized, the value of having a process in place to assist international patients cannot be overstated. Being hospitalized in a foreign country carries a lack of familiarity with the medical system; limited support networks, financial, familial, or otherwise; isolation from their families, who may live thousands of miles away; and possibly language difficulties. Offering additional support isn't just a good practice, it's the right thing to do. Add in complications created by an emergency, such as a terrorist incident, that support becomes even more important. Ordinarily complex tasks, such as being able to identify international patients and locate and contact their family, become even more critical."

Alberts outlined some of the challenges patients from outside the United States face during a disaster, such as difficulty contacting family members, complications accessing overseas medical records, and possible lack of travel documents. "Having even a basic understanding of their needs and difficulties allows clinicians and hospital staff to offer a higher overall standard of care. Translation services and language lines can be extremely

useful, as can incorporating external partners into their care. Including the patient's embassy or consulate in a patient's care can allow for a unique level of support. Consulates are normally staffed by employees from the home country; they understand the language, the culture, and the difficulties that patient may be encountering and can help them, and the healthcare system, resolve issues relating to their hospitalization and repatriation."

As a result of their experience with the Pulse mass shooting, Alberts said that Orlando Health saw the need to have a plan in place for helping people visiting from other countries. "Foreign missions contacted Orlando Health immediately following Pulse, but we didn't have a process in place to help them connect with their nationals. We worked to rectify this and developed a paper outlining how healthcare systems can recognize foreign patients at admission and offer additional services." The white paper can be accessed at [https://www. orlandohealth.com /campaigns/orlandohealth-foreign-national-white-paper](https://www.orlandohealth.com/campaigns/orlandohealth-foreign-national-white-paper).

MMIC has had considerable experience with weather disasters. Paquet discussed how their product helps to relieve a complicated medical situation. "Mobile Medical International Corporation's Mobile Surgery Unit can be quickly reconfigured to attend to ten patients simultaneously in a disaster situation or can be utilized to provide on-site surgical services, depending on the needs applicable to the situation. Two of our Mobile Surgery Units provided on-site surgical capability for a year following the tornado in Joplin, Missouri, that devastated Mercy St. John's Hospital in May 2011," stated Paquet. "Mobile Medical also responded with two Mobile Surgery Units and a Mobile Recovery Care Unit in October 2008 to the University of Texas Medical Branch in Galveston, TX, following Hurricane Ike."

Some results of a flu pandemic simulation in Romania

Variable	No. of observations	Total	County average	Obs
Total flu cases	41	3.934.972.00	95974.927	
Total deceased	41	4644.00	113.268	
Total flu cases that must be hospital admitted	41	657257.00	16030.659	
Hospital admittance capacity	41	5166.00	126.00	
Total patients cared at home	41	3.147.977	76779	

Table 1: The result of simulating a flu pandemic in Romania [13]

From the data presented in the table above, in the case of a flu pandemic in which a flu-like strain with that from in the 1918 pandemic circulates, Romania's health system has exceeded and the overall morbidity and mortality by influenza can not be curbed.

Are you preparing for emergencies and disasters?

In August 2017, the Medical Group Management Association's MGMA Stat poll queried healthcare professionals about whether they have an emergency preparedness plan.[11] More than 78 percent of the respondents stated they have an emergency plan in place.

Less than 18 percent reported they do not have an emergency preparedness plan. The remaining 4 percent said they were unsure.

Among those who responded "yes," they most often reported their plans cover natural disasters such as weather, fire, and tornados, along with other emergency issues such as loss of computer systems, workplace violence, and active shooter(s).[11] Many said their plans have been tested "with drills and collaboration with local specialists such as fire departments to help optimize their plan." [11]

If your facility is among those who are unprepared or underprepared, here is some sage advice from a world-renowned expert. Osterholm spoke specifically about a pandemic, but considering our world is out of balance, with one unspeakable tragedy after another unfolding on almost a daily basis, his advice can apply to most any disaster or emergency. He issued this warning: "This is a critical point in history. Time is running out to prepare for the next pandemic. We must act now with decisiveness and purpose." [12] HPN Ike

References:

1. Centers for Disease Control and Prevention. Office of Health Preparedness and Response. Are you prepared? <https://www.cdc.gov/phpr/areyouprepared>. Last accessed May 18, 2018.
2. Hugo K. Ebola outbreak 2018 update: virus has killed 26 people in recent, deadly Congo epidemic. Newsweek. May 20, 2018. <http://www.newsweek.com/ebola-killed-26-people-recentcongo-outbreak-2018-virus-935577?yptr=yahoo>. Last accessed May 20, 2018.
3. Bearak M. Congo confirms first Ebola case, raising possibility of 'explosive increase in cases.' Washington Post. May 17, 2018. https://www.washingtonpost.com/world/first-confirmed-urban-ebola-case-is-a-game-changer-in-congo/2018/05/17/430babce-5890-11e8-9889-07bcc1327f4b_sto-ry.html?noredirect=on&utm_term=.9bad9cbdfb52. Last accessed May 22, 2018.
4. Thompson H. Ebola vaccinations begin in Congo. Science News. May 21, 2018. https://www.sciencenews.org/blog/science-ticker/ebola-vaccinations-begin-congo?utm_source=email&utm_medium=email&utm_campaign=latest-newsletter-v2. Last accessed May 22, 2018.
5. Osterholm MT, Olshaker M. Deadliest Enemy: Our War Against Killer Germs. Little, Brown and Company, New York; 2017.
6. This mock pandemic killed 150 million people. Next time it might not be a drill. Washington Post. May 30, 2018. https://www.washingtonpost.com/news/to-your-health/wp/2018/05/30/this-mock-pandemic-killed-150-million-people-next-time-it-might-not-be-a-drill/?noredirect=on&utm_term=.5ca72b29d4ab. Last accessed June 4, 2018.
7. Loria K. Bill Gates thinks a coming disease could kill 30 million people within 6 months - and says we should prepare for it as we do for war. Business Insider. Apr. 27, 2018. <http://www.businessinsider.com/bill-gates-warns-the-next-pandemic-disease-is-coming-2018-4>. Last accessed May 21, 2018.
8. Southern Research. Shielding against pandemic flu dangers. ScienceDaily. January 23, 2018. www.sciencedaily.com/releases/2018/01/180123113106.htm. Last accessed May 29, 2018.
9. Furse J. Virus danger is spreading. New York Daily News. May 14, 1995. <http://www.nydailynews.com/archives/news/virus-danger-spreading-article-1.690136>. Last accessed May 19, 2018.
10. Loria K. Bill and Melinda Gates think a weaponised disease may be the biggest threat to humanity - here's how worried you should be. Business Insider Australia. March 13,

2018. <https://www.businessinsider.com.au/pandemic-risk-to-humanity-v2-2017-9>. Last accessed May 21, 2018.
11. Medical Group Management Association. MGMA Stat poll: many health leaders report they have an emergency preparedness plan. <https://www.mgma.com/data/data-stories/many-health-leaders-report-they-have-an-emergency>. Last accessed June 4, 2018.
12. Osterholm MT. Preparing for the next pandemic. Foreign Affairs. 2005;July/August. <https://www.foreignaffairs.com/articles/2005-07-01/preparing-next-pandemic>. Last accessed May 19, 2018.
13. Nicolae Steiner: Some results of a flu pandemic simulation in Romania. 2019 Personal unpublished data.