



EMERGENCY

STRATEGY AND LEADERSHIP IN CRITICAL TIMES

MANAGEMENT

WINTER 2015

WHAT DID WE
LEARN FROM
THE EBOLA SCARE
AND WILL WE
BE READY FOR

THE NEXT PANDEMIC?

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Does your system limit in how many USERS it will allow?

Can you reach SUPPORT when you need them?

Does your system allow you to make DECISIONS instead of excuses?

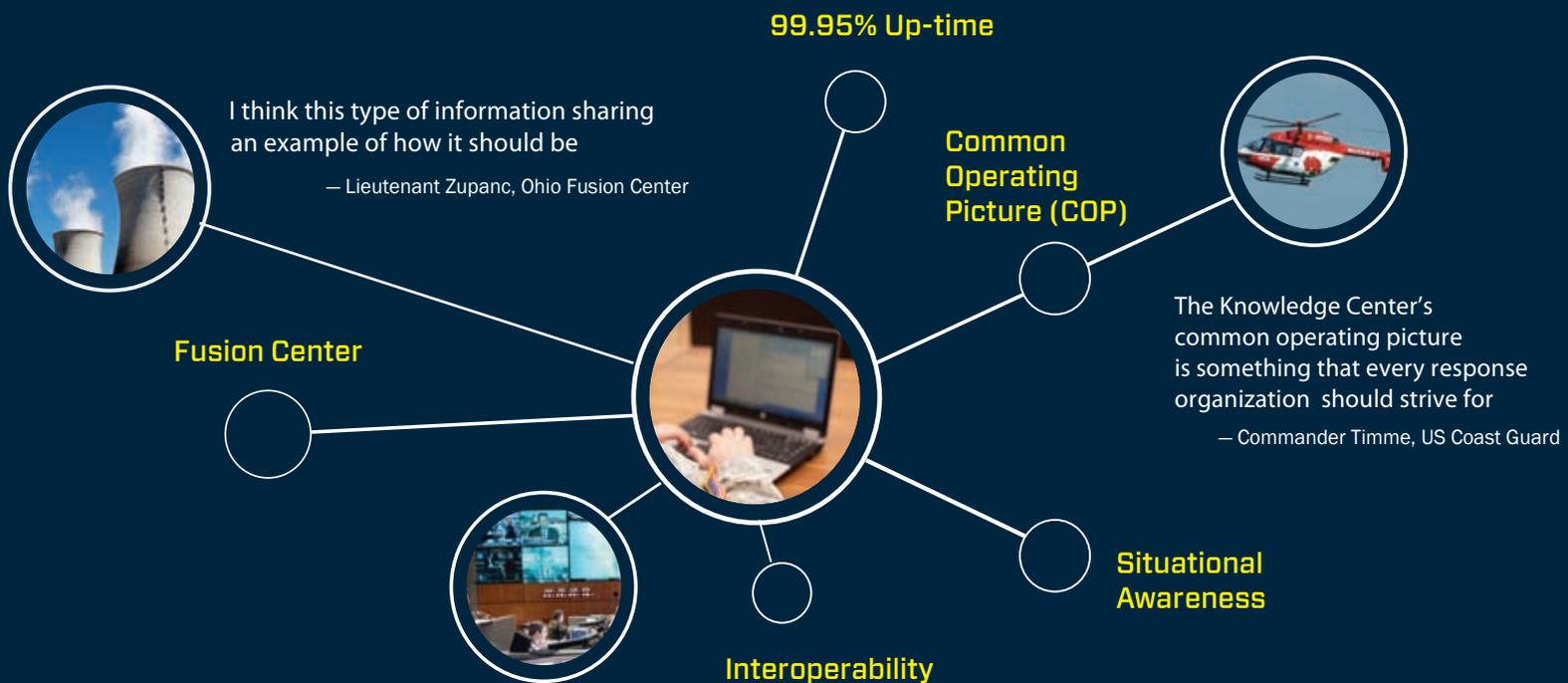


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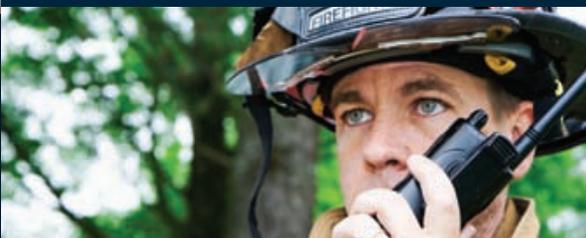
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Emergency Management (ISSN 2156-2490) is published bimonthly by e.Republic Inc. 100 Blue Ravine Road, Folsom, CA 95630. Periodicals Postage paid at Folsom, CA and additional offices. Postmaster: Send address changes to *Emergency Management* 100 Blue Ravine Road, Folsom, CA 95630. © 2015 by e.Republic Inc. All rights reserved. Opinions expressed by writers are not necessarily those of the publisher or editors.

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Being prepared for any emergency, disaster, or zombie apocalypse is a no brainer when you have reliable back-up power.





Calling a drone an unmanned aerial vehicle just gives it more respect than it deserves. The devices being used by noncommercial users, the only legal variety, are both payload and range limited. Larger airframes are needed, such as those used by the military for strategic reconnaissance, carry a significant sensor suite for a reasonable period of time.

Automated, autonomous aircraft date to World War I when Sperry developed a biplane nicknamed the Doodlebug, controlled by onboard guidance. In World War II, weapons with wire and radio guidance launched from aircraft and ships, and autopilot-controlled cruise missiles were used. Radio-controlled aircraft were used as targets for training for obvious reasons.

During the Vietnam conflict, Firebee target drones were converted to photo reconnaissance aircraft for deep penetrations.

Any airframe can carry the sensors and communications links required for either reconnaissance or weapons release as long as the load does not exceed the airframe's capability. The aircraft can be preprogrammed to follow a course or commanded by a ground or air operator.

What an unmanned vehicle cannot do is maintain anti-collision awareness in three dimensions at present or carry the equipment needed to do so in small airframes. The air traffic control system cannot track aircraft that do not cooperate with it. That is why airliners carry transponders and Traffic Collision Avoidance Systems. Without the

transponder, aircraft are not visible to air traffic control radars and, except in special circumstances near terminals, are not visible below several thousand feet altitude. Introducing small, untracked, not

very visible objects into this environment is not safe for manned aircraft and may not be safe for those below unmanned aircraft.

The current crop of quad-rotor and small fixed-wing unmanned aircraft endanger manned aircraft. The unmanned aircraft present collision dangers similar to bird strikes with the added dangers of having lasers or other sensors on board that can disrupt or distract operations.

Irvin Lichtenstein — in response to *Savior or Threat?* in the November/December issue

Team Rubicon is a great asset to local emergency management offices. Now we need to just get the [emergency manager] to see that. The teams have been trained by the world's finest and have the ability to help put people and communities back on their feet. Thank you all for continuing to serve our country.

CHBluhm — in response to *A Powerful New Purpose* in the November/December issue

As I was reading the Daily Briefing Report, which I receive from the Virginia Department of Emergency Management, your article was so timely. My county is in the early stages of reinventing how we utilize our Everbridge system and your information will be valuable as we go about accomplishing that task.

Mark Nugent, emergency services coordinator, Middlesex County, Va. — in response to *Signing up the Public* in the November/December issue

Interoperability is more than just equipment and systems but often rooted in the departmental/agency culture. There are many departments in communities that have the equipment and infrastructure to communicate directly with one another but for whatever reason choose not to. It will be interesting to see if this program becomes just a wish or whether it can actually work.
Frank Kriz — in response to *FirstNet: Is Opting Out an Option?* in the November/December issue

The use of UAVs is not really a question anymore. They are being used by a multitude of agencies and organizations and civilian users! There are opportunities for positive use, misuse and more significantly dangerous use.

Hawaii County Civil Defense Agency has experienced both positive and negative uses of UAVs. Hawaii County Civil Defense Agency is currently responding to an active lava flow threatening the village of Pahoa. They coordinated with the FAA to establish restricted airspace control measures that centered over the leading edge of the active portion of the lava flow.

In the first case, we experienced numerous cases of a civilian UAV flying over the flow. It was in restricted airspace at the same time as an authorized helicopter media flight and a National Guard helicopter over flight. The footage was being used by television news and various blogs. The individual was finally confronted and appears to have ceased operations.

In the second case, Hawaii County Civil Defense utilized the University of Hawaii at Hilo's UAV for high-definition reconnaissance. Key to success is positive airspace control measures and the difficult task of tracking down violators, and enforcing airspace control measures. I also believe there is a need to establish appropriate use standards to alleviate concerns of misuse.

Troy M Scott — in response to *Savior or Threat?* in the November/December issue



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By Jim McKay

More Mobile in 2015

Welcome to the Winter 2015 issue. Yes, we will be publishing quarterly now instead of six times a year. This is, in part, due to the nature of the market and because we are beefing up our online coverage.

We will still provide the best magazine available on the subject of emergency management and will work even harder to make sure that the four print issues are relevant to you and provide information you won't get elsewhere.

At the same time, you can count on that same kind of excellence at emergencymgmt.com. Our readership on the site has been growing steadily and maintained a record-breaking pace through the end of last year. We will be rewarding those online readers with more in depth features like the ones in the magazine.

So in effect, you will be getting the same coverage (better, we hope) but some of it will be online instead of in print.

We will stay on top of emergency management issues and themes critical to you. For instance, with the backdrop of the Ebola outbreak, we take a look at the issue of public health trends. What will the next pandemic be and are we ready? Will it be measles or pertussis? Monkeypox? Rift Valley fever? Chikungunya? Dengue or malaria? The flu? Will it be Ebola? See *The Next Pandemic*.

This article discusses why we are more primed for a pandemic than ever before and how and why it could play out.

There were lessons learned about the communication during the Ebola scare – or were there? Certainly there were lessons about how to communicate the risk of a potentially

lethal infection but were they observed or really learned?

Read *Risky Communications* and learn about some of the missteps that took place during the Ebola scare and how they can be remedied for the next infectious disease threat or pandemic.

With a warming climate, there will be public health consequences. In our feature, *The Climate Connection*, we uncover some of the hazards that have public health officials concerned about warming, including: increasing deaths and illnesses from heat stress; increasing risk of injuries and illnesses due to extreme weather events, such as storms and floods; more respiratory and cardiovascular illness and deaths caused by smoke from heat-related and drought-related wildfires, as well as changes in air pollution, particularly ozone smog; changes in the rates and ranges of infectious diseases carried by insects or in food and water; and threats to the safety and availability of food and water supplies.

We've also included an extra feature in this issue. *Fusion Center Model Emerges* discusses the evolution of the fusion center into a hub for communication between agencies and jurisdictions as well as with the federal government.

These are the types of in-depth features you can count on for 2015, whether in the print issue of *Emergency Management* magazine or online at emergencymgmt.com. 

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⊕ In the News

The Center for Domestic Preparedness (CDP) is a FEMA teaching facility where some 14,000 first responders and emergency managers come each year to drill, pairing classroom time with intensely realistic exercises. Walking wounded stagger through a mock downtown. Radiation victims crowd the halls of a full-scale hospital. Hazmat teams deal with actual anthrax and ricin. It's a hardcore program, with FEMA picking up all participants' costs.

Founded in June 1998, the CDP has produced about 850,000 graduates. Students come from the ranks of emergency management, EMS, fire service, hazardous materials, health care, law enforcement and others. The center's 40-plus training courses focus on incident management, mass-casualty response and emergency response to a catastrophic event.

The Anniston, Ala., campus includes three major components:

⊕ **Advanced Responder Training Complex:**

A series of buildings spread over 5 acres, including an apartment complex, dining facilities, a subway, as well as a street tableau with offices, businesses and warehouses. This is where disaster scenarios typically play out.

⊕ **Noble Training Facility:** Formerly a working Army hospital, this 100-bed medical facility is pretty close to being a functioning hospital.

⊕ **Chemical, Ordnance, Biological and Radiological Training Facility:**

This is the only facility in the country where civilian responders train in a toxic-agent environment. Students use nerve agents GB (sarin) and VX, as well as nonpathogenic strains of anthrax, ricin and radiological materials.

See more of this story at emergencymgmt.com/cdp.





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DAYS WITH MULTIPLE TORNADOES INCREASING

Tornado Alley is undergoing a transformation.

The number of days that damaging tornadoes occur has fallen sharply over the past 40 years, a study published recently in the journal *Science* shows. But the number of days on which large outbreaks occur has climbed dramatically.

In the early 1970s, there was an average of 150 days each year with at least one F1 tornado. That number has dropped to about 100 days each year now.

There were just six days in all of the 1970s with at least 30 F1 tornadoes. But that number has jumped to three a year now.

2014 followed that trend. There were 66 days with EF1 tornadoes and two days with 30 or more EF1 tornadoes: April 28 and June 30.

— TRIBUNE NEWS SERVICE

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NEW FEMA HIGHER EDUCATION BOOK

The FEMA Higher Education Program has released a new book that combines the knowledge and experience of emergency management practitioners and researchers, the result of which is an exchange between the two sectors about the top issues in emergency management.

Critical Issues in Disaster Science and Management: A Dialogue Between Researchers and Practitioners includes 12 sections written from the views of more than 20 emergency management practitioners and researchers. The 12 sections are dialogs on:

- Whole community — state, local and federal relationships
- Volunteers and nonprofits in disaster
- Public-private partnerships
- Access and functional needs
- Public health preparedness
- Planning and improvisation
- Reflections on the National Incident Management System
- Long-term recovery
- After-action reporting for exercises and incidents
- Social media
- Professionalization of emergency management
- Unmet needs and persistent problems



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FEMA TO REFORM FLOOD INSURANCE PROGRAM

FEMA UNVEILED a broad series of reforms in December to address concerns that contractors conspired to underpay flood insurance settlements to homeowners after Sandy.

In a strongly worded letter to private companies that work for the government-run National Flood Insurance Program, FEMA Administrator W. Craig Fugate said he had “deep concern” over allegations that engineers falsified documents to deny claims.

The reforms include:

- Revising how insurers are compensated to ensure claims aren’t underpaid.
- Releasing draft reports suspected of being doctored to deny claims.
- Reopening claims of 270 homeowners whose appeals were denied because they missed a paperwork filing deadline.
- Expanding the role of a flood-insurance advocate to assist policyholders with future claims.

— TRIBUNE NEWS SERVICE

Earthquake Early Warning System Rollout in 2015

OFFICIALS ARE PLANNING the first major rollout of California's earthquake early warning system this year, providing access to some schools, fire stations and more private companies.

The ambitious plan highlights the progress scientists

have made in building out the system, which can give as much as a minute of warning before a major earthquake is felt in metropolitan areas.

Until now, only academics, select government agencies and a few private firms have received

the alerts. But officials said they are building a new, robust central processing system and now have enough ground sensors in the Los Angeles and San Francisco areas to widen access. They stressed that the system is far

from perfected but said expanded access will help determine how it works and identify problems.

The warnings would allow fire stations to get garage doors open before a quake can jam them shut, instruct students to duck

and cover, and eventually, automatically shut off sensitive equipment at private companies and tell surgeons to halt surgery. When the data is more reliable, even amusement parks could have time to shut down rides.

— TRIBUNE NEWS SERVICE

Is it Flu or Ebola?



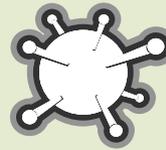
Flu (influenza)



The **flu** is a common contagious respiratory illness caused by flu viruses. The flu is different from a cold.

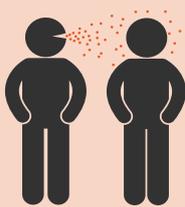
Flu can cause mild to severe illness, and complications can lead to death.

Ebola



Ebola is a rare and deadly disease caused by infection with an Ebola virus. Sporadic outbreaks have occurred in some African countries since 1976.

How Flu Germs Are Spread



The flu is spread mainly by droplets made when people who have flu cough, sneeze, or talk. Viruses can also spread on surfaces, but this is less common.

People with flu can spread the virus before and during their illness.

How Ebola Germs are Spread



Ebola can only be spread by direct contact with blood or body fluids from

- A person who is sick or who has died of Ebola.
- Objects like needles that have been in contact with the blood or body fluids of a person sick with Ebola.

Ebola cannot spread in the air or by water or food.

Who Gets The Flu?



Anyone can get the flu.

Some people—like very young children, older adults, and people with some health conditions—are at high risk of serious complications.

Who Gets Ebola?



People most at risk of getting Ebola are

- People with a travel history to countries with widespread transmission or exposure to a person with Ebola.
- Healthcare providers taking care of patients with Ebola.
- Friends and family who have had unprotected direct contact with blood or body fluids of a person sick with Ebola.

Signs and Symptoms of Flu

The signs and symptoms of flu usually develop within 2 days after exposure. Symptoms come on quickly and all at once.



- **Fever or feeling feverish**
- **Headache**
- **Muscle or body aches**
- **Feeling very tired (fatigue)**
- **Cough**
- **Sore throat**
- **Runny or stuffy nose**

Signs and Symptoms of Ebola



The signs and symptoms of Ebola can appear 2 to 21 days after exposure. The average time is 8 to 10 days. Symptoms of Ebola develop over several days and become progressively more severe.

- ***People with Ebola cannot spread the virus until symptoms appear.***



- **Fever**
- **Severe headache**
- **Muscle pain**
- **Feeling very tired (fatigue)**
- **Vomiting and diarrhea develop after 3–6 days**
- **Weakness (can be severe)**
- **Stomach pain**
- **Unexplained bleeding or bruising**

BY MARGARET STEEN

THE NEXT PANDEMIC

The recent Ebola outbreak has spread both disease and worry, though it wasn't a pandemic. Still, it has raised interest in what the next pandemic might be — and what can be done to either stop it or prepare for it.

A pandemic is an infectious disease in human populations that has spread worldwide and affected many people in almost all countries, said Thomas Campbell, professor of medicine in the Division of Infectious Diseases at the University of Colorado School of Medicine.

“What we're talking about is the global spread of an infectious disease,” he said. (This is why Ebola doesn't meet the definition; the cases are concentrated in just a few countries, with a few others having a handful of cases.)

The spread doesn't have to be fast for a disease to be considered a pandemic — HIV is a recent example of a slow-spreading pandemic — and the illness doesn't have to be deadly. “Severity is not part of the

pandemic definition, but we are more concerned about the ones that are severe and have the most potential to cause death or harm,” Campbell said.

What makes a particular pathogen dangerous? One factor is a prolonged incubation period or an asymptomatic phase. For example, most people don't know when they are first infected with HIV, so they can easily spread the illness before they experience any symptoms of it themselves.

Are pandemics increasing? It's not clear. “We're at the most risk we've ever been for pandemics. We're doing so



?

*THE DANGER
OF PANDEMICS
HAS BECOME
GREATER THAN
EVER.*

many things on the planet that cause them to emerge, and we're so connected to everywhere else," said Peter Daszak, president of the EcoHealth Alliance, a nonprofit focused on global health issues.

On the other hand, international travel has been happening for centuries, albeit more slowly than today, Campbell said. The introduction of smallpox by the Europeans into the Native American population is an example of a disease that spread that way.

"The difference between pandemics today and pandemics from centuries past is that now we have a much better scientific understanding of the factors that cause pandemics," Campbell said. "We're much more able to maybe not prevent the pandemic but to lessen the effects."

For example, he said, although the bubonic plague still exists and sickens some individuals, better living and sanitary conditions keep it from wiping out millions of people as it did in the Middle Ages. In addition, a strong public health infrastructure allows outbreaks to be identified and stopped early, and victims can be treated with antibiotics. "It's a combination of knowing the science and having good public health and medical care," Campbell said.

It's not possible to know exactly what types of pandemics are in our future or when they will occur. However, it's possible to evaluate the most likely ways for them to originate and potential candidates.

There are two main kinds of pandemic, Campbell said. Some originate from an animal reservoir — there are infections that occur in animals that cross into people and then spread through the human population. This happens frequently with influenza, for example.

These diseases don't usually kill the animals that are their hosts. "From the pathogen's standpoint, it's not a good strategy to kill your host as fast as you can," said Robert T. Schooley, professor of medicine and head of the Division of Infectious Diseases at the University of California, San Diego.

But they can be deadly when they spread to humans.

"What is worrisome is that when there is that cross-species transmission, if humans haven't been exposed to it, there may not be any herd immunity," said Campbell. Herd immunity, in which some members of a population are immune to an illness, helps to slow its spread. The Spanish flu epidemic of 1918 is an example of a flu strain that rapidly spread around the world once it appeared in humans.

How do these viruses make the jump from animals to people? One common way is through the food supply or in the process of butchering animals for food.

"Pandemics generally originate in the tropical countries where there's a lot of wildlife diversity and human activity," Daszak said. For example, SARS (short for severe acute respiratory syndrome) came from bats and has probably existed in bats for a long time since it doesn't kill them. Eventually people got infected and it started to spread.

"Once a pathogen is able to go from human to human and it gets into a city, people get on planes and travel," Daszak said.

"There are lots of different animals out there, and they have lots of different viruses and bacteria," said Campbell. "And we don't know about all of them."

The second type of pandemic comes from a disease that exists only in human hosts. These are "less troublesome,"



FEDERAL PANDEMIC FLU RESOURCES

The federal government has several websites that can help emergency managers and the general public understand more about possible pandemics, particularly flu.

✚ **Pandemic Flu Preparedness Tools**

www.cdc.gov/flu/pandemic-resources/tools
This site links to resources for hospital administrators as well as state and local health officials.

✚ **Influenza Risk Assessment Tool**

www.cdc.gov/flu/pandemic-resources/tools/risk-assessment.htm
This tool considers 10 factors in evaluating risk from various strains of flu. Criteria include how

easily it is transmitted in lab animals, whether the human population has existing immunity to it, and the severity of the illness.

✚ **Flu.gov**

www.flu.gov
This site provides information about seasonal flu and flu vaccines.





One of the main types of pandemics originates from an animal host and crosses over into humans.

Campbell said, because they're better known. "We're able to know about them and take measures like developing a vaccine to keep them from spreading."

The Candidates

What will the next pandemic be?

"If we knew what it would be, we'd be preparing for it," Schooley said.

Still, it's possible to consider some possibilities, with some more likely to pose a threat than others.

MEASLES AND PERTUSSIS

Experts agree that although resistance to vaccinations has caused some outbreaks of these illnesses, they are not likely to cause a pandemic since we have vaccines and understand how to stop the diseases.

"It would be very unlikely that that would become a pandemic as long as we maintain adequate vaccination rates," Campbell said.

Lower vaccination rates do carry some risk, though, both to the people who are not vaccinated and to the population as a whole, since a smaller fraction of the society will be immune, Schooley said.

EBOLA

Ebola is not a pandemic today — "the vast majority of countries around the world have not had a single case,"

said Campbell — although it's definitely an epidemic in West Africa.

And it's not clear if Ebola is a strong candidate to cause a pandemic. "Ebola is not very smart: It causes an acute disease and kills a large fraction of its infected people," Schooley said. There is a very short period, perhaps none at all, when an infected person can transmit the disease but does not yet have symptoms.

"And once you get over it, it's gone," Schooley said. "It doesn't have a latent form that allows it to be in a human over long periods of time and get transmitted to other people who don't realize the person is a carrier." This makes it easier to halt the spread, especially when the disease is recognized early and the health-care system can respond.

MONKEYPOX

Monkeypox, a relative of smallpox, came to the United States a few years ago from Africa with some imported pets. "The outbreak got controlled, and they banned the importation of rodents from West Africa," Daszak said. "But the big concern was, what if it had gotten into wild populations of groundhogs? That's really hard to get rid of."

RIFT VALLEY FEVER

This fever, carried by animals such as antelope and sheep, can kill people. It can

also be transmitted by mosquitoes. "If that gets into the United States, it's a virus that could persist in our animals and then be very difficult to eradicate," Daszak said.

CHIKUNGUNYA

This virus is working its way through the Caribbean, and Schooley suspects it will be seen more often in the Southeast and eventually the Southwest of the United States. Like West Nile virus, it is carried by mosquitoes.

DENGUE OR MALARIA

Climate change may affect where pandemics can take hold. "Mosquitoes that used to be restricted to warmer climates are finding places where they can propagate more effectively," said Schooley.

This could lead to a resurgence of illnesses like dengue and malaria in places where they haven't been common.

INFLUENZA

Flu pandemics happen when a new strain of flu — that people are not vaccinated against or immune to — enters the population. They have happened in the past, and "we can certainly expect" influenza pandemics in the coming years, Campbell said. In fact, this is one type of pandemic that has received a lot of preparation. (See the sidebar on page 18 for resources.)

UNKNOWN VIRUS

It's quite possible, of course, that the next pandemic will be an illness no one has yet identified. The biggest threat, Daszak said, is a disease that is spread by mosquitoes or that can be transmitted through the air.

What to Do

What should those in charge of preparing for pandemics — including public health officials and emergency managers — be doing?

Emergency managers are on the front lines for these sorts of events, Daszak said. "Pandemics are like any other threat or danger: It's all about managing risk and getting ready to deal with it when it happens."

One key is that management is a lot easier and more cost-effective at the beginning or even before the outbreak.

Looking at trends over the past 60 years to see where diseases such as West Nile virus, SARS and Ebola have emerged and how

they have spread, some patterns become clear. “The primary drivers of pandemics are things that we do on the planet: chopping down forests, more intensive farming and increasing travel networks,” Daszak said.

On a broader level, experts warn that actions people take now could increase the risks of, and from, pandemics.

For example, people build logging camps in tropical forests and send in workers, telling them they can hunt for their food. “We’re effectively placing people right in the middle of a virus hot spot and telling them to go out and hunt wildlife,” said Daszak. That’s a classic way that previous pandemics have emerged.

The creation of more intensive farms, particularly for poultry, is another cause for concern, Daszak said. “To a virus, a very intensive chicken farm is just a big pile of protein waiting to be infected.”

Of course, it’s not necessarily practical to stop practices, from intensive farming to international travel, that could help pandemics emerge. “The truth is, this is what we do: We need food, we need to

travel and have a trade network,” Daszak said. “We should get ready for the risk and not just hope it doesn’t happen.”

For example, when companies build roads into a forest, they should also build a food supply chain to reduce the risk that workers will go hunting on their own.

And a good surveillance system in the health-care system is crucial.

“We’re much better prepared now to deal with pandemics than we have been in the past,” Schooley said. Sophisticated microbiological techniques can identify organisms we didn’t previously know about.

Improving the health-care systems, especially in parts of Africa, Asia and Central America where new pathogens often originate, is another key to preparedness. The Ebola outbreak does show how important a good health-care system is in preventing the spread of a disease. When the current outbreak started, authorities initially believed it was cholera. The Ebola outbreak might not have reached the U.S. if the health-care system in West Africa

had been more robust. Even in the U.S., when an early victim appeared in an emergency room, he was initially sent home.

Public and private organizations should have pandemic plans, said Bo Mitchell, former police commissioner of Wilton, Conn., and founder of 911 Consulting. The plan should be “evergreen,” he said. “It doesn’t matter what the virus is called.”

Some of these plans may cover questions that were raised with the Ebola cases: How do you protect caregivers? Can health-care workers be forced to provide this care? Should they be quarantined?

Another key issue with pandemic planning is economics. “The economy has to keep on going,” Mitchell said. Most cities do not have enough food to feed the population if a quarantine won’t allow deliveries or employees to go to work for an extended period.

“We don’t know what the next pandemic will be or where it will come from,” Campbell said, “but we have to be prepared.” +

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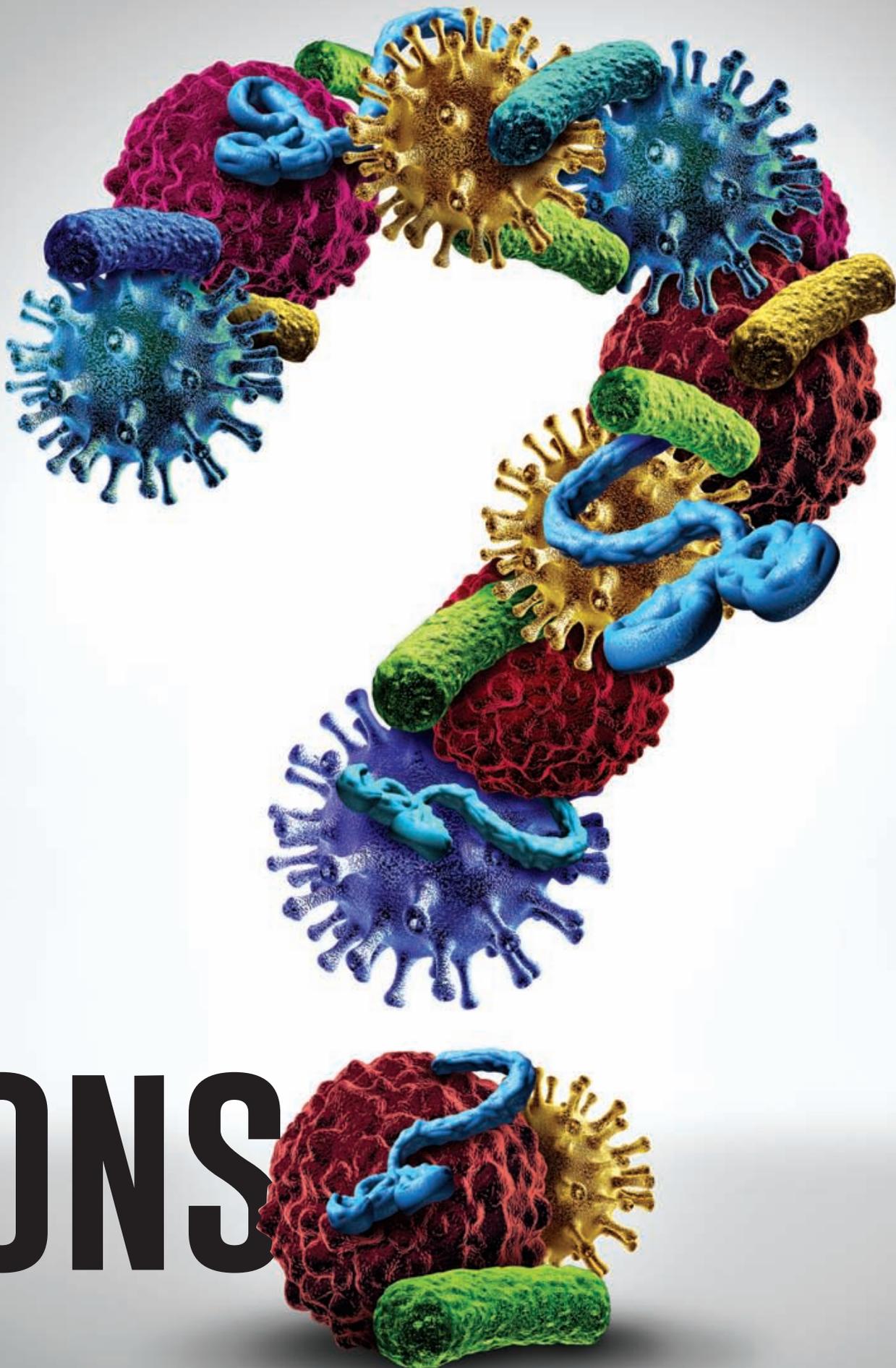
RISKY COMMUNICAT

BY JIM MCKAY

It would be interesting to see what would happen if there was another Ebola scare in the U.S. The answer might depend on when it happened and perhaps where the person became infected. But chances are the health infrastructure would handle it, and perhaps respond to another infectious disease outbreak much better, having had the experience that the recent Ebola episodes provided.

That experience included hiccups and communication errors that resulted not in panic but disagreement on the part of some in the health community and alarm in the public. One target of criticism is the Centers for Disease Control and Prevention (CDC), which was confident from the beginning in expressing that hospitals throughout the U.S. were ready to handle Ebola cases and messaging to the public about the difficulty of transmission of the infection. The CDC chose not to participate in this discussion.

When Thomas Eric Duncan, who eventually died, was first found to have Ebola the CDC sought to calm fears and educate the public about the likelihood of the disease spreading by normal contact with an infected individual, and what should be done if someone was thought to have symptoms. It also expressed confidence in the ability of the health infrastructure to deal with an outbreak.



IONS

There was pushback immediately and that escalated when it was learned that two nurses had been infected by Duncan. The CDC was and is considered an authority on matters of infectious disease and was confident in communicating what was known about Ebola.

Maybe too confident.

In the end, according to world-renowned risk communication specialist Peter Sandman, “Ebola in the U.S. has turned out awfully well so far. All the patients brought here for treatment have recovered, without infecting anyone else.” But there were miscues from which to learn about communicating public health risk.

The CDC initially said that the infection couldn’t spread through “indirect transmission routes,” such as coughing and sneezing and from objects, and that it was transmitted only by direct contact with the body or bodily fluids of someone infected. That line changed with the CDC saying that it was possible to transmit the infection from droplets of the virus from about 3 feet away.

Protocols for health-care workers changed as well after the Dallas nurses became infected. They included new guidance for EMS when transporting Ebola patients and more training for health-care workers, including new protocols for protective equipment.

The criticism was not that the CDC got it wrong but that the initial guidelines were communicated with certainty, in a way that suggested that Ebola was a well-understood disease.

“There’s no question that the CDC’s overconfident, over-reassurance exacerbated the American public’s ‘adjustment reaction,’ its temporary overreaction to Ebola,” wrote Sandman in an email. When the CDC changed its guidelines it made the initial recommendations look “insufficiently cautious” and incompetent.

Sandman wrote that the CDC started out very confident that the risk to health-care workers was negligible, ignoring examples of workers who had been infected in West Africa even with the use of protective equipment. Making matters worse, the public health establishment labeled the more alarmed voices as stupid or irrational.

Melissa McDiarmid, a professor at the University of Maryland School of Medicine, said there wasn’t a consensus about



Two nurses survived after contracting Ebola from a Dallas patient who eventually died.

ease of transmission and that the CDC, portrayed and taken as the authority, effectively squelched other health-care communities voicing differing opinions.

“There were other people in both the infection control community [biohazard] and the occupational health community that didn’t think [transmission of the infection] was quite as tidy as CDC was portraying,” McDiarmid said.

There were differing opinions about transmission and “hair splitting” about aerosol versus airborne transmission that created confusion, she said. “I know

a lot of hospitals did not agree with the initial CDC guidance and had their first receivers and their Ebola designated people in protection as well as a complete coverage, which at first was not called for.”

The reassessments by the CDC added to the controversy, and with an infection as deadly as Ebola, the stakes were too high not to take a stand toward caution. “It was not just opinion, there was some evidence that aerosol transmission, if not airborne transmission, was possible,” McDiarmid said. “Maybe not likely, maybe not efficient but possible, and I think that confused



the risk message given the severity of the consequences of an Ebola infection.”

The lesson from the standpoint of many who have spoken on this issue is that it’s OK, even wise to say, “We’re not sure on this. We don’t know for sure.”

But the CDC was convinced it had things right, according to McDiarmid, and just didn’t listen to other viewpoints. “Other voices were not allowed at the table from a government health point of view,” she said. “There were others wanting to participate and give input.”

McDiarmid would like to see others involved in discussions because there

are people doing research (people get doctoral degrees in aerosol science, for instance) that could add valuable input. She said the people caring for patients aren’t necessarily the experts on how an infection like Ebola is transmitted.

Whole Community Approach

Lessons from other countries about how to attack an infectious disease like Ebola would have meant having a national plan, and treating the response with a whole community approach, said Gavin Macgregor-Skinner, assistant

professor in the Department of Public Health Sciences at Penn State Hershey.

Macgregor-Skinner was invited by the Nigerian government during summer 2014 to help when Patrick Sawyer’s Ebola infection in Lagos sparked concern of an epidemic. Sawyer died, but not before infecting at least 19 people, eight of whom died before the outbreak was contained.

Lagos is the most populous city in Nigeria with estimates from 17 million to more than 20 million people. “When I arrived, the Nigerian government said, ‘We’re going to have two hospitals in the country that will have the Ebola containment suites and there’s going to be 70 beds,’” Macgregor-Skinner said. They set up a 1-800 number and Facebook and Twitter accounts just for Ebola.

The plan was that everyone in the country would know that one of the hospitals would be in Lagos and one in Port Harcourt and that’s where Ebola patients would be taken. In addition, training would be intensified in those areas to take on a whole community approach. From EMS to mortuaries, hospital staff, politicians, tribal leaders, business leaders, everyone got the message.

“They covered everyone and said, ‘This is the plan, these are the messages,’ and you didn’t get the panic,” Macgregor-Skinner said. “Nigeria could have turned out differently, everyone could have panicked but they didn’t because of the messaging that we put out there.”

The same thing could have been done in the U.S., he said.

Social media, video, a 1-800 number and involvement by emergency managers could have made for a whole community approach that was lacking. “The government at the federal or state level could have used social media just like we’ve done in West Africa and other countries,” Macgregor-Skinner said. “That wasn’t done properly. Then suddenly we have governors making decisions based on fear and anxiety and not based on medical or scientific evidence.”

There are plans for tornadoes, wildfires, hurricanes and earthquakes, Macgregor-Skinner said, but not for Ebola. “Where’s the national communication plan and who was managing the event? We knew we were going to face these challenges, and they could have been solved quite simply with a communication plan and putting emergency managers in charge from day one.”

Macgregor-Skinner called emergency managers in the U.S. the best in the world at managing limited resources and getting what's needed for the response. "They'll get it done. Instead we had from Dallas so many challenges and problems and still don't know what the lessons learned are."

There was fear in Dallas and elsewhere from the unknown. No one wanted to accept the deceased Duncan's ashes, and there were challenges in dealing with waste management from the Ebola patient.

Macgregor-Skinner said there should have been requests for training and questions about needs from those in charge at the state level to the CDC. "The question you would ask as emergency managers when Dr. [CDC Director Tom] Frieden said 'all hospitals are ready' is: What do you need from us?"

And they needed training, drills and understanding of how they could implement the CDC's recommendations and create safe working environments in the community and in hospitals for those with Ebola. It wasn't done, said Macgregor-Skinner.

In terms of communicating to the public or anyone, videos would have been one good source, Macgregor-Skinner said. "In my 20 years of emergency management, videos have been really important on how to do things. You don't see any videos on the CDC website."

He said the information provided by the CDC is great but it's paper-based — PDF documents and people have to go to the site, read the documents, understand them and develop the "how," and that hasn't been addressed.

Social Media Use

Social media was used in New York where a doctor, Craig Spencer, tested positive. Even before that case, there were rumors that had to be quashed and that was done via Twitter.

Before Spencer was confirmed as having tested positive, there were no cases of Ebola but rumors persisted and people were afraid to take public transportation. There were even several fake pictures (doctored screenshots) posted on social media that looked like patients, spreading alarm.

"I think it got out of hand," said Tamer Hadi, strategic initiatives coordinator at the New York City Department of Health and Mental Hygiene. "It was really unwarranted fear of catching Ebola on the train to the point where people were wearing

"I THINK IT GOT OUT OF HAND. IT WAS REALLY UNWARRANTED FEAR OF CATCHING EBOLA ON THE TRAIN TO THE POINT WHERE PEOPLE WERE WEARING RESPIRATORS ON THE TRAIN AS IF RESPIRATORS WERE GOING TO BE EFFECTIVE, AND WEARING GLOVES."



respirators on the train as if respirators were going to be effective, and wearing gloves."

The city was effective in tamping the fear, calming everyone and putting out a lot of information — and squelching rumors was key. Keren Fleshler, social media manager for the Department of Health and Mental Hygiene, led a 10-person monitoring team that worked around the clock during the scare.

The staff was divided into three-person groups with Fleshler reporting to the public information officer who used press conferences to help get the word out. The team also distributed a palm card and people began sharing those on Twitter and Instagram.

The team used social media channels to try and clarify the confusion between airborne and non-airborne transmission of the infection, and used promoted Facebook posts to spread the message. It also held Ebola events, informational sessions and town halls and used social media to tell people where to attend these meetings.

Fleshler said it was important for her team to remain flexible and be able to respond

as the situation evolved. "Prior to the [NYC doctor's] case we were still activated and monitoring but the nature of the monitoring changed as the conversation was changing because Ebola was now in New York City."

Once the doctor was confirmed positive for Ebola, the social media staff ramped up its activity even more, extending shifts and monitoring numerous tools including GIS maps and keyword searches. "We always had someone looking at it," Fleshler said.

It was the first time the department put social media data into an official situation report that is looked at by all the incident command system leadership, said Hadi. "If emergency management and public health, in particular, are not using social media they should consider it because it gives you situational awareness and puts out official information. It allows you to monitor your reputation."

Next Time

Risk communication expert Sandman thinks if there were an outbreak today things would go more smoothly. But what about next year or the year after that?

"It depends," McDiarmid said. "I do think we lost our memory about certain threats previously." She reminded that there was a resurgence of tuberculosis in the 1990s in the U.S. and many experts were "asleep at the switch. We forgot how to do prevention, we were dismantling public health infrastructure, thought we were beyond it."

She's hoping the memory is still there next time and investment in preparedness takes place. "Part of the issue is preparedness requires investment of both human resources and money," McDiarmid said, "and it's human nature not to want to make an investment or buy something that you think you might not necessarily need."

That preparedness includes training and exercising a plan and an approach, Macgregor-Skinner said. "The focus should be on highly infectious diseases but also the systems approach that we need here in the states. Emory University is still drilling and exercising every week for Ebola," he said in October. "It doesn't stop and that translates to any highly infectious disease, whether it's a coronavirus or SARS or MERS or any other disease we could face." ⊕

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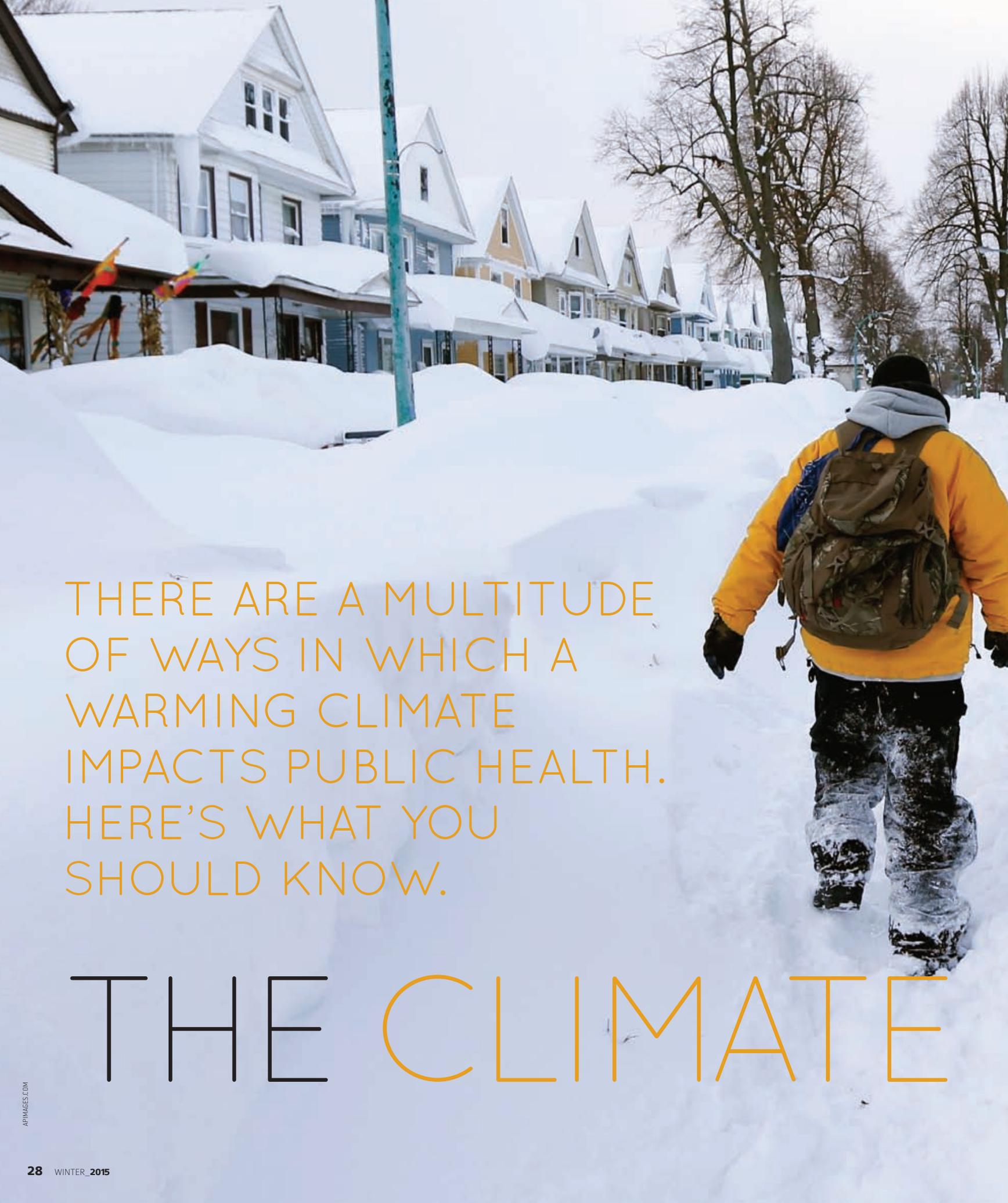
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THERE ARE A MULTITUDE
OF WAYS IN WHICH A
WARMING CLIMATE
IMPACTS PUBLIC HEALTH.
HERE'S WHAT YOU
SHOULD KNOW.

THE CLIMATE



BY DAVID RATHS

It may seem counterintuitive to make a connection between a warming planet and the huge snowfall totals that hit Buffalo, N.Y., in November, but these dramatic storms are happening at least in part because the world is warmer, scientists say.

“There is an influx of Arctic air into Buffalo because the Arctic is warm,” said John Balbus, senior adviser for public health at the National Institute of Environmental Health Sciences. The water temperatures in the Bering Sea are running way above what are usual, the air temperatures are higher and it displaces the usual patterns, he added.

CONNECTION



As researchers study climate change, one area getting more attention recently is the impact of climate variability on public health. Greater climate variability means regions of the country can expect to see new types of human health hazards, which will lead to more public health emergencies.

“Places that haven’t had to deal with certain kinds of phenomena, like searing heat in Minnesota or in coastal Washington, need to start developing plans to prepare for that, because they will have to deal with it,” Balbus said.

The Centers for Disease Control and Prevention (CDC) has identified several ways public health will be affected as temperatures rise, and many of them could have a direct impact on emergency management and response:

- increasing deaths and illnesses from heat stress;
- increasing risk of injuries and illnesses due to extreme weather events, such as storms and floods;
- more respiratory and cardiovascular illness and deaths caused by smoke from heat- and drought-related wildfires, as well as changes in air pollution, particularly ozone smog;
- changes in the rates and ranges of infectious diseases carried by insects or in food and water;
- threats to the safety and availability of food and water supplies; and
- greater levels of mental and emotional stress in response to climate change and extreme weather-related emergencies.

George Luber, an epidemiologist and the associate director for global climate change in the Division of Environmental Hazards and Health Effects at the CDC’s National Center for Environmental Health, said researchers are seeking to understand the key pathways through which health will be compromised. There are direct impacts, such as storms, extreme weather, heat waves and air quality problems, but there are also indirect effects climate change will have, including the abundance and distribution of vector-borne diseases.

Climate change will affect the cumulative exposure people have to some impacts, Luber explained. “If you get heat stroke once, your sensitivity to heat is much higher the next time around,” he said. “Multiple heat waves have a cumulative effect. Multiple



Drought conditions lead to wildfires and have a direct impact on food and water supplies.

medical equipment. We do see a spike in mortality during power outages. Those systems — communications for EMS, transportation for egress from storms, power — when those go down, public health is affected. And those types of incidents are expected to increase in frequency and magnitude from storms. That is of critical importance.”

Luber reiterates Balbus’ comment about regions needing to prepare for surprises and anomalous weather events. Profound

to them that they need to prepare for an event they have never experienced before.”

Regional public health officials are making the connection between climate change and chronic health conditions. The increase in ground-level ozone causes airway inflammation that can damage lung tissue, said Anne Kelsey Lamb, director of the Oakland, Calif.-based Regional Asthma Management and Prevention (RAMP), a project of the Public Health Institute. “We also see

climate change is leading to an increase in particulate matter, which are tiny particles, which, if inhaled, can damage the lungs and cause chronic breathing problems,” she said.

Another way climate change is impacting asthma is through increasing the length of ragweed pollen season, which is a significant asthma trigger. “We see that this is already happening and is only going to get worse,” Lamb said.

RAMP has been working with other Public Health Institute projects toward the goal of increasing public health engagement in climate action. “We are recognizing that climate change is one of the most significant public health issues of our time, and we want to see the public health community increasing the level of engagement with this issue,” Lamb said. “Asthma is just one

example, and it is the one my organization is most focused on, but there are so many other ways that climate change is already impacting public health. We want to see the public health community become more engaged.”

There are ways that the whole array of public health strategies — policy advocacy, surveillance and monitoring, health education and case management — can integrate climate change, Lamb said. “Even recognizing the financial constraints of many people working in public health, we

A warmer climate produces more wildfires, which can exacerbate respiratory and cardiovascular illness.



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cumulative exposures to bad air mixed with high temperatures mixed with ozone have a death-by-a-thousand-cuts impact. But in addition to that, you have the potential for more complex emergencies.”

The magnitude of climate change-related events is projected to get much bigger, and storms will stress the capability of response systems to manage them. “The potential for multiple disasters within a disaster really exacerbates public health issues,” Luber said. “A loss of electricity affects those on durable

changes in ecology lead to the potential for the emergence of pathogens in areas where they have never been seen before. “We are seeing a food-borne illness, paralytic shellfish poisoning, in Alaska that extended the northernmost range 1,000 kilometers,” he said. And he pointed to the 2003 heat wave in Europe, which killed approximately 70,000 people, and for which public health officials there were unprepared. “In subsequent heat waves, they learned their lesson,” Luber said. “It drove home



An increase in the number and severity of floods is part of the climate change equation.

would recommend there are ways they can integrate climate change into what they are already doing as part of their everyday job.”

The release of the third annual National Climate Assessment in 2014 was a milestone for public health, said Georges Benjamin, executive director of the American Public Health Association.

“The significance of the National Climate Assessment is the recognition that climate change is here now,” he said. “We have been hearing that it is coming. Well, people now realize that it is already here and affecting every region of the nation.”

Public health agencies need to think about how they are going to respond,

Benjamin said. “They have to know where their vulnerable citizens are so that when there is a severe event, they can respond to their needs,” he said. “When the power goes off, they can prioritize people who will need help right away because they are at home with electronics-dependent equipment.”

More work needs to be done around systems preparedness and doing out-of-the-box thinking about cascading failures, Benjamin said. “We know that in Hurricane Sandy, EMS units had to move out of firehouses because of flooding. What do you evacuate to and maintain response capacity? What is the backup plan if 911 goes down?”

Many states and some cities are starting to do vulnerability assessments as part of the Climate-Ready States and Cities Initiative, which Lubber’s office at the CDC oversees. With federal grant funding, 16 states and two cities (San Francisco and New York) are going through a five-step process to anticipate health effects by applying climate science to predict health impacts and prepare flexible programs.

The program, called BRACE (Building Resilience Against Climate Effects), takes a hazards assessment approach. “It is guided by principles of adaptive management, which is an iterative, learning-based process,” Lubber said.

The first step is projecting current climate hazards into the future. States identify their principal hazards, such as heat waves and floods, and use climate models to project how those will change in the future. North Carolina, for instance, would look at flood plains, coastal zones and urban heat islands, and which populations are most vulnerable, as well as risk factors for exposures.

The assessment would also look at rates of respiratory problems, water-borne disease incidents, septic systems and other aggregations of risk to project disease burden. Officials look at the current health profile of the state and project how that could change in the future. “The next question is: Which ones can we do something about now?” Lubber said. “They identify which interventions would have the most impact and work to put those in place. They are also building capacity to track health outcomes over time.”

For example, the BRACE program at the Florida Department of Health collaborated with the University of South Carolina Hazards and Vulnerability Research Institute to assess hurricane winds, storm surge, sea-level rise, drought and wildfires. To quantify social and medical vulnerability to these hazards, they used a Social Vulnerability Index and Medical Vulnerability Index linked to hazard maps to display the intersection of vulnerabilities and hazards throughout the state.

Some states are trying new technologies and approaches. For instance, Vermont is using crowdsourcing and a Web-based tracking tool to identify the presence of ticks.

A 2014 report in the *Journal of the American Medical Association* notes that in response to heat waves, “cities with investments in early warning and response programs have seen some success. For example,

after Milwaukee implemented an extreme heat conditions plan following 91 fatalities during the 1995 heat wave, a subsequent heat wave in 1999 resulted in only 10 deaths, or 49 percent less than expected.”

Benjamin said it is important for public health agencies to form tighter partnerships with other emergency response organizations. “The time to plan is now,” he stressed. “In the middle of a disaster is not the time to exchange business cards.” Agencies need to plan and drill together and understand each other’s capabilities, he added. They should provide redundancies in systems and make sure they have adequate communications capacity. “We have lots of multi-jurisdictional responses to things, and frequently the responders can’t talk to each other.”

Even primary care providers should begin talking to patients about emergency preparedness, Benjamin said. Doctors can help people think through how they should prepare for emergencies, especially if they have a medical condition that requires some urgency. “In the hospital settings, we have seen several cases where patients had to be evacuated. We need to be more imaginative about what can go wrong.” While there were some improvements after hurricanes Katrina and Rita, he said, there were evacuations again during Sandy.

Balbus is leading an initiative called Sustainable and Climate-Resilient Healthcare Facilities, a public-private partnership developed to ensure that facilities such as hospitals, nursing homes and dialysis centers are getting information to help them prepare for their role in extreme weather situations. “Having to move patients in a storm is a huge issue,” he said. “We’ve seen very straightforward, low-tech things cause problems, like getting an emergency generator out of a basement during a flood.” The goal is to look at innovative architectural designs for new structures as well as doing vulnerability assessments on existing ones.

Benjamin called it a tragedy that climate change has become unnecessarily political. “Climate change, hurricanes and tornadoes don’t know political parties or pick victims. People need to follow the science. Shame on us if we can’t put aside the politics on this,” he said. “The scientific community is clear about it. There was a time, not that long ago, when this was a bipartisan issue. We are hoping it will get back to that.” +

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Fusion centers are evolving into horizontal

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communication hubs between states. By Adam Stone

Denial-of-service telephone attacks on 911 centers in Louisiana aren't typically the sort of thing to make alarm bells ring in Kentucky. Yet that's exactly what happened in one recent episode, when bad actors started blocking emergency calls and analysts in Louisiana's fusion center quickly passed the word to their counterparts in Kentucky. "We got that out to our 911 centers in the next hour, and almost right away we started hearing that our 911 centers were experiencing the same thing," said Mary Cope Halmhuber, director of the Kentucky Intelligence Fusion Center.

That swift heads-up from a neighboring state helped the Kentucky fusion center contain what might have been a big problem. This kind of interstate cooperation typifies today's emerging fusion center. Initially formed after 9/11 as a means to coordinate local, state and federal intelligence, fusion centers have increasingly become hubs for cooperative information-sharing, not just vertically — from states up to federal authorities — but also horizontally, with data moving between states.

While some interstate efforts have existed from the start, lately there has been a push to formalize these ties. This is most visible in the 2014-2017 National Strategy for the National Network of Fusion Centers, published recently by a collaborative of interested groups.

Interstate Sharing

Fusion centers came into being as a way to ensure that security information could percolate up from the local level to federal authorities. At the same time, these centers have broken ground in their ability to share information from state to state — a trend that has become increasingly visible.

Consider a few recent accomplishments, as reported in the Department of Homeland Security 2013 Fusion Center Success Stories:

➤ The Immigration and Customs Enforcement office in Fort Lauderdale, Fla., brought in the Central Florida Intelligence Exchange on a case involving an individual wanted for production of child pornography. The exchange notified the Tennessee Fusion Center and Georgia Information Sharing and Analysis Center, and the suspect was arrested by the Georgia State Patrol.

➤ A San Antonio Police Department officer made contact with an individual who had ties to a Minnesota-based hate group. The officer reported this information to the Southwest Texas Fusion Center, which shared it with San Antonio's FBI Joint Terrorism Task Force (JTTF) and from there it was subsequently shared with the Minnesota JTTF. With the Minnesota Fusion Center helping to coordinate events, the FBI executed a search warrant that uncovered Molotov cocktails, suspected pipe bombs and firearms, and ultimately led to the individual's arrest.

➤ Alaska State Troopers informed the Alaska Information and Analysis Center (AKIAC) that a fugitive wanted for multiple felony charges may have departed the state. Working with the Transportation Security Administration, the center's analysts determined that the subject had departed Anchorage on a commercial flight en route to Memphis via Minneapolis. AKIAC coordinated through the Tennessee Fusion Center, and the subject was soon taken into custody of the Memphis International Airport police department.

Each of these cases highlights the growing importance fusion center directors are placing on state-to-state cooperation. While sharing vertically — from the state up to federal agencies — has proven useful, it turns out that a lateral move may have equal if not greater value.

"What we are finding more and more is that the horizontal aspect of fusion centers, with centers sharing among themselves, makes all this information even more powerful," said W. Ross Ashley III, executive director of the National Fusion Center Association.

While a National Network of Fusion Centers has always existed, it has generally been a loose affiliation with few specific ground rules. The National Strategy aims to formalize those ties, in an effort to further strengthen cooperation between state fusion centers. "As you evolve through time, you have to be sure you are grounded in doctrine, that the same ideas mean the same things to everyone," Ashley said. "If everyone is on the same sheet of music, then there is a common way to communicate with each other. Whatever the crisis is that you are talking about, you now have the same doctrinal grounding."

In practical terms, this formalization could play out in a number of ways.



Alaska State Troopers worked with the Alaska Information and Analysis Center, which in turn worked with the Tennessee Fusion Center to catch a fugitive from Alaska.

FLICKR/MIKHAL SIKOFF

For example, the National Strategy calls for strengthening the Fusion Liaison Officer program as a means for law enforcement agencies as well as public safety and private-sector entities to engage with fusion centers.

Likewise, the strategy's authors point to the power of the Nationwide Suspicious Activity Reporting Initiative, which establishes standardized processes and policies for sharing timely and relevant terrorism-related information.

Such interstate initiatives are at the forefront of the fusion center evolution today. At the same time, fusion centers remain enigmatic for some: Challenged as a potential threat to civil liberties and charged by Congress with being insufficiently cohesive, fusion centers have seen their federal budgets decline while their state allocations have climbed.



The 78 state and major urban area fusion centers across the U.S. remain a mixed bag. Yet at their core, supporters say, these state-run hubs of information gathering continue to play a vital role in the overall effort to safeguard the nation through intelligence gathering and analysis.

Raising Awareness

The signs of terrorism can be difficult to spot: A few feet of missing copper wire, a break in a security fence, such minor events may easily go unnoticed. “You are looking for a needle in a haystack, so you need to look at all the haystacks to find that needle,” said Jim Saunders, director of investigative operations in the Iowa Department of Public Safety, which operates the state fusion center.

The center draws the vast majority of its \$2.2 million budget from the state, as is typically the case. The money is local — and most

of the work is local too. The haystacks Saunders investigates are Iowan at the heart, even if they may one day land in some federal file.

Take, for instance, city sanitation: It’s hardly one’s first choice as a security agency, but Saunders sometimes relies on the trash haulers as much as he does the intelligence analysts. “We educate them: If you see empty cans of ether, if you see stripped lithium batteries or propane canisters or boxes of pseudoephedrine, you need to know that there is something going on here,” he said. “Then when they start picking up something that looks like the components of a meth lab, they will know to call those things in.”

The local private sector plays an equally vital role. All that copper wiring that disappears from construction sites? “By itself, that’s just somebody stealing metal,” Saunders said. “[But] if you take this wiring from a cellphone tower, you have disabled cellphone capa-

bilities in a big chunk of the state, including 911 capabilities. So we have worked closely with utility providers to better track these instances, to better secure these facilities, to better identify suspects, to mitigate the potential impact beyond the theft itself.”

If the intelligence network is local — from law enforcement to municipal workers to private-sector partners — the threats also can be highly localized in nature. In Northern California, for instance, operators of the regional fusion center were at one time seeing cybercriminals hitting local companies for \$40,000 in a single incident. As a region rich in technology firms, the area was a prime target for cybercrime.

A year and a half ago, the Northern California Regional Intelligence Center fired back, working with FEMA and the DHS to develop training to help analysts triage cybercrime incidents. “We can’t send the IT folks to help you, but we can say, ‘Here are the potential resources that are available, especially at the federal level,’ the same way we do on the level of physical threats,” said the center’s director, Mike Sena. “Now there is a routine for how we triage that and how it is passed along to the appropriate agency.”

A Focal Point

None of this alters the basic function of the fusion center, which is primarily to feed local data up to federal law enforcement. While that has not changed, it’s clear that state-level concerns are growing.

The numbers help tell the story. In 2013 the federal government’s direct expenditures on fusion centers were \$69.6 million, a 10 percent decline from the prior year. At the same time, state spending rose 3.6 percent to \$102.1 million and local spending went up 2.1 percent to \$70.3 million.

As a result, no one fusion center is like another. “These are state assets, so each state is going to use these centers differently and to different effect. It was never the intention to say, ‘This is what a fusion center is going to look like,’” said Rick “Ozzie” Nelson, a senior associate at the Center for Strategic and International Studies.

While there may be idiosyncrasies, in many cases a similar model has emerged, one that puts the fusion facility not just at the center of intelligence analysis, but also as the focal point of public communications.

“There will be times when the governor will use the fusion center to get critical information out to everyone in the network,” said Nelson. “The fusion center gets the information, and then if local first responders have questions about public safety data, about a health threat or terrorism threat, now they have someone to call.”

Ebola may well become an example: Fusion centers won’t analyze the threat, but they may come to serve as the hub of information for diverse public service agencies.

While terror may have been the impetus at first, this readiness to play quarterback in every type of emergency situation has become a hallmark of most fusion centers. “The states are seeing value in these fusion centers and it’s not because of the terrorist threat alone,” Nelson said. “It’s specifically because of this all-hazards approach.”

Questions of Liberty

In Kentucky it’s clear to see how the fusion center is working to straddle the



KATHERINE WELLES / SHUTTERSTOCK.COM

line, facilitating both federal and local needs for information. Participants in the fusion center include state and local law enforcement and emergency agencies, as well as FBI, ATF, customs and other federal officials. Together they gather, analyze and share data in the search for possible threats.

Some find this appalling, claiming that “[f]usion centers have been used to record and share information about First-Amendment-protected activities in a way that aids repressive police activity and chills freedom of association,” in the words

of the Electronic Frontier Foundation, a nonprofit civil liberties advocacy group.

This charge has hovered around fusion centers since their inception, the proposition that such facilities are in effect internal spying apparatus. Nelson dismisses this on principle. “At the end of the day, the fusion center is a clearinghouse, meant to help public safety officials have the information they need to do their jobs,” he said.

In fact, some say the role of the fusion center is to ensure the information is not wrongly elevated to the status of a national security threat. “Information has to be

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vetted. A lot of things come through that may look suspicious, but in actuality you may be violating someone's civil rights and civil liberties if that report is improperly collected," Ashley said. "Taking a picture of a bridge is not a suspicious act."

Saunders relies on his two dozen analysts and field agents to ensure the First Amendment remains intact. "Civil liberties and privacy are at the forefront of all this," he said. "If we don't have any credible information that there is an active threat, we don't want anything to do with it."

Most in the fusion center community would suggest that conversations about spying only detract from the far more pressing issues in their world, especially the need for talented analysts. As fusion centers feel their way forward in the coming years, this is going to be a pivot point, some say.

"The true power of the fusion center is in the analytic capability — not the fancy software, but the trained individuals who are able to create value from the informa-

"What we are finding more and more is that the horizontal aspect of fusion centers, with centers sharing among themselves, makes all this information even more powerful."

tion," Ashley said. "That is the No. 1 resource that a fusion center brings to bear."

And yet, looking forward, some express concern that those human assets may not be available as needed. In Kentucky, one of Halmhuber's four analysts just left for the private sector, and she worries it's a growing trend, especially for those on IT security detail.

"You bring someone in from college and train them as an intelligence analyst, focusing on the cyber-realm. They get a couple of years under their belt and then they can earn four or five or six times their salary somewhere else," she said. "You invest thousands of dollars in training and then the private sector comes in and offers them something that we as the state government can't match."

At least some in Congress have heard that call. "Fusion center analysis will not continue to grow to fully meet the national needs without additional and advanced analyst training," noted a July 2013 report from the House Committee on Homeland Security. The report called for a defined road map of analyst competencies, as well as the development of specialized training programs.

It's clear that a solid base of analytic skill will be a fundamental component going forward, especially as fusion centers move to broaden and solidify their interstate cooperation efforts in order to become a true national network, as much in practice as in name. +

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Rise of Disaster Robotics

A founder of the field of disaster robotics, Robin Murphy discusses the potential robots have for enhancing emergency response and recovery.



Robin Murphy is a leader in the field of disaster robotics, having started working on the topic in 1995 and researching how the mobile technologies have been used in 46 emergency responses worldwide. She has developed robots that have helped during responses to numerous emergencies, including 9/11 and Hurricane Katrina. As director of the Center for Robot-Assisted Search and Rescue at Texas A&M University, Murphy works to advance the technology while also traveling to disasters when called upon to help agencies determine how robots can aid the response. The center's first deployment was in response to 9/11, which also was the first reported use of a robot during emergency response.

By Elaine Pittman | Associate Editor

⊕ Since 9/11, how have you seen the use of robots in disasters change?

We started out in 2001 and up until 2005 you didn't see the use of anything but ground robots. Everything was very ground-centric, and I think that reflected the state of the technology. For years we had bomb squad robots, which were being made smaller and smaller for military tactical operations so that gave them a tool that was pretty easy to use. Starting in 2005, we saw the first use of small unmanned aerial vehicles that were being developed primarily for the military market and those were very useful. Those have really come up and, in fact, since 2011, I've only found one disaster that didn't use an unmanned aerial vehicle and that was the South Korea ferry where they used an underwater vehicle. So we went from ground robots dominating to about 2005 and then we started shifting toward unmanned aerial vehicles. In about 2007, it became much more commonplace to see underwater vehicles being used. Then starting in about 2011, I think if you have a disaster and you're an agency and you haven't figured out a way to use a small unmanned aerial system, it's kind of surprising.

⊕ Is one of the issues that people are waiting for FAA regulations to use UAVs?

Every single disaster since about 2011, but definitely since 2012, looking at the 46 disasters we've kept tabs on, have used unmanned aerial systems, including the ones here in the United States. I would not say the adoption problem is the FAA regulations. It takes very little time to get an emergency COA [certificate of authorization]. It does take time to get some of the paperwork in advance done to fly a regular COA but the FAA has given jurisdictional COAs. The emergency COAs take a very short period of time — it's knowing the paperwork, like with any new technology.

The deterrent to adoption seems to have been the lack of money to flat out purchase them. They're basically computers and you know how fast the technology for your cellphone and computer changes, you wouldn't expect to have a computer that's 10 years old, so you wouldn't buy these the way you buy big equipment. We're suggesting that agencies look at plans that allow them to lease the technology. And also because it's a new technology, you don't know what that means in terms of training and how it's going to be integrated and that means they don't have to recoup some of the training and maintenance costs right off the bat.

⊕ What are you currently working on?

I work mostly on the human factor side: How people actually use these. I am not worried about whether a UAV is going to fall out of the sky or a ground robot's wheels will stop turning. In my book, *Disaster Robotics*, I go back over 34 disasters, of which I was in a bunch. If you look at the data that's available, there were 13 terminal failures where the robots failed for some reason and that caused the mission to be aborted. In about 51 percent of the cases it was human error. When I go back and analyze that I see that it's human error, but it was the designer — the designer didn't give it an interface that allowed the user to have the right type of information to make a different or better decision. You can only see what you can see.

We're also very interested in how these technologies change the way emergency response works. What we saw at the Washington state mudslide was that everybody's thinking "these UAVs will be useful for ESF [emergency support function] 9 for urban search and rescue" but actually they're more useful in that particular case, in a mudslide, for public safety and you can start thinking

about ESF 14 and recovery. [Questions include:] How are you going to share that information? How are you going to do that without creating a data avalanche that just overwhelms different decision-makers who need to share, to plan, to interact with each other? And if I want to use this robot and you want to use it and we both want to point it in different directions, how do we handle that? So how do you get these interfaces that let people interact in real time and then process the data and share and work together?

We've got a group of students that have put together what we call the Skywriter interface that lets somebody with a tablet, laptop or mobile phone see what a UAV or robot is seeing and communicate to the operator or system what they want to do, like circle or draw an arrow, which indicates where to go, or follow my finger and track this.

⊕ When you deploy to a disaster, what's your role there?

We're always invited in, we do not self-deploy. Our center, this is something frankly that I am little disappointed that we're still doing, I had hoped that at this point everybody would have robots, but we can provide robots. We can usually provide robots through our Roboticists Without Borders program where members train with us beforehand and then when we're called out, they will donate their equipment and time. So we go out and our role is to first off see, what's the right technology for what they're trying to do? There are some times when a robot isn't going to work because you can't afford in a disaster to make anything worse, so we have to be conservative. We act as a dating service.

What we've found is that most responders prefer to work with us side by side. We'll drive and you tell us what to do. We also do formal studies and what we've found is that in looking at the video data and the sensor data coming from robots, two heads are nine times better than one head. Having a team work together really takes off the cognitive load, one person will catch something that the other person didn't and it just adds a vast improvement to performance. ... With that said, I would love to be out of business, I would be just as happy for groups to have robots on their own. I would like the

data though; I love learning from the practitioners what's working and what's not.

+ Have you been working on anything in response to public health needs like for the Ebola response?

We find that in Ebola a lot of people are thinking about clinical applications, like replacing the nurse. Nurses and doctors are hard to replace and duplicate; robots rarely are cost-effective at replacing what humans do. They're often better at giving some capability that you didn't have before. So in this case, rather than looking at clinical needs, we've looked at logistical needs and the fact that a lot of people involved in health aren't really doing health work, they're cleaning up messes, they're hauling all of these sheets that are contaminated, they're trying to move people around. So having one person instead of four doing that begins to be more of what the military calls a "force multiplier" and becomes much more efficient. There are things like

that that exist. There's general reconnaissance: How long is the line outside? What's going on in the villages in the rainforest, do they seem empty? Is there dirt overturned that may indicate graves? That can indicate what's going on.

We're also looking at clinical but that's going to be much more specialized. We like to work with the practitioners and find out what's going to be the most bang for the buck. If there's one thing to do to make your life easier, what would that be?

+ Looking to the future, where do you see disaster robotics headed in the next five to 10 years?

There's that idea of adoption, which will hopefully continue to accelerate.

In the future, for the new technology, I expect to see three things: Better software on what we call emergency informatics; it's how you share the data and how you visualize it. In ground robots, I am so excited at work at looking at burrowing robots. The big value in

most big building collapses lies in the smaller the better, what do you do when there's not an obvious void and can you get something to literally snake and nudge and worm its way through there. There are some animals that do that — there's a sand lizard and types of snakes that navigate in the ground — so we're doing some work with Georgia Tech and Carnegie Mellon on that. There are also some great advances being made in manipulation. Initially I would characterize the first decade of robots as having been all about allowing the responders to see at a distance, but now we're seeing a shift. We can see at a distance but now we would like to poke things, we would like to move them over, we would like to drop off things. So we need to act at a distance and not just see at a distance. There's some advances in robot manipulation that are coming up and are very exciting and we'll be incorporating those into future work. +

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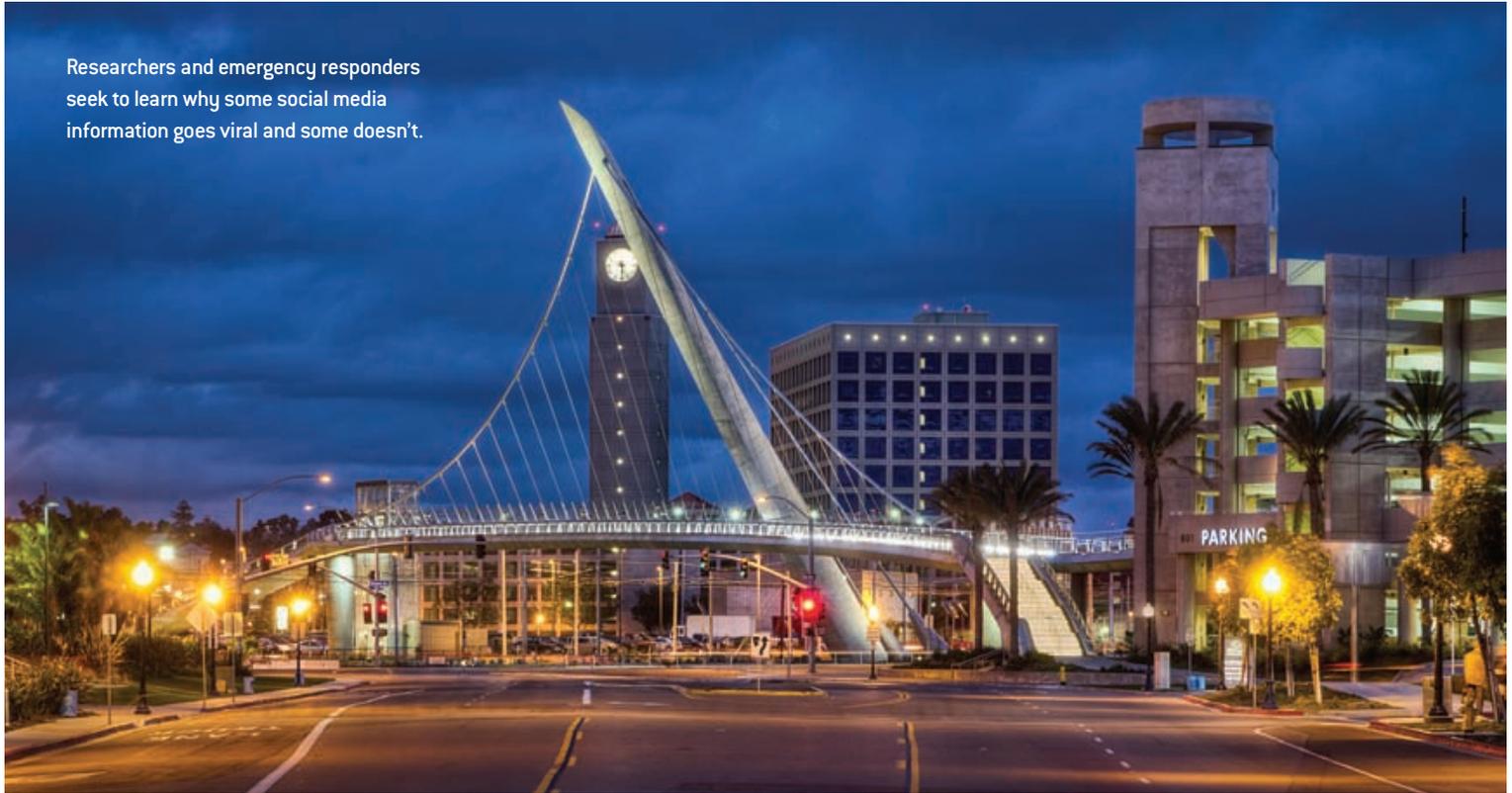
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Researchers and emergency responders seek to learn why some social media information goes viral and some doesn't.



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Active Social Media

San Diego is examining how to make social media work more effectively in emergency response situations.

By **Justine Brown** | Contributing Writer

What role could social media play in effectively communicating information about breaking news such as natural disasters and disease outbreaks? It's not a new question, but one that lacks an easy answer. Researchers and emergency response personnel in San Diego plan to spend the next four years exploring the topic, and what they find may eventually serve as a model for other communities looking to better leverage social media for disaster response.

San Diego County and San Diego State University (SDSU) recently formed a partnership to research and develop a new social media-based platform for disseminating emergency warnings to citizens. The project aims to allow San Diego County's Office of Emergency Services (OES) to spread disaster messages and distress calls quickly and to targeted geographic locations, even when

traditional channels such as phone systems and radio stations are overwhelmed.

Cutting Through the Noise

The social media emergency response project under way in San Diego is spearheaded by Ming-Hsiang Tsou, an SDSU geography professor who also directs the Center for Human Dynamics in the Mobile Age, one of the university's Areas of Excellence.

The new project stemmed from an earlier effort. In 2010, Tsou launched a research project called Mapping Ideas from Cyberspace to Realspace, which evaluated different types of online information and how it was linked to real-world activities. And it uncovered some interesting facts about disaster response.

"We found that during disaster events, the information landscape of social media is very noisy," Tsou said. "The important messages

from official agencies such as the Office of Emergency Services were not very visible."

With the new project, Tsou wants to explore how social media can expand emergency communications.

"We want to know how people disseminate information in different kinds of situations," he said. "Why does some information go viral and other information doesn't? By understanding the mechanisms of Internet memes, we hope to apply that knowledge to disaster awareness."

In September, Tsou was awarded a grant from the National Science Foundation to support his efforts. The nearly \$1 million award over four years will enable SDSU and OES to work together to refine software the county can use to better identify trends, topics and influential messages disseminated through social media during a disaster.

“Social media has become more and more important for our communication,” said Tsou. “We need to study and understand how messages are broadcast, redirected and received by our community.”

The 1,000 Volunteer Approach

A key component of the new project is what Tsou calls “influential social media users.” Tsou and his team are in the process of identifying and reaching out to the top 1,000 Twitter users in San Diego County and asking them to agree to retweet the county’s emergency messages.

“We are changing our approach from the previous passive monitoring of social media to design an active platform for recruiting social media volunteers to accelerate social media communication before, during and after disaster events,” he said. “We want to make sure that the public can receive the most important alert messages from official agencies as quickly as possible and that these critical messages will not be over-written by other social media messages.”

To compile the top 1,000 Twitter user accounts, Tsou started with followers of the official San Diego County Twitter account (@SanDiegoCounty) and followers of related media channels, like the local news channels. “These followers already indicated their interest in public safety issues and have the potential to become volunteers for the Office of Emergency Services,” he said.

Tsou will then use social network analysis tools to evaluate the selected followers’ influential powers, such as number of followers, how many retweets have stemmed from their accounts and their social network structures.

“A complicated computer algorithm will be used to compute the influential index,” Tsou said. “Another criteria is that these volunteers must be within the San Diego region. We will use the location information from the Twitter accounts’ user profile to identify their regions. So if one influential Twitter user is located in New York, we will not include him or her.”

Once the top 1,000 influential Twitter users in San Diego are identified, the research team will develop a mechanism and a platform to invite them (or remind them each time) to retweet important announcements when OES needs to broadcast them.

“These 1,000 volunteers will be mainly the young generation of people in San

Diego. They are the future of our community,” Tsou said. “We hope through this project and the volunteer platform, we can encourage these young people to play a more active and important role in our society.”

The Big Picture

OES and SDSU have partnered on other projects prior to this one, most recently coordinating a volunteer team to help augment the county’s Emergency Operation Center by developing GIS maps during emergencies. But OES is also interested in expanding its ability to use crowdsourced information to get a pulse on what goes on during an emergency, and Tsou’s project will help there as well.

“There are a lot of tool sets out there that allow you to see individual things that occur, but you have to use a bunch of different tools to get the big picture of what’s going on,” said Robert Barreras, OES emergency services coordinator. “Tsou had an idea about a social media platform that could

“Geotargeting is a very important aspect of our project. When people tweet, we can actually see where they are.”

aggregate everything and do crowdsourcing during an emergency, and that is something we had been looking into — being able to analyze what’s going on during an emergency and having that situational awareness.”

Barreras said OES recently purchased Geofeedia, a platform that allows users to search, monitor and analyze real-time social media content by location. Now, if people tweet or take a photo with their smartphone and post it on their social media site, the location information is captured.

“Geotargeting is a very important aspect of our project,” said Tsou. “When people tweet, we can actually see where they are.”

Emergency officials will also use geotargeting to make their messages more effective, as officials can direct retweet requests to volunteers who are most likely to impact an affected area rather than deluge the entire county with tweets that only are meaningful for a small part of the population.

But Tsou’s tool also goes beyond basic geotargeting. “Geofeedia does the aggregation of all the social media, but it really

doesn’t do the analytical side of it,” Barreras said. “What Tsou is working on will give us a way of figuring out who the individuals are that are leading the message. It will allow us to not only aggregate data but also see from an analytical perspective who is running the conversation, what’s trending, what hashtags are winning out, etc.”

The Right Path

The National Science Foundation grant will enable Tsou to hire graduate students at SDSU (one Ph.D. student and two master’s students). Three other SDSU faculty members (including representatives from communications, public health and linguistics) will also collaborate on the project, as well as two research teams from Kent State University and the University of Arkansas that will work with SDSU on computational models for the project. Some funds will go to organize an international research workshop this summer.

The prototype of the new social media volunteer platform will be built within six months, just as the area’s wildfire season begins. The county is expected to test and use the system throughout its development. Officials within OES are currently offering feedback to Tsou on how it can be tailored to best fit their needs. SDSU and OES will then continue to revise and improve the system over the following four years.

“Tsou has a deep knowledge in this field, and he’s already ahead of the curve in leading us down the right path,” Barreras said. “But if we see something that might be more useful, or if something can be adjusted in a certain way to make it more valuable to us in an emergency management realm, that’s really where the partnership or joint guidance becomes critical.”

County officials also plan to use the new system to monitor social media for rumors and false information originating from other channels, then address those falsehoods succinctly and directly.

“One of the most important things we do in an emergency operations center is to get correct critical information out to the public so they can make better-informed decisions,” said Barreras. “Used effectively, social media could be a very important tool in helping us do that.” 📍

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12-Step Program

There are 12-step programs for many personal issues, so I figured there should be a 12-Step Program for Emergency Managers. I've written about our addiction to Department of Homeland Security grants that are administered by FEMA. Therefore it is only natural that we look for ways to escape our addiction and gain control over our individual programs. Getting out of addictive behavior can be difficult.

Generally the concept of 12-step programs is to acknowledge a higher power and give everything over to its control. The only "higher power" that emergency managers have is FEMA, so we are in a bit of a Catch-22 in that we are trying to escape its grant clutches while at the same time giving our lives over to its control. We should at least try this 12-step program that I've adapted from Alcoholics Anonymous.

The 12 Steps

- We admit that we are powerless over disasters and that our lives, calendar and email have become unmanageable.
- We have come to believe that a power greater than ourselves (FEMA) can restore our sanity. (I am a bit suspect of this step, but what choice do we have? Civilian contractors?)
- Collectively we have made the decision to turn our program over to the care of FEMA and the grant processes it administers.
- We have made a searching and fearless inventory of all our natural and human-caused disasters, especially those that are currently hot buttons with FEMA and the DHS.
- We admitted to FEMA, to ourselves and to another human being the exact nature of our program gaps, knowing that in doing so we will never obtain accreditation by the Emergency Management Accreditation Program.
- We are entirely ready to have the federal government change all our emergency management doctrine with every switch in presidential administrations and FEMA administrators.
- We humbly asked FEMA to remove any and all grant restrictions that will limit our ability to get federal funds and allow us to decrease the percentage of funding that our program gets from our parent organization. We do this knowing that it might be called supplanting, but also knowing that it has never been a finding from the FEMA or DHS Inspector General.
- We have made a list of all persons we need to know and became willing to meet with them in order to build a relationship. This includes people from other states, counties, cities, fire districts, water districts, sewer districts, school districts, nonprofits, large businesses, medium and small businesses, international organizations, hospitals, clinics, public health, fire and police departments, emergency medical services, neighborhood and community groups, and the paperboy, should we still get a paper.
- We have made direct amends to agencies we don't really like, whenever possible, except when to do so would cause them to gloat.
- We continue to take a self-assessment, and when we are wrong about something, promptly document it as a lesson learned, avoid taking any remedial action and seek training via an online FEMA course on the Incident Command System.
- Through the Internet, email, phone calls and personal meetings, we sought to improve our conscious contact with FEMA as we understand it. We do so only for knowledge of FEMA's will for us and the funding to carry out that will.
- Having had a spiritual awakening as the result of these steps, we try to carry this message to other emergency managers and to practice these principles in all our affairs. Therefore, we do so perpetuating the rut in which we and our discipline is mired. 



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CBRN PROTECTION

Ansell recently introduced Trelchem ACT, a new protective solution for law enforcement responders dealing with the consequences of chemical, biological, radiological and nuclear (CBRN) terrorism incidents. The garment is intended for use in all CBRN terrorism environments, including the Immediately Dangerous to Life and Health zone and is certified according to the American standard NFPA 1994 Class 2.

To exceed the current solutions on the market, Ansell has developed a suit with superior design features, like the uniquely cut mask seal, the neck strap on the back of the hood, the elastic waist and the shoulder padding (as well as the optional padding on elbows and knees). All these features ensure that the suit fits optimally and hence offers optimal user comfort. www.ansell.com



MULTIVIEWER IN EOC

Whittier, Calif., recently opened a new multi-room EOC located within its main police department complex. Funded by a \$500,000 FEMA grant, the facility added state-of-the-art equipment, including an RGB Spectrum QuadView HDx Multiviewer. The multiviewer enables numerous video and computer sources to be displayed as a single source, which can be routed as required throughout the facility. The interconnected system lets EOC operators use the multiviewer to transmit information to any individual room in the complex or to all rooms simultaneously. www.rgb.com



HELICOPTER LANDING ZONE KIT

Helicopters are vital to getting victims out of a traumatic situation and to medical personnel. CMC Government Supply knows that landing zones are not always ideal and more accidents happen at night and in bad weather. Eflare Electronic Helicopter Landing Zone

Kits make landing in less-than-desirable conditions not only safer but also faster and more efficient.

Each kit comes with four amber or red Eflare safety beacons, one blue Eflare safety beacon, five Eflare rubber bases, one zipper carrying case with handles, and a helicopter

landing zone instruction card.

The kit features Eflare safety beacons, which set the standard for LED warning beacons when used in the application of landing areas for helicopters. Each safety beacon has up to eight bright LEDs.

www.cmcgov.com/store/pc/c349.htm





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APRIL 14 – 17, 2015
ATLANTA, GA

By Jim Sharp

Main Street Terrorism

The September arrests/detentions in Australia of suspected Islamic State of Iraq and Syria (ISIS) supporters who had allegedly been planning to kidnap random people, decapitate them and then drape their bodies in the group's flag and post the entire horrific event live to the Internet has brought to the forefront one of the most serious yet least discussed scenarios in counterterrorism. We term it "Main Street terrorism" and by that we mean terror attacks not on a grand scale, but multiple small attacks carried out by individuals or very small groups in environments where we have traditionally felt safe. The December hostage situation in Australia is another example. It was an attack on a soft target, a target that would not fit the "traditional" profile of being highly visible or connected to government or military operations, carried out by an individual espousing extremist beliefs but acting essentially alone.

Who remembers the pipe bombs placed in mailboxes throughout the American Midwest during spring 2002? A total of 18 bombs were placed with six of those exploding (injuring four U.S. Postal Service mail carriers and two residents) and 12 others discovered without exploding. Until the suspect was apprehended, how many of us changed our routine for something as mundane as getting the mail because, suddenly, that everyday activity had become potentially deadly?

You could say the same thing about the anthrax attacks in fall 2001. Letters containing a very specific strain of B. anthracis were mailed to several U.S. senators as well as to media outlets in New York City and Boca Raton, Fla. Twenty-two people contracted anthrax, five fatally, with another 31 testing positive for exposure and more than 10,000 people categorized as at risk. Again, what had been a routine task we never thought twice about (opening our mail) had suddenly become potentially life-threatening.

This is the new, evolving face of terrorism: nontraditional terrorism. Main Street terrorism.

We're good at stopping the big stuff, and we're getting better at that all the time. We've worked hard and made significant improvements to physical security and other counterterrorism measures at what have always been considered attractive potential targets: airports, government buildings, sporting venues, etc. But what about the "small" stuff? What about the attacks that strike fear into our hearts and change the minutiae of our daily routines not because of their scope, scale or complexity, but because of their abject brutality and random nature?

There is a lot of news coverage about the possibility of Americans traveling to Iraq and Syria to join with ISIS, and then returning to the U.S. better trained to carry out an attack here on our soil. Is that happening? In all probability yes, but the fact remains that a person doesn't have to travel halfway across the world, join in an armed conflict and then return here to pose a legitimate threat.

Instead, they decide that their role in jihad is to drive their car at high speed through a school playground at recess time, or to open fire at a crowded city bus stop or at the crowd around an airport baggage pickup carousel (because let's face it, even though you have to pass through multiple layers of mutual-supportive security to board an aircraft, you don't have to do much to get to baggage claim). And because the "conspiracy" to commit that type of attack remains in the mind of the attacker, relying on traditional methods and sources of intelligence is going to be of limited value. If an attacker doesn't engage in social media, or text or email — if none of the "chatter" exists — then our capabilities in data monitoring and collection are nullified.

It's an ugly subject — the thought that terrorism has become so commonplace that we can categorize it as traditional or nontraditional — but that appears to be more and more the case. +



JIM SHARP IS THE VICE PRESIDENT AND CHIEF TRAINING OFFICER FOR AEGIS EMERGENCY MANAGEMENT.



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